

DIRTY GENES

A Breakthrough Program to Treat the Root
Cause of Illness and Optimize Your Health

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Are Your Dirty Genes Creating These Problems for You?

Brain and Mood Issues

- ADD/ADHD
- Anxiety
- Brain fog
- Depression
- Fatigue
- Insomnia and sleep problems
- Irritability
- Memory problems

Cancer

- Breast cancer
- Ovarian cancer
- Stomach cancer

Cardiovascular Issues

- Atherosclerosis
- Heart disease
- Hypertension
- Stroke
- Triglyceride elevation

Female Hormone Issues

- Menopause difficulties
- Menstrual challenges—cramps, excessive bleeding, mood and cognition difficulties
- Menstrual migraines
- PMS

Fertility and Pregnancy Issues

- Difficulty getting pregnant
- Difficulty carrying to term
- Increased risk of birth defects

Gland and Organ Issues

- Fatty liver and other liver dysfunction
- Gallstones

- Small intestine bacterial overgrowth (SIBO)
- Thyroid dysfunction

Metabolism Issues

- Food cravings, especially for sweets and carbs
 - Obesity and weight gain
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Are Your Genes Dirty? Some Common Symptoms

- Aching joints and/or muscles
- Acid reflux/heartburn
- Acne
- Allergic reactions
- Anger and aggression
- Anxiety
- Attention issues
- Blood sugar spikes and crashes
- Brain fog
- Cold hands and feet
- Constipation
- Cravings, especially for carbs and sugar
- Depression
- Diarrhea
- Edginess
- Fatigue
- Fibromyalgia
- Food intolerance
- Gallstones
- Gas and bloating
- Headache/migraine
- Heart racing
- Indigestion
- Insomnia
- Irritability
- Itchy skin
- Menopause/perimenopause symptoms
- Mood swings
- Nosebleeds
- Obesity/weight gain
- Obsessiveness
- Overreactive startle reflex

- PMS / difficult periods
 - Polycystic ovarian syndrome (PCOS)
 - Rosacea
 - Runny nose / congestion
 - Sweating
 - Unexplained symptoms—just “not feeling right”
 - Workaholism
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Meet Your Dirty Genes

Here are the seven genes—I call them the Super Seven—that we target in this book. I chose them because they're extremely common, have been well researched, and have the most far-reaching effects on your body. If these guys are dirty—whether born dirty or just acting dirty—the rest of your genes will be gunked up, too. Some dirty genes are hard to scrub. Not these seven. They are easily cleaned up through diet and lifestyle changes.

Being born with dirty genes has an upside as well as a downside. Born-dirty genes might put you at risk for some nasty health challenges—but they also help to shape your personality, activating strengths as well as weaknesses. Your goal is to work with diet, chemical exposure, and lifestyle to maximize the benefits while minimizing the drawbacks.

① MTHFR, the methylation master gene

This gene initiates your ability to *methy*late, a key process that affects your stress response, inflammation, brain chemistry, energy production, immune response, detoxification, antioxidant production, cell repair, and genetic expression.

When MTHFR is born dirty:

Strengths: intensity, alertness, productivity, focus, improved DNA repair, decreased risk of colon cancer

Weaknesses: depression, anxiety, autoimmunity, migraines, increased risk of stomach cancer, autism, pregnancy complications, Down syndrome, birth defects, and cardiovascular conditions such as heart attack, stroke, and thrombosis

② COMT, the gene whose SNPs help determine whether you're focused and buoyant, or laid-back and calm

COMT and its SNPs have powerful effects on mood, focus, and how your body handles estrogen, a key factor in the menstrual cycle, in fibroids, and in some estrogen-sensitive cancers.

When COMT is born dirty:

Strengths: focus, tons of energy and alertness, good spirits, glowing skin

Weaknesses: irritability, insomnia, anxiety, fibroids, increased risk of estrogen-sensitive cancers, test anxiety, neurological disorders, migraines, PMS, impatience, vulnerability to addictions

③ **DAO, the gene whose SNPs can make you supersensitive to certain foods and chemicals**

When this gene is dirty, it affects your response to the histamine that lurks in various foods and beverages and that's also produced by some gut bacteria, affecting your likelihood of food sensitivities and allergic reactions.

When DAO is born dirty:

Strengths: immediate awareness of allergens and trigger foods (so you can get them out of your diet before they cause serious long-term problems)

Weaknesses: food sensitivities, pregnancy complications, leaky gut syndrome, allergic reactions, the risk of more serious conditions such as autoimmunity

④ **MAOA, the gene that affects mood swings and carb cravings**

This gene helps govern your levels of dopamine, norepinephrine, and serotonin: key brain chemicals that affect mood, alertness, energy, vulnerability to addictions, self-confidence, and sleep.

When MAOA is born dirty:

Strengths: energy, self-confidence, focus, “highs” of productivity and joy

Weaknesses: mood swings, carb cravings, irritability, headaches, insomnia, addictions

⑤ **GST/GPX, the gene(s) that can create detox dilemmas**

A dirty GST or GPX affects your body's ability to rid itself of chemicals.

When GST/GPX is born dirty:

Strengths: immediate awareness of potentially harmful chemicals (before they have the chance to make you really sick), improved response to chemotherapy

Weaknesses: supersensitivity to potentially harmful chemicals (with responses ranging from mild symptoms to serious autoimmune disorders and cancers), increased DNA damage (which increases the risk of cancer)

⑥ **NOS3, the gene that can create heart issues**

NOS3 affects your production of nitric oxide, which is a major factor in heart health, affecting such processes as blood flow and blood vessel formation.

When NOS3 is born dirty:

Strengths: decreased blood vessel formation (angiogenesis) during cancer, which reduces the growth of cancer

Weaknesses: headaches, high blood pressure, vulnerability to heart disease and heart attack, dementia

⑦ **PEMT, the gene that supports your cell membranes and liver**

This gene affects your body's ability to produce phosphatidylcholine, an essential compound that you need to maintain cell membranes, bile flow, muscle health, and brain development.

When PEMT is born dirty:

Strengths: more support for methylation, better response to chemotherapy

Weaknesses: gallbladder disorders, small intestine bacterial overgrowth (SIBO), pregnancy complications, cell membrane weakness, muscle pain

What Dirties Up Your Genes?

Diet

- Too many carbs
- Too much sugar
- Too much protein
- Not enough protein
- Not enough healthy fat
- A shortage of nutrients that your genes need to work properly, such as B vitamins, vitamin C, copper, and zinc

Exercise

- Sedentary lifestyle
- Overtraining
- Electrolyte deficiency
- Dehydration

Sleep

- Not enough deep, restorative sleep
- Going to bed late, getting up late
- Irregular sleep patterns

Environmental Toxins

- “Dirty” food
- “Dirty” water
- “Dirty” air—including indoor air
- “Dirty” products: sprays, cleaners, cosmetics, paints, pesticides, herbicides

Stress

- Physical stress: long-term illness, chronic infections, food intolerance/allergies, insufficient sleep
 - Psychological stress: issues at work, at home, with your loved ones, with life
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The Clean Genes Protocol: How You Can Clean Your Genes

Following is your Clean Genes Protocol—a lifelong program to keep your genes clean as you optimize your health. Although you may periodically add in Spot Cleaning from the second step of the program, this is the approach to diet and lifestyle that will best support your genes for the rest of your life.

In this chapter the Clean Genes Protocol is outlined in broad brush strokes, as an introduction. Fear not, though: in later chapters, we'll address all the components—diet, exercise, and so on—in greater detail.

Diet

- Eat appropriate amounts of protein and healthy fat.
- Make sure to get all the nutrients that your genes need to work properly, such as B vitamins, vitamin C, copper, and zinc.
- Cut out cow's milk dairy, gluten, excess carbs, and white sugar.
- Avoid foods high in pesticides, herbicides, preservatives, and/or artificial ingredients.
- Avoid fermented foods, leftovers, or food that's likely to contain excess bacteria if you find they trigger symptoms.
- Avoid foods that are high in histamines: wine, some types of cheese, and smoked and/or preserved meat and fish if you're particularly susceptible.
- Eat in moderation: stop eating when you're 80 percent full.
- Avoid snacks and late-night meals.

Exercise

- Get the right amount of exercise for your body—not too much and not too little.
- Exercise when you're rested and only until you're pleasantly tired. Don't exhaust yourself, and don't force it.

- Exercise when it doesn't negatively impact your sleep. Don't skimp on sleep to exercise; don't exercise later in the evening if it keeps you from falling asleep.

Sleep

- Make trying for deep, restful sleep a priority.
- Consistently match your sleep schedule to nature's circadian rhythms: asleep by 10:30 P.M., awake seven to eight hours later.
- Avoid electronic screens in the hour before bed.
- Block out or turn off artificial lights. Natural moonlight is great.

Environmental Toxins

- Eat organic food or at least avoid the "dirtiest" conventional foods.
- Filter the water you use for drinking, cooking, and bathing.
- Avoid the use of household and garden chemicals.
- Avoid all plastic containers for your food and water, especially BPA plastic and especially in the microwave. Ideally, store and cook foods only in glass or stainless steel.
- Follow guidelines to keep indoor air clean, bearing in mind that indoor air is often more toxic than the air outdoors.

Stress

- Attend to sources of physical stress: long-term illness, chronic infections, food intolerances/allergies, insufficient sleep.
 - Reduce and relieve psychological stress: issues at work, at home, with your loved ones, with life.
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Marvelous Methylation

Methylation produces many key chemicals, including:

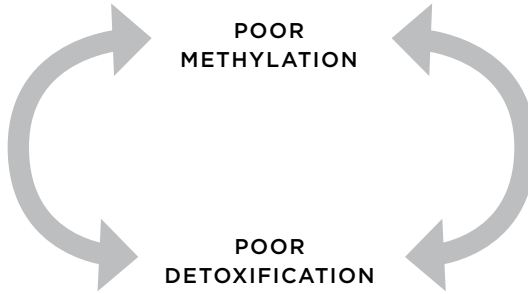
- Phosphatidylcholine
 - to produce cell membranes, enabling your cells to absorb nutrients and repel harmful ingredients
 - to produce bile, which helps you absorb fat and fat-soluble vitamins, and which keeps excess bacteria from growing in your small intestine
- Creatine, essential for brain and muscle function
- Norepinephrine and epinephrine, for energy, attention, and alertness
- Melatonin, for easing you into sleep
- Carnitine, for fat burning and energy
- Polyamines, for regulating your immune system

Methylation reduces many key chemicals, including:

- Histamine, which contributes to asthma, migraines and other headaches, insomnia, mania, allergies, and skin disorders
 - Estrogen, which at high levels can contribute to acne, irritability, heavy menses, and cancer
 - Dopamine and norepinephrine, which at high levels increase headaches, irritability, and stress
 - Arsenic, high levels of which occur in many common foods and beverages (including water, apple juice, chicken, and rice), contributing to muscular weakness, tingling, and brown spots on skin
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Exposure to Harmful Chemicals

As Keri found out in chapter 1, chemical exposure can be overwhelming. If your body is staggering under a huge chemical burden, your genes are going to be frantically trying to compensate for the strain. Methylation will suffer as a result. And now, sad to say, you've got another vicious cycle:



Other Common Barriers to Methylation

- Alcohol
 - Antacids
 - Heavy metals
 - Infections
 - Inflammation
 - Intestinal yeast overgrowth
 - Nitrous oxide
 - Oxidative stress (caused by free radicals)
 - Small intestine bacterial overgrowth (SIBO) and other gut infections
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How Your Clean Genes Protocol Supports Methylation

- A diet rich in methyl donors and the vital nutrients that your genes need to complete methylation—without the packaged foods that contain folic acid
 - The right type and amount of exercise
 - Deep, restful sleep
 - Avoidance of industrial chemicals and heavy metals; support for detoxification
 - Stress reduction and stress relief
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The Super Seven: A Snapshot

- MTHFR supports *methylation*, a crucial process that enables more than two hundred of your body's vital functions, including genetic expression.
- COMT affects metabolism of *dopamine*, *norepinephrine*, and *epinephrine*, affecting your mood, energy level, ability to calm down, ability to sleep, and ability to focus; it also affects *estrogen metabolism*, which governs your body's estrogen levels and hormonal balance, affecting your experience of the menstrual cycle and menopause, and increasing your vulnerability to female cancers.
- DAO affects your body's response to *histamine from food and bacteria*, which in turn affects your vulnerability to allergy symptoms and food intolerance.
- MAOA affects your relationship to *dopamine*, *norepinephrine*, and *serotonin*, governing your mood, energy level, and ability to sleep, as well as sugar and carb cravings.
- GST/GPX enables *detoxification*, your body's ability to rid itself of harmful chemicals from the environment and to expel harmful biochemicals produced by your own body.
- NOS3 affects *circulation*, which helps determine your cardiovascular health and your vulnerability to heart attack, circulatory issues, and stroke.
- PEMT affects your *cell walls*, *brain*, and *liver*, determining a wide range of health issues including pregnancy problems, gallstones, fatty liver, digestive problems, SIBO, attention problems, and menopause.

Profiles and Personalities

Any one gene is just a single factor in your genetic profile—let alone in your entire personality. But to give you some idea of how your genetic profile might help shape your temperament, here are some quick personality sketches that I've observed in conjunction with the seven key genes when they're dirty:

MTHFR

Some days you're blue and depressed, while other days you're anxious. On good days, your focus is great and you get stuff done. On bad days, you have performance anxiety, a hair-trigger temper, and/or headaches—or maybe you just feel grumpy. After eating a salad you tend to feel great, but you've never paid attention to that because, after all, it's just a salad.

COMT (Slow)

Man, you're on fire! ADHD?—not in this house. You're cranking away on several projects and already eager for the next one or five. As you lie down to sleep, you're still cranking away. After tossing and turning, you finally doze off, dreaming of tomorrow's tasks. Tomorrow arrives. Coffee is needed. Once again, you're off and running. You put pressure on yourself, and if you're not accomplishing what you need to, anxiety sets in, so you focus harder to get everything done. And you *do* get it done. Your colleague makes fun of you for working overtime on a particular project, and you snap at her. As usual, you're quick to be irritated. In addition, sometimes you have an extreme sensitivity to pain and can be plagued with headaches.

COMT (Fast)

Look at that blinking light! Did you see that dog over there? Man, I wish I could read a book, but I just can't focus. You're always jumping from one task to another, and it's hard to get much done. Friends have suggested that you might have ADHD. You also love shopping and buying new things! The problem is, you feel great buying them, but the next day

the “shopping high” wears off, and you find that you need to buy something else or you start feeling blue. It’s getting expensive and time-consuming. Oh—and hugs! They’re awesome! The more hugs you get, the better you feel.

DAO

You are so tired of not knowing what you can and can’t eat. One meal you’re good, and the next you feel awful: throbbing head, irritable mood, sweaty body, racing heart, itchy skin, bleeding nose. Perhaps you’ve even spent a ton of money on food allergy testing—and found nothing! So frustrating. You keep limiting your foods one by one in hopes of identifying the culprit, but it’s a never-ending battle.

GST/GSX

Ever since you figured out that chemicals and smells make you feel sick, you’ve been on a mission to get rid of such stuff from your home. That neighbor of yours is using scented dryer sheets—again! Those give you a headache within seconds. Your friends wonder why you’re such a clean freak. But you know that you’re tuned in and sensitive to these things because you have to be.

MAOA (Fast)

Carbs. CARBS! Pleease, get me some of those! Your grocery cart looks like you work for the grain and chocolate industry! You feel so great eating carb-laden foods. You know you shouldn’t, but when you don’t, you feel blue. The problem is, eating carbs picks you up only for a moment or two; then you crash. So what do you do then? You eat more carbs. You try diet after diet, but they just make you feel depressed. You’re sick of gaining weight, but you feel stuck in that pattern. You don’t want to be on antidepressants, but you feel like you can’t keep going this way.

MAOA (Slow)

You’re easily startled and quick to become anxious or irritated. You can become aggressive and later feel bad for overreacting. You just can’t seem to help it. You always have to watch out for headaches, especially when you

eat cheese or chocolate and drink wine. Falling asleep at night is always tough, but once you do, at least you sleep soundly through the night.

NOS3

You're freaking out. Your dad, uncle, grandma, and grandpa all had significant heart problems when they were around fifty years old, and now you're getting there. Your doctors check your heart and say it looks okay—but are they checking everything they need to, or are they missing something? Your hands and feet are constantly cold, but your doctors say that's nothing to worry about. You need answers, because this family history is weighing on you.

PENT

Ever since you switched to a vegan or vegetarian diet, you've felt just a bit off. Your mind isn't as sharp, you're forgetting things, and you've got aches and pains all over your body. As an omnivore, you felt good overall, though you did have some aches and pains. Your liver felt heavy then, and it still does—just under your right-side ribcage. Fatty foods just don't sit right with you either. Now your doctor has said that you have gallstones and need to have your gallbladder taken out. No! There must be a way to save it.

Laundry List 1: Which of Your Genes Need Cleaning?

This is an exciting moment for you. You're about to run through your first Laundry List of symptoms so that you can see which of your genes might be dirty.

Remember, you don't know which dirty genes were *born* dirty and which are simply *acting* dirty. Before we can begin blaming things on our genes, we need to see if our lifestyle, diet, nutrition, mindset, and environment (both indoor and outdoor) are influencing their function.

Let's get started.

Laundry List 1

No one else will see your answers here. Only you. Be absolutely honest. The goal of this exercise is to identify which genes are dirty so that you can make significant and strategic changes for the better.

If you're like me, your first impression might be, "Oh, I'm a mess!" But do as I have learned to do—reframe that negative thought into one that's both more positive and more accurate: "Wow! I have so much potential that I didn't know I could tap into!"

Check each box if the condition has occurred frequently within the last sixty days or is generally true:

MTHFR

- I suffer from headaches.
- I sweat easily and profusely when exercising.
- I take supplements with folic acid and/or eat foods enriched with folic acid.
- I struggle with depression.
- I have cold hands and feet.

DAO

- I tend to suffer from one or more of the following symptoms after eating leftovers, citrus, or fish: irritability, sweatiness, nosebleeds, runny nose, and/or headache.
- I'm sensitive to red wine or alcohol.
- I'm sensitive to many foods or suffer from leaky gut syndrome.
- I generally feel better two or three hours after a meal as compared to twenty minutes after eating.
- I felt better during pregnancy and could eat more varied foods.

COMT (slow)

- I get headaches.
- I find falling asleep a challenge.
- I easily become anxious or irritable.
- I suffer from PMS.
- I'm sensitive to pain.

COMT (fast)

- I struggle with attention and focus.
- I'm easily addicted to substances or activities: shopping, gaming, smoking, alcohol, social media.
- I'm prone to feelings of depression.
- I often lack motivation.
- I feel an initial happy rush after eating lots of carbs or starchy foods, but feelings of depression return quite quickly.

MAOA (slow)

- I'm easily stressed, panicked, or made anxious.
- I find it hard to calm down after becoming stressed or irritated.
- I enjoy cheese, wine, and/or chocolate but tend to feel irritable or "off" after I eat them.
- I'm plagued by migraines or headaches.
- I have difficulty falling asleep; but when I do, I tend to stay asleep.

MAOA (fast)

- I fall asleep quickly but wake up earlier than I'd prefer.
- I'm prone to depression and a lack of desire.
- I find that chocolate gives me a great mood lift.
- I tend toward smoking or alcohol addiction (or excessive use).
- I achieve a better mood after eating carbohydrates, but that improved mood doesn't help my focus or attention.

GST/GPX

- I breathe air and drink water. (Yes, you read that right! This gene is at least a little bit dirty in all of us these days.)
- I'm sensitive to chemicals.
- I developed gray hair early.
- I have a chronic condition such as asthma, inflammatory bowel disease, autoimmune disease, diabetes, eczema, psoriasis.
- I have a neurological disorder that results in symptoms such as tics, tremors, seizures, or problems with gait.

NOS3

- I have above-normal blood pressure (higher than 120/80).
- I have cold hands and feet.
- I tend to heal slowly after an injury or surgery.
- I'm a type 2 diabetic.
- I'm postmenopausal.

PEMT

- I tend to have generalized muscle pain.
- I've been diagnosed with fatty liver.

- I'm a vegetarian/vegan, or I don't eat much beef, organ meat, caviar, or eggs.
- I have gallstones or have had my gallbladder removed.
- I've been diagnosed with small intestine bacterial overgrowth (SIBO).

Scoring

Create a separate score for each gene, awarding one point per question:

- 0 points: Excellent! This gene is likely quite clean and functioning well!
- 1 point: Quite impressive! Your gene needs a bit of attention, but most likely because of problems in other genes rather than this particular one.
- 2 points: This gene seems to be a bit dirty. Fortunately, the Clean Genes Protocol will be a good first step in cleaning out the gunk. Cleaning the rest of your Super Seven will also help this gene function better.
- 3–5 points: This gene is definitely dirty. Two weeks on the Clean Genes Protocol will give you a great start. When you run through Laundry List 2, you can see whether this gene needs some extra attention.

My Score

MTHFR _____

MAOA (fast) _____

DAO _____

GST/GPX _____

COMT (slow) _____

NOS3 _____

COMT (fast) _____

PEMT _____

MAOA (slow) _____

Your MTHFR in Action

Dirty MTHFR genes are probably the most common of all the SNPs. You've already taken Laundry List 1, so you have a good idea whether your MTHFR is dirty, but here are a few more ways to track down a dirty MTHFR:

- I'm hypothyroid.
- My white blood count (WBC) has been on the low end of the normal range most my life.
- I get strong side effects from laughing gas (nitrous oxide).
- I had to have IVF or significant interventions in order to become pregnant and go to full term.
- One or more of my children are on the autism spectrum.
- One or more of my children have Down syndrome.
- My doctors say I don't tolerate medications such as methotrexate, 5-fluorouracil, or phenytoin as well as other patients.
- I get menstrual cramping and have clots in my menstrual fluid.
- My homocysteine levels are routinely high—above 12 micromoles per liter.
- My folate and/or vitamin B₁₂ levels are elevated.
- I can't tolerate alcohol of any type well.
- I don't eat leafy green vegetables every day.
- I feel noticeably better after eating leafy greens.

MTHFR: The Basics

Primary function of the MTHFR gene

The MTHFR gene initiates the Methylation Cycle, a process that provides methyl to at least two hundred functions in your body.

Effects of a dirty MTHFR

Your entire Methylation Cycle is disrupted, affecting antioxidant production, brain chemistry, cell repair, detoxification, energy production, genetic expression, immune response, inflammation, and many other crucial processes.

Signs of a dirty MTHFR

Common signs include anxiety, brain fog, chemical sensitivity, depression, irritability, and a hair-trigger temper.

Potential strengths of a dirty MTHFR

Potential strengths include alertness, decreased risk of colon cancer, stellar focus, good DNA repair, and productivity.

Health Conditions Related to a Dirty MTHFR

Following are some of the disorders that researchers have associated with MTHFR SNPs. However, remember those Italians, who are typically healthy *in spite of* their SNPs! Genetics is not destiny, and the right diet and lifestyle go a long way toward keeping you fully healthy.

General Conditions

- Alzheimer's disease
- Asthma
- Atherosclerosis
- Autism
- Bipolar disorder
- Bladder cancer
- Blood clots
- Breast cancer
- Chemical sensitivity
- Chronic fatigue syndrome
- Down syndrome
- Epilepsy
- Esophageal squamous cell carcinoma
- Fibromyalgia
- Gastric cancer
- Glaucoma
- Heart murmurs
- High blood pressure
- Irritable bowel syndrome
- Leukemia
- Male infertility
- Methotrexate toxicity
- Migraines with aura
- Multiple sclerosis
- Myocardial infarction (heart attack)
- Nitrous oxide toxicity

- Parkinson's disease
- Pulmonary embolisms
- Schizophrenia
- Stroke
- Thyroid cancer
- Unexplained neurologic disease
- Vascular dementia

Pregnancy- and Birth-Related Complications

- Cervical dysplasia
- Miscarriages
- Placental abruption
- Postpartum depression
- Preeclampsia

Birth Defects

- Anencephaly
 - Cleft palate
 - Congenital heart defects
 - Hypospadias
 - Spina bifida
 - Tongue-tie
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What Makes MTHFR Dirty?

- Inadequate methylfolate (methylated vitamin B₉), methylcobalamin (methylated vitamin B₁₂), or riboflavin (vitamin B₂)
 - Exposure to industrial chemicals
 - Psychological stress
 - Physical stress
 - Hypothyroidism
 - Folic acid
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Riboflavin: A Crucial Nutrient

Riboflavin is crucial to the function of your MTHFR gene. Without it, your MTHFR can't function properly. What's more, a dirty MTHFR needs even more riboflavin than a clean one.

Long story short: make sure you're getting enough riboflavin in your diet, through such foods as spinach, almonds, and liver. Otherwise, your MTHFR won't be able to initiate the Methylation Cycle, and your whole body will suffer.

Key Nutrients for a Healthy MTHFR and Methylation Cycle

Here are some of the key nutrients that your MTHFR and your Methylation Cycle need to work properly:

Riboflavin/B₂: liver, lamb, mushrooms, spinach, almonds, wild salmon, eggs

Folate/B₉: green vegetables, beans, peas, lentils, squash

Cobalamin/B₁₂: red meat, salmon, clams, mussels, crab, eggs (vegans and vegetarians, you guys have to supplement)

Protein: animal sources including beef, lamb, fish, poultry, eggs, and dairy; vegan/vegetarian sources including beans, peas, lentils, broccoli, nuts, seeds

Magnesium: dark leafy greens, nuts, seeds, fish, beans, avocados, whole grains

Reasons You Might Be Low in Cobalamin/B₁₂

- Vegan/vegetarian diet
 - Omnivore diet lacking enough meat, poultry, eggs, and fish
 - High stress
 - Antacid use
 - *Helicobacter pylori* (or *H. pylori*), a type of bacterium that can proliferate in the intestine
 - Pernicious anemia (an autoimmune disease)
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Making the Most of MTHFR

As I lay out the Clean Genes Protocol, you're going to learn everything you need to know about how to support your MTHFR gene, whether it was born dirty or is only acting dirty. Luckily, I've had years of personal practice in supporting this gene, for me and for my three sons (as well, of course, as for my many clients). I'll happily share with you our keys to balance.

Meanwhile, if you think your MTHFR was born dirty, here are a few suggestions to get you started. You can get moving on the following suggestions as soon as you like, even before you start the Soak and Scrub:

- Know that your moods will naturally ebb and flow, and don't let mood swings throw you. Recognizing your varied nature will help you be more okay with feeling blue one day and anxious the next. Our goal is to get you more of those good focused and productive days—and we can.
- Folic acid is your enemy. And it's everywhere—supplements, energy bars, foods, drinks. Cut it out of your life. Right now.
- Filter your drinking water. By removing arsenic, chlorine, and other unwanted chemicals from your water, you reduce the work your dirty MTHFR has to do.
- Leafy green vegetables are key for you. Eat them. Often.
- Make sure you're getting enough B₁₂. Eat sufficient beef (grass-fed only), lamb, eggs, crab, clams, and dark-meat fish. Vegetarians and vegans need to check out the Clean Genes Protocol for instructions on how to ensure adequate dietary choline and/or methylated B₁₂.
- In many cases, you'll want to avoid cow's milk dairy entirely. Food allergies and/or sensitivities to dairy produce antibodies that can clog your folate receptors. Goat's and sheep's milk products are usually fine—unless you have an autoimmune disease—and cow's milk products *may* be okay after you've cleaned up your diet and healed your gut.

How the Clean Genes Protocol Supports Your MTHFR and Your Methylation Cycle

Diet. By loading up on leafy greens, you compensate for the methylfolate that a dirty MTHFR can't easily produce on its own. By avoiding folic acid, you ensure that your folate receptors remain open to methylfolate and keep your MTHFR as clean as possible. By getting a range of other nutrients—especially B vitamins, protein, and magnesium—you're ensuring that your Methylation Cycle has all the nutrients it needs, which is crucial both for your MTHFR's function and for your overall health.

Chemicals. By avoiding exposure to industrial chemicals and heavy metals, you're keeping your MTHFR as clean as possible while significantly easing the burden on your Methylation Cycle; in addition, to the benefit of your overall health, without those chemicals your body can methylate more homocysteine, because less is needed for glutathione. By reducing or avoiding alcohol and avoiding nitrous oxide, you're also keeping your MTHFR as clean as possible while easing the burden on your Methylation Cycle.

Stress. Deep, restorative sleep is your best friend here—it's the best stress-reducer I know! Along with other types of stress relief on the Clean Genes Protocol, sleep will lighten the burden on your MTHFR as well as on your Methylation Cycle.

COMT: The Basics

Primary function of the COMT gene

The COMT gene affects the way you metabolize estrogen, catechols from food and drink, and the stress neurotransmitters dopamine, norepinephrine, and epinephrine.

Effects of a dirty COMT

Slow COMT. You may not be able to clear catechols, estrogen, dopamine, norepinephrine, and epinephrine from your system. As a result, they remain in your system longer than they should, with a variety of physical and psychological effects.

Fast COMT. You clear catechols, estrogen, dopamine, norepinephrine, and epinephrine from your system *too* efficiently. As a result, they leave your system sooner than they should, with a variety of physical and psychological effects.

Signs of a dirty COMT

Slow COMT. Common signs include buoyancy, confidence, energy, enthusiasm, strong sexual function, estrogen issues (PMS, menstrual issues, fibroids, risk of female cancers), irritability, pain intolerance, sleep difficulties, trouble relaxing or powering down, workaholism, and sensitivity to caffeine, chocolate, and green tea.

Fast COMT. Common signs include excessive sense of calm, good-temperedness, lack of sleep difficulties, effective stress response, pain tolerance, difficulty completing tasks, difficulty focusing, forgetfulness, lack of confidence or optimism, low energy, menopause/perimenopause challenges, and reliance on caffeine, chocolate, and green tea.

Potential strengths of a dirty COMT

Slow COMT. Potential strengths include altruism, energy, enthusiasm, exuberance, focus, generosity, and productivity.

Fast COMT. Potential strengths include ability to relax, acceptance of others, broad focus, calm, high tolerance for stress, restful sleep, and a wide range of interests.

Meet Your Dirty COMT

You've already run through Laundry List 1, so by now you have a sense of whether you have a dirty COMT. But just to help you paint a fuller self-portrait, here are a few more traits associated with slow and fast COMTs. Do you recognize yourself in either category?

Slow COMT

- I've always been able to focus and study for long hours.
- I enjoy traveling and exploring.
- I tend to be a workaholic.
- When I get stressed, it takes me a long time to calm down.
- I tend to work hard for weeks, then crash and need to take a long break to recharge.
- I get anxious and panicky easily.
- I find that caffeine often increases my stress.
- I'm easily irritated. I wake up on the wrong side of the bed often.
- I have strong bones.
- It takes me a long time to fall asleep.
- My skin glows and people compliment me on it.
- I had early menarche.
- I usually get PMS.
- I experience heavy menstrual bleeding (menorrhagia).
- I have or have had uterine fibroids.
- I'm sensitive to pain compared to others.
- Eating a higher-protein diet (such as Gut and Bowel Syndrome [GAPS] or Paleo) makes me feel more irritable.
- I do poorly with central nervous system (CNS) stimulant medications such as Ritalin, Adderall, Vyvanse, and Focalin.
- I do better with CNS calming medications such as Intuniv.

Fast COMT

- I have a difficult time paying attention. I'm a poster child for ADHD.
- I tend to go with the flow.
- I'm not a workaholic.
- When I get stressed, I recover quite quickly and move on.
- I fall asleep quickly.
- Where's my cup of coffee? I need it!
- Eating a higher-protein diet (such as GAPS or Paleo) makes me feel great.
- I tend to be more depressed than enthusiastic, and have been for years.
- I'm just not that excited about things.
- I had late menarche.
- I don't get PMS.
- I have (or had) typically light menses.
- I have weaker bones.
- I'm very tolerant of pain compared to others.
- I do better with CNS stimulant medications such as Ritalin, Adderall, Vyvanse, and Focalin.
- I do worse with CNS calming medications such as Intuniv.

Health Conditions Related to a Dirty COMT

Whether your COMT was born dirty or is just acting dirty, it can create problems for you if you don't clean it up.

Following are some of the disorders that researchers have associated with a dirty COMT.

Slow COMT

- Acute coronary syndrome
- ADD with hyperactivity
- Anxiety
- Bipolar disorder—especially mania
- Breast cancer

- Fibroids
- Fibromyalgia
- Panic disorder (especially in women)
- Parkinson's disease
- PMS
- Preeclampsia
- Schizophrenia
- Stress cardiomyopathy
- Stress-related hypertension
- Uterine cancer

Fast COMT

- ADHD—inattention, multitasking, inability to focus
 - Addictive disorders—whether to drugs, alcohol, gambling, shopping, or video games
 - Depression
 - Learning disability
-

Do Not Self-Medicate with SAME!

I know that the Internet is full of SAME success stories, making it seem like the miracle supplement of all time. And I'm not saying that you should never self-medicate with SAME. If you learn how it affects you and when it's safe to take it, and if you really have a deficit, it can be a wonder supplement. But if you don't look at the big picture, SAME can really mess you up.

One of my clients, a successful concert pianist, used to take SAME before bed to help her sleep. Since she had a slow COMT, some extra methylation helped her get the stress neurotransmitters out of her system. But if she took SAME on days when she *wasn't* stressed, she found herself tired, depressed, and crying all the time. On those days, speeding up her methylation got *too* many stress neurotransmitters out of her system!

I had another client who gave some SAME to her “behavior-problem” kid—and his problems got even worse. When she put her son on the Clean Genes Protocol, he calmed down and became more cooperative, simply because he was now eating well and sleeping soundly and getting the exercise that his body craved, while staying away from the video games and sweets and chemicals that dirtied up his genes. She had found a lifelong approach to diet and lifestyle that brought out the best in her son.

You get the idea. *Please* don't run out to the store and buy supplements first thing. Put those car keys down and wait to

complete your Soak and Scrub. If you do need supplements, you'll find out about it when you do your Spot Cleaning.

What Makes COMT Dirty?

Slow COMT

- Not enough SAMe
- Low homocysteine levels
- Excessive tea, coffee, and/or chocolate
- Too much stress, causing a buildup of stress neurotransmitters
- Excess weight or a diet high in animal fat, causing a buildup of estrogen
- Overexposure to xenoestrogens in plastics, personal-care products, or home and garden products, again causing a buildup of estrogen

Fast COMT

- Too much SAMe

Both Types of COMT

- Elevated homocysteine levels
 - Insufficient vital nutrients, especially folate/B₉, cobalamin/B₁₂, and magnesium, all of which are crucial for both methylation and COMT
 - A born-clean MTHFR that's acting dirty, or a born-dirty MTHFR that's not getting enough support
-

Key Nutrients for a Healthy COMT

As you saw in chapter 5, the Methylation Cycle depends upon a number of nutrients: riboflavin/B₂, folate/B₉, cobalamin/B₁₂, protein, and magnesium. Because your COMT depends on the Methylation Cycle, it also depends on those nutrients.

That final nutrient, magnesium, is especially important for your COMT to function properly. So if you don't have enough magnesium in your diet—and about 50 percent of all U.S. residents don't—you're going to dirty up your COMT.

Magnesium: dark leafy greens, nuts, seeds, fish, beans, avocados, whole grains

Besides dietary insufficiency, there are two common reasons for magnesium deficiency: caffeine intake and the long-term use of a group of antacids called proton pump inhibitors (PPIs). When we get to the specifics of the Clean Genes Protocol, I'm going to help you stop using both caffeine and antacids while offering you some alternatives to promote better digestion and alertness. I don't drink caffeine or take any type of medication. None. You won't need to either.

For Both Slow and Fast COMT

- Optimize your weight, because body fat creates estrogen, making it harder for your COMT to regulate estrogen levels.
- Avoid as much as possible any contact between your food and plastic. Plastics are *xenoestrogens*, meaning that they mimic the effects of estrogen in your body. Your COMT is already struggling to optimize your estrogen levels. Why dump a lot of extra estrogen into your system?
- The subgroup of BPA plastics are also xenoestrogens, so avoid them, too—even if they're not in contact with your food. BPA can be found in a discouraging number of places—everywhere from the inside of cans to the outside of cash-register receipts—but do what you can to stay away from it.
- Meditate at least a few minutes every day. If you're overcharged, meditation will calm you down. If you're undercharged, it will help you focus.
- Go to bed and get up according to a fixed routine to help your body get the most refreshing sleep. If you're wired, a regular bedtime helps cue your body toward sleep. If you're scattered and unfocused, a regular bedtime helps create a routine that encourages focus. A sleep app such as Sleep Cycle can help. (See the Resources section.)
- Avoid the herbicide Roundup, as it affects aromatase activity. (*Aromatase* is an enzyme that converts other biochemicals to estrogen.) Also avoid all nonorganic soy and soy products, which have likely been farmed with Roundup. More generally, limit your exposure to all herbicides, pesticides, and other endocrine-disrupting chemicals in your home, garden, and personal-care products, including cosmetics. Especially damaging are glyphosate, phthalates, and dioxins.
- Eat as clean as you can. Buy organic produce, at least for the foods that are most likely to be exposed to industrial chemicals. The Environmental Working Group (www.ewg.org) has a list of foods—the worst offenders when it comes to toxins—that you should buy organic, and a list of foods that you can buy conventionally farmed.

- To balance your estrogen levels, eat more beets, carrots, onions, artichokes, and cruciferous vegetables (broccoli, cauliflower, kale, brussels sprouts, cabbage). Bitter vegetables such as dandelion greens and radishes support the liver, which metabolizes your estrogen, so load up on them as well.
- Be sure to eat a maximum of three times a day—balanced meals that each contain some protein, some carbs, and some fats. This way your blood sugar is balanced, and so are your moods.
- Declutter your home, office, garage, yard, and car. The more “noise” you have around you, the more “noise” you have in your head. That’s the last thing you need! Keep things minimal and organized, and consider feng shui to order your environment.

For Slow COMT

- Monitor your stress levels throughout the day. Notice when you’re getting more revved up or tense than you enjoy being. Develop ways to slow down, even for a minute or two—take a few deep, slow breaths; listen to music; pause before each meal to appreciate the sights and scents of the food, so that when you start eating you’re relaxed and not stressed.
- Make sure you get all the breaks, days off, and vacations you need. You might *feel* like a superhero—and most of the time you might even act like one—but overexertion is your kryptonite. Listen to your body and rest as needed.
- Burn it off. Exercise or sport of any type is a great way to burn through excess stress neurotransmitters.
- Be aware of how you feel in response to caffeine, chocolate, and tea. If you’re feeling irritable or anxious from them, reduce your intake.

For Fast COMT

- Protein is your friend; sugar and refined flour are your enemies. Make sure to get high-quality protein at every meal—that is, organic protein that isn’t deep-fried or buried in a white-bread sandwich. If

you start the day with a starchy, low-protein breakfast, you're setting yourself up for a low-dopamine day, and your focus, motivation, and energy levels will suffer.

- Sleep is also your friend. During sleep your body makes more of everything you're short on—in the context of COMT, you need to give your body that time to make more dopamine. Everybody needs different amounts of sleep to function well. Figure out what *you* need and make sure to give yourself that advantage every day.
- Participate in brain-engaging activities like dancing, playing an instrument, sports, fast board games (not boring slow ones), and yes, even some video games. (Don't go overboard on the latter—they can be addictive and sometimes *too* stimulating.)
- Hugs! Hugs raise dopamine.
- While caffeine and chocolate may be helping you, don't overly rely on them: try the above suggestions instead. If you sleep well, eat right, participate in engaging activities, and get hugs, your need for stimulants from food and drink will go way down.

How the Clean Genes Protocol Supports Your COMT

Diet. Eating balanced meals up to three times a day will support your blood sugar and take some pressure off your COMT. (Constant snacking, by contrast, stresses your COMT and makes it even dirtier.) Eating only until you're 80 percent full also supports your COMT; eating until you're full, let alone stuffed, stresses all your genes. On the Clean Genes Protocol, you'll also get all the nutrients you need to support your Methylation Cycle and your COMT, because your diet will include lots of B vitamins and magnesium, as well as the right amount of protein—neither too much nor too little.

Chemicals. Avoiding industrial chemicals will lighten the burden on your liver, where estrogen is metabolized. Adding in sauna, hot yoga, Epsom salt baths, or any means of sweating is a fantastic way to support your liver and move toxins out of your body. We all have them—so we all need to detox.

Stress. Stress relief is a huge component of the Clean Genes Protocol. You'll learn to identify your stressors—news, social media, problematic friends, office work on weekends, news-laden TV, depressing movies—and you'll work to eliminate them. I'll also encourage you to identify what your hobbies are, including long-lost activities you absolutely loved when you were younger. Rekindle them and enjoy yourself! Your COMT will thank you for it. For example, I'm done writing this chapter, so I'm going kayaking with my wife! Follow my lead and reward yourself!

DAO: The Basics

Primary function of the DAO gene

The DAO gene produces the DAO enzyme, which is found in most organs but is especially plentiful in your small intestine, prostate, colon, kidney, and placenta (when you have one). The DAO enzyme helps process a key biochemical called *histamine*.

Your body's supply of histamine exists in two places: within your cells and outside your cells. Your DAO gene is focused on expelling the histamine that lives outside your cells, mainly in your gut.

- Some of that histamine is produced by the bacteria that live in certain foods, such as fermented foods, cured meat, and aged cheese.
- Certain probiotics, such as many species of *Lactobacillus*, produce histamine.
- Certain gut bacteria produce high amounts of histamine.
- Some histamine is produced by your own immune system in response to stress and to potential dangers from the foods you eat.

The right amount of histamine helps keep you healthy, but too much can overexcite your immune system, causing it to overreact to certain foods and even to your own tissues.

Effects of a dirty DAO

You tend to overreact to the histamine in your gut. As a result, you're more likely to develop food sensitivities and allergic reactions.

You might also *absorb* the histamine in your gut, which means it gets into your blood and then into your cells. When your cellular histamine is too high, you're vulnerable to neurological disorders such as Parkinson's disease.

Signs of a dirty DAO

Common signs include allergic reactions (such as hives,

runny nose, and itchiness) and food sensitivities, car sickness and seasickness, leaky gut, migraine, nausea/indigestion, pregnancy complications, and SIBO.

Potential strengths of a dirty DAO

It's an advantage to be aware of allergens and trigger foods right away, before they have the chance to make you sick.

Meet Your Dirty DAO

I know firsthand that a dirty DAO is no picnic. For as long as I can remember, I struggled with delayed symptoms after eating—symptoms that didn't show up for anywhere between twenty minutes and two hours after I had finished a meal. This time lag made it difficult to associate the symptoms with my food choices—especially since the symptoms were so varied. Maybe my pulse would start racing. Sometimes I'd get irritable, or hot, or my feet would start to sweat. (*What???*) I might develop patches of eczema on my neck, or maybe my nose would start to bleed. I might even have insomnia, unable to fall asleep with no idea what was keeping me up.

As you can imagine, I was miserable and frustrated. I was able to pinpoint a few problem foods—citrus fruits, wheat—and that helped a little. But not enough.

Years later, when I found out about dirty genes, I wasn't surprised to discover that I have a dirty DAO. I can enjoy *some* histamine-containing foods—I just can't overdo it. And now I know that if those pesky symptoms appear, they're probably the result of something I ate within two hours of when the symptoms showed up.

You've already run through Laundry List 1, so you've probably already figured out whether you have a dirty DAO. But here are a few more ways to track down this dirty gene:

- I'm often irritable, hot, or itchy after eating.
- I can't tolerate citrus, fish, wine, or cheese.
- If my skin gets scratched, it stays red for several minutes.
- I can't tolerate yogurt, sauerkraut, or kefir (a type of fermented milk).

- I can't tolerate shellfish.
- I can't tolerate alcohol, especially red wine.
- I can't tolerate chocolate.
- I have sweaty feet.
- I'm frequently itchy.
- I often get heartburn and frequently need an antacid.
- My eyes often itch.
- I have skin issues, such as eczema or urticaria (hives).
- I get frequent nosebleeds.
- I struggle with asthma or difficulty breathing.
- I get migraines or other headaches often.
- I get carsick, seasick, or generally feel dizzy.
- I have ringing in my ears at times, especially after eating.
- I seem to react to many foods.
- I've been told that I have leaky gut syndrome.
- I get diarrhea at times without any reason I can identify.
- I struggle with ulcerative colitis.
- I frequently have to take antihistamines.
- I frequently have a runny nose or am congested.
- I have trouble falling or staying asleep.
- I have blood pressure that's lower than 100/60.
- I struggle with asthma, exercise-induced asthma, or wheezing.
- I frequently have joint pain.
- I have arrhythmia.
- When I was pregnant, I could eat more foods than usual without symptoms.
- I get side effects from morphine, metformin, NSAIDs (medications like aspirin and ibuprofen), antacids, clonidine, isoniazid, pentamidine, and/or amiloride.

Health Conditions Related to a Dirty DAO

As we've seen, dirty genes can create health issues, whether those genes were born dirty or are simply acting dirty. Following are some of the disorders that researchers have associated with a dirty DAO.

- Anaphylaxis
 - Arrhythmia
 - Asthma/exercise-induced asthma
 - Conjunctivitis or keratoconjunctivitis
 - Duodenal ulcer
 - Eczema
 - Heartburn
 - Insomnia
 - Irritability
 - Irritable bowel disorders, including colon adenomas, Crohn's disease, and ulcerative colitis
 - Joint pain
 - Nausea
 - Parkinson's disease
 - Pregnancy-related complications
 - Psoriasis
 - Vertigo
-

High-Histamine Foods and Drinks

Here are some of the major histamine culprits:

- Aged cheeses
- Alcohol—all types, but especially champagne and red wine
- Bone broth
- Chocolate
- Citrus fruits and juices (except lemon, which is well tolerated by most)
- Cured meats: salami, some types of sausage, corned beef, pastrami, and the like
- Dried fruits
- Fermented foods, including yogurt, sour cream, kefir, raw sauerkraut, kimchi, pickles, and fermented vegetables
- Fish, especially smoked or canned; and certain types of fresh fish, especially when raw (as in sushi)
- Fruit juices
- Soured foods—for example, foods marinated in lemon or orange juice
- Tomatoes when raw; cooked are typically okay
- Spinach
- Vinegars (although some people do well with unfiltered, organic apple cider vinegar)

What Makes DAO Dirty?

- Too many histamine-containing foods.
 - Too many histamine-containing liquids.
 - Imbalanced microbiome.
 - Small intestine bacterial overgrowth (SIBO).
 - Disease or infection in the gut, caused by harmful bacteria, yeast (various *Candida* species), parasites, ulcerative colitis, Crohn's disease, and the like.
 - Certain medications—antacids, antibiotics, metformin, and MAO inhibitors.
 - An acidic diet.
 - A high-protein diet.
 - Gluten.
 - Food sensitivities.
 - Emotional/mental stress.
 - Chemotherapy.
-

Key Nutrients for a Healthy DAO

The two primary nutrients that your DAO gene needs to work properly are calcium and copper:

Calcium: kale, broccoli, watercress, sprouted grains and beans, lower-histamine cheese (again, goat or sheep), bok choy, okra, almonds

Copper: beef liver, sunflower seeds, lentils, almonds, blackstrap molasses, asparagus, turnip greens

You also need to nourish your body with foods that balance high-acid or acid-generating foods:

Almond milk	Goat's milk
Artichokes	Grasses—such as wheatgrass, barley grass, alfalfa, and oatgrass
Arugula	Green beans
Asparagus	Himalayan salt
Avocado oil	Kale
Beets	Kelp
Bok choy	Leeks
Broccoli	Lentils
Brussels sprouts	Mustard greens
Buckwheat	Okra
Cabbage	Onion
Carrots	Peas
Cauliflower	Quinoa
Celery	Rhubarb
Chia seeds	Sea vegetables
Coconut	Sprouts of any type
Coconut oil	Watercress
Endive	Zucchini
Flax	
Garlic	
Ginger	

Making the Most of DAO

Hunter and I spoke a few weeks after our first meeting, and he was doing much better. He had already started to figure out which histamine-containing foods gave him the most trouble (in his case, sauerkraut, pickles, salami, and red wine) and which he could sometimes manage in small amounts (aged goat's or sheep's milk cheese, yogurt, and kefir). In addition, he was making good use of a supplemental probiotic that helps process histamine.

Hunter also realized that he needed to limit leftovers, focusing only on fresh food. (Remember, the older the foods, the more histamine-producing bacteria are present.)

"It's sort of a pain," Hunter told me in his quiet way, "but it's worth it, because all those symptoms are gone and I've got more energy than I've had in years." Although Hunter had cut out fermented vegetables and raw sauerkraut, those foods have enormous benefits for the microbiome. I reassured him that, as his system got stronger, he'd be able to add some back in.

Here are some other suggestions to support your DAO. You can start them right away, without waiting to begin your full Soak and Scrub:

- Stop taking probiotics containing *Lactobacillus casei* and *Lactobacillus bulgaricus*. (You have to read the labels closely to discover specific ingredients.) In chapter 15, you'll get some tips on which probiotics to take.
- *For women:* Check your estrogen levels, especially if your histamine symptoms get worse around the time of ovulation—ten to fourteen days after your period ends. High estrogen levels can trigger your body to release more histamine. Be sure to follow the estrogen-balancing suggestions in chapter 6: avoid plastics; optimize your weight; and eat more beets, carrots, onions, artichokes, dandelion greens, radishes, and cruciferous vegetables (broccoli, cauliflower, kale, brussels sprouts, and cabbage).
- Support your digestion so that you have adequate stomach acid, digestive enzymes, and bile flow. These are all essential to keep your

microbiome healthy and pathogens out. (I'll go into detail about how to do this in my discussion of the Clean Genes Protocol.)

- Counter foods that *generate* acids with foods that help *reduce* acids. Make sure your meals are balanced. For example, if you're eating a lot of protein, have a lot of steamed vegetables to go with it. If you have a little bit of kombucha, have some sprouted greens to go with it. Use the foods from the list on page 130 to balance foods from the list on pages 123 and 124.
- Optimize sleep and reduce stressors, because stress neurotransmitters increase histamine release. Effective sleep supports include meditating, using blue-light filters on computers and other screens, avoiding screens one hour before bedtime, sleeping in a dark room or in a good eye mask, and monitoring your sleep with such apps as Sleep Cycle or ÖURA.

How the Clean Genes Protocol Supports Your DAO

Diet. We'll make sure you reduce your consumption of high-histamine foods and drinks. We'll ensure that your DAO enzyme can function optimally by providing it copper and calcium. We'll also have you balance your meals so that your body's acid levels are low enough to allow your DAO enzyme to work.

Chemicals. In a variety of ways, we'll support your digestion completely so that you avoid pathogenic bacteria coming in and taking hold in your gut. Adequate stomach acid, pancreatic enzymes, and bile are essential here—and the diet and supplements on the Clean Genes Protocol ensure that you get them.

Stress. Stress neurotransmitters limit your ability to release your stomach acid, digestive enzymes, and bile. On the Clean Genes Protocol, you'll practice stress reduction and stress relief, calming you down so that your body can digest your food and keep bad bacteria out.

MAOA: The Basics

Primary function of the MAOA gene

The MAOA gene produces the MAOA enzyme, which helps you process two key stress neurotransmitters—dopamine and norepinephrine—both of which enable you to rev your body up for the stress response. MAOA also helps you process *serotonin*, a neurotransmitter that enables you to feel calm and optimistic.

Effects of a dirty MAOA

A dirty MAOA sets you up for tremendous mood swings, especially if you were also born with a dirty MTHFR and/or COMT. The combination of these three born-dirty genes can give you tremendous energy and focus—but can also make it hard for you to control your temper or rise above irritating situations.

Slow MAOA. A slow MAOA eliminates norepinephrine, dopamine, and serotonin more slowly than usual, which can set you up for an excess of these neurotransmitters.

Fast MAOA. A fast MAOA eliminates norepinephrine, dopamine, and serotonin *too* quickly, which can set you up for a shortage of these vital neurotransmitters.

Signs of a dirty MAOA

Slow MAOA. Common signs include difficulty falling asleep, overactive startle reflex, headaches, irritability, mood swings, prolonged anxiety, rage and/or aggressive behavior, and trouble relaxing or powering down.

Fast MAOA. Common signs include alcoholism and/or other addictions, ADHD, carb and sugar cravings, depression, difficulty staying asleep, fatigue, and flat affect.

Potential strengths of a dirty MAOA

Slow MAOA. When you're not stressed, you can be more alert, attentive, cheerful, energetic, focused, productive, and self-confident.

Fast MAOA. When you're stressed, you have a greater ability to calm down. You're generally more relaxed and easygoing.

Meet Your Dirty MAOA

Completing Laundry List 1 has given you a good idea of whether you have a dirty MAOA. But if you'd like some more specific questions to round out the portrait, here you go:

- I've been diagnosed with ADHD.
- Major depression is common in my family.
- Alcoholism is present in my family.
- I feel that I'm addicted to carbs.
- I do better when I eat more protein.
- I find that I breathe faster when I'm stressed.
- I tend to become aggressive more often than I'd like.
- It often takes me a while to slow down.
- I can focus for a long time.

Health Conditions Related to a Dirty MAOA

Whether your MAOA is fast or slow, it can create a number of health problems for you. Note how many conditions on the following list are neurological or mood disorders. That's because your MAOA is involved in processing *neurotransmitters*, the biochemicals that enable communication within and from your brain.

- Addictions, such as alcohol, nicotine
- ADHD
- Alzheimer's disease
- Antisocial personality disorder
- Anxiety
- Autism
- Bipolar disorder

- Depression
 - Fibromyalgia
 - Irritable bowel syndrome
 - Migraine
 - Obsessive-compulsive disorder
 - Panic disorder
 - Parkinson's disease
 - Schizophrenia
 - Seasonal affective disorder
-

What Makes MAOA Dirty?

Slow MAOA

- Too much tryptophan
- Too little riboflavin/vitamin B₂

Fast MAOA

- Too little tryptophan
- Too much riboflavin/vitamin B₂

Both Types of MAOA

- Too little glutathione
- Chronic stress
 - Physical stress, such as blood sugar imbalance, infection, yeast overgrowth, SIBO, leaky gut, or anything else that puts an ongoing physical strain on your body—including improper breathing (for example, holding your breath while concentrating; or breathing shallowly, from your chest, instead of deeply, from your abdomen)
 - Emotional stress, such as demands at work, home, or in your personal life that create an ongoing emotional strain

Chronic inflammation

- From your diet—excessive eating, or eating foods that you react to with allergies or intolerance
 - From chronic physical or emotional stress
 - From chronic conditions such as obesity/overweight, cardiovascular disease, diabetes, autoimmune conditions, and cancer—which both create inflammation and are made worse by it
-

Key Nutrients for a Healthy MAOA

For your MAOA to function properly, you need two compounds: riboflavin and tryptophan.

Riboflavin/B₂: liver, lamb, mushrooms, spinach, almonds, wild salmon, eggs

Tryptophan: spinach, seaweed, mushrooms, pumpkin seeds, turnip greens, red lettuce, asparagus

Once again, I suggest that you load your diet up with these foods, rather than taking supplements. Your body is always happier with fresh, whole foods than with any other form of nutrition. Remember, while tryptophan is found in protein, it isn't as well absorbed as the tryptophan you get from carbohydrates.

Making the Most of MAOA

Remember how in chapter 6, Margo and Blake realized that self-awareness was their key to managing a dirty COMT?

Well, that same self-awareness is your key to managing a dirty MAOA. Whether your MAOA is fast or slow, you need to notice certain warning signs, which are your gene's way of asking you to slow down and give it some more support.

Each of us has our own warning signs, although it might take some work for us to recognize them. I asked Keisha and Marcus to identify their warning signs, and here are their lists. Are their warning signs anything like yours—or would you make a different list?

Keisha's Warning Signs (FAST MAOA)

- I've gotta have that chocolate!
- I'm dreaming about that sugar!
- I'm starting to feel blue again.

- I woke up again in the middle of the night and needed a snack to fall back asleep. So tired of this. I just want to fall asleep and *stay* asleep!

Marcus's Warning Signs (SLOW MAOA)

- I'm staring at the ceiling again, not able to fall asleep.
- I find myself irritable about nothing—the kids joking around, my wife on the phone when I get home, little things. If I start getting annoyed at nothing, that's a bad sign.
- I can't calm down. That tells me I've let things go too far and I've messed up somehow by not eating right, not sleeping enough, or piling on the stress.
- I've got a headache again, one that's already pretty far along. I'm looking to recognize the warning signs *before* a headache.
- I'm holding my breath frequently—like when I buckle down to concentrate or work hard—or I'm breathing more shallowly.

As you build your self-awareness, you'll start to discover things you can do to interrupt a stress pattern and stop your cravings.

For Keisha, it helped to eat protein with every meal and have some high-protein snacks in the fridge at work—pumpkin seeds, a slice or two of turkey, some hummus and carrots. I didn't want her to snack too often, but if she was going to snack, protein was better than something sweet or starchy. At dinner, she learned to have some tryptophan-rich foods to provide her with much-needed serotonin and melatonin.

As Keisha cleaned up her genes, she also found herself losing weight—without even really trying—for the first time *ever*. Until she went on the Clean Genes Protocol, Keisha had always experienced weight loss as a huge effort requiring massive amounts of willpower—only to find herself failing as she caved a month later.

“Since I started adopting these changes, my cravings have gone way down. But I didn't notice it at first; it just happened. Then a friend of mine at work told me, ‘You seem so much more upbeat and—hey, you've lost some weight, too!’ That was a nice surprise.”

How did this happen? First, Keisha was having protein with each meal and not waiting until she felt starving to eat. This led to her no

longer craving carbs and sugar, which meant that her blood sugar was stable and her metabolism was working efficiently; this also improved her mood. Finally, her cells were getting what they needed to burn fuel, which also improved her metabolism. Keisha loved feeling full and satisfied without overeating, and she was thrilled to see her weight optimize—without a fight!

Learning about the Tryptophan Steal convinced Keisha to practice some stress-release techniques, including deep breathing, listening to music, and leaving the scene. (Saying “Excuse me, I need a bathroom break” when things get tough is a good stress-buster!)

Marcus also relied on leaving the scene when he found himself getting irritated, especially at home. Now that he’d learned he was genetically susceptible to remaining irritated, he knew he had to manage his anger. He’d step outside for a brisk five-minute walk or go to another room and look out the window, which helped him recharge and reset. He also paid deliberate attention to his mood, his breathing, and his body.

“I’ve figured out that when I’m stressed at work, I have to be especially careful about my diet and my breathing,” he told me. “When I’m on vacation, I’m much more relaxed, so I can ease up a bit with my diet and still be fine.”

How the Clean Genes Protocol Supports Your MAOA

Diet. Eating balanced meals helps keep your neurotransmitters in balance. Making sure to have protein, healthy carbohydrates, and healthy fats *every time you eat* is key. Don’t say, “I had a high-protein lunch, so I can just have some brown rice for dinner.” You need to balance *every* meal. That doesn’t mean the proportions always have to be identical, however. For example, one meal you might have more protein, fewer carbs, and a touch of fat, while the next meal might be low-protein and low-carb with a bit more fat. Limiting sugar and processed foods and making sure not to overeat are musts; otherwise, you mess up your blood sugar and trigger mood irregularities.

Chemicals. Your MAOA produces a ton of hydrogen peroxide when you're stressed out, as we've seen. This depletes your glutathione, which means you have far less protecting you against heavy metals and chemicals. On the Clean Genes Protocol, we'll help you avoid stress so that you can conserve your glutathione.

Stress. The Tryptophan Steal is a real deal. Don't fall victim to it. By implementing stress reduction techniques, you can turn your tryptophan into feel-good serotonin and sleep-well melatonin, instead of sending it down the road to make brain-harming quinolinic acid. You need to figure out which stress-reducing techniques are right for *you*. As for me, now that I'm done with this chapter, I'm off to go hiking in the forest with my wife and boys.

GST/GPX: The Basics

Primary function of the GST gene

The GST gene makes the GST enzyme, whose primary job is to help your body transfer *glutathione*—your body’s chief detox agent—to *xenobiotics* (harmful environmental compounds such as pesticides, herbicides, and heavy metals) that have infiltrated your body, enabling you to pee them out. If not eliminated, these chemicals damage your DNA, cell membranes and mitochondria, enzymes, and proteins.

Effects of a dirty GST

With a dirty GST, your body is unable to attach glutathione to xenobiotics—an especially big problem if you’re facing a lot of chemical exposure.

Signs of a dirty GST

Common signs include hypersensitivity to chemicals (which can create such responses as congestion, runny nose, watery eyes, coughing, sneezing, fatigue, migraine, rashes, hives, digestive issues, anxiety, depression, and brain fog), increased inflammation, high blood pressure, and overweight/obesity.

Potential strengths of a dirty GST

Although everyone is vulnerable to industrial chemicals, your increased vulnerability makes you aware of the problem sooner and builds motivation for you to protect your health. You also have a better response to chemotherapy, since your GST can’t easily clear these chemicals from your system.

Primary function of the GPX gene

The GPX gene makes the GPX enzyme, which helps attach glutathione to hydrogen peroxide (which is produced in your body as a by-product of the stress response), thus converting it to water that you can pee out.

Effects of a dirty GPX

With a dirty GPX, you can't efficiently use glutathione to convert hydrogen peroxide to water. Excess hydrogen peroxide disrupts your Methylation Cycle.

Signs of a dirty GPX

Common signs include early graying or white hair, erratic moods, chronic fatigue, memory problems, irritability, and aggression.

Potential strengths of a dirty GPX

Your increased vulnerability to excess hydrogen peroxide makes you aware sooner of the problem and more motivated to do something about it.

Meet Your Dirty GST/GPX

If you've been through Laundry List 1, you already have a good idea about whether your GST or GPX gene is dirty. But here are a few more questions to help you figure that out:

- I am (or have been) infertile.
- I'm sensitive to chemicals and smells.
- I feel better after a sauna or intensive exercise.
- It's easy for me to gain weight even though I eat right.
- Cancer runs in my family.

Yeah. Cancer. I don't want to scare you. In fact, I want to get you as jazzed as I am about how much you can do to clean up a dirty GST/GPX. But if you don't, cancer is one potential outcome. Let's do everything we can to keep that from happening.

Health Conditions Related to a Dirty GST/GPX

The list of health conditions that researchers have linked to a dirty GST/GPX is daunting.

- Alzheimer's disease
- Amyotrophic lateral sclerosis (ALS)
- Anxiety
- Autism
- Autoimmune conditions, including Graves' disease, Hashimoto's thyroiditis, multiple sclerosis, rheumatoid arthritis
- Cancer
- Chemical sensitivity
- Chronic infections such as hepatitis, mold reaction, Epstein-Barr, *Helicobacter pylori*, and Lyme disease
- Crohn's disease
- Depression
- Diabetes, types 1 and 2
- Eczema

- Fatigue
 - Fibromyalgia
 - Heart disease
 - Hypertension
 - Hearing loss
 - Homocysteine surplus
 - Infertility
 - Keshan disease (a type of heart problem)
 - Mental disorders, including major depressive disorder, bipolar disorder, schizophrenia, and obsessive-compulsive disorder
 - Migraine
 - Obesity
 - Parkinson's disease
 - Pregnancy complications
 - Psoriasis
 - Seizure
 - Stroke
 - Ulcerative colitis
 - Vision loss (progressive worsening)
-

What Makes GST/GPX Dirty?

- **Exposure to a lot of industrial chemicals, heavy metals, bacterial toxins, and plastics.** The more you lighten the chemical burden on your GST/GPX, the better chance you give this gene to function at its best.
- **Stress.** Under physical and mental stress, your Methylation Cycle uses up more ingredients than intended, yet doesn't function as well as it should, which means your body is short of the raw materials it needs to make glutathione. Stress dirties all your genes surprisingly quickly—including your GST/GPX.
- **A disrupted Methylation Cycle.** Whenever your Methylation Cycle struggles, you have trouble making all the glutathione your body needs. This puts a big strain on your GST/GPX.
- **Insufficient riboflavin/vitamin B₂.** Your body uses riboflavin to regenerate decaying, dysfunctional glutathione back into whole, functional glutathione. If you're not consuming enough foods that are rich in riboflavin, your supply of glutathione can't keep up. Without functional, healthy glutathione, you can't remove industrial chemicals or hydrogen peroxide from your body. And your GST/GPX has to work harder to combat the chemical onslaught.
- **Insufficient selenium.** In order for your glutathione to turn hydrogen peroxide into water, it needs selenium. Without selenium, your GPX enzyme can't get rid of hydrogen peroxide.
- **Insufficient cysteine.** Cysteine, found in many nutritious foods and made from your homocysteine, is the key ingredient in glutathione. And as you know by now, if your GST/GPX gene doesn't have enough glutathione available, it can't function at all.

Key Nutrients for a Healthy GST/GPX

As we've seen, the GST/GPX gene's work involves transferring the antioxidant glutathione to chemicals and compounds that need to be eliminated from the body. In order to make that antioxidant, your body requires *cysteine*, a sulfur-containing amino acid that many people are deficient in:

Cysteine: red meat, sunflower seeds, chicken, turkey, eggs, broccoli, cabbage, cauliflower, asparagus, artichoke, onions

You also need riboflavin to transform damaged glutathione back into a ready-to-use antioxidant. Otherwise, damaged glutathione remains damaged—and contributes to further damage in your cells.

Riboflavin/B₂: liver, lamb, mushrooms, spinach, almonds, wild salmon, eggs

Finally, your GPX needs *selenium*, a trace mineral that many people are deficient in:

Selenium: brazil nuts, tuna, halibut, sardines, beef, liver, chicken, brown rice, eggs

Making the Most of GST/GPX

Just as with Keri, I wanted Megan to know that there was hope for her—plenty of hope. She was in no way doomed to a life of skin rashes and headaches and mockery from her family.

I reminded Megan that the more xenobiotics, free radicals, reactive oxygen species, sugar, excess fat, and excess protein she was exposed to, the more glutathione she would need. Producing and recycling glutathione is a demanding and difficult process that requires a number of genes and enzymes. So cleaning up her environment and her diet would make a terrific start to easing her symptoms and cleaning up her genes.

I also reminded Megan that the dirtier her glutathione genes—GST and GPX—the less well her cells were going to work. And it was poor cell function that had created her chronic symptoms.

Here are some of the ways that Megan could begin cleaning up her genes—and you can, too. You don't even have to wait for your Soak and Scrub. Just jump right in:

- **Eat a lot of fiber.** Your microbiome loves fiber! Those gut bacteria eat the fiber that your own body can't digest, and then they help your body detox. Fiber contributes to the production of detoxification enzymes, and it also binds to xenobiotics. Once fiber hooks up with those chemicals, it ushers them out through your stool. Problem solved! Exception: If you're struggling with SIBO, you should *not* start eating more fiber. You'll have to address the SIBO first.

High-Fiber Foods

- Artichokes
- Avocados
- Black beans
- Blackberries
- Broccoli
- Brussels sprouts
- Chia seeds (which you can sprinkle on salads and vegetables or stir into yogurt)

- Flaxseed meal (which you can add to oats, smoothies, yogurt, and baked goods)
 - Lentils
 - Lima beans
 - Oatmeal (stick to gluten-free)
 - Pears
 - Peas
 - Raspberries
 - Split peas
-

- **Clean up your environment.** Every time you eat, drink, breathe, or touch an industrial chemical—and yes, I’m including plastics, pesticides, air fresheners, dryer sheets, herbicides, and car exhaust—you add another load to your body’s burden. The more you can limit your exposure, the less detox labor your body has to do, the less glutathione you need, and the easier job your GST/GPX has. You don’t want to overwork any GST/GPX, but especially not one that was born dirty and already has trouble getting the job done. Remain on the Clean Genes Protocol as you filter your water, eat organic food, clean your indoor air (especially at home), and avoid toxic products.
- **Evaluate your environment for mold.** If you’re struggling with lots of symptoms that won’t go away even after you clean up your diet, air, water, and products, you might want to test for mold in your home, at work, in your car, and anywhere else you spend a substantial amount of time. An environmental inspector can help make this evaluation.
- **Sweat it out.** Your body detoxes in four ways—breath, pee, poop, and sweat. You’re already breathing—and hopefully properly—so that takes care of that. You’re already hydrating, so that takes care of the pee. You’re eating lots of fiber—that takes care of the poop. Now let’s get you breaking a sweat at least two times a week. You’ve got lots of choices, from the energizing to the super-relaxing: sauna, Epsom salt bath, vigorous exercise, hot yoga, sex. If you go the sauna route, choose low heat so that you can stay in there longer and keep sweating. Living in a hot climate like Arizona is not going to cut it unless

you get outside and sweat. Because with a GST/GPX SNP, you've gotta sweat. A lot.

- **Be aware.** Know that you're sensitive to chemicals, and keep avoiding them. At the same time, know that others aren't as sensitive as you, which may be why they don't follow your recommendations or believe your stories about how chemicals are affecting you. It can be tricky to convince a skeptical family or a doubting friend—but the first step is for *you* to believe yourself.
- **Grow broccoli sprouts and radish sprouts.** I'll warn you—the taste is quite potent! But you'll get tremendous glutathione support. It's the combination of sprout types that does it. Eating broccoli sprouts on the third day after they sprout gives maximum benefits.

Just as Keri found a lot of success cleaning up her GST, so did Megan enjoy improved health from cleaning her GST/GPX. She had already done a solid job of reducing her exposure to toxic chemicals, but with my help she identified a few more that she had missed.

What she hadn't done was support her body's detox through breath, pee, poop, and sweat. So she began focusing on breathing properly, hydrating regularly, eating more fiber, and taking twice-weekly saunas. "I can *feel* the toxins flowing out of my body," she told me at our second meeting. "It's the best thing—and also so relaxing!"

Megan also found a lot of support in living according to the Clean Genes Protocol: especially getting better sleep, and reducing and relieving stress. These key steps helped support her entire system, lightening the burden on all her genes and allowing her dirty GST/GPX to function at its highest capacity.

Remember when I told you that a lot of Italians have a dirty MTHFR but live symptom-free, without supplements or medications? That's possible for people with a dirty GST/GPX also—as long as you're eating well, getting the right kind of exercise, enjoying deep sleep, avoiding toxins wherever possible, and reducing or relieving stress. This is the protocol I follow, and my family too; and we've seen it ease the burden on our dirty genes. Keri and Megan found success with it as well—and I know you can too.

How the Clean Genes Protocol Supports Your GST/GPX

Diet. You'll get a balance of fiber, sulfur, and riboflavin/vitamin B₂, which will support your body's stores of glutathione as well as the function of your GST and GPX. You'll eat healthy fats and cut out the processed carbs, sugars, and unhealthy fats that trigger a number of glutathione issues and burden your GPX. And you'll eat the right amount of protein, rather than burdening your body—and your genes—with too much of it.

Chemicals. Avoiding industrial chemicals will lighten the burden on both genes and on your stores of glutathione. You'll be breathing, sweating, peeing, and pooping out the toxins, which will help as well.

Stress. Stress relief lightens the burden on your MAOA, which in turn decreases the amount of hydrogen peroxide your body makes, thereby lightening the burden on your GPX. Identifying infections and eliminating them also significantly reduces the amount of hydrogen peroxide generated and reduces the work your GPX has to do.

NOS3: The Basics

Primary function of the NOS3 gene

The NOS3 gene influences the production of nitric oxide, which is a major factor in heart health, affecting such processes as blood flow and blood vessel formation.

Effects of a dirty NOS3

With a dirty NOS3, you don't produce enough nitric oxide. As a result, your blood vessels don't dilate sufficiently and your platelets can become sticky, which can lead to blood clots.

Signs of a dirty NOS3

Common signs include angina, anxiety, cold hands and feet, depression, heart attack, erectile dysfunction, high blood pressure, migraines, mouth-breathing, sinus congestion, and wounds that are slow to heal.

Potential strengths of a dirty NOS3

Potential strengths include decreased blood vessel formation during cancer, which reduces the growth of cancer.

Meet Your Dirty NOS3

You've just seen that a dirty NOS3 can lead to high blood pressure, cardiovascular issues, blood clots, and stroke, as well as depression. It can also produce complications for diabetics.

Diabetes is known to cause significant difficulties in blood flow and healing. Legs are cold. Ulcers form. Toes have to be amputated. Diabetes is also known to cause loss of vision. All of these issues result from a dirty NOS3: insufficient nitric oxide leads to a loss of blood flow; as a result, your legs, feet, and eyes can't get the nutrients and oxygen they need.

Why not? Well, when you have diabetes, your blood levels of insulin

are high all the time. And, among other things, insulin pushes NOS3 to make nitric oxide.

That's usually a *good* thing, and in healthy people it remains so. But diabetes dirties up your NOS3 if it wasn't already born dirty. So instead of making nitric oxide, your NOS3 makes *superoxide*, one of the most dangerous free radicals there is. This reactive compound causes all kinds of havoc in your body—and diabetic complications are the result.

Another NOS3 danger is birth defects. During fetal development, your baby is growing rapidly and needs you to form new blood vessels to nourish his or her developing cells and tissues. If a dirty NOS3 slows down your ability to form these blood vessels, your baby's heart won't get the support it needs and he or she could develop a congenital heart defect—which, as it happens, is the most common birth defect in humans.

So *yes*, good thing you're going to learn how to clean up your dirty NOS3, if you have one! Your Laundry List 1 has given you some indication, but here are a few more factors to help you determine whether your NOS3 is either born dirty or acting dirty:

- I have high blood pressure.
- Many people in my family have high blood pressure.
- Heart attacks are common in my family.
- I've had a heart attack.
- I have a lot of circulation issues due to my diabetes.
- I frequently have cold hands and feet.
- Stroke runs in my family.
- I was diagnosed with preeclampsia when I was pregnant.
- Hardening of the arteries (atherosclerosis) runs in my family.
- I'm a mouth-breather.

Health Conditions Related to a Dirty NOS3

Whether your NOS3 was born dirty or is only acting dirty, it sets you up for some potentially serious disorders,

contributing to more than four hundred conditions. Here are the ones most closely associated with a dirty NOS3.

- Alzheimer's disease
- Angina
- Asthma
- Atherosclerosis
- Bipolar disorder
- Brain ischemia
- Breast cancer
- Cardiovascular disease
- Carotid artery disease
- Chronic sinus congestion
- Coronary artery disease
- Depression
- Diabetes, types 1 and 2
- Diabetic nephropathy
- Diabetic retinopathy
- Erectile dysfunction (often an early sign of cardiovascular disease)
- Hypertension
- Hypertrophy, left ventricular
- Inflammation
- Kidney failure, chronic
- Metabolic syndrome (or syndrome X)
- Miscarriage, recurrent
- Myocardial infarction
- Neurological disorders, including ALS
- Obesity
- Preeclampsia
- Prostate cancer
- Pulmonary hypertension
- Schizophrenia
- Sleep apnea
- Snoring
- Stroke

Stay Away from Statins

The class of drugs known as *statins* help stimulate the production of nitric oxide and support NOS3. They are among the most prescribed drugs in the United States, used by many doctors to lower cholesterol. But I'm always skeptical of relying on a drug to do something that your body is supposed to do by itself. After all, none of us is born with a statin deficiency.

Furthermore, a number of serious side effects have been associated with statins, including:

- Abdominal cramping
or pain
- Bloating
- Constipation
- Diarrhea
- Dizziness
- Drowsiness
- Gas
- Headache
- Muscle ache, weakness,
or tenderness
- Nausea or vomiting
- Rash
- Skin flushing
- Sleep issues

Statins can also produce even scarier side effects, especially among the elderly, including memory issues, mental confusion, increased blood sugar, and type 2 diabetes.

Given everything, wouldn't you rather look for natural ways to accomplish what statins are supposed to do? Especially since, as research suggests, statins don't seem to work well if your NOS3 is dirty.

What Makes NOS3 Dirty?

- Breathing abnormalities
- Folic acid
- High blood sugar
- High carbohydrate intake
- High homocysteine levels
- High insulin levels
- Infection
- Inflammation
- Lack of movement—sitting, standing, lying down
- Low antioxidants
- Low arginine
- Low BH4
- Low estrogen
- Low glutathione
- Low oxygen
- Microbiome imbalance
- Mouth-breathing
- Overeating
- Oxidative stress (too many free radicals)
- Poor methylation
- Pollution
- Sinus congestion
- Sleep apnea
- Smoking
- Snoring
- Stress
- Tongue-tie

Key Nutrients for a Healthy NOS3

You need both arginine and BH4 for your NOS3 to work properly, as we've seen. Arginine is the fuel in your tank, while BH4 is your starter. If you don't have both, your vehicle can't get going.

Making BH4 is a process that requires folate, magnesium, and zinc. You can't get BH4 directly from food: you have to support your MTHFR so that your body produces BH4. Please do *not* take BH4 supplements unless you were born with a rare form of BH4 deficiency. Research has shown that taking BH4 has no benefit if oxidative stress is present. It absolutely does not address the underlying problem. Remaining on the Clean Genes Protocol to protect your Methylation Cycle and maintain adequate glutathione levels is the best way to guarantee sufficient BH4.

Arginine, however, you can get from your diet:

Arginine: turkey breast, pork loin, chicken, pumpkin seeds, spirulina, dairy products (but stick to goat's or sheep's milk), chickpeas, lentils

Your NOS3 also needs the following nutrients to function:

Calcium: cheese, milk, and other dairy (but stick to goat's and sheep's milk products); dark leafy greens, bok choy, okra, broccoli, and green beans; almonds

Iron: seeds from squash and pumpkin; chicken liver; oysters, mussels, and clams; cashews, pine nuts, hazelnuts, and almonds; beef and lamb; white beans and lentils; dark leafy greens

Riboflavin/vitamin B₂: liver, lamb, mushrooms, spinach, almonds, wild salmon, eggs

Finally, your NOS3 needs plenty of oxygen—which you get from *breathing*. Now this seems obvious. What is *not* obvious is that many people struggle with sleep apnea, are mouth-breathers, have chronic sinus congestion, snore, unconsciously hold their breath, or breathe in a

shallow way. Breathing is an absolutely essential, unconscious task that we do on average twenty thousand times a day. Do it wrong and it begins to create a significant problem. If you could implement only one change in your life to support your NOS3, I would—without hesitation—say to improve your breathing.

Exercise is healthy. We all know that. But did you know that moderate exercise actually helps support your NOS3 gene by making it work more efficiently?

Making the Most of NOS3

Rudy was committed to cleaning up his dirty NOS3. His high blood pressure was an early sign that he needed to make some changes. To create further incentive, I let him know that the erectile dysfunction he mentioned to me was another sign that his NOS3 was dirty.

The first recommendations I had for him were to reduce how much he was eating, get off his couch, move around at least a few times a day for twenty minutes each time, and switch his diet to a more gene-friendly regime instead of the standard American inflammatory diet. I knew that these three changes alone could make significant gains in restoring his dirty NOS3.

I also worked with Rudy on some deep-breathing exercises. I had him place his palm on his abdomen and then breathe all the way down to his belly, until he could feel his stomach pushing out when he inhaled. I asked him to breathe slowly and evenly, in and out through his nose, ten times, so he could feel what a huge difference it made to be fully oxygenated. I told him that throughout the day, I wanted him to check in and remind himself to breathe in this way—which would make a huge difference in cleaning up his NOS3 as well as in relieving stress.

Rudy was silent for a moment after I gave him my suggestions. “You know,” he said thoughtfully, “my other doctors just told me to lose weight, exercise more, and take a blood pressure medication. I seriously thought about taking the medication, but I had no interest in changing my diet or in exercising.”

Rudy paused for another moment. “The way you so clearly explained what’s going on with my dirty NOS3—how it’s linked to blood pressure, how it can lead to erectile dysfunction—makes me actually look forward to making some changes,” he said. “It’s not just ‘Go lose weight’ or ‘Go exercise.’ Now I know *why* I need to do these things. I guess it gives me a sense of clarity and purpose. Now that I know how these changes will clean up my NOS3, they don’t feel like a hassle. It feels like I have the opportunity to make myself better. And *nobody* ever told me about the breathing!”

I was excited for Rudy. He was on his way, and he wouldn’t need me harping on him about what he needed to do or stop doing; he’d gotten the message. A prescription lasts until your refills are expired. Education lasts an eternity.

Here are some other key things I let Rudy know about—steps that you can take, too, even before you begin your Soak and Scrub:

- Consume foods rich in natural arginine.
- Consume some foods that contain natural *nitrates*, which also support nitric oxide production: for example, arugula, bacon, beets, celery, and spinach.
- Keep building awareness of your breathing. You should be breathing at a nice, even pace—neither too fast nor too slow, and not erratically. You should also be breathing from your abdomen in deep, full breaths, rather than taking shallow breaths from your chest. Are you holding your breath at times? Do you snore? Consider breathing classes—for example, in either the Pranayama or the Buteyko breathing technique—or try some yoga or tai chi. If heart disease runs in your family or if your doctor has said it’s a concern for you, improving your breathing is probably the best thing you could do to turn things around.

How the Clean Genes Protocol Supports Your NOS3

Diet. We’ll make sure you get the right balance of nitrates and arginine, as well as all the other nutrients you need to support your NOS3. Eating healthy foods rather than

inflammatory ones is a must; otherwise, you run the risk of running through all your available BH4. Avoid all foods and drinks that contain folic acid.

Chemicals. By reducing your chemical exposure, you'll keep your BH4 levels high. You also ensure healthy glutathione levels so that you can keep your Methylation Cycle happy. And remember, a happy Methylation Cycle is a happy NOS3.

Stress. Stress neurotransmitters increase the demands on your glutathione and methylation, as we've seen repeatedly. Both glutathione and methylation are needed to support your NOS3. Increased stress also increases your susceptibility to infections, which use up a ton of arginine and glutathione. That competition for needed biochemicals further reduces the amounts available for your NOS3, making it dirty. Most important, a common consequence of stress is rapid and shallow breathing. Insufficient oxygen is the fastest way to dirty your NOS3, and proper breathing is the fastest way to clean it up. In the Clean Genes Protocol, I'll help you practice breathing.

PEMT: The Basics

Primary function of the PEMT gene

PEMT, with the help of your Methylation Cycle, helps your body produce *phosphatidylcholine*, a key biochemical that you need for several important roles:

- Phosphatidylcholine is the primary component of your cell membranes. Without enough of it, your cells are unable to properly absorb nutrients. You can develop malnutrition even if you're eating a healthy diet—in fact, even if you're overweight!
- You need extra phosphatidylcholine during pregnancy and breastfeeding. Children who are still growing also need extra phosphatidylcholine. Basically, whenever your body is making a lot of new cells, you need a lot of this vital substance.
- Phosphatidylcholine helps your bile flow smoothly out of your gallbladder to aid in digestion, thus keeping bacteria out of your small intestine.
- Phosphatidylcholine also helps package and move triglycerides, a type of fat, out of your liver. Without enough phosphatidylcholine, you can develop a condition known as *fatty liver*.
- In addition, phosphatidylcholine is essential for nerve function, muscle movement, and brain development.

PEMT also helps produce *choline* when you don't get enough of it from your diet. You need choline for a number of tasks:

- To support liver function, nerve function, muscle movement, energy levels, and metabolism.
- To make acetylcholine, a brain neurotransmitter important for learning and concentration.
- As a backup pathway for the Methylation Cycle when you don't have enough methylfolate (methylated vitamin B₉) or methylcobalamin (methylated B₁₂).

Effects of a dirty PEMT

With a dirty PEMT, you're unable to produce sufficient phosphatidylcholine. As a result, your cell membranes lose their integrity and the numerous bodily functions that depend upon phosphatidylcholine can't proceed smoothly.

Signs of a dirty PEMT

Common signs include fatigue, fatty liver, gallbladder disorders, inflammation, muscle pain, malnourishment (due to nutrients not being fully absorbed by damaged cell membranes), pregnancy complications, SIBO, elevated triglycerides, and muscle weakness.

Potential strengths of a dirty PEMT

With a dirty PEMT, you're better able to conserve choline to help with attention and focus. You also tend to have a better response to chemotherapy.

Meet Your Dirty PEMT

Your PEMT is the unsung hero of your genetic profile. Its work is vital to your well-being and health. But describing what your PEMT does is complicated, and it's even harder to explain how a dirty PEMT is connected to all the ways your body can go wrong.

So let's start with a few questions, over and above the ones you answered in Laundry List 1. The following factors can help you determine whether your PEMT is dirty and can give you a sense of all the different areas a dirty PEMT can affect:

- I have general pain everywhere—muscles, joints, all over.
- I'm a vegetarian or vegan.
- I had to have my gallbladder taken out.
- I've been told I have fatty liver, and/or someone in my family has fatty liver.
- I rarely eat leafy green vegetables.
- During pregnancy, my gallbladder acted up.

- I have SIBO.
- I've had genetic testing and know that I have the MTHFR C677T genetic polymorphism.
- I'm vitamin B₁₂-deficient.
- I'm intolerant of fatty foods.
- My estrogen levels are low.
- I take antacids.
- I have pain or discomfort in the upper right quadrant of my abdomen.
- My right shoulder is tight, by my scapula.
- I tend to have constipation.
- I tend to be itchy.
- I'm a postmenopausal woman.

Health Conditions Related to a Dirty PEMT

As we've seen in this chapter, a wide range of conditions are impacted by a dirty PEMT. They include the following:

- Birth defects
 - Breast cancer
 - Depression
 - Fatigue
 - Fatty liver
 - Gallstones
 - Liver damage
 - Muscle damage
 - Nutrient deficiency inside your cells
 - SIBO
-

Key Nutrients for a Healthy PEMT

Your PEMT makes from 15 to 30 percent of your phosphatidylcholine, and in a pinch, it can supply more—but that's when it starts to stagger under the burden of its job. To avoid that dirty situation, you need a good supply of dietary choline so that other genes can use it to make phosphatidylcholine:

Choline: liver, eggs, fish, chicken, red meat

As you can see, getting dietary choline is tough for vegetarians and vegans. It's also tough for “carbottarians,” people who feast solely or primarily on carbohydrates. People who don't eat meat or eggs are at high risk for choline deficiency, which means they'll run short on important compounds made from choline, including phosphatidylcholine. However it comes about, a low-choline diet puts people at risk for fatty liver, liver cell death, and muscle damage. I was reasonably sure that such a diet was largely responsible for Marisol's symptoms.

Young women have an extra capacity to make choline, because, as we saw earlier, estrogen stimulates their PEMT. That makes them less dependent on dietary choline: their PEMT can fill in the gap. This

makes sense when you think that young women are the ones who get pregnant and breastfeed. They need a whole lot of choline to bear and nurture children, so nature has arranged backup.

But even young women suffer from a low-choline diet if they were born with a certain type of dirty PEMT—the type that doesn't respond to estrogen. And that particular SNP, it turns out, is quite common—and a significant health hazard. Some studies have shown that the less choline a woman consumes, the higher her risk of breast cancer.

If you're not a vegetarian or vegan, make sure to get enough animal protein in your diet—not too much (we don't want too much histidine, as we saw in chapter 7, or too much tyrosine, as we saw in chapter 6), but not too little. And if you're a committed vegetarian or vegan, try some alternative sources of choline:

- Asparagus
- Beets
- Broccoli
- Brussels sprouts
- Cauliflower
- Flaxseed
- Green peas
- Lentils
- Mung beans
- Pinto beans
- Quinoa
- Shitake mushrooms
- Spinach

In the Clean Genes Protocol, I'll also suggest ways to supplement with choline and/or phosphatidylcholine, especially if you're a vegan or vegetarian. But as always, I want you to start with diet and lifestyle solutions first.

Who Is Most at Risk for Choline Deficiency?

Pregnant and breastfeeding women. As this chapter stresses, choline is needed to make phosphatidylcholine, which is used to make cell membranes. Since women who are pregnant or breastfeeding are making a *lot* of new cells, they need a *lot* of choline.

Children. As children grow, they create lots of new cells every day, so they need lots of phosphatidylcholine, too. Without enough choline in their diet, they could be at risk of

a phosphatidylcholine deficiency.

Vegans and vegetarians. It's hard to get enough choline from vegetable sources, although vegetarians who eat eggs have some advantage. (See above for a list of vegetable sources of choline.)

People fasting inappropriately. If you choose to go for more than forty-eight hours without food, consider supplementing with choline and/or phosphatidylcholine. It isn't a healthy choice, however. I'd rather you gave your body the nourishment it needs.

People on a low-protein diet. Without consuming substantial protein, it's hard to get enough choline. A *high*-protein diet isn't the solution, though. We're always looking for the right balance.

Postmenopausal women. High levels of estrogen trigger a clean PEMT to make phosphatidylcholine—but after menopause, estrogen levels drop. Even if you were born with a clean PEMT, menopause could make it dirty—unless you get enough choline in your diet. Of course, if you were born with a certain type of dirty PEMT, you won't have this “estrogen advantage” even before menopause.

Men. Without high levels of estrogen to trigger the backup action of their PEMT, men must be sure to eat a high-choline diet.

People who are low in folate, or with dirty genes in the folate pathway (MTHFR or MTHFD1). The amounts of folate and choline in your body are related. Too little folate means that your body uses way more choline—and you could end up deficient.

People with a dirty PEMT. If your PEMT is dirty, it doesn't respond to estrogen—so you need more choline in your diet.

What Makes PEMT Dirty?

- Not enough choline in your diet
 - Not enough methylfolate in your diet
 - Not enough SAMe
 - A disrupted Methylation Cycle
 - A dirty MTHFR
 - Insufficient estrogen—if you're a postmenopausal woman or a man
 - A born-dirty PEMT SNP that doesn't respond to estrogen
-

Making the Most of PEMT

Marisol was concerned to realize the full extent of her health problems, but relieved to learn that she could turn her situation around. I urged her to start with diet. Since she was still reluctant to rely too much on meat, I suggested that she start making egg salads, which are a mainstay of my own diet. (I like egg salads made with soy-free mayonnaise, pickle relish, salt, pepper, and chopped romaine, perhaps served on gluten-free toast.) I also recommended deviled eggs, which I personally prefer to plain old scrambled or fried eggs.

Here are some more suggestions for supporting a dirty PEMT that you can begin immediately, even before you start the Clean Genes Protocol:

- Make sure to eat some high-choline foods every day. It doesn't matter whether you choose meat or vegetable sources—just make sure you're getting enough choline. I was surprised when I evaluated my own diet and found out that I wasn't getting enough choline. My liver reminded me when I began feeling queasy. If you get enough choline in your diet, then having a born-dirty PEMT gene is much less of an issue.
- Eat in moderation. This is good for everyone, but it's particularly important for you, because those extra proteins, carbs, fats, and sugars burden an already stressed liver. The solution is simple. Stop eating when you feel about 80 percent full. Give it fifteen minutes after you've cleared your plate, and the sense of satiety will come. Your liver will thank you.
- Control your stress. We all need stress relief, but it's especially important for you, because stress burns through choline like nobody's business. Keeping stress in bounds gives your dirty PEMT a chance to catch up.
- Eat leafy green vegetables. The lower you are in methylfolate, the more choline you have to use to support your Methylation Cycle.
- Make sure you *absorb* and *digest* your protein. This requires chewing thoroughly, eating while calm, not drinking more than eight ounces

of liquid during meals, not taking antacids, and not driving while eating.

- Reduce your intake of refined carbs. That means cutting out the chips and crackers! Go for proteins, healthy fats, and complex carbs, such as snap peas, baby carrots, and hummus.
- Wash your hands—with natural soaps, *not* antibacterials—before eating or after spending time in highly public places such as airplanes, hospitals, schools, offices, and sporting facilities. This will help you reduce infections from bacteria and viruses, which will ease the burden on your system and reduce your need for extra choline.
- Cook with avocado oil, sunflower oil, and/or ghee to reduce fatty acid oxidation. Don't cook with coconut oil or olive oil, as they have low smoke points. Also, be sure to turn on your stove fan while you cook.
- Love your liver. Because 85 percent of all methylation reactions occur in the liver, easing the strain on that organ will protect your phosphatidylcholine levels, and your liver as well. Limit your alcohol intake and cut out preservatives and all unnecessary medications (with your doctor's permission).
- If your gallbladder is sluggish, consider working with a professional who specializes in visceral manipulation. These practitioners can gently work to manually drain your gallbladder. I personally had this done, and it worked beautifully. The manipulation is fast and effective and allows immediate relief while you change your diet and lifestyle.

How the Clean Genes Protocol Supports Your PEMT

Diet. We'll make sure you get enough choline and methylfolate in your diet, while removing the foods and beverages most likely to stress your liver: high-fat foods, foods with preservatives, and alcohol.

Chemicals. By helping you to heal your leaky gut and strengthen your digestion, we'll protect you from pathogenic bacteria and infections that stress your system, eat up choline, and burden your Methylation Cycle.

Stress. Both physical and emotional stress burn through choline. By focusing on stress reduction and stress relief, we'll help you conserve your choline and support your PEMT.

Soak and Scrub: Week 1

You might already be following some of the recommendations I provided earlier to clean up your genes. If so, and you're having success, fantastic! Keep on implementing those changes. Simply add the new recommendations below to further enhance cleaning up your genes. If you're trying some of those earlier recommendations and not having success, stop them and follow what you find outlined below for the Soak and Scrub. If you haven't tried them at all, no worries. Now is the time to do so.

In the pages that follow, the recommendations are grouped according to the diet and lifestyle elements covered by Soak and Scrub:

- Food
- Supplements
- Detoxification
- Sleep
- Stress relief

Let's turn to the biggie, food, and get you started!

Food

As Hippocrates wisely said, “Let food be thy medicine.”

But here’s the thing. Just as each of us might need different types of medicine, we each need different types of food.

We all know that while a certain medicine might help one person, it hinders another by generating significant side effects. The exact same thing is true of food. While fermented foods might be great for me, replenishing my microbiome and healing my leaky gut, you might have a dirty DAO that can’t handle the extra bacteria. Maybe you can tolerate small amounts of gluten, while I can’t. My son Mathew gets a runny nose, irritability, and earaches from cow’s milk dairy, while Theo responds to the same thing with frequent eye blinking and constant clearing of his throat. Tasman, meanwhile, can eat cow’s milk dairy with no symptoms. We are all different, and our reactions to food reflect that.

We are also each changing, all the time. Maybe a food that worked for you last year gives you massive symptoms this year—or perhaps it’s the other way around. Different genes become dirty or get clean, and since all your genes are always talking to one another, your whole biochemistry is constantly changing in response.

That’s why *tuning in to how you feel* is the cornerstone of your life on the Clean Genes Protocol. The goal of this book is to teach you how to live as optimally as possible so that you can reach—and maintain—your genetic potential. You can do that best by learning how to tune in to yourself, so that you always know what to eat, and when.

Tune In to Your Body and Emotions

Let’s face it. Some days you feel like eating out and other days you feel like just a salad is enough. That’s life.

Over the years, I’ve learned to tune in to how I’m feeling mentally, physically, and emotionally. That’s how I figure out what I’m going to eat. If you’re like most people, when you’re stressed out, you go for carbohydrates and suck down calorie-dense foods to give yourself a feel-good dopamine rush. The issue? It doesn’t last. So you do it again and again,

only to gain weight and feel irritated with yourself about the choices you made—but you can't help it. It gives you a lift.

I get it.

That's why the first step to tuning in is recognizing the difference between *cravings* and *hunger*. Easier said than done, of course.

It's especially hard to understand the difference between cravings and hunger when you're in the craving state. A craving is a feeling that you *want* to eat something specific, while hunger is that gurgling, empty feeling in your gut that you *need* to eat.

We all have dirty genes that give us cravings. The dirtier our genes, the more cravings we have. That's one piece of terrific news: remaining on the Clean Genes Protocol will greatly reduce your cravings.

At the beginning, though, your cravings will be screaming at you, "Give in! Fail! This is too hard!" Don't listen to them. I've learned ways to shut them up, and I'll share those with you.

For now, though, simply try to switch your mindset from *craving* food to actually *being hungry*. Simply ask yourself, "Do I need to eat or do I want to eat?" If you succeed in this, your genes will thank you for the rest of your life. But meanwhile ...

Banish Regrets

We're all human. We all have cravings. We all enjoy food that tastes exceptional and tickles our taste buds. We all deserve to experience amazing food and that sense of warmth that comes over us after a great meal.

And so, yes, there will be days and nights when you go to town and overeat and likely consume foods you know aren't ideal for you. That's fine! I do it, too. The next time you do this, enjoy it. Go for it. Don't beat yourself up over it the next day. No guilt trips. You made a decision, you enjoyed the meal—now the next day is a new day. To paraphrase my colleague Dr. Sachin Patel, "Your decision to be healthy starts with your next bite." How beautiful is that? Just go back to cleaning up your genes and supporting the ones that need some extra help. The cool thing is that now you know how to do that.

Just promise me that the next time you overindulge or eat a food you know you shouldn't, you'll *enjoy* it. Feeling guilty or regretful will only make your genes more dirty.

Think of it like this. You invited a load of great friends over, hired a band, had a bouncy house for the kids, and cooked for twenty people. People were laughing, dancing, and having an exceptional time. On their way out, each of your friends gave you a huge hug and said, “Wow—awesome party! Thank you!” and you felt great, too.

The next morning you wake up, tired and heavy, and with bleary eyes, and you face a huge mess. Stains on the carpet, dishes everywhere, dogs on the table eating scraps, the yard trashed from the kids. You smile, remembering the great evening. You turn on your favorite CD and start cleaning up the mess, one room at a time. No regrets!

Plan Your Meals

Most of us just follow our cravings. Instead, I want you to tune in, listen to your body—and *plan*.

Why?

Food should be restorative and nurturing. Many of us don’t think of food this way. We think instead, “Oh, what do I feel like? Something salty, sweet, fatty, chewy, crunchy?” or “Dang it. I’ve so much work to do, but I have to eat. I’m gonna run out and grab something and eat it really quick.”

I want you to switch to a different mindset. Food is beautiful. Food is your fuel. It’s not a nuisance to get out of the way. Think of it this way: “Hmm ... I have a big day ahead. I’m doing a presentation at work, taking the kids out to play soccer, and then we’re off to watch a movie. What do I need to eat in order to succeed today? Protein to help me think. Some complex carbs to keep me going while I run around on the soccer field, and a light salad before I sit on my butt watching a movie.”

Making that kind of plan takes awareness of what you’ll be doing and what your body will need to succeed. Tune in to your body and make your food plans based on the following factors:

- **Your activity level, including both mental and physical activity.** More mental activity requires more protein for sustained acuity, while more physical activity requires protein, healthy fats, and carbs for sustained energy.

- **Your emotions—happy, sad, mad, enthusiastic, bored.** Happy and enthusiastic moods require less food, as does being bored. Extreme emotions—such as sadness and anger—might require more or less food, depending on the situation. However, being bored, sad, or mad typically drives *cravings* for food—not actual *hunger*.
- **Your symptoms (or lack of symptoms).** Do you have a headache? Feel heavy? Have brain fog? Can't sleep? Have no energy? Feel stressed? Or do you feel great—clear-headed, energetic, sharp? Feeling great, clear, and sharp requires less food. You've got something good going, so don't mess it up with extra food. Headache, lack of energy, trouble sleeping, stress, and brain fog may be due to inappropriate food choices, and you're experiencing the consequences. On the other hand, if you haven't eaten for a long time, those symptoms may be signs that you need to eat or hydrate. Tune in so that you can make the right judgment call. *Next time*, you'll make the right decision.
- **Your genes.** Which ones need cleaning? Which need additional support? Food fuels your genes. It's your job to deliver what they need so that they can perform at their best—and you can too. Give them garbage, and that's what they'll deliver in return. Give them quality nutrition and time to utilize it, and they'll do their best for you so you can succeed.

Track Your Meals

Knowing how a food is helping or hindering you is important. Tuning in definitely helps. Taking it a step further and tracking what you eat in a food journal is even better. This way, when symptoms occur, you can look back and see what you ate and deduce what might be contributing to those symptoms. Tracking also helps you see the big picture of your diet—the amount of protein, carbs, and fat you're eating, for example, and what times of day you typically eat more and less.

When I started tracking what I ate, I discovered that I was eating way more carbohydrates than I'd thought, which was contributing to my sleepiness, brain fog, and weight gain. I also discovered reasons why I wasn't sleeping at night—eating too much, too late, and too much protein.

I prefer to use an app like CRON-O-Meter, which is easy to use. There are also other programs (see the Resources section) that can help you.

Eating to Clean Your Genes: The Basics

- The easiest way to keep your genes clean is not to make them dirty. By eating organically, you reduce how much work your genes have to do. Organically grown foods also have more nutritional content compared to nonorganically grown.
- Cost can be a limiting factor with organically grown foods. If this is the case in your household, buy organic for only the worst offenders—those fruits and vegetables that, when conventionally farmed, are highest in toxins. Check out the lists of “dirty” and “clean” foods—conventionally farmed foods most and least contaminated by industrial chemicals—maintained by the Environmental Working Group (www.ewg.org). Every year, the EWG determines the “Dirty Dozen” and the “Clean Fifteen.” Typically, these lists don’t change much. Commonly, the following fruits and vegetables are those to avoid if not buying organic: strawberries, apples, nectarines, peaches, pears, celery, grapes, cherries, spinach, bell peppers, tomatoes, cherry tomatoes, cucumbers, hot peppers, and kale.
- If you aren’t hungry, don’t eat. Now, of course there are some exceptions—such as if you know you’re facing a long stretch of time when you won’t be able to eat—but for the most part, this injunction generally applies.
- Eat until you’re 80 percent full—then *stop*.
- Eat a maximum of three meals a day. Ideally eliminate snacking if you can. If not quite yet, at least limit it.
- If you find yourself snacking, consider the following common reasons:
 - You’re experiencing a craving rather than true hunger. Don’t give in to the craving. Be strong. Ask yourself, “Do I want to eat or do I need to eat?”
 - You’ve got a bad habit—reaching for food between meals—that you need to break. Break it!

- Your fuel-burning functions aren't working properly.
 - You're eating, but you're not absorbing your nutrients.
 - You're not eating health-promoting foods, which means your body never feels satisfied. On top of that, eating poorly creates inflammation and even malnutrition.
- Fast for twelve to sixteen hours daily. This is easily accomplished if you stop eating at 7 P.M. and then wake up to breakfast at 7 a.m. If you finish dinner at 7 P.M. and don't eat again until 11 A.M., that's sixteen hours. Personally, I feel the best most days when I stop eating at 7:30 P.M. and break my fast at 11 A.M. or noon. If I'm leaving out the door to a conference or have a presentation in the morning, I'll have breakfast earlier. At the first sign of a blood sugar drop (slower thinking), I make sure to eat.
 - Chew, chew, chew. Take a bite of food. Put your utensil down. Chew completely. Enjoy the flavor. Savor it. Swallow. Repeat. I would say 99 percent of us don't chew thoroughly, allowing time to appreciate each bite—but this alone will greatly decrease how much food you eat and increase how good you feel.
 - Limit drinking during meals. Have one glass of filtered water, goat's milk, almond milk, tea, or—every so often—wine, but never any more than *one* glass. Don't dilute your digestive enzymes. Doing so limits your ability to absorb what you're eating. Trust me on this.
 - Don't drink cold beverages during meals. Room temperature or warmer is best. Cold temperatures require your body to warm it up thereby depleting you of energy. By drinking water that is cool but not cold, you are conserving energy. Sorry, no, you won't lose weight by drinking cold water. Cold water may also cause stomach cramping and colic, especially if exercising.
 - There's no "mostly" gluten-free. If you have even a bite or two of gluten, that potentially sets off the same biochemical reaction as eating a loaf of bread. Why? Because your immune system responds via antibodies, and the antibodies are triggered by even tiny amounts of food. So 99 percent gluten-free is the same as 0 percent. Either you're 100 percent gluten-free or you aren't.

- If you have a fever, don't eat. Just hydrate with electrolytes. Of course, if you have a prolonged or high fever, you need a health professional to assist you.
- Drinking fruit juice is like drinking soda. It's pure sugar. Limit it. I avoid both juice and soda 100 percent. It took me years to adapt to this, but I accomplished it; and I feel so much better without either. Drinking fruit juice quenches a craving. It also dirties your genes right up.
- Juicing at home is great, but be sure to juice vegetables and not fruit. Ideally, use a Blendtec or Vitamix and blend whole vegetables and herbs to get all the nutrients and fiber. Organic produce is preferred, of course, so you don't load yourself up with herbicides and pesticides. That'd be one dirty smoothie.

Make Wise Food Choices

Getting your food choices dialed in is going to help you make great strides in cleaning up your dirty genes. The key is knowing what you can and cannot eat. I've made that much easier for you: in the next chapter, you'll find amazing recipes for breakfast, lunch, and dinner.

Before choosing your recipes, complete Laundry List 1 in chapter 4 (if you haven't already) to discover which of your genes are dirty. Armed with this insight, select the recipes that will help you clean those genes. Make yourself a shopping list and get started!

Here are some additional guidelines for eating to clean your genes:

- **Avoid foods that are stocked in the middle aisles of the grocery store, foods with ingredients you can't pronounce, and foods that are white:**
 - Soda, diet as well as regular
 - Fast food
 - Anything that contains folic acid (which is *everywhere* in processed foods)
 - Ready-to-eat frozen dinners or ready-to-eat packaged foods
 - Cold breakfast cereals (oatmeal and other hot, gluten-free cereals are okay)

- Granola
- Chips
- Snacks, including crackers, trail mix, granola bars, energy bars, and anything else that doesn't create a full meal
- Candy
- Ice cream
- Energy bars
- Juice
- Unfiltered water
- Gluten
- Soy
- Dairy
- Alcohol

▪ **Focus on foods stocked on the perimeter of the grocery store, foods without added ingredients, and foods that the planet provides you naturally:**

- Filtered water
- Loads of fresh vegetables
- Some fresh fruits—no more than three daily servings; best eaten in the morning or afternoon and not at night
- Eggs, organic or free-range
- Free-range meat, ideally from the local rancher or local butcher—grass-fed beef, lamb, bison, venison
- Fish and shellfish—wild, fresh-caught
- Nuts and seeds
- Sprouts of all types: beans, grains, seeds, and nuts
- Wild rice
- Quinoa
- Fresh deli ready-made foods from a natural food co-op—chili, soups, salads, entrées—all of which are excellent when you're busy. Be sure to read the ingredients and avoid the foods that aren't health-promoting for you and your genes.

▪ **Individualize your meals.** Specifically tailor each meal to how you scored on Laundry List 1. A full guide of what and when you should eat is provided in the next chapter.

- **Cook or steam foods fresh.** Avoid frozen foods and leftovers. Leftovers are especially problematic if you're struggling with a dirty DAO.
- **Digest your food.** Thirty percent of your stomach acid is released in response to *preparing* to eat: observing your food, smelling it, and looking forward to eating it. Take the time to do all three of these things. Food should be nourishing *all* of you—mind, body, spirit—and genes. A meal shouldn't be something that you rush through and “get over with.” To see what I mean, think *lemon* right now. Did you feel the flow of saliva in your mouth? That's a sign that your digestion is ready to rock. Anticipating and “presavoring” your food in this way will make it taste better—and you'll eat less, burn food way more efficiently, and support a healthy metabolism.
- **Use your stove exhaust fan when cooking.** I know it's noisy, but the oil smoke is toxic. The less you breathe in, the better.
- **Cook with high-smoke point oils only.** Ghee, avocado oil, sunflower oil, and safflower oil are best for cooking or baking. Olive oil, coconut oil, flaxseed oil, and walnut oil are great for salads.

Supplements

While it's our goal to get all our nutrients from food, that isn't always possible. Nutrient density in food is lost for various reasons. For example, soils are often depleted; in addition, transportation, extremes in temperature, the cooking process, and time on the shelf all degrade nutrients. We're also exposed to chemicals and stressors each day that burn through our much-needed nutrients. For all these reasons, sometimes we need to supplement.

Here are some basic principles regarding supplementation that most people don't follow—but that will make a huge difference in your health if you do!

Choose the Form of Supplement That's Best for You

When I talk about the *form* of a supplement, I'm referring not to the nutrient it contains, but the means by which that nutrient is delivered.

The easiest form of supplement to absorb is liposomal (delivered via microscopic fat balls in liquid). The hardest is tablet. Here's the order, from easiest to hardest to absorb:

Liposomal (liquid) > lozenge > powder > chewable > capsule > tablet

When you want to regulate how big your dose should be, the order is the same. Liquids are easiest when you want to fine-tune a dose; tablets are hardest. It's easy to take ¼ teaspoon of something, but it can be tough trying to hack a tablet into equal fourths!

Here are some other things for you to consider when deciding which form of supplement to take:

- If you're sensitive to supplementation, start a liposomal form with just a single drop. If you tolerate supplements well, start with a ¼ teaspoon. The nutrients, in this liquid form, are delivered right into your cells.
- Taking a lozenge is great as well, not only for absorption but also for regulating the amount you're getting. If you place the lozenge in your mouth and tune in, you can often experience the action of that supplement quite quickly—sometimes within minutes. If you're feeling better, or if you don't feel anything, great; let it continue dissolving. If you're feeling worse, though, take it out. You might not do well with this particular product, or you might want to cut the lozenge into quarters or halves to regulate your dose.
- Powders are also great, because you can easily adjust the dose. Taste is an issue here for some, but there are many great-tasting powders. The ones that don't taste so great can be mixed with an ounce of juice or little bit of applesauce.
- Chewables can often be cut into halves or quarters if you need to adjust the dose.
- Capsules are handy in that they mask the taste and protect the nutrients from air and water. Most high-quality capsules dissolve quite well in the stomach or small intestine. Oftentimes people want to open capsules and sprinkle the contents directly into their mouth

or in food or water. This is fine as long as you check with the manufacturer or your practitioner. Some capsules should not be opened in this way—for example, betaine HCl, as it is highly acidic and can burn.

- Tablets aren't generally useful unless they were designed as a sustained-release form of a supplement such as niacin. If you have low stomach acid or are taking antacids, tablets may not dissolve well in your gut. Then you just end up with expensive stool. A park ranger once told a professor of mine about how many vitamins he sees in the outhouse—tablets that made it through whole! X-rays also often show undissolved tablets in people's digestive systems. Tablets may be generally cheaper to make (and buy), but in the end they're expensive, because you're wasting time and money.

Don't Feel Tied to "Suggested Use"

The "suggested use" directions you see on a supplement bottle are just that: suggested only. Follow your health professional's prescription—or your own sense of what works for you. I always believe in starting small, to see how a supplement affects you. If the "suggested use" is four capsules a day, start out with only one capsule a day. The amount of nutrients you're getting would then be one-fourth of what's shown on the supplement facts label.

Take One Supplement at a Time

I understand the impulse to load up on lots of new supplements. I get excited too! When I first began working with patients, I knew which supplements could help them, and I often recommended several at a time to get started. When it worked, it was awesome. When it didn't, it was a nightmare, because we had no idea which supplement had caused the problem. I've learned the hard way to try just one supplement at a time. Take it for a few days and see how it's working for you. Only then, once you see either a benefit or no change, should you add in another supplement. (I say "no change" because the supplement might not have had time to work yet—but at least it isn't causing you any harm!)

Know Your Body and Know Your Supplement

Before you swallow any supplement, you need to understand what that supplement is designed to do. What is its purpose? To raise serotonin and slow your fast MAOA? To clear out dopamine and support a slow COMT?

When you've purchased a particular supplement and are ready to try your first dose, take a moment to notice how you're feeling. Be aware. Tune in.

Then notice how you're feeling. Some supplements act within minutes, such as NADH. Others may take thirty minutes (such as acetyl-L-carnitine) or twenty-four hours (such as ashwagandha) to act. Again, be aware and tune in. Did the supplement do what you thought it was going to do? Is your slow COMT working faster now? Did you slow down your fast MAOA?

You're responsible for your own health—but more important, you know your body better than anyone else ever could. Only by listening to what your body tells you can you decide which supplements you need—and when you don't need them anymore.

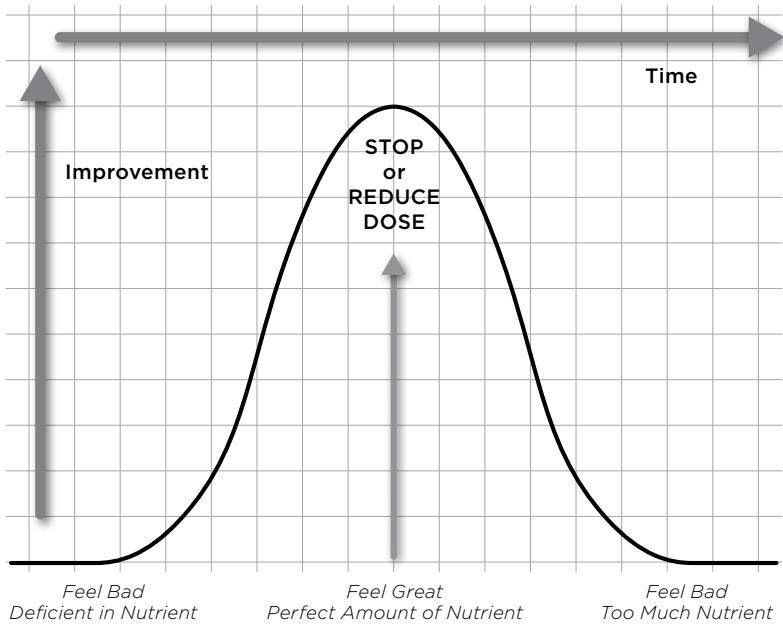
Follow the Pulse Method

The Pulse Method is my approach to figuring out how much of a supplement you need—and at what point you should increase the dose, decrease it, or cut the supplement out altogether. It is *vital* for you to understand and use this method. Otherwise, you'll end up taking supplements long after you need them and maybe even after they've begun to do you harm. If your body is deficient in something and you fill up that deficiency with a supplement, chances are you won't need that supplement anymore. If you keep taking it, you might well end up with a surplus, pushing your system into a new extreme with new and unpleasant symptoms.

So here is the Pulse Method, your guide to taking supplements:

As the diagram shows, the moment you feel great is the moment you should *stop or reduce* a supplemental nutrient. First lower your dose—then keep lowering it, until you're down to little or no dose at all. If you feel bad again over time, you can increase the dose gradually. But if you start getting *different* symptoms, that might mean you're taking too much.

The Pulse Method



For all the supplement recommendations below, you need to be using the Pulse Method. These supplements are powerful and highly effective. Use them *only* when you need them. Stop or lower the amount when you feel great. Add them back in when you need support again. Think of it this way—when you’re on vacation, you likely can take a mini-vacation from your supplements. I do. On the other hand, when you’re stressed out, not sleeping well, or sick, you need more supplemental support. Adding in a few essential supplements makes up for these deficiencies. Below are three that I’ve found very supportive:

- **Multivitamin/multimineral—without folic acid.** Your genes depend on specific nutrients in order to work properly. Many of us aren’t getting enough of those nutrients for optimal genetic function. A good multivitamin/multimineral can go a long way toward solving that problem. Just be sure that you’re getting one with no folic acid, which—as you know by now—can dirty your genes instead of clean them. Instead, choose a multivitamin with methylfolate and folinic acid, which are the best forms of supplemental folate available. Iron

can be inflammatory, so ideally find a multi without iron (unless you know that you're iron-deficient).

- Take a multivitamin only if you feel tired, have brain fog, or otherwise sense that you need extra support. If you feel great, don't take it.
- Take one-fourth to half the suggested daily dose of your multivitamin with breakfast—if you feel you need it.
- Take another one-fourth to one-half of your multivitamin at lunch—again, only if you feel you need it.
- Never take a multivitamin within five hours of bedtime. The B vitamins can be quite stimulating and prevent you from experiencing deep sleep.

- **Electrolytes.** Many people are deficient in electrolytes, your body's electricity carriers, which are sodium, potassium, chlorine, calcium, magnesium, and phosphate. When you're low in electrolytes, your electrical energy is low. Common signs of electrolyte deficiency are muscle contraction, irregular heartbeat, mental and physical fatigue, brain fog, frequent urination, urinating within minutes of drinking water, feeling dizzy upon standing, and not sweating well. You should be taking an electrolyte supplement that contains, at a minimum, potassium, magnesium, chloride, sodium, and taurine, with no sugar, food coloring, or artificial anything. Taurine is needed as it helps carry electrolytes.

- Take the electrolytes before exercise or upon waking.
- If you don't have the symptoms listed above, and if you're not exercising or using the sauna, stop taking electrolytes.
- If you get constipated from electrolytes, you need to either drink more water or skip a day.

- **Adaptogens.** Herbal compounds that support your ability to handle stress are known as *adaptogens*. Common adaptogens are ashwagandha, rhodiola, Siberian ginseng, passionflower, and wild oats. Vitamin B₅ and vitamin C are also supportive for stress.

- Adaptogens are best taken daily, since they give you the resources to be resilient under stress. You might want to skip them while on vacation, since your stress levels should be lower then.

—Take with breakfast or, if you're quite stressed, with both breakfast and lunch.

In addition to taking the above supplements as needed, get yourself *off* as many medications as you can—but always with professional help.

- **Stop taking medications that weren't prescribed by a health-care professional.** Some over-the-counter medications, such as antacids, need to be tapered down, so work with your health-care provider to begin that process. Stopping certain medications cold turkey can create a rebound effect—that is, your symptoms come back superstrong after you stop taking the med that was designed to suppress them. This isn't fun, so avoid it by tapering off your meds gently—and *only* under a professional's care.
- **For prescription supplements and medications, ask your provider if you can stop or taper off.** Don't stop taking any prescription medication or supplement without your provider's permission and assistance. Your health could be at risk if you go cold turkey here.

Detoxification

- **Avoid plastic for use with food.** This applies to all containers that you use for cooking, storing, eating, and drinking.
- **Rely on stainless steel, glass, or clay.** Again, this applies to all kitchen uses.
- **Avoid nonstick pans or cookware.** The two-part trick is to not cook on high heat and to remove the pan from the heat for a few minutes before flipping or plating the food. It will slide right out!
- **Avoid air fresheners and scented products.** Product smells are pervasive these days—in soaps, dryer sheets, toilet paper, paper towels, and much more. Since when did clean smell “clean”? Marketing has convinced many that if something is clean, it has to have a smell. No. If something is clean, it shouldn't have any smell. If it smells, it's making your genes dirty.

- **Avoid pesticides, insecticides, and herbicides.** These are everywhere. Foods. Schools. Parks. Workplaces. Start by making a change in your own backyard. The cheap combination of vinegar and water is a great weed killer, as is a propane torch. Healthy soils grow healthy plants and don't require chemicals.
- **Investigate your environment.** Look for possible sources of mold or other toxins: damp areas, actual mildew or mold patches, or water spots on floors, walls, or ceilings. Make a plan for cleanup and/or removal. Also check www.scorecard.org for the most common chemicals in your local environment. Then protect yourself from them.
- **Sweat.** Do this however you can. Exercise, fast walks with lots of warm clothes, and Epsom salt baths are all good options. If you're taking electrolytes, consider hot yoga or a sauna at 120 degrees Fahrenheit (or similar low heat) for as long as you can comfortably tolerate, placing a towel on the bench to keep the wood clean. Be sure to shower and wash with soap afterward. While you're in the sauna, focus on your breathing and try using a massage roller on your muscles or dry-brushing your skin. Never force yourself to spend time in a sauna. The moment you feel done, you *are* done. If you feel that way after thirty seconds, that's fine. Try again the next day. Rest for an hour or two afterward. Don't engage in exercise or sex during that time.

Sleep

- **Your ideal bedtime is 10:30 P.M.** If you're going to bed much later than that, start going to bed earlier in half-hour increments every other day.
- **Improve your sleep quality.** The following strategies, in combination, should make a significant difference:
 - Stop eating three hours before bedtime, unless you have a fast MAOA. If you have a fast MAOA—and if you're *not* sleeping through the night—enjoying a light snack within an hour of bedtime may be helpful. Just a few bites of that evening's leftover dinner is sufficient.

- Drink no caffeine after 2 p.m. Ideally, none at all. Period.
- Stop all electronic activity at least one hour before sleep, and put your devices on airplane mode until morning.
- Install a blue-light filter on computers, phones, and devices.
- Turn off all night-lights.
- Crack open your window for fresh air. If you're cold, get a warmer blanket.
- Block bright illumination from street lights or neighbors—ideally, ask your neighbors to turn those lights off. They're ruining your deep sleep.
- Ask someone if you snore or are a mouth-breather at night. If the answer is yes, talk with your dentist. Snoring and mouth-breathing make for a poor night's sleep and, as we saw, a dirty NOS3.
- Don't take a multivitamin before bed, as it might keep you awake at night. Supplements such as tyrosine and some herbal stimulants can also keep you awake.
- Track your sleep with the Sleep Cycle app or the ŌURA ring (see the Resources section). Tracking your sleep helps you spot trends. I've spotted many trends in my own sleep through tracking, and have altered my habits to obtain more deep sleep and REM. I've improved from averaging six minutes—yes, only six minutes!—of deep sleep and an hour of REM per night to now averaging forty-five minutes of deep sleep and three hours of REM. Good news: I've shared all my tricks with you here in this book.

Stress Relief

- **Get outside.** Go for a walk, play a sport, meet a friend, or just admire the beauty around you. In the summer, spend fifteen minutes a day out in the sun with exposed skin and no sunscreen. After that, lather up with a healthy sunscreen. (See the Resources section.)
- **Do a simple, comfortable stretching routine for five minutes each day.** The yoga sequence Sun Salutation is great, especially first thing in the morning.

- **Breathe deeply.** Focus on your breath. Breathe only through your nose at a slow and steady rate. Be aware if you're holding your breath, snoring, yawning, or mouth-breathing—and deliberately change your breathing. You should feel the air coming in slowly through your nose and then slowly going out. When people are stressed, a common response is to breathe faster and more shallowly from the chest up, rather than slowly and deeply from the belly. Work to reverse that pattern so that you continue to breathe deeply and slowly even when stressed. It's terrific stress relief and will also enable you to focus better and think more clearly.

Here's a simple five-minute exercise you can do when you're feeling stressed or anxious, have cold hands and feet, can't unwind, and/or have a dry mouth:

While sitting in an upright position or lying down flat on your back, position one hand on your chest and one on your belly so you can feel how your hands move. Your belly hand should move first followed by your chest hand. Focus only on your breathing. Count each breath in/out as one.

Notice the slightly cold air coming into your nose and the slightly warm air leaving your nose. Then start slowing down your breaths deliberately. You want to feel slightly out of breath, as though you were walking up a hill.

When you're ready, slow down your breathing even a bit more. Breathe so softly that you barely feel the air entering and leaving your nose. Continue doing this until your five-minute timer goes off. During and after, you should sense warmer hands and feet, a less congested nose, increased saliva in your mouth, and an overall feeling of calm.

The next time you need a break at work or home, practice this simple breathing exercise to reset your circulation and create a calming mindset.

A Typical Soak and Scrub Day

Below is a sample schedule of a Soak and Scrub day. Use it to create your own schedule of healthy choices. I've found that what gets *scheduled*, gets *done*. Be sure to use the results from your Laundry List 1 to determine how you should best eat to support *your* genes. Use the Gene Meal Guide in the next chapter.

- **Waking up.** Wake up naturally with the sun, or set your Sleep Cycle alarm to wake you when it's optimal for your body. (The Sleep Cycle alarm tries to wake you up when you're in light sleep, but no later than your set alarm time.)
- **Morning routine.** Listen to your body as you start your day.
 - Drink 4 ounces of water with 1 teaspoon of apple cider vinegar or freshly squeezed lemon juice.
 - Do the Sun Salutation.
 - Eat breakfast, but only if you're hungry.
- **Breakfast.** If you're not hungry for your usual breakfast, skip it. Eat later.
 - Don't eat because you "have to"; eat when you start to notice that you're getting hungry. I typically wake up at 7 A.M. and eat breakfast anywhere from 10 A.M. to 11:30 A.M.
 - Some days I don't eat breakfast at all. I tune in to how I'm feeling. Clear-headed, focused, not hungry? Don't eat. Starting to get brain fog, tired, a bit hungry? Eat.
 - Don't wait to eat until you're starving or get the chills. Those symptoms mean that your blood sugar tanked, and you're likely to binge on carbs to get your sugar back up, which will create a yo-yo effect of sugar spikes and crashes that will likely last the rest of the day. Try to keep things on an even keel. The key is awareness—learning to listen to your own body. It may take a while for you to build that kind of awareness, but you'll be surprised how quickly it comes once you start routinely asking yourself, "How am I feeling now?"

- **Work.** Take a bottle of filtered water with you, augmented with electrolytes. You can use sea salt to start. (See the Resources section for options.)
 - Before starting work, go for a ten-minute walk to get some air and motion.
 - Focus on being productive. Eliminate distractions to earn yourself free time later. Identify the top three things you need to accomplish each day. Then accomplish them. If you put more than three things on your list, you may have trouble getting them all done, which can be frustrating and reinforces the idea that you can't control your day. Stick to three!
 - Say no to anything that distracts you from your main goals and agenda. Just say no. You'll be amazed at your productivity.
 - Stand up every hour and move around for a few minutes. Maybe do some push-ups or go up and down a flight or two of stairs. Even better—go outside to get some fresh air.
- **Lunch.** This is likely your largest meal of the day.
 - Don't use electronics. No driving. Eat lunch sitting down, conversing with others.
 - Chew your food well.
 - Take your time. Enjoy your meal.
- **Postwork.** Plan a nonelectronic activity for yourself when you've finished work obligations for the day.
 - Exercise, read, hike, or make progress on a hobby.
 - Do grocery shopping, laundry, or housecleaning.
- **Dinner.** Eat based on your activity for the day and how you're feeling.
 - Consult the Gene Meal Guide in chapter 13 and eat accordingly.
 - Don't eat within three hours of bedtime unless you have a fast MAOA (based on Laundry List 1), in which case have some hummus and carrots or a few bites of leftovers from dinner within an hour of bedtime.
- **Evening routine.** How you conclude your evening impacts how you'll sleep at night.
 - Filter the blue light out of your screens. Put all your electronics on

the Night Shift mode built into your phone, or install the f.lux app on all your devices.

—Write down what you're thankful for that day.

—Meditate for five minutes.

- **Bedtime.** Time going to bed so that you get between seven and eight hours of sleep. Go to sleep when you're tired. Don't fight it. (But remember, your goal is to be asleep by 10:30 P.M.!)
—Drink a glass of filtered water.

—Put your phone on airplane mode. Set your Sleep Cycle app. Turn off the Wi-Fi.

The preceding suggestions were targeted toward regular weekdays. Be conscious about how you schedule other days as well. Here are some suggestions:

- **Weekend.** Keep your sleep and wake times consistent with your weekday schedule.

—Honor your weekend. Don't work unless it's absolutely essential to meet a deadline.

—Write in your journal: What are you most thankful for in the past week?

—Organize for the coming week. Shop. Do laundry. Clean the house and yard. Have the entire family pitch in. Assign chores and delegate routine tasks off your plate.

—Plan an activity for each day with friends, family, yourself. It can be resting, a “staycation”—whatever is fulfilling for you.

- **Vacation.** Plan ahead. Talk out your needs and wants.

—Where would you like to go?

—When will the kids be out of school? Block school breaks out on your calendar, if possible. I'm self-employed, so I have some flexibility. Once I started blocking school breaks out on my calendar, our family life improved significantly! Now I always plan around my kids.

- **Spontaneous day.** Play hooky every so often. Surprise your partner and kids.

—Go skiing for the day, have a family picnic, or do a city excursion—something totally fun that says, “Screw it, I’m playing today.”

Notice that the key to this schedule is *balance*. You need time to work and time to rest, play, and relax. You eat and sleep based on your body’s natural rhythms, but you also help your body by setting up a routine. If you have a job that keeps you seated for long hours at a time, you honor your body’s need for movement every sixty minutes or so. When you eat, you make it a time of relaxation and pleasure, so your body switches out of stress mode and into relaxation mode. Remember, stress is a real, measurable, physical factor in your health. This schedule helps you achieve true stress relief—and your genes will thank you for it.

Soak and Scrub: Week 2

Continue your routine from Week 1, with these changes/additions:

Food

- **Take steps to digest your food better.** Still have some gas and bloating with meals? Perhaps you need more digestive support. Upon waking in the morning, mix 4 ounces of filtered water with 1 teaspoon of unfiltered apple cider vinegar. Sip until you feel a slight warmth in your stomach; then stop. Do *not* do this if you have (or suspect) a stomach ulcer.
- **Focus on eating in peace, conversing with friends or family, or making the most of your alone time.** No electronics at the table, please! Enjoy mealtimes for what they are—chances to nourish you, your cells, and your genes. There are no shortcuts to good digestion. We sometimes fall for fast food, for working while eating, just shoveling that burger down. Don’t go that route. Food isn’t something to shush your stomach with so that you can get back to work. Enjoy the opportunity to nourish *you*. This is also a great time to interact with your colleagues or partner and your children. Kids are kids only once—ever. Mealtimes are a great way to build a healthy family—with food and conversation.

Supplements

- **Add in liposomal glutathione.** This nutrient, which many people are low in, helps countless important pathways. Don't take it unless you're already taking a multivitamin, however. The multivitamin provides the nutrients you need to help you use the glutathione.
 - Start with just 3 drops before breakfast or before lunch for three days.
 - If you feel no change or only a slight improvement, increase to ½ teaspoon a day for three days.
 - If still no change or only a slight improvement, increase to 1 teaspoon a day for three days. If you feel an improvement, continue for three weeks and then stop.
 - If you feel outstanding, stop taking glutathione until you feel that you need it again.
 - If you feel worse, stop taking it until you've added molybdenum and digestive enzymes for two weeks (see below). Then try again.
- **Take molybdenum if your breath, armpits, and/or gas smells of sulfur, or if you're sensitive to sulfites.** Start with 75 micrograms of molybdenum using The Pulse Method. This should resolve the problem within a few days. If not, continue the molybdenum, increase the amount of molybdenum taken, reduce sulfur-containing foods for a week, and then try the liposomal glutathione again.
- **Add in digestive enzymes—if needed.** If you're still experiencing gas, bloating, or belching during or after meals, you need additional digestive support. Consider taking betaine hydrochloride (HCl) along with pancreatic enzymes. If you're intolerant to fats or oils, add in lipase or about 250 milligrams of ox bile.
 - Take betaine HCl, digestive enzymes, and ox bile with meals. If you're going to eat a light meal, though, you might not need them. You'll learn from experience when you need additional support and when you don't.
 - Have an ulcer? Do *not* take betaine HCl or digestive enzymes until your stomach ulcer is healed. Use zinc carnosine, aloe vera gel, and L-glutamine to help heal the stomach ulcer.

Detoxification

- **Avoid household cleaners.** The basics work well: hot water, unscented soap, vinegar, salt, baking soda. Remember, if something smells, it's making your genes dirty.
- **Get a water filter.** Using a multistage water filter is a great and inexpensive way to drink clean water. Bottled water is usually of poor quality and is horrible for the environment, due to packaging and heavy shipping requirements. Don't use Brita-style water filters because they only filter chlorine, are comparatively more expensive than other filters, and use plastic. **Install a filter in your shower to remove all chlorine from your water.** Chlorine is harmful to your lungs, skin, and hair. Within a week of putting in the filter, you'll notice that your skin and hair feel better. You may not even need any lotions or creams once your skin gets used to a chlorine-free existence.
- **Get a HEPA filter vacuum.** A cheap vacuum blows around more dust than it picks up. Get a highly reviewed vacuum and enjoy the benefits for years. It's an investment, but it will last a long time—and because of it, so will you! Ideally, limit carpet in your home. If you can, consider replacing it with tile, stone, or wood to reduce the dust and chemicals that can irritate your genes.
- **Clean or replace your furnace air filters.** Don't skimp here. A dirty furnace puts more work on your GST/GPX gene, which then dirties all your other genes.
- **Clean your air ducts.** If you use forced air to heat your home and you haven't cleaned your ducts in two years, that job needs to get done.
- **Clean the sink traps and drain pipes under every counter.** Unscrew them, take them apart, and brush them clean with hot soapy water. Scrub inside the pipe, too. You'll be amazed how full of nasty stuff these elements are!

Sleep

- **Continue to move your bedtime toward 10:30 P.M.** You'll be amazed at how much energy you gain when you sleep during the night and

wake up in the morning, rather than pushing your circadian rhythms out of balance with the cycles of the sun.

- **Rise with the sun.** Allow the sun to flood into your room every morning. Put your blinds (if needed to block out lights at night) on automatic timers. If this isn't possible, consider a sunrise alarm clock to help create morning light.

Stress Relief

- **Meditate for at least three minutes each day before bed.** See my suggestions in the Resources section of www.DrBenLynch.com for apps and other supports to help you, unless you prefer to use traditional methods of meditation. The key is to meditate consistently. Three minutes each day is more effective than twenty minutes once a week.
- **Go on a “news fast.”** Stop watching the news and engaging in negative conversations. Let's face it: most news is negative. Flooding your brain with this information is hurting you. I haven't watched the news for more than ten years. I still stay connected to what's going on, and so can you. Set Google Alerts for headlines, or subscribe to your favorite online newspaper and opt for headlines. Read only what you really need to read. Ignore the rest.
- **Reduce time on social media.** Twice daily social media use is fine, but if you're on your favorite site any more often—and especially if you're checking it compulsively—I can practically guarantee that it's stressing you out more than it's relaxing you. Much more important, the time you're spending with “friends” online is pulling you away from real-life friends and family. Stress levels go up online—partly because the blue light on your computer is so stimulating, and also because you get into fights and read upsetting news and don't have anyone to process those things with. Stress levels go down after spending time with loved ones, because you feel secure and connected and plugged into the *real* world. Feeling skeptical? Try it just for the next few weeks as you complete your Soak and Scrub and move on to Spot Cleaning. You won't know how great it feels to clean out the social media gunk until it's gone!

Your Clean Genes Recipes

Look. I know you're busy. You want to make it easy to change your diet and feel better. You want a twenty-eight-day program that will provide you the answers you need to get better *now*.

Okay. But what happens in six months? A year? Two years? Ten?

It would be a disservice to you if I gave you a menu plan to follow. I don't know your schedule. I don't know where you live. I don't know your climate and food availability, nor do I know what foods you like, react to, or loathe.

A menu is handy—in some cases. If you're targeting a specific condition—excessive weight, leaky gut, autoimmune disease—a menu plan might be just what you need.

In this book, though, we're doing something radically different. I'm teaching you about how your body works, all the way down to the genetic level. You now know how the Methylation Cycle works. You know how important those “Super Seven” are—and you know how they get dirty.

So instead of offering a menu plan, I've created a number of super-healthy recipes for you, including many that I eat in my own home with my wife and boys. Each recipe is tagged with an indication of which gene(s) it supports, and which gene(s) might get a bit dirty from it.

Why would I give you a recipe that might make some of your genes a bit dirty? Well, it's nearly impossible to make every recipe support every

gene. Depending on which gene or genes are giving you trouble, you'll want to focus on certain recipes and avoid others.

For example, some of the recipes call for tomatoes. If you have a dirty DAO, perhaps you should eliminate tomatoes from the recipe or find a different recipe to support your dirty DAO. If you have a clean DAO and love tomatoes—well, we have a fantastic recipe for you!

How to Determine Which Recipe to Use

- At the beginning of your Clean Genes Protocol, you'll complete Laundry List 1. Two weeks later, you'll complete Laundry List 2. Each list will help you zero in on which of your genes are dirty.
- Find the recipes that support those dirty genes. See which ones sound good to you, and add similar ones that you already use at home.

Gene Meal Guide

The following general meal tips apply to everyone, regardless of which genes are dirty:

- Fast twelve to sixteen hours a day.
- Eat only when you're calm and relaxed.
- Focus on eating. No work. No electronics. Chewing and conversation only.
- Eat a maximum of three meals a day—no snacks.
- Eat until you're 80 percent full.
- Learn to distinguish cravings from true hunger.
- Eat only when you're hungry.
- Don't eat within three hours of bedtime (unless you have a fast MAOA; then you might need a light snack an hour before bed).
- Make sure each meal has a balance of protein, carbs, and fat.
- Use organically grown foods as much as possible, or at least avoid the Dirty Dozen—the foods most contaminated by industrial chemicals according to the Environmental Working Group (www.ewg.org).

Now let's look more specifically at how you can choose recipes and plan meals that target *your* dirty gene(s). Remember, too, that each recipe in this chapter identifies the genes that it best supports.

Dirty MTHFR

- Any recipe with leafy greens or beans
- Any recipe that supports PEMT

Slow COMT, Slow MAOA

- Breakfast with balanced protein, carbs, and fat
- Lunch with balanced protein, salad, and fat
- Dinner with little protein, more salad, and fat

Fast COMT, Fast MAOA

- Breakfast with balanced protein, carbs, and fat
- Lunch with balanced protein, carbs, and fat
- Dinner with balanced protein, carbs, and fat

Dirty DAO

- Recently prepared foods only; no leftovers
- Only *fresh* seafood and meat, rinsed and dried before cooking
- Any recipe low in histamine-containing foods
- Any recipe that can be adapted to remove or reduce the amount of higher histamine foods

Dirty GST/GPX

- Any salad recipe or recipe with eggs, leafy greens, and/or cruciferous vegetables

Dirty NOS3

- Any recipe that supports GST, MTHFR, or PEMT
- Any recipe that balances COMT and MAOA
- Any recipe that contains nuts and seeds

Dirty PEMT

- Any recipe with eggs, beets, quinoa, or lamb
- Any recipe that supports MTHFR

Clean Genes Recipes

Whenever possible, select organic ingredients and use filtered water for cooking. Conventionally “factory-farmed” meats, fish, and produce will dirty up your genes, as will unfiltered water. In addition, I recommend that you abandon standard table salt for Himalayan or Celtic sea salt, both rich in minerals. If food is to be your medicine, you must eat “clean,” health-supportive food!

BREAKFAST

Tunisian Breakfast Soup with Poached Egg

This is a riff on a popular Tunisian chickpea breakfast stew, leblebi. A fried or hard-boiled egg can be substituted for poached, if you prefer. For authenticity, the hot sauce should be harissa, available in most supermarkets.

This hearty breakfast choice supports all your genes. If you have a dirty DAO, you may need to eliminate the hot sauce (unless you have a sauce that works for you).

Serves 4

- 4 cups chicken or vegetable broth (homemade or store-bought)
- 1 15-ounce can chickpeas, drained
- 4 cups beet greens or mustard greens, chopped into 2-inch pieces
- 1 tablespoon ground cumin
- 1 teaspoon paprika
- ½ teaspoon coarse sea salt, or more to taste
- 1 teaspoon hot sauce
- Water to fill a pan 3 inches deep
- 2 tablespoons freshly squeezed lemon juice
- 4 large eggs, cold
- 4 thick slices gluten-free bread, toasted

1. In a small saucepan, heat the broth over medium heat. Add the chickpeas, greens, cumin, paprika, salt, and hot sauce. Cook until the greens wilt.
2. To poach the eggs, fill a pan with water 3 inches deep. Add the lemon juice, stir, and bring to a simmer over medium heat. Cooking 2 eggs at a time, crack the eggs into the water. Poach the eggs for approximately 3 minutes. (For a runny yolk cook for 2 minutes; for a set yolk, cook for 4 minutes.) Gently remove the eggs with a slotted spoon and place them on a paper towel.
3. Place the toast in 4 bowls. Distribute the chickpea soup from the saucepan over the bread. Top with an egg. Serve with additional hot sauce.

Dr. Lynch's Breakfast Smoothie

Mmm ... tangy berries, almond milk, and some protein-rich seeds for fiber and texture. Quick, easy, nourishing—the perfect breakfast if you're on the go.

This quick-and-easy smoothie supports all your genes. Add more protein powder if you need to support a fast MAOA and/or a fast COMT, and less if you have a slow COMT and/or a slow MAOA.

Serves 2

3 cups almond milk

½ cup frozen blueberries

½ cup frozen raspberries

2 tablespoons chia seeds

2 tablespoons flaxseed

2 tablespoons hemp seeds

1 to 1½ tablespoons pea protein powder

Add all ingredients to the blender and blend until smooth. Serve and enjoy!

Scrambled Eggs with Kale and Carrots

This dish offers the homey comfort of scrambled eggs with some extra fiber and nutrients from the vegetables. You'll benefit from lots of choline in the eggs and methylfolate in the kale.

This breakfast supports all genes. Those with a dirty DAO may want to skip the hot sauce.

Serves 2

2 tablespoons ghee, divided

5 to 6 eggs

½ teaspoon coarse sea salt

⅛ cup water

1 clove garlic, diced or pressed through a garlic press

½ yellow onion, thinly sliced

1 bunch kale, divided, stems cut into ¼-inch pieces and leaves cut into 1¼-inch pieces

1 large carrot, peeled and cut thinly into half moons

3 slices cooked ham or bacon, chopped

¼ teaspoon freshly ground black pepper

Hot sauce (optional)

1. Heat 1 tablespoon ghee in a pan over medium-high heat.
2. While the pan is getting hot, beat the eggs with the salt and water.
3. Pour the mixture into the hot pan and gently mix the eggs with a spatula until they're cooked through. Leave them in the pan, removed from the heat, and start working on the greens.
4. In another pan, heat the remaining ghee over medium-high heat. When the pan is hot, add the garlic and onions. Cook until lightly browned. Add the kale stems, carrots, and ham or bacon. After the carrots become slightly tender, add the kale leaves and mix in. Season

with pepper and additional salt to taste. Cover the pan and turn the burner off. Let the mixture set for another 3 to 4 minutes.

5. To serve, put the scrambled eggs in bowls and top with the vegetable mixture. If desired, add some of your favorite hot sauce.

Escarole and Feta Frittata

This flavorful frittata can be served hot, warm, or at room temperature. Add ham or sausage for added protein.

As is, this dish is good for GST/GPX, PEMT, both fast and slow COMT, and both fast and slow MAOA. If you have a dirty DAO, remove the cheese and mushrooms and make sure to use fresh (rather than cured) ham.

Serves 4

8 eggs

4 tablespoons almond milk

4 tablespoons sheep's or goat's milk feta cheese, crumbled to ½-inch pieces, divided

½ teaspoon coarse sea salt

½ teaspoon freshly ground black pepper

4 tablespoons ghee

2 tablespoons chopped onion

6 medium mushrooms, chopped into ½-inch pieces

1 pound escarole, cut into ½-inch pieces

½ cup diced cooked ham, or 2 cooked hot or sweet sausages cut into ¼-inch pieces

1. Preheat the oven to 475° F.
2. In a small bowl, beat the eggs, almond milk, half the feta, salt, and pepper.

3. In an ovenproof 12-inch skillet, heat the ghee. Add the onions and sauté over medium heat until translucent, about 5 minutes. Add the mushrooms and sauté for an additional 5 minutes. Add the escarole and cook until wilted, about 5 to 7 more minutes.
4. Add the ham or sausage and stir to combine, spreading the resulting mixture evenly in the skillet.
5. Pour the egg mixture over the vegetables and meat and cook until the eggs begin to set.
6. Sprinkle on the remaining feta. Place the skillet in the hot oven and bake for 5 minutes, until the frittata is firm but not brown.

Quinoa Porridge

A fast, tasty breakfast and a healthier hot cereal option than many traditional alternatives. For additional protein, serve it with a side of bacon, a glass of goat's milk, or an egg.

If you have a light appetite first thing in the morning, this dish is for you. While it doesn't directly support your genes, neither does it dirty them with excessive food. It's a great breakfast to help you transition from traditional breakfast cereals.

Serves 2

1¾ cups water, plus more for rinsing

1 cup quinoa

½ teaspoon coarse sea salt

1 tablespoon ghee, for garnish

Raisins, for garnish

Almond or goat's milk, for garnish

Maple syrup (optional)

1. Put the quinoa in a small pot and add a bit of water to rinse it. Dump the water and keep the rinsed quinoa in the pot.

2. Add the rest of the water and salt to the quinoa and bring it to a boil. Reduce to a simmer and then cover. Cook for 17 minutes.
3. Serve in bowls topped with ghee, raisins, and almond or goat's milk. Add a drizzle of maple syrup if desired.

Nutty Oatmeal

A quick and easy healthy start to your day made with oats and lots of nuts and seeds.

A good way to support your NOS3, slow COMT, and slow MAOA. Those with a fast MAOA or a fast COMT should add a sausage patty, bacon, or hard-boiled egg for extra protein.

Serves 4

4 cups water

1 tablespoon coconut oil

1 tablespoon ground cinnamon

1 teaspoon ground allspice

1 teaspoon ground nutmeg

¼ teaspoon ground turmeric

1 tablespoon vanilla extract

2 tablespoons almond butter

2 cups gluten-free rolled oats

¾ cup flaxseed

½ cup raw pumpkin seeds

¼ cup raw sunflower seeds

½ cup raw walnut pieces, chopped

¼ cup unsweetened coconut cream, or more to taste

½ cup chopped pistachio nuts, for garnish

¼ cup chopped almonds, for garnish

1. In a medium-size saucepan, heat the water, coconut oil, spices, vanilla extract and almond butter. Bring to a slow boil, stir, and lower the heat to simmer.
2. Add the oats, seeds, and walnuts. Cover and cook for 10 minutes, or until the mixture is the consistency you prefer. Serve with the coconut cream and garnish with the pistachios and almonds.

Bedeviled Breakfast

The smoked trout fillets that this recipe calls for can be found, packaged, in the fish section of the supermarket.

This recipe is a fantastic way to support GST/GPX, PEMT, both fast and slow COMT, and both fast and slow MAOA. This recipe is neutral for DAO, but if you're histamine-sensitive, don't include the trout, mustard, and tomatoes.

Serves 4

8 fresh eggs

Water

3 tablespoons mayonnaise

1 tablespoon Dijon mustard

¼ teaspoon hot sauce

1 teaspoon coarse sea salt

½ teaspoon freshly ground black pepper

1 teaspoon paprika, for garnish

4 ripe orange or yellow tomatoes, sliced

1 small sweet red onion, very thinly sliced (optional)

12 radishes, halved

12 ounces smoked trout, cut into 1-inch pieces

4 handfuls mixed baby greens or arugula

1. Place the eggs in a heavy-bottomed saucepan and cover them with at least 1 inch of cold water.
2. Bring the water to a full boil.
3. When there are big bubbles, remove the pot from the heat and cover. Let the pot stand untouched for 15 minutes. Remove the boiled eggs from the water. Transfer to a bowl of cold water for 10 minutes.
4. Peel the eggs and cut them in half lengthwise. Gently remove the yolks. Mash the yolks with the mayonnaise, mustard, and hot sauce. Add the salt and pepper, adjusting amounts to taste.
5. Fill the whites with the yolk mixture. Dust the eggs with paprika.
6. On a platter, arrange the eggs, tomatoes, onion, radishes, trout, and greens.

Gingered Green Smoothie

Zingy sweet creaminess is your reward with this delicious smoothie.

This nourishing breakfast supports MTHFR, GST/GPX, a slow COMT, and a slow MAOA.

Serves 1

½ cup peeled, pitted, chopped avocado

½ cup chopped fresh parsley

¼ cup chopped fresh basil

½ cup stemmed, chopped kale

½ teaspoon grated fresh ginger

1 teaspoon freshly squeezed lemon juice

½ cup almond milk

1 teaspoon MCT (medium chain triglyceride) oil

2 tablespoons pea protein powder

In a blender or food processor, blend all ingredients until smooth.

LUNCH OR DINNER

Root Vegetable Soup

The sweet potatoes, carrots, celery root, and tarragon add a lovely sweetness to this chicken soup for the soul! The Jerusalem artichoke is an amazing vegetable for liver support, and for your microbiome, too.

Enjoy this hearty soup as you support all your genes. Add chicken breast or other meat of your choice to support a fast COMT and/or a fast MAOA.

Serves 4

- 2 tablespoons coconut oil
- 1 onion, chopped
- 2 cloves garlic, minced
- 3 sweet potatoes, peeled and cut into bite-size pieces
- 3 carrots, peeled and cut into bite-size pieces
- 3 parsnips, peeled and cut into bite-size pieces
- 2 turnips, peeled and cut into bite-size pieces
- 1 celery root (celeriac), peeled and cut into bite-size pieces
- 3 Jerusalem artichokes, scrubbed, peeled, and cut into bite-size pieces
- 1 quart chicken broth (homemade or store-bought)
- Water, as needed
- 3 tablespoons chopped fresh tarragon
- 2 tablespoons chopped fresh parsley
- 1 teaspoon chopped fresh thyme
- 1 teaspoon coarse sea salt, or more to taste
- 1 teaspoon freshly ground black pepper, or more to taste
- 2 boneless, skinless chicken breasts, cooked and cut into half-inch pieces (optional)

1. In a large soup pot, over medium heat, heat the coconut oil, then sauté the onion until softened.
2. Add the garlic and cook for 30 seconds. Add the vegetables and stir to combine.
3. Add the chicken broth and additional water if necessary. Add the herbs, salt, and pepper.
4. Cook over medium heat for 45 minutes or until the vegetables have softened. Add the cooked chicken breast (optional), season with additional salt and pepper to taste, and serve.

Cold Borscht

Enjoy your ultimate liquid salad—super-refreshing and yummy. It's a must at least twice in the summer season—perfect for a hot day!

This Russian version of gazpacho will nourish all your genes.

Serves 4

2½ quarts water

½ to ¾ pound cooked beets, cooled, peeled, and shredded

Juice of ½ to 1 lemon, or less if you prefer less sourness

Coarse sea salt and freshly ground black pepper to taste

1 small bunch red radishes or 6 ounces daikon radish, cut in half and then sliced thinly into half moons

1 large English cucumber, cut in half and then sliced thinly into half moons

⅓ cup fresh dill, finely chopped

⅓ cup fresh scallions or chives, finely chopped

⅓ cup fresh parsley, finely chopped

6 to 8 ounces chopped ham (optional)

1 to 2 hard-boiled eggs, chopped (optional)

Mayonnaise or plain goat's milk yogurt, for garnish
($\frac{1}{2}$ to 1 teaspoon per serving)

Additional scallions, chives, parsley, and/or dill, for garnish

1. In a large pot, combine water, shredded beets, lemon juice, salt, and pepper. Add the radishes, cucumber, and finely chopped herbs.
2. Chill the mixture in the refrigerator for at least 30 minutes, letting the flavors mix.
3. Pour the cold soup into bowls. Add the ham and eggs if desired, and garnish with mayonnaise or yogurt and additional fresh-cut herbs.

Thai Coconut Chicken Soup

An exceptional blend of vegetables and spices makes this a comforting and nourishing soup. For a variation, try serving it over cooked basmati rice.

This is a nourishing soup for all your genes, but if you have a slow MAOA or a slow COMT, cut back on the shrimp and chicken at dinnertime.

Serves 4

2 14-ounce cans coconut milk

1 $\frac{1}{2}$ cups chicken broth (homemade or store-bought)

$\frac{1}{4}$ cup green curry paste

2 $\frac{1}{2}$ tablespoons freshly squeezed lime or lemon juice

1 tablespoon freshly grated ginger

1 pound chicken breast, sliced thinly, or 1 pound fresh shrimp, peeled

1 large carrot, cut in half and sliced into $\frac{1}{4}$ -inch half moons

2 stalks celery, sliced into $\frac{1}{4}$ -inch pieces

2 baby bok choy, chopped into 1-inch pieces

¼ cup fresh cilantro, chopped, for garnish

¼ cup fresh basil, chopped, for garnish

1. In a pot over medium-high heat, whisk together the coconut milk, chicken broth, green curry paste, lime or lemon juice, and ginger. Bring to a boil.
2. Add the chicken or shrimp. Cook, stirring occasionally, for 10 minutes, or until the chicken or shrimp is cooked all the way through.
3. Add the carrot and cook for 3 minutes. Add the celery and baby bok choy; then turn off the burner, cover the pot, and let the mixture sit for 3 additional minutes.
4. Divide the soup among four bowls and garnish with cilantro and basil.

Russian “Fur Coat” Salad (Shuba)

This salad is traditionally made with salted herring, but my family and I prefer a Northwest version that uses smoked wild Alaskan salmon instead.

This is one of my favorite salads. It’s fantastic for those with a slow COMT or a slow MAOA, but it will support all your genes—including a dirty DAO.

Serves 4

1 pound beets, washed but not peeled

1 large or 2 medium carrots

2 medium potatoes

1 8-ounce pack cold-smoked wild Alaskan salmon, chopped into small pieces

¼ cup finely chopped red or yellow onion

1 to 2 tablespoons grapeseed or walnut oil

¼ teaspoon freshly ground black pepper
1 teaspoon dry dill or ¼ cup chopped fresh
½ cup mayonnaise (regular or egg-free)

1. Boil the vegetables for this salad the night before you want to eat it, so you don't have to wait to cool them down. Boil the beets separately from the carrots and potatoes so they'll all cook faster and the beets won't color the other vegetables. Simmer the beets, whole, in water that fully covers them, for 40 to 60 minutes; simmer the carrots and potatoes, likewise whole and fully immersed, for 20 to 40 minutes.
2. In a 5 × 8 × 3-inch glass loaf pan, combine the fish, onion, oil, pepper, and dill. Spread the mixture evenly in the dish.
3. Once cool, shred the potatoes and add for the second layer.
4. Once cool, peel and shred the carrots to create a third layer.
5. Once cool, peel and shred the beets for a fourth layer.
6. Mix the mayonnaise with a bit of water to make a thick paste. Pour the paste evenly over the top of your salad. Cover and put it in the refrigerator for 15 to 20 minutes to let the mayonnaise layer settle.
7. Add salt if desired, and serve chilled, making sure to include all four layers in each portion. We like to use a spatula for serving.

Vegetable Nut Curry

This is an almond-rich vegan stew that can be enriched with cooked chicken or pork. It's delicious paired with a leafy green or tricolor-leaf salad.

This flavorful dish offers great support for all genes, especially a slow COMT or a slow MAOA. People with a fast COMT or a fast MAOA should add more protein. This dish is well tolerated by those with a dirty DAO.

Serves 4

4 cups water
1 cauliflower, “cored” and broken into large florets
6 small sweet potatoes, peeled and cubed
3 large carrots, peeled and cut into ½-inch chunks
1 onion, chopped
¼ cup walnut oil
1 tablespoon minced garlic
2 tablespoons finely chopped fresh ginger
1 teaspoon finely chopped jalapeño pepper, seeds removed
2 tablespoons curry powder
1 teaspoon ground turmeric
½ white cabbage, sliced
2 cups almond milk
1 tablespoon almond butter
1 cup chickpeas, cooked or canned and drained
1 teaspoon coarse sea salt, or more to taste
½ teaspoon freshly ground black pepper, or more to taste
3 tablespoons chopped almonds
3 tablespoons chopped fresh parsley or cilantro, for garnish
4 teaspoons unsweetened coconut flakes (optional), for garnish

1. To a large saucepan, add the water, cauliflower, sweet potatoes, and carrots. The water should cover the vegetables by 2 inches. Bring to a boil and cook on high heat for 7 minutes, or until the potatoes can be pierced with a fork. Remove the pan from the heat. Drain the vegetables and set them aside.
2. In a 12-inch skillet, sauté the onion in walnut oil over medium heat for about 3 minutes, or until softened. Add the garlic, ginger, jalapeño, curry powder, and turmeric. Stir to combine; then cook on low heat for 2 minutes.

3. Add the cooked cauliflower, sweet potatoes, and carrots and the raw cabbage and cook the mixture gently for 5 minutes.
4. Add the almond milk, almond butter, and chickpeas and cook for 15 minutes.
5. Add more almond milk if necessary to make sure the stew is saucy.
6. Add salt and pepper to taste. To serve, sprinkle with the chopped almonds, parsley or cilantro, and coconut flakes.

Lazy Cabbage Rolls

Preparing traditional cabbage rolls takes some time. “Lazy” rolls have the same ingredients, taste just as good, and require much less time because you don’t stuff the cabbage leaves and roll them up. To simplify further, you can also leave out the rice; then the dish becomes a delicious stew of ground beef and vegetables.

This lazy dish supports all genes very well and tastes fantastic. It’s a favorite winter dinner in the Lynch family.

Serves 6

1 tablespoon ghee

1 white or yellow onion, chopped

1 pound ground beef

Coarse sea salt and freshly ground black pepper to taste

1 cup shredded carrots

¼ cup chopped red bell pepper (optional)

1 medium-size head white cabbage, shredded

Optional: 1 cup white rice (or 1 cup half-cooked brown rice)

For the sauce:

1½ cups water

½ cup tomato sauce or pureed fresh tomatoes

2 to 3 tablespoons mayonnaise, sour cream, or plain goat's milk yogurt (with additional for optional garnish)

1 to 2 cloves garlic, minced

1. In a large skillet over medium-high heat, warm the ghee. Add the onions and fry them until golden. Add the beef, salt, and black pepper and let the mixture cook together for 10 minutes. If needed, drain off the fat.
2. Add the carrots and bell pepper and cook for 2 minutes. Add the cabbage and rice (optional) and lower the heat, simmering until the vegetables are tender and the rice is cooked.
3. In a bowl, combine all the ingredients for the sauce. Pour the sauce into the pan with your cooked ingredients. Bring that mixture to a boil, covered, and then adjust to a simmer for 15 minutes. If the sauce gets thicker than you like, add more water as everything cooks.
4. Divide among six bowls and serve. Add an additional dollop of mayonnaise, sour cream, or yogurt for garnish, as desired.

Vibrant Green Vegetable Salad with Lynch Family Dressing

In composing this vibrant green salad, you can use all the ingredients listed or choose just a few—or add your own favorites!

This salad supports MTHFR, slow COMT, slow MAOA, and GST/GPX. Those with a dirty DAO may need to eliminate the olives. Those with a fast MAOA and a fast COMT should add sliced chicken.

Serves 4

2 cups stemmed and ribbon-sliced kale

4 cups mixed baby greens

1 cup watercress, stemmed

2 cups arugula

1 tablespoon plus 2 teaspoons chopped fresh tarragon, divided
Lynch Family Dressing (page 263)
16 endive leaves
16 very thin asparagus spears
2 cups sugar snap peas
2 avocados, peeled, pitted, and sliced
½ cucumber, peeled, seeded, and sliced
½ cup coarsely chopped green pepper
1 large fennel bulb, thinly sliced
½ cup pitted green olives, or more to taste

1. In a bowl, combine the kale, baby greens, watercress, and arugula.
2. In a separate bowl, add 2 teaspoons of tarragon to the Lynch Family Dressing. Toss the greens with 2 tablespoons of dressing.
3. Divide the greens among four plates. Arrange the endive in four directions, tucking a bit of each leaf under the mounded greens but leaving the points out. Place the asparagus spears on the endive with the cut ends tucked under the greens.
4. In another bowl, combine the snap peas, avocados, cucumbers, green peppers, fennel, and olives with 2 tablespoons of the dressing. Spoon onto the greens. Sprinkle with the remaining tarragon.

Warm Artichoke, Asparagus, and Pine Nut Salad

A warm salad is good any time of year—especially this salad, with its array of flavors and textures.

This would make a wonderful lunch or dinner for those with a dirty MTHFR, a slow COMT, a slow MAOA, or a dirty GST. If you have a dirty DAO, you may need to reduce the amount of Dijon mustard and pine nuts, but the quantities are small so you may tolerate them just fine.

Serves 4

4 medium artichokes

Water

1 teaspoon freshly squeezed lemon juice

16 asparagus spears, bottom quarter removed

2 cups cooked wild rice

1 tablespoon ghee

2 tablespoons pine nuts

1 pound baby bok choy, sliced

For the dipping sauce:

6 tablespoons freshly squeezed lemon juice

2 teaspoons finely grated lemon zest

1 teaspoon Dijon mustard

Coarse sea salt and freshly ground black pepper to taste

½ cup olive oil

3 teaspoons flaxseed oil

1. With scissors, cut off the thorns of each artichoke and the end of the stem, leaving about one inch of the stem. Place a steamer basket in a large pot with a lid. Fill the pot with water until it reaches the bottom of the basket; add 1 teaspoon lemon juice. Place the artichokes in the steamer basket, stem end down. Put a lid on the pot and bring the water to a boil. Lower the heat to medium and steam the artichokes for 40 minutes, or until the stem can be pierced with a fork. Drain and set aside. (Keep the pot close; you'll be using it again.)
2. In the same pot, boil the asparagus in salted water until it's crisp and tender. Drain and set aside.
3. In the pot you cooked the artichokes in and then the asparagus in, combine the rice and the ghee to warm them. Once warm, add the pine nuts to the pot and combine.

4. To make the dipping sauce, in a small lidded jar, combine the lemon juice, lemon zest, mustard, salt, and pepper. Add the two oils and vigorously shake. Add more salt and pepper to taste.
5. In the middle of each of four plates, make a bed of the bok choy, spoon the rice in the center, top with the artichoke, and surround with the asparagus. Season with additional salt and pepper to taste, and serve with the lemon dipping sauce on the side.

Seared Scallops

Not all scallops are the same! Buy “dry” scallops, not “wet”—terms that refer to how the scallops were packed after shucking. Dry scallops don’t have the chemical preservatives of wet, and can be identified by their pearly or pink look. Pair with basmati rice and a side dish of green beans sautéed with sliced carrots and walnuts.

This nutritious meal supports a fast COMT, a fast MAOA, a dirty NOS3, and a dirty PEMT. Those with a slow COMT and a slow MAOA should do well with this dish if they eat fewer scallops. Those with a dirty DAO should tolerate this dish well if the scallops are fresh.

Serves 4

- 1¼ pounds large dry sea scallops
- ½ teaspoon coarse sea salt
- ½ teaspoon freshly ground black pepper
- 2 tablespoons avocado oil or ghee
- 2 tablespoons freshly squeezed lemon juice
- 1 teaspoon capers (packed in salt), rinsed
- 1 tablespoon chopped fresh parsley

1. Wash and dry the scallops. Season them with the salt and pepper.
2. Heat the oil or ghee in a heavy 10-inch skillet over high heat.

3. Quickly place the scallops in the skillet, in one layer, not touching. Sear the scallops for 1 to 2 minutes on each side, until a golden crust forms. Remove them from the pan and arrange them on plates.
4. Add the lemon juice, capers, and parsley to the oil or ghee remaining in the pan. Cook until hot. Pour the mixture over the scallops and serve.

Picadillo

This classic sweet-and-sour Cuban dish can be made with ground pork or beef. Serve with brown rice and organic corn tortillas.

This tangy dish supports those with a fast COMT or a fast MAOA. Those with a slow MAOA and a slow COMT should eat a smaller serving for dinner, to limit their late-day protein. If you have a dirty DAO, this dish should be well tolerated because the tomatoes and olives are cooked. If you're very sensitive, though, you can skip those two ingredients.

Serves 4

- 4 tablespoons coconut oil
- 1 onion, finely chopped
- 3 cloves garlic, finely chopped
- 1 pound ground lean pork
- 1½ teaspoons ground cumin
- 1½ teaspoons ground allspice
- 1 teaspoon dried oregano
- 1¼ teaspoons ground cinnamon
- 1 teaspoon coarse sea salt
- ¼ teaspoon freshly ground black pepper
- 1 28-ounce can chopped tomatoes, *not* drained

- 3 tablespoons freshly squeezed lemon juice
- 2 tablespoons honey
- $\frac{3}{4}$ cup raisins
- 2 teaspoons capers, packed in salt, rinsed
- 2 tablespoons chopped pimento-stuffed green olives

1. Heat the oil in a medium skillet over medium heat. Add the onions and cook until soft but not brown. Add the garlic and cook for 30 seconds.
2. In a bowl, combine the pork, cumin, allspice, oregano, cinnamon, salt, and pepper, using a spoon to break up any clumps.
3. Add the pork mixture to the onion and garlic in the skillet and cook for 6 minutes.
4. Add the tomatoes, lemon juice, honey, raisins, capers, and olives. Cook for 15 minutes, or until the sauce has thickened. Taste for seasoning.

Fish Stew

This is an easy stew that can be enriched with shellfish.

This yummy stew supports those with a fast COMT, a fast MAOA, and a dirty GST/GPX, NOS3, or PEMT. Those with a slow COMT or a slow MAOA should consider less protein—perhaps using only half the recommended amounts of fish and optional shellfish. Those with a dirty DAO should tolerate this dish if both the fish and shellfish are fresh and well rinsed before cooking.

Serves 4

- 2 tablespoons coconut oil
- 1 cup chopped onion
- 4 cloves garlic, minced
- 1 cup chopped fennel stalk (save the greens for garnish)
- 1 cup chopped carrots

2 teaspoons coarse sea salt, or more to taste
1 teaspoon freshly ground black pepper, or more to taste
2 cups fish stock or bottled clam juice
2 cups water
1 28-ounce can crushed tomatoes
5 star anise seeds
24 mussels (optional)
1½ pounds fresh cod or haddock, cut in 2-inch pieces
2 tablespoons chopped fresh parsley
12 medium “dry” (see page 254) scallops (optional)
1 tablespoon fennel greens, for garnish

1. In a 10-inch Dutch oven, heat the oil and sauté the onion until it's soft and golden. Add the garlic and cook for 30 seconds. Don't let the garlic brown.
2. Add the fennel and carrots, salt and pepper, and cook for 5 minutes. Add the fish stock or clam juice, water, tomatoes, and star anise and cook for 15 more minutes, or until the carrots are tender.
3. If using the optional mussels, add them to the pot and continue cooking until they open.
4. Remove the cooked mussels from the pot and set them aside.
5. Add the fish and the parsley. Bring the soup back to a simmer and cook until the fish easily flakes apart, about 5 minutes.
6. Add the optional scallops and cook until they turn opaque. Remove the scallops from the pot.
7. Taste the soup for additional salt and pepper.
8. When you're ready to serve, place 3 scallops and 6 mussels in each bowl. Fill the bowls with the hot fish soup and garnish with the fennel greens.

Roasted Miso Chicken and Vegetables

Asian influence on a traditional roast chicken flavors this delicious dish. Serve with brown rice or quinoa.

This flavorful dish supports those with a fast COMT, a fast MAOA, or a dirty PDMT. Those with a slow MAOA or a slow COMT should eat less chicken and more vegetables when this is served at dinner. Miso can dirty the DAO, so if yours is already very dirty, consider skipping this ingredient; however, since the miso is cooked and only a small amount is used, it should be well tolerated by most.

Serves 4

- 4 tablespoons white or yellow miso
- ½ cup sunflower or safflower oil
- ¼ cup honey
- 2 tablespoons freshly squeezed lemon juice
- 1 teaspoon finely chopped fresh ginger
- 1 teaspoon coarse sea salt
- ½ teaspoon freshly ground black pepper
- 4 chicken breasts or 8 chicken thighs, bone-in, skin-on
- 3 carrots, cut into ½-inch pieces
- 1 cauliflower, “cored” and cut into ½-inch pieces
- 2 teaspoons toasted white sesame seeds, for garnish

1. Preheat the oven to 425° F.
2. Line 2 baking sheets with parchment paper brushed with oil.
3. In a bowl, combine the miso, oil, honey, lemon juice, ginger, salt and pepper. Set aside 2 tablespoons of this mixture and divide the remainder into 2 large bowls.
4. In one bowl, rub the miso into the chicken and let it marinate for 30 minutes or more. Toss the carrots and cauliflower into the other bowl just before cooking. Place the chicken in a single layer on one baking sheet and transfer the vegetables to the other.

5. Roast in the oven for 30 minutes, or until the skin is crisp and the internal temperature of the chicken is 160 to 165°F. The vegetables should be tender but crisp.
6. Divide both the chicken and the vegetables among four plates. Garnish with sesame seeds.

Salmon with Ginger Vinaigrette

This is a slightly Asian take on a delicious fish dish. Accompany with basmati or wild rice and sautéed asparagus for a real feast

This dish supports a dirty MTHFR, a fast COMT, and a fast MAOA. Those with a dirty PEMT should replace the coconut oil. Those with a dirty DAO should tolerate fresh and washed salmon. Those with a slow COMT and/or a slow MAOA should eat a smaller portion of the salmon and eat more of the vegetables.

Serves 4

4 wild salmon fillets, about 7 ounces each

3 teaspoons grated fresh ginger

1 tablespoon gluten-free soy sauce

1 teaspoon sesame oil

1 tablespoon olive oil

Coarse sea salt and freshly ground black pepper to taste

2 teaspoons coconut oil

1. Preheat the oven to 450°F.
2. Wash and dry the salmon.
3. In a food processor, combine the ginger, soy sauce, sesame oil, and olive oil. Process until smooth and set aside.
4. Place a small, heavy-bottomed ovenproof skillet or cast-iron pan over high heat.

5. Salt and pepper the fish on both sides.
6. When the pan is very hot, add the coconut oil and place the salmon in the pan, flesh side down. Cook on high heat until opacity creeps one-third of the way up the side of the fish, about 3 minutes. Don't turn the fish.
7. Put the pan in the oven and bake the salmon for 5 to 7 minutes, until the flesh is opaque and firm. Using a long spatula, turn the fish onto a plate.
8. Serve with the ginger vinaigrette on the side.

Lamb Chops with Herb Sauce

The zesty, minty sauce, paired here with lamb, may also be served with pork or chicken. Roasted potatoes and sautéed green beans would pair well with this dish.

This dish supports a fast COMT, a fast MAOA, and a dirty PEMT. Those with a slow COMT and/or a slow MAOA should eat less of the lamb and more of the vegetables. Those with a dirty DAO should leave the anchovy out of the recipe.

Serves 4

5 cloves garlic, minced, divided

½ teaspoon chopped fresh rosemary

2 teaspoons coarse sea salt

½ teaspoon freshly ground black pepper

8 loin lamb chops, each about 1¼-inch thick

For the sauce:

1 cup fresh mint, chopped

¼ cup fresh cilantro, chopped

½ cup fresh parsley, chopped

- 1 teaspoon chopped jalapeño pepper, seeds removed
- 1 anchovy fillet (optional)
- 1 tablespoon honey
- 1 teaspoon freshly squeezed lemon juice
- ½ teaspoon hot sauce (optional)
- ½ cup olive oil

1. Preheat the broiler or grill to medium heat.
2. Mash two cloves of the garlic, the rosemary, and the salt and pepper into a paste.
3. Rub the mixture into the lamb chops and set aside for 10 to 15 minutes.
4. In a food processor, pulse the mint, cilantro, parsley, remaining garlic, jalapeño pepper, and optional anchovy until well combined. Add the honey, lemon juice, and optional hot sauce, and pulse briefly. With the machine going, slowly add the olive oil until incorporated. Add additional salt, pepper, or hot sauce to taste.
5. Broil the chops for 4 minutes a side for medium (3 minutes for medium-rare). The chops should be 4 to 5 inches from the flame or broiler.
6. Serve the sauce on the side.

Vegan Rice Bowl

This Mexican-style rice bowl can include cooked chicken or meat for additional protein.

This dish supports a dirty MTHFR, a slow COMT, and a slow MAOA. Those with a fast COMT or a fast MAOA should add some chicken or additional beans. Those with a dirty DAO shouldn't use tomatoes and should not use lime juice in the dressing.

Serves 4

3 tablespoons coconut oil, divided
1 tablespoon chopped onion
1 $\frac{1}{4}$ teaspoons minced garlic, divided
1 cup uncooked brown rice
2 $\frac{1}{4}$ cups water, divided
 $\frac{1}{2}$ teaspoon ground cumin
 $\frac{3}{4}$ cup Lynch Family Dressing (see page 263)
1 teaspoon chopped cilantro (plus 2 teaspoons for optional garnish)
2 cups canned black beans, rinsed and drained
1 teaspoon coarse sea salt, divided
 $\frac{1}{2}$ teaspoon freshly ground black pepper, divided
3 cups tightly packed chopped chard, kale, or escarole
3 large ripe orange or yellow tomatoes, diced
2 avocados, peeled, pitted, and sliced

1. In a medium saucepan, add 1 tablespoon of the oil and sauté the onion until soft. Add $\frac{1}{4}$ teaspoon of the garlic and cook for 30 seconds.
2. On low heat, add the rice and sauté, stirring until it turns opaque. Add the water and cumin and cook, covered, for about 30 minutes, or until the liquid has been absorbed.
3. While the rice is cooking, prepare the Lynch Family Dressing and adding 1 teaspoon chopped cilantro.
4. In a sauté pan over low heat, warm the rest of the garlic in the remaining oil. Do not brown.
5. In a bowl, combine half of that garlic oil with the drained beans. Add $\frac{1}{2}$ teaspoon salt and $\frac{1}{4}$ teaspoon pepper. Set aside.
6. Wash the greens, shake off excess water, and sauté the damp greens in the remaining garlic oil, still on low heat, for 5 minutes, or until they're wilted. Season with remaining salt and pepper.

7. To assemble the dish, spoon rice into four large soup bowls. Top with consecutively placed sautéed greens, tomatoes, avocados, and black beans. Pour the dressing over the vegetables. Garnish with the remaining chopped cilantro (optional).

BASIC RECIPES

Lynch Family Dressing

¼ cup walnut oil, grapeseed oil, or sunflower oil
1 to 2 tablespoons maple syrup
1 to 2 tablespoons apple cider vinegar or tamari
2 tablespoons freshly squeezed lemon or lime juice
1 to 2 teaspoons minced garlic
1 to 2 teaspoons thinly grated fresh ginger
¼ teaspoon freshly ground black pepper
⅛ cup water

Put all ingredients in a small glass jar or bottle and shake it well. You can store this dressing in the refrigerator for weeks.

Vegetable Preparations for Entrée Sides

Most entrées in the preceding “Lunch or Dinner” recipe section mention vegetable pairings. They are suggestions only. Please follow your taste and substitute your own choices.

Enhance sautéed and roasted vegetables with herbs and spices—for example, cucumber and fennel with tarragon, carrots with cumin and cinnamon, cauliflower with curry, zucchini with basil.

The fastest vegetable preparations are wilting and sautéing. Roasted vegetables take longer, but the cooking

time can be reduced by parboiling hard vegetables before seasoning and roasting.

Composed salads also make easy sides. Leftover roasted vegetables are a savory addition to a green salad. Unusual vegetables such as jicama, parsnips, shredded brussels sprouts, beets, and Jerusalem artichokes make interesting ingredients in a salad. Rice, potatoes, and grains such as millet, quinoa, and amaranth are textural enhancements. The simple “green salad” can be varied in color, shape, texture, and taste. Try including radicchio, endive, Boston lettuce, Bibb lettuce, red and white cabbage, arugula, spinach, watercress, mustard greens, and/or a mixture of baby lettuce. Dried fruit and nuts and grated cheese add sweetness and texture.

Roasted Vegetables

Potatoes, cauliflower, carrots, onions, brussels sprouts, asparagus, squash, garlic, and all root vegetables are ideal for roasting. Leftover roasted vegetables, at room temperature, make a delicious salad ingredient or snack.

1. Preheat the oven to 450° F.
2. Cut the vegetables into uniform sizes and shapes. For example, potatoes should be halved, onions should be quartered, squash and carrots should be cut into 1-inch chunks. Toss with oil; baking times will vary.
3. To save time, hard vegetables such as cauliflower, potatoes, carrots, and squash can be parboiled until just tender.

Sautéed Vegetables

Sautéing is a quick method of cooking vegetables, taking typically between 3 and 7 minutes. The key is to cut the vegetables into equivalent

bite-size pieces. This ensures that they will finish cooking at the same time. The cooking time will vary depending on the type of vegetable. Green beans, zucchini, mushrooms, asparagus, corn kernels, and tomatoes will cook in a short time. Brussels sprouts, broccoli, and cauliflower cook in a medium amount of time. Very dense vegetables, such as potatoes and carrots, can be steamed or cooked in water first to make them ready for the sauté pan. If you're making a medley of vegetables, add those that have the longest cooking time first. The aim is to achieve the desired firmness and integrity of each vegetable.

1. Cut the vegetables into rounds, sticks, or bite-size pieces. They should be uniform in size.
2. In a wide sauté pan, add avocado oil. Heat the pan to medium-high.
3. When the oil starts to shimmer, add minced garlic, immediately followed by the vegetables. Don't overcrowd the pan. If necessary, cook in two batches. Toss the vegetables repeatedly and cook until fork-tender. The time will depend on the type of vegetables. One minute before removing from the heat, add herbs and spices, including salt and pepper.

Wilted Vegetables

For all tender leafy greens such as Swiss chard, spinach, escarole, baby kale, dandelion greens, mustard greens, and broccoli rabe, this cooking method works well. Allow 2 cups tightly packed greens per person. (The following recipe can be scaled up as needed.)

Serves 2

4 cups packed greens

3 small garlic cloves, thinly sliced

2 tablespoons ghee or avocado oil

1 tablespoon freshly squeezed lemon juice

Coarse sea salt and freshly ground pepper to taste

1. Remove tough stems from the greens. Wash the leaves and drain them in a colander. Don't dry them.
2. On low heat, lightly sauté the garlic in the oil. Don't allow it to brown. Turn the heat up to medium and add the greens, tossing them in the oil until they're fully wilted.
3. Add the lemon juice, then salt and pepper to taste.

Laundry List 2: Which Genes Need More Cleaning?

Wow, here we are again—time to run through our second Laundry List! Now that you’ve given your genes two weeks of great diet and lifestyle, let’s dig even deeper to find out which genes might need some additional support.

Laundry List 1 was a great way to quickly evaluate which genes are dirty. It allowed you to determine which recipes to use. The goal of Laundry List 2 is to really dial in and determine which additional lifestyle, dietary, and environmental changes you need to implement, along with supportive supplementation. It isn’t possible to act on Laundry List 2 without having completed Laundry List 1 and spent at least two weeks on your Soak and Scrub.

Fill out this questionnaire—again, be absolutely honest—and calculate a separate score for each gene. Use those scores to determine which genes need extra attention as you turn to chapter 15 and find out how to Spot Clean specific dirty genes.

Check each box if the condition has occurred frequently within the last sixty days or is generally true:

MTHFR

- I get shortness of breath or become red in the face after exercising.
- At times, I get exercise-induced asthma.
- My moods often fluctuate between irritability and depression.
- I can't easily tolerate alcohol of any type.
- I feel generally tired and "toxic."
- I don't eat leafy green vegetables every day.
- I tend to be able to focus and concentrate quite well—when I'm not mad or sad.
- I have difficulty falling asleep at times.
- I've had laughing gas (nitrous oxide) at the dentist's or the doctor's office and it made me feel horrible.
- When I get irritated, it takes me quite some time to calm down.
- There are some days I push it and take risks, but that's usually not my style.

DAO

- I'm often irritable, hot, or itchy after eating.
- I can't tolerate yogurt, kefir, chocolate, alcohol, citrus, fish, wine (especially red), or cheese.
- I get random joint pains that move around and come and go.
- I have skin issues such as eczema, urticarial (hives), or psoriasis.
- If I scratch my skin, I get red streaks.
- I can't tolerate many probiotics.
- I have SIBO.
- I have a lot of food allergies or food intolerances.
- I have ringing in my ears at times, especially after eating.
- I've been told I have leaky gut syndrome, Crohn's disease, or ulcerative colitis.
- I get migraines or other headaches often.
- I have a runny nose often, as well as nosebleeds.
- I can't fall asleep for several hours after eating or drinking.
- I have asthma or exercise-induced asthma.

COMT (*slow*)

- I feel *more* irritable after eating a high-protein diet (GAPS, Paleo).
- I'm easily irritated, and it takes me a long time to calm down.
- I routinely have (or used to have) PMS.
- I'm a very happy, enthusiastic person—but it's easy to irritate me.
- I'm not very patient.
- I've always been able to focus and study for long hours.
- I've struggled with falling asleep since I was a child. I know the ceiling patterns well.
- My doctor put me on birth-control pills to control acne or heavy bleeding.
- I have (or have had) uterine fibroids.
- Caffeine does wake me up, but I have to be careful not to drink too much or I get irritable.
- I don't like taking risks. I'm pretty cautious.

COMT (*fast*)

- I have difficulty paying attention.
- I get depressed quite often.
- When I get stressed out, I can calm down quickly.
- I tend to be calm most the time, but I don't always like to be.
- I'm a risk taker. I enjoy pulling stunts, because I feel awesome afterward.
- I'm the class clown. I love it when I make people laugh.
- I find myself fidgeting and moving constantly.
- I sometimes pinch myself so hard that it hurts.
- I have a hard time getting going in the morning.
- I find that I can easily get addicted to things or activities: video games, social media, smoking, drinking, shopping, drugs, gambling.
- I'm not very interested in sex.
- When it's bedtime, my head hits the pillow and I'm out like a light.
- Caffeine helps me focus and pay attention.
- I crave high-fat, high-sugar foods, and they do make me feel better—for a bit.

MAOA (slow)

- I tend to be rather aggressive.
- It takes me a while to slow down.
- I can focus for a long time.
- When I drink alcohol, I become an angry drunk.
- I'm not drawn to carbs, and I feel less irritable when I don't eat many of them.
- I'm more irritable and angry when I eat cheese and/or chocolate or drink wine.
- It takes me a while to fall asleep.
- When I do fall asleep, I tend to stay asleep through the night.
- My doctor put me on an SSRI for depression, and I got very irritable from it.
- Melatonin doesn't work well for me. It makes me feel more awake and irritable.
- Caffeine tends to make me irritable.
- Lithium helps my mood.
- 5-HTP makes me feel anxious and irritable.
- Inositol overstimulates me.
- I'm self-confident.
- I'm a man.

MAOA (fast)

- Since I was a kid, I've had a very hard time focusing and paying attention.
- I crave cheese, wine, and chocolate, and I feel better after I consume them.
- I crave carbohydrates, and they make me feel less depressed.
- I fall asleep quite well, but I tend not to be able to sleep through the night. I need a snack to fall back asleep.
- I have an autoimmune disease, such as Graves' disease, Hashimoto's thyroiditis, multiple sclerosis, or active celiac.
- I'm chronically inflamed.
- Winters and prolonged darkness affect my mood. I've been told I have seasonal affective disorder.

- I love exercising. It helps my mood.
- I'm a woman.
- I'm a worrier.
- I tend to be depressed and anxious.
- I get a bit obsessive about things.
- I have fibromyalgia, constipation, or irritable bowel syndrome.
- Melatonin works quite well to help me sleep.
- Inositol improves my mood.
- 5-HTP improves my mood.
- Lithium makes me feel more depressed.
- My doctor put me on an SSRI, and it did help.

GST/GPX

- I'm sensitive to chemicals and smells.
- I feel way better after taking a sauna or sweating heavily.
- It's easy for me to gain weight even though I eat right.
- Cancer runs in my family.
- I notice gray or white hairs coming in when I get stressed.
- I have early graying of my hair.
- I have high blood pressure.
- I just got done fighting an infection.
- I tend to be chronically stressed out.
- I have an autoimmune disease.
- I have chronic inflammation.
- I have asthma or difficulty breathing. I often feel like I can't get enough air.
- I generally feel tired and "toxic."
- I have high blood pressure.

NOS3

- I have high blood pressure.
- I've had a heart attack.
- I have diabetes, type 1 or 2.
- I have cold hands and feet.

- I struggle with asthma.
- I snore, breathe through my mouth, or have sleep apnea.
- I'm noticing that my memory is getting worse.
- I had preeclampsia during pregnancy.
- I have atherosclerosis.
- I'm postmenopausal.
- My moods are all over the place.
- I don't exercise or move much.
- I have an autoimmune disease.
- I'm chronically inflamed.

PENT

- I'm postmenopausal.
- My estrogen levels are low.
- I have gallstones.
- I don't eat leafy green vegetables often.
- I don't eat eggs or meat much.
- I've been told I have fatty liver.
- I have SIBO.
- I'm a vegetarian or vegan.
- I had my gallbladder removed.
- I've had general pain everywhere—inside and out—for years.
- I don't tolerate fatty foods well.
- My symptoms started partway through pregnancy and have gotten worse since.
- My child has a congenital birth defect.
- Breastfeeding wore me out physically and mentally.

Scoring

Score each gene separately.

- 0 points: Excellent! This gene is amazingly clean!
- 1–4 points: This gene needs a bit of attention, but the problems are probably related to several genes rather than this particular one.

- 5–7 points: This gene seems to be a bit dirty. Paying some direct attention to this gene will likely produce results. Looking at how other genes influence this gene is important.
- 8 points and above: This particular gene is definitely dirty. Spend some time identifying all the factors that are affecting its function. Identify other genes that scored high, because they are dirtying this gene as well.

My Score

MTHFR _____

MAOA (fast) _____

DAO _____

GST/GPX _____

COMT (slow) _____

NOS3 _____

COMT (fast) _____

PEMT _____

MAOA (slow) _____

Being Happy with Your Haplotype

Harriet, Eduardo, and Larissa, whom we met back in chapter 3, each identified one key dirty gene. But sometimes we can identify *combinations* of dirty genes—what scientists call *haplotypes*. For example:

- SNPs in both MTHFR and NOS3 give you an increased risk of cardiovascular issues and migraines, which you can address through diet, exercise, and stress relief. On the flip side, both of these genes are thrifty in the ways they conserve nutrients: with this haplotype, you typically have more folate for DNA repair and more arginine for muscle tone and infection fighting.
- The cardiovascular issues and migraines mentioned above become even more intense if you have SNPs in MTHFR, NOS3, and COMT; and your risks increase further with SNPs in MTHFR, NOS3, COMT, and GPX/GST. You don't need to panic if you have that haplotype—but you do need to make extra sure to follow the Clean Genes Protocol and give your dirty genes all the support they need. Once again, the good news is that you're conserving

folate and arginine. In addition, your brain chemicals stick around longer with this haplotype, giving you much greater attention and focus.

- SNPS in both MTHFR and DAO increase histamine intolerance, putting you at risk of chronic or exercise-induced asthma. With this haplotype, you'll want to take extra care to avoid histamines in your food and your environment, and to choose the kinds of aerobic exercise that increase your lung capacity.
- The haplotype of SNPs in MTHFR, DAO, COMT (slow), and MAOA (slow) further increases histamine intolerance, putting you at even greater risk of chronic or exercise-induced asthma. Increased irritability and anxiety are also potentially present, and you need to take even greater care with diet and exercise. However, your ability to focus is incredible, and people wonder how you can concentrate for so long.
- SNPs in both MTHFR and COMT (slow) increase aggression, irritability, and your risk of estrogen-related cancers, which means you might want to incorporate extra stress relief into your life. Vacations are a fabulous way to combat the downside of this haplotype. The good news is that you're extremely productive and get things *done*. Did I say your skin looks fabulous, too?
- The haplotype of SNPs in MTHFR, COMT (slow), and GST/GPX make you still more likely to be aggressive and irritable and put you at risk for estrogen-related cancers, neurological disorders such as Parkinson's disease or multiple sclerosis, and cardiovascular disorders such as heart attack and hypertension. You can overcome these risks with the Clean Genes Protocol, but you'll want to make extra time for stress relief. On the plus side, your creativity and focus are *solid*.
- The haplotype of SNPs in MTHFR, COMT (slow), MAOA (slow), and GST/GPX further increases your risk of irritability, neurological disorders, and insomnia. When you're on, though, you're on. The things you come up with and accomplish are unreal. Some say you're a genius!

- SNPs in both MTHFR and PEMT increase your risk of pregnancy complications, gallbladder issues, SIBO, and fatty liver. These risks are increased still further if you have the triple combination of MTHFR, PEMT, and GST/GPX. With this haplotype, you have a great reason to eat more meat and eggs!
- SNPs in MTHFR, PEMT, and NOS3, in combination, further increase the risk of pregnancy complications, liver problems, and cardiovascular issues. The risk increases a bit more with the combination of MTHFR, PEMT, NOS3, and GST/GPX. The good news is that you don't have to worry about the risks even a little if you follow the Clean Genes Protocol.
- The haplotype of SNPs in COMT (fast) and MAOA (fast) increases your risk for ADD/ADHD, lack of drive, and depression. On the upside, your friends say you're the most chill and easygoing person they know.

Understanding these and many other combinations gives you the power to live a healthier, happier life. Once again, the Clean Genes Protocol allows you to make the most of your upside while minimizing the risks to your downside.

Spot Cleaning for Life

Your body is constantly changing—and your environment is too. Maybe you've had a stressful two months at work and are now passing into a peaceful time. Or perhaps you've had a quiet, pleasant summer and are now gearing up for a challenging fall. Maybe your tastes in food have changed, or perhaps you've noticed significant differences in your health thanks to your time on the Clean Genes Protocol.

Whatever your situation, your health is a lifelong journey. Don't just complete the questionnaire in this chapter, do your Spot Cleaning, and forget about it. I encourage you to return to Laundry List 2 every three to six months—as you continue to live according to the Clean Genes Protocol—and to use this questionnaire as your guide for

whatever Spot Cleaning you need *throughout your life*. That's how my family and I do it—and that's how I encourage my clients to do it also. Your Laundry List 2, your Soak and Scrub, and your Spot Cleaning procedure—detailed in the next chapter—are your best tools for keeping your genes clean now and for the rest of your life.

Spot Cleaning: Your Second Two Weeks

So you've completed the Soak and Scrub and you're raring to dig deeper and get more specific, all the while maintaining the gene-friendly diet and lifestyle you've begun. Terrific!

But before you move on to Spot Cleaning, I have to ask: Did you do everything—I mean *everything*—in the Soak and Scrub? If you did, you're ready to move on to Spot Cleaning while continuing to follow the Soak and Scrub principles. If you didn't, your results for Spot Cleaning will be—well—spotty.

In order for you to Spot Clean a particular gene, *all* the genes have to be fairly clean, just as you can't target one specific spot on your jeans until the whole garment is generally clean. For general cleanliness to happen in your body, you need to *faithfully* follow the Soak and Scrub approach.

Remember, genes work together—in groups and clusters. So if you decide to skip straight to this chapter, you might find yourself frustrated.

Plan of Attack

Here are important points to keep in mind as you Spot Clean:

- The cleaner your genes are, the faster you'll be able to lower the dose of your supplements, or stop them altogether.
- The dirtier your genes are, the more you'll need to start with a low dose of a nutrient and then work up to what works best for you. You might find that you need the nutrient at a higher amount for some time—but don't *assume* that you will without working up to it. As you feel better, adjust your dose downward according to the Pulse Method, described in chapter 12.
- If you want more information about any of the procedures or supplements mentioned in this chapter, consult the Resources section at the end of this book. See also my website, www.DrBenLynch.com; it too has a Resources section.
- If you find that you have a single dirty gene, go right to that gene and follow the protocol for Spot Cleaning it. Even if you scored only a 1 for that gene, it might need a short, quick Spot Clean. As always, tune in to how you're feeling and adhere to the Pulse Method when it comes to supplements.
- If you find that you have multiple dirty genes—and most of us do—you might assume that you should address your dirtiest gene first. I've found that that's not the most effective approach, however. Instead, you should Spot Clean your genes in this order:
 - DAO
 - PEMT
 - GST
 - COMT
 - MAOA
 - MTHFR
 - NOS3

Implement the Pulse Method

As we discussed in the Soak and Scrub chapter, it's important to implement the Pulse Method to fine-tune your personal dosage of supplements. If you need a refresher, please go back to page 218.

Let me give you a couple more examples showing how the Pulse Method can help.

People who feel depressed often take supplemental methylfolate. In a few days, they feel great! Then they begin feeling irritable, snappish, wired; they experience that “jumping out of their skin” feeling. Oops—they need to cut their methylfolate dose right away. The Pulse Method could have helped them figure out how much to take without the seesaw effects described here. Because your body is always changing, the “right amount” of any supplement is always changing too.

Here’s an example of you using the Pulse Method for the first time. See if you can spot where you went wrong.

Suppose you have a clean DAO gene and you want to start supporting your dirty PEMT with phosphatidylcholine. You evaluate how you’re feeling: slightly anxious, a bit constipated, and a little achy in the muscles. You know that phosphatidylcholine may help support you in all these areas.

You start by taking one capsule with breakfast. For a few days, you don’t feel anything, but on the fourth day, you notice that you’re more calm and you’re going to the bathroom a bit better than usual. You keep improving gradually over subsequent days, and your symptoms seem to be basically gone on the twentieth day. You’re so stoked! You keep taking the phosphatidylcholine because it’s working so well for you.

On the thirtieth day, you remember to tune in before you take your supplement. That day you sense a change: you realize that you seem a bit depressed. You reach for the bottle and think, “Wait. I was anxious, then I felt great for about two weeks, but now I feel depressed. I need to stop taking this supplement for now. I’ll take it again if I feel I need it—if I get a bit anxious or constipated, or if my muscles hurt.”

Did you catch it? Overall you did great here but you made two mistakes and it cost you. The first mistake occurred on the twentieth day—you felt great! What should you have done? You should have stopped taking phosphatidylcholine yet you continued taking it. Now you had an excessive amount of this supplement and it made you feel depressed. The second mistake occurred for about ten days—you were not tuning in each day. You remembered to do so on the thirtieth day. At the end, you figured it out and now know you should stop taking it when you feel great and to resume when you need it.

In the beginning, the Pulse Method will be a learning curve. As with anything new, daily practice is what will make it routine and easy. I'm confident you'll get it and experience the tremendous benefits!

As you go through Spot Cleaning, make sure to tune in to how you're feeling. Apply the principles of the Pulse Method with supplements, and you'll greatly improve your outcome.

Spot Cleaning Your DAO

The Dirty DAO Lifestyle

- Select Clean Genes recipes that support your DAO.
- You may need to find a health professional to help you identify infections and heal your leaky gut. We'll try a few things together first.
- Finding a health professional who specializes in visceral manipulation can be a game-changer. Have him or her focus on your gallbladder, liver, and diaphragm. For more information, see PEMT Spot Cleaning (the next section, below).

Fixing High Histamine in the Gut

High histamine in the gut can be triggered by a variety of causes—pathogenic bacteria, leaky gut, and many more—each of which has its own distinctive fix. Let's look at those causes in turn:

- **Overgrowth of pathogenic bacteria.**
 - Blastocystis hominis*, *Helicobacter pylori*, *Clostridium difficile*, and other bacteria are very common. Interestingly, if one person in your family has this type of pathogen, typically everyone else does, too. Using natural antimicrobials (see below) can help get rid of the pathogens, but they might come back if you're stressed, have low stomach acid, use antacids, take antibiotics, or consume contaminated food or water. Effective antimicrobials include olive leaf extract, mastic gum, oregano oil, wormwood, neem, black walnut, garlic, and ox bile. It is best to rotate them rather than using a blend of them every day. This helps prevent resistance.

- If you have gut pathogens, and most of us do, you should experience gas and bloating when taking an effective antimicrobial. Starting with a low dose after dinner is recommended. That way you're less likely to have a large “die-off reaction”—all those bacteria dying at once can make you feel horrible. And if you do have the common die-off reaction—gas and bloating—you'll have it while you sleep, which is easier than having it when awake.
 - Use gas and bloating as your guide to tolerance. If you take one capsule of an antimicrobial and don't experience any gas or bloating, increase the dose the next evening. If that still doesn't do it, stop using that product and switch to another one.
 - Saccharomyces boulardii* is a beneficial yeast that helps eliminate harmful pathogens. You can take it one hour after taking antimicrobials. Because *Saccharomyces boulardii* isn't killed by antibiotics, it's a great probiotic to take while taking antibiotics. You should take it for only about three to six months and then stop, however. Restart it only if you begin taking antibiotics or have a particular need, such as a gut reinfection.
 - If you're not seeing results, see Appendix A for lab tests that can help you determine which pathogens you have and what will kill them.
 - Restore your gut with probiotics after you've worked on eliminating pathogens. Consider replenishing with a blend without *Lactobacillus* first, such as a blend of *Bifidobacterium* probiotics. As with antimicrobials, after dinner is the best time to take probiotics.
 - If you have significant gut problems, work with a health professional.
- **Leaky gut and gut inflammation.** Either leaky gut syndrome or an inflammatory condition such as ulcerative colitis or Crohn's disease contributes to a dirty DAO. None of these conditions will heal if you're stressed, eating foods to which you're intolerant or allergic, and/or have an overgrowth of pathogenic bacteria, yeast, or parasites.
 - After you've worked on eliminating the pathogens, consider using L-glutamine powder to heal your small intestine, which is where your DAO enzyme lives. If your small intestine is unhealthy,

your DAO's home may be in need of a remodel. Help your DAO enzyme by repairing its house. Start small, with 1 gram of L-glutamine powder. This supplement can increase irritability in some people. If that happens to you, stop using it for a couple days while you take some magnesium, vitamin B₆, and niacin. Keep taking those supplements while you resume the L-glutamine.

—A more effective option is to use a combination of L-glutamine, aloe vera, zinc carnosine, and marshmallow root.

- **SIBO.** Small intestinal bacterial overgrowth is associated with many causes, including antibiotic use, antacid consumption, constipation, low serotonin, sluggish bile flow, a diet high in refined foods, and excessive probiotic supplementation. Identifying the cause of SIBO is a must, or it will come right back after every attempt to treat it.

—Ox bile in small doses can help support the elimination of harmful bacteria in your small intestine, which will also support your DAO. Start with 250 milligrams at dinner.

—See PEMT Spot Cleaning (below) to get your bile moving again, which often helps eliminate SIBO.

- **A system that's too acidic.** Your DAO likes certain conditions. If your intestines are too acidic, DAO won't work well. If that's your problem, taking digestive enzymes and betaine HCL may help support your dirty DAO. The betaine HCL triggers your pancreas to secrete enzymes that reduce the acid in your small intestine. *Take only with meals.*

- **Food and drink high in histamine.** Lower your consumption of dietary histamine (see page 122) until you've healed your digestion and gut. Once you've healed your digestive tract by eliminating pathogens and providing the nutrients it deserves, you may find that you're able to eat histamine-containing foods again.

—Beverage choice is especially important. The histamine in drinks or produced in response to them can overwhelm your DAO enzyme, creating such symptoms as headache, runny nose, itchy skin, tingling sensation, sweating, fast heart rate, and irritability. Reevaluate your consumption of the following beverages:

- Juices and citrus.* Greatly reduce or completely eliminate from your diet drinks that contain citrus.
 - Champagne and wine (especially red, but even white can be an issue).* If you get headaches from wine, you may be experiencing sulfite sensitivity, discussed in chapter 9. Because sulfites interfere with absorption of vitamin B₁, which you need for many functions, it's no wonder they make some people feel bad. If you find yourself sensitive to sulfites, consider taking the supplement molybdenum. Look for molybdenum that isn't bound to ammonia, as many are. Common capsule dosages range from 75 to 500 micrograms. If you get molybdenum in liquid form (at 25 micrograms per drop), you can experiment to see what works best for you. Many people are sensitive to sulfites even if they don't know it. Trying some molybdenum early on may provide some incredible benefits. Just be aware that any supplement comes with potential side effects, and more is not necessarily better. If you take a lot of molybdenum for too long, it can drive up your uric acid levels and cause conditions such as gout. If you start to experience any negative effects, stop taking molybdenum and add in *pyrroloquinoline quinone*, commonly called PQQ. PQQ will help reduce the side effects from too much molybdenum.
 - Lime juice, tomato juice, and cocoa drinks.* These can also put you over the edge with their load of histamine. You may be able to tolerate an ounce or so, and as you improve you may find yourself tolerating more and more. For now, though, be careful. Symptoms can appear rapidly—anywhere from within seconds to half an hour.
 - Histamine-containing foods aren't as critical as beverages. Some people are able to tolerate a small amount of such foods, but a full serving puts them over the edge. Symptoms can be delayed, especially with food, so keeping a food journal is key. The app CRON-O-Meter or other programs can help you identify which foods you can tolerate.
- **Undergrowth of bacteria that break down histamine.** If undergrowth of histamine-tackling bacteria is the cause of your dirty DAO, you need to take probiotics to replenish those bacteria while avoiding the probiotics that might make your condition worse.

- A combination of *Bifidobacterium* and *Lactobacillus plantarum* probiotics is fantastic at helping break down histamine.
- Avoid *Lactobacillus* probiotics until you restore your gut, including *Lactobacillus casei* and *Lactobacillus bulgaricus*.

- **Medications.**

- Metformin slows the DAO enzyme, thereby increasing histamine. However, stopping this medication is likely not an option for people it's been prescribed for. If you're one of those people, the key is to understand that you may be more histamine-intolerant because of the medication, and that you should therefore reduce your intake of histamine-containing foods and drinks.
- Aspirin and other NSAIDs and salicylates also contribute to increased histamine release. Instead of relying on these anti-inflammatory medications, look for natural ways to reduce inflammation. Low-dose naltrexone (LDN), a prescription medication, is quite well tolerated by many. Also, since inflammation is commonly associated with chronic infections, have your doctor look for them.

Additional Supplements for Your DAO

- **Copper.** The primary nutrient that your DAO enzyme needs to work properly is copper. Consider trying a supplement that contains that nutrient. Most people get all the copper they need quite easily from foods, but if you've been taking zinc supplements for a while, you might have developed a copper deficiency. For a list of copper-containing foods, see page 129. If you decide to go with a supplement, start with a low dose, because copper can be inflammatory. Consider, for example, 1 milligram of copper with a meal—but only if it's not already in your multivitamin. (See Appendix A for lab tests that can measure your copper levels.)
- **Histamine blockers.** A combination of stinging nettle, luteolin, bromelain, and quercetin works wonders to help keep histamine locked up and not troubling you.
- **Vitamin C and fish oil.** These nutrients help stabilize mast cells (cells that store and release histamine).

- **Cell membrane supporters.** Healthy cell membranes are needed to keep histamine inside individual cells. For ways to support your cell membranes, read *Spot Cleaning Your PEMT*, below.
- **Buffering agents.** Sodium bicarbonate and potassium bicarbonate can be lifesavers if you eat acidic foods or are having a histamine reaction. Simply take a capsule or two with filtered water. The beneficial results are often immediate.

Spot Cleaning Your PEMT

The Dirty PEMT Lifestyle

- Select Clean Genes recipes that support your PEMT.
- Understand that you'll need additional support during pregnancy and breastfeeding.
- You may also need additional support after menopause.
- Consider visceral manipulation of your liver, gallbladder, and diaphragm.

Supporting Low Estrogen

- If your premenopausal estrogen levels are low, you need to get help balancing them from your health-care professional.
- Common reasons why estrogen can be low:
 - High stress that uses up precursor hormones for cortisol instead of estrogen production.
 - Weak fat absorption that translates to low cholesterol, which in turn results in low estrogen.

Supplements for Your PEMT

- **Phosphatidylcholine.** Support your cell membranes with phosphatidylcholine. Use a non-GMO, soy-free form, because soy is a common allergen; furthermore, most soy is GMO. Store liquid phosphatidylcholine in a cool, dry area, but not in the refrigerator (which would

make it harder to pour). If you're not a vegan or vegetarian, you can also find phosphatidylcholine in gelatin capsules. Taking phosphatidylcholine supplements can lead to feelings of depression, so be sure to follow the Pulse Method (again, see chapter 12) and fine-tune your dosage.

- **Creatine.** Take creatine in order to conserve SAME so that there's more SAME available to help make needed phosphatidylcholine.

Spot Cleaning Your GST/GPX

The Dirty GST/GPX Lifestyle

- Select Clean Genes recipes that support your GST/GPX.
- Avoidance is king. Clean up your environment, and limit your exposure to chemicals that you touch, breathe in, or ingest.
- Sweating via a sauna, an Epsom salt bath, exercising, or hot yoga helps your body expel the industrial chemicals that burden your GST/GPX.
- Eating fiber supports detoxification as well as binding and removing xenobiotics. It also bolsters the beneficial bacteria that support detoxification.
- Dry-brushing your skin and massage are fantastic ways to help support detoxification.

Supplements for Your GST/GPX

- **Liposomal glutathione.** This easily absorbed form of the supplement helps deliver glutathione directly into your cells so that they can bind to the compounds. Start slowly and work up. I recommend that you skip some days; consider taking glutathione a few times a week rather than daily. If you notice it helping, then move to daily and adjust as needed.
- **Riboflavin / Vitamin B₂.** You need this nutrient to regenerate damaged glutathione back into useful glutathione. Otherwise, your glutathione remains damaged and can contribute to further cell damage.

- **Selenium.** Without selenium, you can't use your glutathione to get rid of hydrogen peroxide. You can have all the glutathione you want—but without selenium, it's “stuck.”
- **Detox support powders.** There are a variety of detoxification support products available. If you use a powdered detox supplement, you can add it to a smoothie for a fast and easy breakfast or lunch.

Spot Cleaning Your Slow COMT

The Slow COMT Lifestyle

- Select Clean Genes recipes that support your slow COMT.
- Be fully aware that when you get stressed, it can take you some time to calm down. Allow sufficient time to recover from the aggravating factors. Find what works for you: walking away, breathing exercises, and stepping outside are some useful tactics.
- Do your stimulating activities earlier in the day and the calming ones in the evening. Exercising, gaming, and dancing can all be stimulating to the point where they interfere with your sleep. This sets you up to fail the next day. Simply adjust when you do your activities and succeed!
- You're a thinker. Find activities that stimulate your brain or you'll be bored.
- While you're a thinker, you need to practice calming activities such as hiking, meditating, playing or listening to music.
- Work hard. Play hard. Understand that you do tend to be a workaholic and that is okay as long as you balance it with extended days off and vacations. If you don't balance it, you'll end up stressed, aggravated, and burned out. It's incredibly important you balance your tendency to overwork. Plan your vacations just as you plan your workday. Get vacations on the calendar.
- Identify your routine stressors and remove as many as possible. News, particular “friends,” a long work commute, routine chores you can

delegate to your kids or professional services (housecleaning, dishwasher loading/unloading, cooking).

- Sleep is a tough one for you. Night owl all the way. You do your best work in the evening, as it is quiet, people don't bug you, and you're incredibly productive. The issue is you're trashed the next day, which sets you up for being more emotionally reactive. Find ways you can do your best work earlier in the morning, before people wake up. I know this sounds awful now, but as you switch over you'll be amazed at the difference in your productivity, health, and mood.
- Consider relaxing yet healthy activities such as massage, Epsom salt baths, and saunas. While these are fantastic for everyone, you really need them in order to stay on top of your game without burning out—or burning up!

Supporting a Slow COMT

- Optimize your weight, because body fat is estrogenic. If you can't lose weight, you may have a dirty GST/GPX.
- Use cosmetics that are low in phthalates and other compounds. Buy organic produce. Use the lists produced by the Environmental Working Group to figure out which items are most important to buy organic (www.ewg.org/foodnews/dirty_dozen_list.php).
- Eat more beets, carrots, onions, artichokes, cruciferous vegetables (broccoli, cauliflower, kale, brussels sprouts, cabbage). If you get gas from these vegetables, consider taking the mineral molybdenum.
- Support your liver with bitter vegetables such as dandelions and radishes.
- Limit high-catechol foods and drinks, and monitor caffeine.
 - As we've seen, catechols are found in green and black tea, coffee, chocolate, and a few green spices such as peppermint, parsley, and thyme. You don't have to *eliminate* them; just be aware of how they're affecting you and limit as necessary, especially during bouts of PMS or insomnia, when you may want to avoid them completely. If you struggle with insomnia, have your green tea in the

morning. If you're getting close to menses and are starting to feel irritable, don't drink a ton of green tea at this time—maybe just have a cup and see how you feel. You get the picture. Moderation is key. Absolute avoidance is hardly ever needed. Just be aware; listen to your body.

—Watch your intake of caffeine, which can make you edgy and deplete your magnesium.

- Limit excess histamine. If your histamine is high, then you'll be relying on methylation to process it. Learn how to reduce your histamine levels by reading *Spot Cleaning your DAO*, earlier in this chapter.

- Limit your protein intake.

—Protein provides tyrosine, a nutrient that your COMT enzyme uses. If you give it a lot of tyrosine, you're potentially slowing it down. If you're following a high-protein GAPS or Paleo-style diet and feeling anxious, it could be because you're consuming too much tyrosine, which is fueling your already likely higher than normal dopamine.

—Eat your biggest portion of protein at breakfast, have a moderate amount at lunch, and have very little at dinner. This way you'll focus well and be “on” during the day, and in the evening you'll be able to wind down.

- Be aware of medications and supplements.

—ADHD, SSRI, and thyroid medications may make you feel even more on edge, so be careful with them. Talk with your doctor if you're experiencing side effects of insomnia, irritability, elevated estrogen levels, or histamine issues.

—Steroids can increase stress and thus increase demand on your COMT, slowing it further.

—Tyrosine can be stimulating, which increases your anxiety and thus raises pressure on your COMT enzyme. Absolutely do not take tyrosine-containing supplements within six hours of bedtime.

—Methylfolate supplements can increase nitric oxide, which in turn stimulates dopamine release and potentially slows your COMT. You often need to open up your slow COMT before supporting it with methylfolate.

- L-dopa can make too much dopamine and push on COMT, again slowing it down.
- Bioidentical estrogen hormones can slow your COMT.
- Birth control that contains estrogen can also slow your COMT.
- Evaluate your thyroid function.
 - Oral estrogen hormone replacement can lead to hypothyroidism. The estrogen stimulates the production of a protein called thyroid-binding globulin (TBG), which carries your thyroid hormone. As a result, too much thyroid hormone becomes bound—but only the unbound, free version of the hormone is active. Even if your total blood levels of thyroid are normal, the amount of active thyroid in your system may be too low. To evaluate thyroid function, it's not enough to check your TSH, which is what most doctors do. You also have to check free T4, free T3, reverse T3, thyroid antibodies, and TBG.
 - Estrogen is far from the only influence on thyroid function, so be sure to check Appendix A to find out which tests to order for evaluating your thyroid.

Supplements for Your Slow COMT

- **Adaptogens.** Use adaptogens as described in Soak and Scrub (chapter 12).
- **Magnesium.** A surprising number of people are deficient in magnesium. You should be getting some magnesium from your electrolytes, as mentioned in the Soak and Scrub chapter. If you want to supplement additionally with this mineral for its calming effect, magnesium glycinate chelate is a good form; it helps moderate anxiety and supports liver function. Three other effective forms are magnesium taurate, magnesium malate, and magnesium threonate.
- **Taurine.** If you take high-quality magnesium supplements and still can't get your magnesium levels high enough, you may have low levels of taurine, a mineral that helps with magnesium absorption. Low taurine levels are caused by many things, but one common reason is *gut dysbiosis*—an imbalance of bacteria in the gut. Spot Clean your

DAO to help correct this issue. Consider working with your doctor to evaluate your digestive function with a comprehensive digestive stool analysis (CDSA). If you're able to right your bacterial balance, you'll support your taurine levels at the same time—and thus your magnesium levels will normalize as well.

- **SAMe.** This can be a very helpful supplement, but only if your Methylation Cycle is working well. To find out, take a 250-milligram capsule of SAMe before bed. If it helps you fall asleep, great. Keep using it. If it makes your insomnia worse, then you might be low in methylcobalamin and/or methylfolate, or your Methylation Cycle might be blocked by heavy metals, insufficient glutathione, excess hydrogen peroxide, or some other factor. If insomnia worsens, stop taking the SAMe until your Methylation Cycle is back in balance—but meanwhile, if you're now wide awake and staring at the ceiling, you can neutralize that insomniac effect by taking 50 to 150 milligrams of niacin. This will help break down the SAMe you just took and get it out of your system.
- **Phosphatidyl serine.** This supplement can be a very helpful sleep aid, especially in conjunction with magnesium malate, niacin, and vitamin B₆.
- **Creatine.** When your body makes creatine, it uses up the majority of your methyl donors—those nutrients that support methylation. When you take supplemental creatine, you conserve methyl donors and SAMe, leaving your SAMe free for other things, like helping your slow COMT. Creatine has helped a number of people who are unable to take methylfolate, methylcobalamin, or other methyl donors. It is safe and well tolerated by many who are otherwise sensitive to supplements. Autistic children or those who are slow to speak do exceptionally well with creatine. We're seeing children who have never said a word begin speaking with creatine supplementation. Be sure to drink a glass of filtered water when using creatine. I also often recommend mixing creatine and electrolytes with filtered water and drinking it from a water bottle or Thermos throughout the day and before exercising.

- **Phosphatidylcholine.** Supplemental phosphatidylcholine is useful for conserving SAME since, like creatine, the phosphatidylcholine your body produces uses up a lot of SAME. Taking additional phosphatidylcholine leaves your body more SAME to support your COMT. Be sure to use a non-GMO, sunflower-based supplement.
- **Indole-3-carbinol and DIM.** These supplements help break down estrogens so that they can be eliminated from your body. Often they come packaged together.

Spot Cleaning Your Fast COMT

The Fast COMT Lifestyle

- Select Clean Genes recipes that support your fast COMT.
- Engage in activities that stimulate and engage your brain. Good choices are playing music, dancing, singing, participating in debate club, hiking in groups, playing team sports, and doing other social activities. Playing a solo sport that keeps you focused—tennis or martial arts, for example—is also beneficial.
- Go for a run or exercise in the morning. This is excellent for you: it gets your blood flowing and boosts your dopamine right away. Find some way to be physically active *every* morning, even if it's only parking your car further away from work or walking to the barista stand for a cup of tea before you start work. Consider more berries, green tea, and flavonoids to slow down the burn of your estrogen and dopamine.
- Notice how your temper works. You may find that you sometimes get involved in arguments, or you may notice that one of your fast-COMT kids tends to instigate fights. Fights spike dopamine, and if you have a fast COMT, the rise in dopamine makes you feel better. So let's raise dopamine by eating protein rather than picking fights! I credit Dr. Daniel Amen for pointing this out to me years ago.
- Be self-aware. Understand that you may naturally bounce from one thing to another. The key is devoting enough time to each activity

that it's meaningful and you accomplish something. Work hard on one thing for thirty minutes or so, shift your focus to something else for another half hour, then come back to what you were doing before. This way you have the variety you crave, yet you also accomplish things.

- Addicted? Be aware that you're susceptible to spending way too much time on social media, video games, shopping, TV, and many other activities. Take it as a warning sign that you need to support your fast COMT with the tools in this book.

Supporting Your Fast COMT

- Ensure that you're absorbing the protein you consume. Follow the Soak and Scrub precepts faithfully. See Spot Cleaning Your DAO (earlier in the chapter) to heal your gut. If you're still struggling with absorbing protein after doing those things, an amino acid blend can be very helpful. Capsules are best, because amino acid blends taste awful.
- Make sure you're getting enough protein at every meal. You need a good supply of protein to keep you focused.
- Be aware of medications and supplements.
 - SAME. Taking some SAME via the Pulse Method can be useful if your fast COMT suddenly becomes slow in response to your new supplements and lifestyle. Be careful with this supplement, however; taking it daily may lower your dopamine and norepinephrine, leaving you feeling flat or depressed.
 - Phosphatidylcholine and creatine. These supplements might be okay for you, but if you notice that you're feeling a bit more depressed than usual, you might need to evaluate your protein intake and increase your dopamine levels. See also Spot Cleaning Your PEMT (earlier in this chapter) for the discussion of potential side effects from phosphatidylcholine.
 - Estrogen-containing birth control or estrogen bio-identical hormone. If this type of birth control or bio-identical hormone improved your mood and focus, the estrogen may have slowed your fast COMT. Talk with your doctor about checking your estrogen levels. (See Appendix A.)

Supplements for Your Fast COMT

- **NADH.** If you're slow to wake up in the morning, consider NADH with CoQ10. These two compounds supply your mitochondria immediately with fuel allowing them to produce your cellular energy, ATP. Typically, your body makes NADH through a long, involved process. You completely bypass this process by taking these. Take one tablet and let it dissolve under your tongue while you're still lying in bed. This can literally wake you up in minutes. If you're trying to quit caffeine—coffee or energy drinks—it's a great nonstimulating replacement. The NADH with CoQ10 provides clean sustained energy compared to the spike and crash from caffeine. Never take with food. Always take upon waking in the morning or at least one hour away from food.
- **Adrenal cortex.** If you can't wake up in the morning or you feel that you're just dragging through the day, adrenal cortex can be a huge help. Adrenal cortex supports your body's ability to make the hormone cortisol. Those who have chronic stress may have lower levels of cortisol. Adrenal cortex helps us wake up as it is cortisol that helps us wake up in the morning. Take one 50-milligram capsule with breakfast. It's a potent supplement, so definitely fine-tune your dosage via the Pulse Method. You may find that you need to take it only a few times a week.
- **Tyrosine.** This supplement—a precursor to the neurotransmitters dopamine, norepinephrine, and epinephrine—can be great for you, especially when taken in the morning and early afternoon. Do *not* take it within six hours of bedtime, though.
- **5-HTP.** While this supplement—a precursor to the neurotransmitter serotonin—is mainly used for those with a fast MAOA, it may also be useful for those with a fast COMT. If you have a slow MAOA, be cautious. Higher serotonin levels slow a fast COMT, which is why I recommend that people with a fast COMT and a fast MAOA consider 5-HTP. However, do *not* take 5-HTP if you're on an SSRI.

Spot Cleaning Your Slow MAOA

The Slow MAOA Lifestyle

- Select Clean Genes recipes that support your slow MAOA.
- The recommendations for a slow COMT (earlier in this chapter) might also benefit you greatly, since both slow genes reduce how fast dopamine and norepinephrine clear out of your system.

Supplements and Medications That May Adversely Affect Your Slow MAOA

- **SSRIs.** If you're experiencing headaches, irritability, insomnia, discuss with your doctor that you believe the dose is too high or the medication is potentially not suitable for your genes.
- **Testosterone.** Supplemental doses of this hormone can increase aggression, especially in people with a slow MAOA. Ask your doctor to reevaluate your testosterone dose and keep it as low as is medically necessary.
- **Thyroid medication.** This type of medication can also increase aggression and anxiety in someone with a slow MAOA. If you experience such symptoms, talk with your doctor about adjusting your dose.
- **Tryptophan, 5-HTP, and melatonin.** Consider stopping these supplements. If prescribed, discuss them with your doctor. All of these put pressure on your MAOA and slow it down.
- **Tyrosine.** This supplement can put a burden on both your COMT and your MAOA genes and slow them down, so reduce or cut out your dose; discuss with your doctor if they've been prescribed.
- **Inositol.** Like lithium orotate, inositol helps regulate serotonin. However, you can inadvertently burden and slow your MAOA with this supplement. Lithium and inositol act opposite to each other, so if you respond poorly to one, you should respond favorably to the other.

Supplements for Your Slow MAOA

- **Riboflavin.** Consider taking 400 milligrams of riboflavin to help support your slow MAOA.
- **Lithium.** Consider 5 milligrams of lithium orotate, a supplement that helps calm the activity of excess serotonin.

Spot Cleaning Your Fast MAOA

The FAST MAOA Lifestyle

- Select Clean Genes recipes that support your fast MAOA.
- Identify potential causes of inflammation and work to eliminate them. Typical causes of inflammation are diet (see next bullet point), poor sleep, stress, chemical exposure, and improper breathing—all discussed in the Soak and Scrub chapter.
- Identify inflammatory food allergies and food intolerances. Lab testing is great at identifying food allergies but not very accurate at identifying food intolerances. Consider following an elimination diet to find out more.
- Make sure you're not overtraining. Evaluate your exercise by measuring your heart rate variability (HRV) using apps such as HRV4Training or the ŌURA ring. Don't train hard if your HRV drops a lot or if your ŌURA ring suggests that you should take it easy.
- Mold is a common trigger for MAOA issues. Call an environmental inspector to come and visit your home or office and assess. Your car, camper, or boat may also be harboring mold.
- Infections are another common trigger. They're tough to spot, though—even for health professionals. If you're struggling with a fast MAOA, consult a naturopathic physician or integrative/functional medicine doctor who specializes in chronic infections to determine whether you have an undiagnosed infection. In the meantime, continue the Soak and Scrub and try the supplements suggested below, which can support you while you're fighting off an infection. See Spot

Cleaning Your DAO (earlier in this chapter) for ways to help you eliminate pathogens.

Supplements for Your Fast MAOA

- **NADH.** If you're slow to wake up in the morning, take NADH with CoQ10, as was suggested for a fast COMT. Dissolved under your tongue while you're still in bed, a tablet wakes you up in minutes. As was noted earlier, this is a great wake-up solution if you want to quit caffeine.
- **5-HTP.** At 50 milligrams per day, this is typically an effective supplement for a fast MAOA. If after a couple of weeks you don't notice enough improvement, try a larger dose. If you're not staying asleep at night, consider a sustained-release capsule to provide small amounts of 5-HTP continuously throughout the night. However, do *not* take this supplement if you're taking an SSRI.
- **Inositol.** Start with a small dose to regulate serotonin and improve mood, and increase as tolerated.
- **Melatonin.** This supplement might help you sleep at night.
- **Liposomal curcumin.** Consider taking this great anti-inflammatory one to three times daily. This helps slow the Tryptophan Steal that we discussed earlier, thereby conserving tryptophan for your fast MAOA.

Spot Cleaning Your MTHFR

The Dirty MTHFR Lifestyle

- The Soak and Scrub should cover all your bases with this gene.
- Select Clean Genes recipes that support your MTHFR.

Hypothyroidism and a Dirty MTHFR

- Hypothyroidism slows your ability to activate vitamin B₁₂, so talk with your doctor about evaluating your thyroid function. (Also see Appendix A.)

- Support your thyroid function by reducing stress, supporting your adrenals, healing your gut, avoiding chemicals, filtering your water, getting adequate sleep, and fighting off infections.
- See Spot Cleaning Your DAO and Spot Cleaning Your Slow COMT (earlier in this chapter) for additional support.

Supplements for Your MTHFR

- **Riboflavin / vitamin B₂.** This is a nutrient that MTHFR needs to work properly. The most active form is riboflavin-5-phosphate (R5P). A daily dose of 20 milligrams is typically enough for most people; however, as much as 400 milligrams may be needed for others, especially those struggling with migraines.
- **L-5-MTHF or 6S-MTHF.** These are both quality forms of methylfolate. Many people do well with just a multivitamin containing 400 micrograms of MTHF. If you feel no change with 400 micrograms, try more. However, don't make a huge jump; try doubling the dose. Many health professionals go straight to higher doses of 7.5 milligrams or above. While this might provide initial benefits, it can cause significant side effects within days. Because this nutrient is so powerful, tuning in to your body as you implement the Pulse Method is of utmost importance. Another option is to use liposomal MTHF. That way you can regulate the dose and deliver the MTHF right inside your cells. (See the Resources section on my website.)
- **If you're taking 5 milligrams or more of methylfolate and don't notice a response, one of these might be the reason:**
 - You have folate receptor antibodies and they're blocking your folate receptors. (See Appendix A for more about tests that can determine whether this is true.)
 - You're still consuming folic acid, and it's blocking your receptors.
 - You're deficient in vitamin B₁₂ so your methylfolate is trapped and can't be used.
 - You're using an inferior supplement containing D-methylfolate instead of L-methylfolate. If the supplement does not specify L-methylfolate or 6S-methylfolate, it may have the inferior

D-methylfolate form. Your body does not use D-methylfolate. Ask the manufacturer.

—Your Methylation Cycle is blocked for other reasons, such as heavy metals, oxidative stress, infections, or medications.

Caution: If you experience anxiety, irritability, runny nose, joint pain, insomnia, or hives, you may be taking too much MTHF. Stop taking it immediately and take 50 milligrams of niacin every twenty minutes, until your side effects disappear (for a maximum of three times). However, if you have low blood pressure of 90/60 or lower, be careful: the niacin might further lower your blood pressure.

Spot Cleaning Your NOS3

The Dirty NOS3 Lifestyle

- The Soak and Scrub should take care of most of your dirty NOS3.
- Select Clean Genes recipes that support your NOS3.
- Keep your GST, PEMT, MTHFR, COMT, MAO, and DAO clean, and your NOS3 will pretty much take care of itself. This is why NOS3 is the last gene for you to clean up if others are dirty. Typically, it's those other dirty genes that are causing your NOS3 to become dirty. Tackle them one by one, and you'll see results. Don't rush it.
- Make sure you're doing some form of exercise, even if it's just a brisk daily walk. Exercise stimulates your NOS3 to function. However, don't overdo it, as too much exercise can uncouple your NOS3. (Uncoupling is discussed in chapter 10.) You can tell you've done too much when you have prolonged soreness for a day or two after exercising.
- Good breathing is important for you. Seriously consider daily yoga or tai chi and breathing exercises. Pranayama, the science of breath, is a good option.
- Sauna is great at stimulating your NOS3—especially on a twice-weekly basis—so give that a try. Don't push it!

Supplements for Your NOS3

If you're inflamed, have high homocysteine, or are fighting a known infection of any type, I recommend first reducing your homocysteine and fighting the infection before supplementing for NOS3. In addition, make sure to clean your other dirty genes before addressing NOS3.

- **Ornithine, beet root powder, or citrulline.** If you're generally healthy, increasing arginine levels via these supplements may be all you need. (I'm not a fan of directly supplementing with arginine, as you read in chapter 10.)
- **PQQ.** This is a must to keep your nitric oxide healthy and keep it from turning into superoxide. If you're exercising hard or tend to get significant postworkout soreness, take one of these capsules after working out. Those with fibromyalgia or chronic fatigue should do very well using PQQ.
- **Liposomal vitamin C and liposomal glutathione.** These supplements help keep your nitric oxide happy and prevent it from turning into superoxide.

Now What?

Perhaps you say, "I'm better, but I'm still not where I want to be. Now what?" Good question.

You've followed the Soak and Scrub. You're *living* it.

You've worked hard on Spot Cleaning your genes.

Yet you continue to struggle.

If that's the case, I recommend finding a functional/integrative practitioner: a licensed naturopathic physician, functional medicine professional, or environmental medicine professional. These health professionals work hard on identifying the cause of disease rather than suppressing the symptoms. (See Appendix A for information on available lab tests.)

By adopting the Clean Genes Protocol, you've come a long way in getting the basics done. Your health professional will have worked with

you on these basics. Now you can work with him or her to dig deeper, seeking out both hidden infection and hidden chemical exposure.

- **Identify hidden infections.**

- Mouth.** Root canals, diseased gums, and throat are all frequent sites of infection. If you have bleeding gums, bad breath, or bad teeth, you likely have a persistent infection in your oral cavity or a chronic infection elsewhere that's causing poor dental health. Work with a biological dentist—that is a dentist who takes a whole-body approach—to fix this problem.
- Nose.** Your nose is a frequent site of mold and infection. Ask your doctor to swab your sinuses and nostrils to check for infection, especially if you have chronic sinus issues of any type.
- Gut.** Even if you don't have digestive issues, you might have full-body symptoms from imbalanced bacteria. Ask your health professional to order a comprehensive digestive and stool analysis (CDSA) to find out.
- Blood.** Get bloodwork done to find out how your immune system responds to various pathogens. That will help you identify any viruses or bacteria you may be harboring.
- Urine.** A urinalysis can provide insight into a recurring bladder infection, as well as immune system markers.

- **Identify hidden sources of chemical exposure.**

- Mouth.** If you have a lot of old fillings, you may need to discuss having them replaced with a less toxic substance by a biological dentist.
- Urine.** Your kidney is a wonderful filter. There are great lab tests out there that can quickly evaluate hundreds of chemicals via your urine; they can also identify heavy metals. Once you know your contaminants, you can tackle their removal.
- Blood.** Blood tests can identify heavy metals, carbon monoxide, and other problematic compounds that your doctor can then help you eliminate from your body.

You've done a tremendous job getting this far. Take it another step by working with a quality health professional to uncover these hidden issues and eliminate them one by one. You're well on the way to reaching your genetic potential!

APPENDIX A

Lab Testing

The Clean Genes Protocol is a comprehensive program. The Soak and Scrub followed by Spot Cleaning should help your well-being significantly—if not completely! The beauty of *Dirty Genes* is that most of you can use this book without ever asking your doctor to order a special lab test. You can evaluate your own status using the two Laundry Lists, and follow the Clean Genes Protocol to optimize your health.

However, if you're struggling—if you've been “clean” for three or four months and don't see any improvement, or if improvement is proceeding at what seems to you a snail's pace—then you might need additional help. Ideally, you'll find a good integrative or naturopathic physician to help you, or you'll find a way to work with your conventional physician that addresses these issues. In either case, you'll then need labwork to evaluate your status.

Unfortunately, lab testing is something that can be either useful or, in the hands of a health provider lacking specialized knowledge, a big waste of money and time. If you get a baseline lab reading to see where you are now, lab testing can be useful going forward, as a gauge to see how you're improving with real data. However, most lab test results are expressed in terms of ranges that are based on the “average healthy person”—who is actually not very healthy! So you have to be prepared to see many of your labs come back reading “normal,” and then a conventional doctor

is going to insist that you're fine. Be aware that you can have plenty of problematic symptoms (or just not be at the peak of your health) and still get a "normal" reading. Without a knowledgeable provider, you can't rely on lab work to identify problems for you to repair.

Specialty testing, while potentially expensive, can be informative—but only if your health professional knows how to interpret the results. Basic labs are usually your best place to start, because they can provide you with some baseline information and are fairly affordable.

Ideally, though, you want to order all your lab tests at once. That way, you get a comprehensive picture rather than a scattershot presentation with results taken from different dates. Even within a week or two, your results might be affected by what you ate the day before, how stressed you're feeling, and other factors that, though subtle, can nonetheless have a big impact on your labs. Again, a skilled health professional is key, because he or she needs to put all the findings together and determine what the patterns mean. Unfortunately, few conventional MDs understand this approach to medicine, but a growing number do (including those I've trained!), as well as many naturopaths and functional/integrative medical providers.

Listed below are the lab tests I recommend. Most are far from standard for a conventional practitioner, but an integrative or naturopathic physician will routinely order them. I've put the names of labs that offer these tests in parentheses after each test. The names and websites of these labs are provided at the end of this appendix.

I begin with a list of general lab tests. Then, in the remainder of the appendix, I move on to lab tests (including some from this general list) that are of particular benefit to each type of dirty gene addressed in this book.

General Lab Tests

- Complete blood count with differential (CBC with diff) (Quest Diagnostics, LabCorp)
- Thyroid panel: TSH, free T3, free T4, reverse T3, thyroid antibodies, TBG (Quest Diagnostics, LabCorp)
- Serum ferritin (Quest Diagnostics, LabCorp)

- Vitamin D: 25 OH vitamin D₃ and 1,25 OH vitamin D₃ (Quest Diagnostics, LabCorp)
- Lipid peroxidation (Quest Diagnostics, LabCorp)
- Fasting serum insulin (Quest Diagnostics, LabCorp)
- Glycated hemoglobin (HbA1c) (Quest Diagnostics, LabCorp)
- High-sensitivity C-reactive protein (hs-CRP) (Quest Diagnostics, LabCorp)
- Methylmalonic acid (Quest Diagnostics, LabCorp)
- Holotranscobalamin (Dr. Lal PathLabs)
- Advanced cholesterol panel (VAP) (Quest Diagnostics, LabCorp)
- Urinary organic acids (Quest Diagnostics, LabCorp, Genova Diagnostics, Great Plains Laboratory)
- Red blood cell (RBC) fatty acids (Doctor's Data, Quest Diagnostics, LabCorp, Genova Diagnostics)
- Chronic infections panel: viral, bacterial, Lyme, parasite, mold (DNA Connexions, Full View test; LabCorp; Medical Diagnostic Laboratories)
- Comprehensive digestive stool analysis (CDSA) (Genova Diagnostics, Doctor's Data, Diagnostic Solutions [GI-MAP])

As noted above, you can also get specialized tests (shown below) to help evaluate function in each of the Super Seven. However, my recommendation is to begin by following the Clean Genes Protocol—first the Soak and Scrub, then the Spot Cleaning—rather than relying on tests as your first step. Remember, these tests are highly problematic unless you have a skilled health professional to help you evaluate them. As we've seen, the results come back with indications of whether you're "within normal range," but those indications can be extremely misleading.

MTHFR

- **Check for folate receptor antibodies.** If you want to know whether you have antibodies to your folate receptor, this is the test. It can offer a good baseline check that helps you monitor treatment. If you do

have antibodies, your remedy is to heal your leaky gut; stop taking folic acid; stop consuming cow's milk dairy products—even in tiny amounts that might be hidden in other foods, like an omelet or a baked good; consume natural folates in your food and supplements; and calm your immune system. (Iliad Neurosciences)

- **Request a fasting test for serum homocysteine.** Have a normal dinner and then have this test the next morning before you have breakfast. Then follow up a month or so later, being sure to eat the same type of dinner and have the blood drawn around the same time of day the next morning. This way you get a more accurate comparison. (Quest Diagnostics, LabCorp)
- **Measure your serum folate.** As I explained in chapter 5, this test is not very useful because of all the folic acid that you might (often unknowingly) be consuming. However, if your reading is high, you might be suffering from one or more of the following conditions: SIBO, folate receptor antibodies, low B₁₂, and/or a blocked Methylation Cycle. If your reading is low, you need to supplement with active folates such as folinic acid and methylfolate while increasing your intake of natural methylfolate in the form of leafy green veggies. (Quest Diagnostics, LabCorp)
- **Test for unmetabolized folic acid.** This test wasn't available at the time of writing, but I'm pushing hard to have a lab develop it. This would be a *true* folic acid test—one that doesn't confuse (unhealthy) folic acid with (healthy) folate.
- **Schedule a methylation panel.** This test checks homocysteine, cysteine, methionine, SAMe, SAH, and SAM:SAH ratio. This provides a useful baseline to see how your Methylation Cycle is doing. It can't tell you *why* it isn't working right, but it definitely shows *whether* it is or isn't. (Doctor's Data)
- **Check for an intrinsic factor deficiency.** If you're consuming vitamin B₁₂ yet your levels are still low, you may have antibodies against the stomach cells that absorb this vital nutrient from your diet. Check using the intrinsic factor test. (Specialty Labs, Quest Diagnostics, LabCorp)

COMT

- **Check your estrogen levels.** Use a procedure known as estrogen fractionation to see all three types of estrogen and their components. You can also order the urinary hormone DUTCH test, which is quite accurate for estrogen. The DUTCH test is the easiest and best way to see how your COMT is working. If the catechol estrogens are elevated, that's a sign that your COMT isn't working as well as it should be. (LabCorp, Precision Hormones)
- **Assess urinary neurotransmitters or urinary organic acids to evaluate neurotransmitter breakdown.** If homovanillic acid (HVA) is low, that can be a sign of low dopamine production or slower breakdown. (Great Plains Laboratory, Genova Diagnostics, Doctor's Data, Neuroscience)
- **Measure your tyrosine levels.** If tyrosine is high, it could be because you're eating a lot of protein or you're supplementing with tyrosine. If your tyrosine levels are high and you're feeling anxious, reducing tyrosine-containing supplements or reducing protein intake a bit can help immensely. (Protein intake should be around one gram of protein per two pounds of body weight per day.) If your tyrosine levels are low, it could be because you aren't eating enough protein or you aren't absorbing your protein. You need to support your digestion if you're eating plenty of protein yet your tyrosine is low. (Doctor's Data, LabCorp, Quest Diagnostics)
- **Screen for endocrine-disrupting chemicals via a test that measures glyphosate, DDT, phthalates, and other environmental chemicals.** A toxic chemical profile (for example, GPL-TOX) can help you determine how much effort you need to expend toward reducing your "body burden" of endocrine disrupters. (Great Plains Laboratory)
- **Measure your intracellular RBC magnesium levels.** Magnesium deficiency is common, so you ought to check your intracellular magnesium levels. You can't get your magnesium levels up without taurine, so if your lab results show a low reading, supplement with both compounds. (Quest Diagnostics, LabCorp, Specialty Labs)

DAO

Lab testing for histamine levels is challenging, since the life of histamine is only one minute. Rather than relying on labs to determine what's going on with your DAO, you'd be better off avoiding histamine-containing foods for a few days and noting whether you improve. Then recheck by eating some histamine-containing foods and observing whether your symptoms return. Checking the amount of DAO enzyme via lab testing simply isn't reliable, according to research.

However, here are some related labs that you might consider:

- **Measure urinary histamine.** This is a decent marker of your overall histamine status, because it checks the histamine levels of your stomach content. If elevated, that could be a sign of food allergies or infection. (Quest Diagnostics, LabCorp, Specialty Labs)
- **Measure plasma histamine.** This lab test isn't the best marker, because within minutes after you've consumed high-histamine foods, your blood levels of histamine can return to normal. If this test shows that your plasma histamine level is elevated, that's useful information. If not—and if you believe you have a histamine issue—you might need to redo the test within half an hour of eating. (Quest Diagnostics, LabCorp)
- **Get a comprehensive digestive stool analysis (CDSA).** This test will help you detect the presence of pathogenic bacteria that increase histamine. If such pathogens are found at high levels, you'll want to rebalance your microbiome by decreasing their presence while replenishing other types of bacteria through specific probiotics. (Doctor's Data, Genova Diagnostics, Diagnostic Solutions [GI-MAP])
- **Identify food allergies.** There are two types of immune responses, IgE and IgG. Allergies that trigger IgE responses tend to cause serious issues such as anaphylaxis, so if you have IgE responses, you probably already know that. You're more likely to want to test for IgG responses but testing for both is useful information. (US BioTek)

MAOA

- **Have a urinary organic acid test showing your 5-HIA.** If your 5-HIA levels are high, then you're burning through your serotonin too quickly. If your 5-HIA levels are low, your body may not be breaking down your serotonin well, or you may have low levels of serotonin building blocks such as tryptophan and vitamin B₆. (Great Plains Laboratory, Genova Diagnostics)
- **Measure your tryptophan levels.** If your urinary or blood levels of tryptophan are high, that might mean you're consuming a lot of carbohydrates or that you're not able to turn tryptophan into serotonin. This inability can be caused by a slow MAOA. (Quest Diagnostics, LabCorp, Great Plains Laboratory, Genova Diagnostics)
- **Evaluate your vitamin B₆.** If these levels are low, your ability to make serotonin is reduced, dirtying your MAOA. Inadequate vitamin B₆ is one factor that leads to increased concentrations of xanthurenate and kynurenate in urine. You can measure these compounds—and thereby infer your B₆ status—through urinary organic acid testing. (Quest Diagnostics, LabCorp, Great Plains Laboratory, Genova Diagnostics)
- **Evaluate your vitamin B₂.** If your vitamin B₂ levels are low, your ability to support your MAOA is reduced and that gene may become slow as a result. If you don't have sufficient riboflavin, compounds such as adipate, suberate, and ethylmalonate may increase in your urine, demonstrating that deficiency. (Quest Diagnostics, LabCorp, Great Plains Laboratory, Genova Diagnostics)

Be aware that inflammation or infection might be one reason why you have low levels of 5-HIA, tryptophan, B₆, and/or B₂. Tryptophan can also move through another enzyme called IDO1 (in addition to MAOA), which increases during times of stress, infection, and inflammation. Those three factors—stress, infection, and inflammation—use up your tryptophan, making it appear that you have a faster MAOA gene, whereas in reality your MAOA isn't able to function well because of the shortage of tryptophan.

The way to check this is by running a urinary organic acid test (see advice on B₆ testing, above). Look for elevated levels of quinolinate and kynurenate. (Great Plains Laboratory)

GST/GPX

Glutathione levels are measured by your health professional in order to understand how well your body is handling free radicals and to evaluate the overall state of your antioxidant potential. Basically, the higher your glutathione levels, the healthier you are, while lower glutathione levels correlate to ill health.

- **Measure RBC glutathione peroxidase.** This marker demonstrates how well the GST is working based on levels of xenobiotics and/or hydrogen peroxide. This can be an expensive test and is difficult to find. (Genova Diagnostics)
- **Evaluate lipid peroxidation.** Test results demonstrate the degree of damage to cell membranes. (Quest Diagnostics, LabCorp)
- **Measure RBC glutathione.** This will help determine levels of glutathione in your red blood cells. (Doctor's Data, Genova Diagnostics)
- **Evaluate urinary organic acid markers for riboflavin deficiency.** This result tells you whether you're able to recycle your glutathione. Elevated levels of any of the following acids denote a possible riboflavin deficiency: succinic acid, fumaric acid, 2-oxoglutaric acid, or glutaric acid. (Quest Diagnostics, LabCorp, Genova Diagnostics, Great Plains Laboratory)
- **Evaluate selenium.** This is done via a blood test. Too much selenium is toxic, and too little means you lack a key cofactor, so yet again, you need balance. I've seen people whose selenium levels rose too high after they got an intravenous infusion of various nutrients, including selenium. Make sure that your doctor isn't giving you too much—and that you aren't taking too much via supplements. (Quest Diagnostics, LabCorp)

NOS3

If you have a history of cardiovascular issues in your family, or if there

are indications that you have a dirty NOS3, keeping an eye on your labs is important:

- You want your homocysteine to measure around 7.
- Your lipid peroxides should be low.
- You need your Lp(a) (an inflammatory type of cholesterol) in normal range, as well as your hs-CRP. (Quest Diagnostics, LabCorp)

Checking for bacterial, viral, and mold infections is also key, because any infection will use up your arginine and increase your cardiovascular risk. As you may remember, you need arginine to help support your NOS3.

Here are some labs to consider:

- **Measure blood amino acids.** This checks your levels of arginine, ornithine, and citrulline so that you know whether your NOS3 has the nutrients it needs to function. (Quest Diagnostics, LabCorp, Doctor's Data, Genova Diagnostics, Great Plains Laboratory)
- **Evaluate your ADMA.** This can be an expensive test, but if your ADMA levels are elevated, that shows clearly that your NOS3 isn't working well. (Genova Diagnostics, Mayo Clinic, Cleveland Heart Lab)
- **Measure your homocysteine.** If your homocysteine levels are elevated, you can assume that your NOS3 isn't working well. (Quest Diagnostics, LabCorp)
- **Measure your lipid peroxides.** Again, if these levels are elevated, you can assume that your NOS3 isn't working well. (Quest Diagnostics, LabCorp)
- **Consider a comprehensive digestive stool analysis (CDSA).** This test evaluates your microbiome for the following bacteria: *Streptococcus* (or *Enterococcus*) *faecalis*, *Mycoplasma*, *Bacillus*, *Pseudomonas aeruginosa*, *Halobacterium*, *Spirochaeta*, and possibly *Clostridium*. If present, these are consuming your arginine, causing a shortage that might be harming your NOS3. (Diagnostic Solutions [GI-MAP], Genova Diagnostics, Doctor's Data)

- **Evaluate fasting insulin.** If these levels are elevated, then your NOS3 might be having to work extra hard. As a result, instead of making nitric oxide (good), it might be making superoxide (bad). (Quest Diagnostics, LabCorp)
- **Assess serum nitrite and serum nitrate.** Checks your levels of nitrites and nitrates. These can be high or low during times of inflammation, infection, or cardiovascular issues, so assessing them can be useful. (Quest Diagnostics)
- **Measure estrogen levels.** If your estrogens are low, as assessed by the DUTCH test, your NOS3 may not be working well and you'll need to figure out how to support it. If they're elevated, your NOS3 might be working too hard; in that case, you need to reduce them. (Precision Hormones)
- **Schedule a sleep study.** If you snore or are constantly tired, consider a sleep study. Evaluating how you sleep and breathe at night could save your life. Sleep apnea is common. The causes of this disorder are many, but first you need to suss out whether you have it. A good place to start is at-home sleep testing, which isn't as thorough as in-office testing, but not nearly as expensive either. (NovaSom, for home test kits)

PEMT

- **Get a serum choline test.** If your serum choline levels are low, you know that your PEMT is stressed by working hard to produce choline. (Quest Diagnostics, LabCorp)
- **Measure creatine phosphokinase (CPK).** This compound is elevated when you're deficient in phosphatidylcholine, so measuring CPK is a useful way to evaluate muscle membrane damage and potential injury to muscles, heart, or brain. (Quest Diagnostics, LabCorp)
- **Evaluate DHEA-S.** This compound is commonly low; when it is, that deficiency contributes to muscle weakness. (Quest Diagnostics, LabCorp, Precision Hormones [DUTCH test])
- **Measure your ALT.** This is a liver enzyme. Elevated, it demonstrates that the phosphatidylcholine levels need to increase. (Quest Diagnostics, LabCorp)

- **Evaluate lipid peroxides.** If these are elevated, then you know that cell membranes are being damaged and your body needs more phosphatidylcholine. (Quest Diagnostics, LabCorp)
- **Measure TMAO.** If these levels are elevated, it may be due to choline or phosphatidylcholine supplementation. Order a comprehensive digestive and stool analysis (CDSA) to determine what's going on. It's important to avoid dairy products if these levels are high. Higher TMAO levels are associated with poor metabolic control (potentially leading to diabetes) and with kidney issues. (Cleveland Heart Lab)
- **Measure GGT.** This is an early marker of fatty liver. (Quest Diagnostics, LabCorp)
- **Use the fatty liver index calculator.** This tool has been developed to help identify fatty liver early—a great aid for you and your health professional. (Quest Diagnostics, LabCorp)
- **Take the SIBO breath test.** This can help determine whether you have SIBO. (Commonwealth Laboratories)
- **Measure your fasting insulin.** This is a great way to see how well your metabolism is doing. If your fasting insulin is elevated, significant lifestyle, environmental, and dietary changes are needed.
- **Measure your LDL and HDL cholesterol, as well as triglycerides, via an advanced cholesterol panel (such as VAP).** People who are deficient in choline typically also show reduced blood concentrations of LDL cholesterol. Further indications of PEMT trouble include low HDL and high triglycerides. (Quest Diagnostics)
- **Measure estrogen.** Because your PEMT is stimulated by estrogen, low estrogen levels will slow down PEMT function—unless you have a SNP that causes your dirty PEMT not to react to estrogen. High estrogen uses up SAME, meaning that your body becomes less able to make phosphatidylcholine. (Precision Hormones [DUTCH test])
- **Measure homocysteine levels.** Homocysteine levels higher than 7 could indicate Methylation Cycle issues, affecting the level of SAME and the production of phosphatidylcholine. (Quest Diagnostics, LabCorp)

- **Evaluate the SAM:SAH ratio as well as SAH levels.** These give you an indication of how your Methylation Cycle is functioning and whether your PEMT has been adversely affected. (Doctor's Data)
- **Measure folate and B₁₂ levels.** If you're deficient in either of these vitamins, your Methylation Cycle won't function well and your PEMT will be affected. (Quest Diagnostics, LabCorp)
- **Identify bacterial infection by assessing LPS.** Elevated levels of LPS reveal the presence of bacterial infection, which can affect your Methylation Cycle and therefore your PEMT function. (Medical Diagnostic Laboratories, DNA Connexions, Quest Diagnostics, LabCorp, Specialty Labs)
- **Test for viral infections, particularly hepatitis (A, B, and C), Coxsackie, and Epstein-Barr.** These increase oxidative stress and inflammation, which affect your Methylation Cycle and therefore your PEMT function. (Medical Diagnostic Laboratories, DNA Connexions, Quest Diagnostics, LabCorp, Specialty Labs)

Laboratories

Cleveland Heart Lab: <http://www.clevelandheartlab.com>

Commonwealth Laboratories: <http://commlabsllc.com>

Diagnostic Solutions: <https://diagnosticsolutionslab.com>

Direct Labs: <http://www.directlabs.com>

DNA Connexions: <http://dnaconnexions.com>

Doctor's Data: <https://www.doctorsdata.com>

Dr. Lal PathLabs: <https://www.lalpathlabs.com>

Genova Diagnostics: <https://www.gdx.net>

Great Plains Laboratory: <https://www.greatplainslaboratory.com>

Iliad Neurosciences: <http://iliadneuro.com>

LabCorp: <https://www.labcorp.com>

Mayo Clinic: <http://www.mayoclinic.org>

Medical Diagnostic Laboratories: <http://www.mdlab.com>

Precision Hormones (DUTCH test): <https://dutchtest.com>

Specialty Labs: <http://www.specialtylabs.com>

Quest Diagnostics: <http://www.questdiagnostics.com/home.html>

US BioTek: <http://www.usbiotek.com>

Genetic Testing and Evaluation

If you're interested in finding out more about your ancestry, you have a wide range of options. But if your focus is on genetics as it relates to *health*, the companies listed in this appendix are your best bet. They offer either genetic testing or help evaluating the results.

Testing

Let's start with the testing options:

- **Genos Research** (<https://genos.co>). As of April 2017, this company tests fifty times more of your DNA than 23andMe. They also give you access to your raw data. Overall, the value is fantastic. However, they don't test the *regulatory regions* of your DNA: the genes that control how other genes are turned on or off. Instead, they test your entire exome, which lies within your regulatory regions. This is important to realize going in, because some genes—PEMT, for example—have SNPs you'd want to know about in the regulatory regions.
- **23andMe** (<https://www.23andme.com>). This company provides two testing options: with a health report and without. The health report is useful if you want their advice on what the data means. However,

you can pay less to get just your data and then use a genetic evaluation tool (see below).

- **Courtagen** (<http://www.courtagen.com>). This company offers specialty panels for various conditions, such as autism, seizure disorder, or mitochondrial disease. Insurance may cover this testing.
- **GeneSight** (<https://genesight.com>). GeneSight offers a panel that's useful if you're not responding well to psychiatric medications. Insurance may cover it.
- **Arivale** (<https://www.arivale.com>). This company offers comprehensive genetic and lab testing, with health coaches to guide you. It's expensive, but you do seem to receive a comprehensive service, rather than being given your lab results with little guidance on how to use them.
- **Pathway Genomics** (<https://www.pathway.com>). They offer a number of different genetic testing options, including corporate wellness programs. Insurance may cover their lab testing.
- **DNAFit** (<https://www.dnafit.com>). This company offers tests tailored to fitness, sports performance, and general well-being.
- **uBiome** (<https://ubiome.com>). This company evaluates the DNA of your microbiome, which is pretty fascinating, given that the genes of your microbiome outnumber your human genes by a factor of 150 to 1 and have an enormous impact on your health. This company can also specifically check the biome of your throat, ears, nose, throat, and skin.

Evaluation

As I explained in chapter 1, genetic test results often lead to massive confusion. You receive all kinds of information with either no recommendations or conflicting recommendations: “Take a lot of vitamin XYZ to respond to SNP A; avoid vitamin XYZ to respond to SNP B; take a moderate amount of vitamin XYZ to respond to SNP C.” What are you supposed to do with that?

The answer may lie with one of the new companies developed to help you evaluate your test results and turn them into a specific, actionable plan. Here are three companies—one of which is my own—that have sprung up to respond to this need:

- **StrateGene** (www.strategene.org). This is the company I developed and continue to run. We provide an integrated approach to clinically relevant SNPs using graphical illustrations. As you learned in this book, you need to understand not only which SNPs you have but also how these genes are affected by your lifestyle, diet, environment, and nutrients. StrateGene offers this information. Your purchase includes access to a private Facebook group for ongoing community and support.
- **Opus23** (<https://www.datapunk.net/opus23>). This company is available to health professionals only. It was developed by Dr. Peter D'Adamo, a brilliant naturopath and the author of *Eat Right 4 Your Type*. Opus23 offers a powerful suite of tools to dig deep into a patient's raw data from uBiome or 23andMe. Consider recommending it to your practitioner.
- **Promethease** (<https://promethease.com>). This online DNA reporting tool uses your raw genetic data to evaluate your SNPs. It provides a lot of SNP information but doesn't discuss how the genes are affected by your lifestyle, diet, or environment. The results can be overwhelming; they're very much about predicting your chances of disease rather than giving you actionable information for health. I would recommend using this tool in addition to StrateGene—but only when you're emotionally prepared for this type of information.

APPENDIX C

Mold and Indoor Air Quality Testing

Mold is a massively important issue that more people need to be aware of. If you're chronically ill and not getting better, mold very likely plays a part in your illness. Please evaluate your home, car, office, boat—and anywhere else you spend time—for mold.

I had a patient with chronic congestion that simply wouldn't go away. She was a teacher, so eventually I had her call in inspectors to evaluate her school. Turns out the building was so contaminated by mold that they had to demolish it! I could have just treated her congestion, but as it turned out, I helped thousands of people. Please, check for mold—and also for a number of other common indoor air pollutants, including radon, carbon monoxide, dust mites, and formaldehyde (to name just a few).

A good starting point is often an at-home mold test kit, available at your local hardware store and online (see below for one recommendation). If this doesn't work, call in the professionals to make an evaluation. Once you identify the mold, you need to have a professional come in and remediate it.

Here are some useful resources related to mold and indoor air quality:

- **DIY Mold Test.** This is an easy-to-use test kit that you can use initially to evaluate whether you have mold. It's widely available (e.g., hardware stores and www.amazon.com), and it comes with an expert phone consultation.
- **The American Lung Association** (www.lung.org). This association is a great resource for learning about potential problems and solutions for your indoor air.
- **Indoor Air Quality Association** (<http://www.iaqa.org/find-a-pro>). This all-inclusive organization focuses on air quality and solving indoor environmental problems, including issues around construction and remodeling, research, school contamination, storm damage, and mold.
- **National Association of Mold Remediators and Inspectors** (<https://www.namri.org/index.php>). Whether you're searching for a reputable mold-removal company, or seeking knowledge about mold-removal services generally, the National Association of Mold Remediators and Inspectors provides essential information for your residential or commercial property.

Resources

In this Resources section, I provide the name and brief description of a wide range of products and services that can help you live the Clean Genes life—products and services relating to the air you breathe and the water you drink, as well as to breathing, health professionals, your house and yard, and personal-care products (including supplements).

Air and Water

Clean air and clean water are absolute musts. No exceptions. If either of these is dirty, your genes are dirty. The following products are what I use in my own home. The results are fantastic, and your health will be too. No compromises.

Air

- **Alen Air Purifiers.** Quality air purifiers that also look beautiful and are compact. <https://www.alencorp.com>
- **Alen Air Dehumidifiers.** Well-made dehumidifiers that will keep your air dry, and thus less likely to be full of mold and dust mites. <https://www.alencorp.com>

- **Essential oils.** Highly concentrated plant oils that nurture physical and emotional well-being. There are many types of essential oils to choose from. You have to be careful of the source, though: you're looking for organic oils, ideally produced not via solvent extraction but by steam distillation or fractional distillation. Keep essential oils out of the reach of children, because they can be toxic if improperly used. A great resource is the National Association for Holistic Aromatherapy. <https://naha.org>

Water

- **10 Stage Countertop Water Filter by New Wave Enviro.** A water filter that does a great job and is inexpensive. This was my first water filter, and we still use it when we travel. (Yes, we take a water filter with us, along with a wrench, so that we can tap in to the hotel or timeshare sink and get filtered water.) <https://www.newwaveenviro.com>
- **Akai Ionizer from High Tech Health.** An option that lets you keep the acidic water for cleaning and watering your plants while you drink the alkaline filtered water. We used this device for fourteen years. Mention “Dr. Lynch” to receive a discount. (*Disclosure:* For this one, I do receive a commission.) <http://hightechhealth.com>
- **Berkey Water Filter.** A quality water filter that removes many compounds, including fluoride (if you choose to get that add-on). <http://www.berkeyfilters.com>
- **Premium Shower Filter by New Wave Enviro.** A product we've installed on all our showerheads at home to filter the chlorine out. Try this, and your skin and lungs will thank you. <https://www.newwaveenviro.com>
- **Rainshow'r Bath Ball.** A product that I used for a long time but eventually stopped using because, although it does remove the chlorine, it's big, bulky, and develops mold. However, if you replace it often, and let it dry out after the bath by hanging it, you should be good to go.

Breathing

It's not easy. Breathing is a skill that we take for granted, yet most of us do it absolutely wrong. Below are resources to help you become a breathing master:

- **Neti Pot.** A device to help rinse mucous from your sinuses and allow air passage through your nose. Ideally, use warm filtered water and a pinch of sea salt. I like to use this in the shower, as it's easiest there, and morning—my shower time—is when I'm most often congested. It can be used over the sink as well.
- **Xlear Sinus Spray.** A big help when your nose is congested. Use a spray or two of this in each nostril (perhaps a few times a day) to help break up the mucous so that it can be blown out. <http://www.xlear.com>
- **Pranayama breathing techniques.** Taught in many yoga courses, likely near you. In addition, you can find some exercises posted online, thanks to *Yoga Journal*. <http://www.yogajournal.com/category/poses/types/pranayama>
- **Buteyko.** A Russian breathing method that's used to treat asthma, anxiety, and other conditions. Learn more about how Buteyko might benefit you. <http://www.buteyko.com>
- **NeuralCranial Restructuring.** A technique that's useful to correct many deviated septums and restore proper breathing. <http://www.ncrdoctors.com>

Food

- **Thrive Market.** Organic healthy food delivered to your door. <https://www.thrivemarket.com>

Health Professionals

It's not easy to find a health professional who understands nutrition and biochemistry while viewing medicine through an integrative mindset.

The organizations listed below are ones that I trust. Except for the individuals listed on my own website—which appears first—I don't know all the health professionals in every directory, but I do know that they think holistically.

- **DrBenLynch.com.** A good source for health professionals trained by me in how best to treat dirty genes. www.drbenlynch.com
- **American College for Advancement in Medicine (ACAM).** A group dedicated to bridging the gap between conventional medicine and complementary or alternative medicine. www.acam.org
- **American Academy of Environmental Medicine and Naturopathic Academy of Environmental Medicine.** Health professionals who specialize in how to remove mold, industrial chemicals, or heavy metals and are expert in understanding allergic and sensitive reactions to environmental conditions. www.aaemonline.org and www.naturopathicenvironment.com
- **Institute for Functional Medicine.** One of the fastest-growing integrative medicine organizations worldwide. www.functionalmedicine.org
- **Medical Academy of Pediatric Needs (MAPS).** An outstanding organization for children with chronic disease or autism. <http://www.medmaps.org>
- **American Association of Naturopathic Physicians.** Licensed NDs listed nationally or through their local state association websites. www.naturopathic.org; see also state websites such as www.wanp.org and www.calnd.org
- **International Society for Orthomolecular Medicine.** An organization that the famed Linus Pauling and Abram Hoffer were part of. www.orthomolecular.org

House and Yard

Most of the products below I use in or around my own home, with a few extra suggestions from my friend Suzi Swope of the wonderfully useful website GurlGoneGreen.com. We don't use any chemicals at all in our

house. Eliminate them in your home too, and the health results will be noticeable.

Fertilizer and Soil Amendment

- **Hendrikus Organics.** The absolute leader in natural soil health and restoration. The difference in your landscape and vegetable garden will be dramatic. <https://www.hendrikusorganics.com>

Food Storage

- **Stasher.** Silicone bags that are the perfect replacement for reusable (and “dirty”) plastic bags. Great for the fridge or freezer, too. <https://stasherbag.com>
- **Bee’s Wrap.** A long-lasting, user-friendly natural product to keep your food fresh without toxic plastic wrap. <https://www.beeswrap.com>

Housecleaning

- **CitraSolv.** For wiping things down that need extra support. <https://www.citrasolv.com>
- **E-cloth.** Great cleaning cloths that don’t require solvents/chemicals to clean with. <https://www.ecloth.com>
- **Ecover.** Good, clean dishwashing tablets. us.ecover.com
- **Norwex.** Cleaning cloths that don’t require solvents/chemicals to clean with. Especially great for mirrors. <https://norwex.com>
- **White vinegar.** Available in any grocery store. Just dilute it with water and you’re good to go.

Laundry

- **CitraSolv.** Great for spot cleaning. <https://www.citrasolv.com>
- **Molly’s Suds.** A great laundry detergent that comes in scented or unscented. <https://mollyssuds.com>
- **The Simply Co.** A great laundry detergent powder. <https://thesimplyco.com>

- **Wool dryer balls.** Use in place of smelly and wasteful antistatic dryer sheets. You can make your own; they're also available from many vendors.

Weeds

- **Propane torch.** A classic tool for open areas that need weeding, such as driveways and walkways.
- **“Hula” hoe.** The best type of hoe for fast removal of weeds.
- **Pitchfork.** The best way to weed a bed. Stick the pitchfork in the soil, tilt back, and remove the fork. Do this for the entire bed. Then bend down and easily pull the weeds out like butter.

Personal-Care Products

The chemicals found in typical personal-care products aren't suitable for you or your genes—so which products can you use instead? As I noted above, my friend Suzi of the highly recommended GurlGoneGreen.com has kindly put together a list of her favorite clean-green products for me so that you can have some gene-friendly options.

Bath Products

- **Acure Body Wash for Kids.** A body wash that makes a fantastic bubble bath. <https://www.acureorganics.com>

Cosmetics

- **100% PURE.** A huge line offering everything from makeup to skin care. Their lengthening mascara is a great option. <https://www.100percentpure.com>
- **Crunchi.** A great clean makeup line. Love their mascara, primer, foundation, and blush. <https://crunchi.com>
- **Dusty Girls.** Love their bronzer, blushes, and BB cream—all budget-friendly. (BB cream is a type of foundation that's not as heavy as normal liquid foundation but not as light as tinted moisturizer.) <http://dustygirls.com>

- **GIA Minerals.** Love their mascara and eyeshadow selection. <https://www.giaminerals.com>
- **Hynt Beauty.** Great all-around clean makeup line. Love their eye-brow cream, mascara, and concealer. <https://www.hyntbeauty.com>
- **Ilia Beauty.** Great lipsticks and lip crayons. <https://iliabeauty.com>
- **Kjaer Weis.** Great foundation, blushes, and lip products. <https://kjaerweis.com>
- **Lily Lolo.** A great all-around makeup line. Love their mascara, eyeshadow palettes, eyeliner, and BB cream. <https://www.lilylolo.us>
- **RMS Beauty.** One of the first natural makeup lines. Great easy-to-wear products, especially their Un Cover-up, Lip2Cheeks, and powders. <https://www.rmsbeauty.com>
- **Root Pretty.** Love their Pearl Powder Mineral Foundation. Budget-friendly. <https://www.rootpretty.com>
- **Vapour Organic Beauty.** An amazing line, including foundations, blushes, and lip products. www.vapourbeauty.com
- **W3ll People.** A good clean makeup line. w3llpeople.com
- **Zuzu Luxe.** Love their liquid liners. Budget-friendly and available at Whole Foods. <https://gabrielcosmeticsinc.com/brand/zuzu-luxe>

Deodorants

- **Green Tidings.** Great, effective natural deodorant. <http://www.greentidings.org>
- **Primally Pure.** Effective and budget-friendly. Sensitive formula available. <https://primallypure.com>
- **Rustic Maka Pachy.** Comes in a variety of natural scents and is budget-friendly. <https://www.rusticmaka.com>
- **Schmidt's.** Effective and budget-friendly; sensitive formula available. <https://schmidtsnaturals.com>
- **Ursa Major Hoppin' Fresh Deodorant.** Effective; comes in unisex scent. <https://www.ursamajorvt.com>

Hair Products

- **Acure.** Budget-friendly shampoos, conditioners, and styling products. Can be found at Whole Foods, health stores, and online. <https://www.acureorganics.com>
- **Flourish Organic Hair.** A variety of hair-care products from shampoos and conditioners to styling products. Budget-friendly. www.flourishbodycare.com
- **Green & Gorgeous Dry Shampoo.** Available in options for light and dark hair. <https://gandgorganics.com>
- **Hairprint.** A very clean hair dye made from food-grade ingredients. <https://www.myhairprint.com>
- **Herbivore Sea Mist Spray.** Hair texturizer and sea salt spray. <https://www.herbivorebotanicals.com>
- **Innersense Organic Beauty.** Natural salon-quality shampoos, conditioners, and styling products. Their shampoo and conditioner are especially great for color-treated hair. <https://innersensebeauty.com>
- **Josh Rosebrook.** The best natural hair spray and the best spray volumizer (“Lift”). Created by a stylist. <https://joshrosebrook.com>
- **Primally Pure Dry Shampoo.** A great nontoxic dry shampoo. <https://primallypure.com>
- **Rahua.** Great volumizing shampoo and conditioner. <https://rahua.com/us>
- **True Botanicals.** Ultra-luxe clean shampoo and conditioner in eco-friendly pump bottles. <https://truebotanicals.com>

Hand Creams

- **100% Pure Hand Buttercream.** Comes in a tube and moisturizes with no greasy residue. <https://www.100percentpure.com>
- **Osmia Organics Vanilla Shea Hand Cream.** A great hand cream that doesn’t leave behind a residue. Smells amazing. <https://osmiaorganics.com>

- **Shea Terra Organics Mini Shea Whippers.** Come in cute jars and are wonderfully hydrating and clean. <https://www.sheaterraorganics.com>
- **Zoe Organics Everything Balm.** Great for hands or anywhere you need some extra hydration. <https://www.zoeorganics.com>

Hand Soaps

- **Kosmatology.** Best hand soap out there! www.kosmatology.com

Lip Balms

- **Henné Organics.** Great lip balm—really smooth formula—and great lip exfoliant. <https://henneorganics.com>
- **Hurraw Lip Balm.** Great lip balm packaged in tubes; available in a variety of flavors. <https://hurrawbalm.com>
- **Kari Gran Lip Whip.** Ultimate lip moisturizer; comes in a jar. <https://karigran.com>

Perfumes

- **Florescent.** Luxury perfumes that come in spritzer form. <https://florescent.co>
- **Josh Rosebrook Ethereal Botanical Fragrance.** A truly luxurious natural fragrance. Makes switching to a nontoxic fragrance easy. <https://joshrosebrook.com>
- **Lotus Wei.** Plant-based scents that come in a variety of application methods, from roller balls to spritzers. Products help with moods. <https://www.lotuswei.com>
- **LURK.** A ton of natural scents to choose from. <https://lurkmade.com>

Skin-Care Products

- **Acure.** Body and facial skin-care products that are budget-friendly. <https://www.acureorganics.com>

- **Dr. Bronner's.** Great castile soaps for use as body washes; DIY cleaning recipes also available. <https://www.drbronner.com>
- **Josh Rosebrook.** A line based on herbs and plant power. <https://joshrosebrook.com>
- **Kahina Giving Beauty.** A skin-care line based on argan oil. kahina-givingbeauty.com
- **Kosmatology.** Great body washes, facial products, and scrubs. Budget-friendly. www.kosmatology.com
- **Leahlani Skincare.** This skin-care line is not only effective and clean, but offers something for every skin type. Also budget-friendly. <https://www.leahlaniskincare.com>
- **Laurel Whole Plant Organics.** A skin-care line based on herbs and flowers that's 100 percent raw, organic, and unrefined. <https://www.laurelskin.com>
- **Live Inspired Organics.** Best scrub and body butter. www.liveinspiredorganics.com
- **Marie Veronique.** A skin-care line based on science and research. It offers something for every skin type. <https://www.marieveronique.com>
- **May Lindstrom.** Great facial masks. <https://maylindstrom.com>
- **Maya Chia Beauty.** A superb antiaging line that uses chia seed oil as the base for all formulations. <https://mayachia.com>
- **Osmia Organics.** Best bar soaps. Great body oils as well, and facial products. <https://osmiaorganics.com>
- **True Botanicals.** This skin-care line has studies backing its potency and results. Great for those who suffer from acne at any age, and a great antiaging line. <https://truebotanicals.com>

Sunscreens

- **Babo Botanicals SPF 40 Daily Sheer Facial Sunscreen.** Sheer and lightweight. www.babobotanicals.com

- **DeVita Solar Body Moisturizer Mineral Sunscreen SPF 30+.** Effective and budget-friendly. www.davita.com
- **Loving Naturals Adorable Baby Sunscreen SPF 30+.** Great for babies and kids, with simple ingredients. <https://lovingnaturals.com>
- **Suntegrity Mineral Sunscreen.** Sunscreen and self-tanners. www.suntegrityskincare.com
- **Raw Elements Sunscreen.** The cleanest sunscreen out there. Comes in a variety of formulas, from stick to tube to tin form. <https://rawelementsusa.com>

Toothpastes

- **Jason’s Toothpaste.** The one we use in our house. Love it! <http://www.jason-personalcare.com>
- **Tom’s of Maine Toothpaste.** Also a family favorite. <http://www.tomsofmaine.com/home>
- **Uncle Harry’s Toothpaste.** Easy to find at Whole Foods; leaves you with a fresh, clean feeling. www.uncleharrys.com
- **Wellness Mama Blog.** Great DIY recipes for toothpastes that will restore minerals back into your teeth—an approach that some people have used (along with a careful diet) to prevent cavities. <https://wellnessmama.com>

Saunas

A sauna is an absolute must-purchase item unless you have access to a gym with a great sauna. The saunas below are all of great quality, though they look different and the heaters are a bit different. I’ve negotiated significant discounts for you. I do receive a commission for recommending these saunas.

- **Sunlighten Saunas.** Beautifully designed, low electromagnetic frequency (EMF), and built with high-quality, safe materials. Heaters are full spectrum—near-, far-, and midrange. Sunlighten also has a one-person sauna just big enough for you to lie down in. Mention “Dr. Lynch” to receive a significant discount. <http://www.sunlighten.com>

- **HighTech Health.** Constructed with high-quality, safe materials and low electromagnetic frequency (EMF); designed for individuals with multiple chemical sensitivities; easy to set up and move as needed. I owned a three-person HighTech sauna for ten years. HighTech offers very low-EMF-emitting heaters, good air circulation, light therapy, and a setup for music. Mention “Dr. Lynch” to receive significant savings. <http://hightechhealth.com>

Supplements

As you take supplements, always keep the Pulse Method in mind. (See chapter 12 for a refresher.) Below are listed supplements I’ve formulated as well as brands I recommend based on how well they’ve performed for my clients and fellow health professionals.

- **Bio-Botanical Research** (<https://biocidin.com>)
 - **Liposomal Biocidin.** An effective antimicrobial.
 - **Biocidin Throat Spray.** Fantastic to support a sore throat.
- **Seacure** (<http://www.seacure-protein.com>)
 - **Hydrolyzed White Fish.** Excellent for healing the gut.
- **Seeking Health** (my company: www.seekinghealth.com)
 - **5-HTP.** Supports serotonin production.
 - **Adrenal Cortex.** Supports adrenals to help you wake up in the morning.
 - **DIM + I3C.** A blend that supports healthy estrogen levels.
 - **HistaminX.** To help counter symptoms of histamine excess.
 - **HomocysteX Plus.** Supports the Methylation Cycle and healthy homocysteine levels.
 - **Lithium.** Supports serotonin levels and promotes a sense of calm.
 - **Molybdenum.** Helps process sulfites. We offer it in liquid 25 microgram doses and 75 microgram capsules.
 - **Multivitamins.** Many to choose from—powders, chewables, capsules.
 - **NADH + CoQ10.** Helps get you out of bed in the morning and eliminates the need for caffeine if you’re trying to quit.

- Neutralize.** Helps reduce a mild histamine reaction or “off” feelings from an environmental exposure.
- Optimal Electrolyte.** A complete electrolyte formula without sugar.
- Optimal GI Powder.** A comprehensive gut lining repair formula.
- Optimal Liposomal Glutathione Plus:** Provides glutathione right to your cells, along with the nutrients needed to use and recycle glutathione.
- ProBiota Bifido.** Helps break down histamine from bacteria, food, and drink.
- ProBiota HistaminX.** Helps break down histamine from food, drink, and bacteria. Helps solve the problem of high histamine by improving your microbiome.
- Pro-Digestion Intensive.** A comprehensive digestive enzyme.
- PreGestion.** Provides stomach acid to help reduce belching and aid digestion.
- Optimal Adrenal.** A nonstimulating, adaptogenic blend of herbs and nutrients to take the edge off stress without sleepiness. A favorite for parents.
- Optimal Prenatal Protein Powder.** My favorite product by far: a complete prenatal with protein powder that can be drunk as a smoothie. This is what I drink most mornings for my breakfast, because it’s fast and complete—although I do not intend to get pregnant! This is what I use in the smoothie recipes on pages 237 and 243.
- Optimal Detox Powder.** A comprehensive detoxification formula with protein powder; makes a great breakfast shake. This is another protein powder blend that I use in my smoothie recipes.
- Optimal Start.** A great foundational multivitamin for those who are sensitive to methyl donors; contains no folate or B₁₂, compounds that some people are sensitive to.
- Optimal Sleep.** A combination of nutrients to help people relax and have a good night’s sleep without feeling hungover the next day.

- Ox Bile.** Supports fat digestion, supports those without a gallbladder, and acts as an antimicrobial in the small intestine to help combat SIBO.
- PQQ.** Useful for those experiencing oxidative stress or significant postworkout soreness.
- **US Enzymes** (<https://usenzymes.com>)
 - Digestxym.** A plant-based comprehensive digestive enzyme.
 - Serraxym.** A systemic enzyme to help break down cellular debris.

Tracking Products for Exercise, Food, Heart-Rate Variability (HRV), and Sleep

Understanding how your body behaves in real time is extremely useful. It's also useful to know exactly what you're eating, how much, and what that food contains. These tracking products can help you gather and interpret such data.

- **CRON-O-Meter app.** Track what you eat and how much of it. This app shows you in real time how much more you should eat for the day, broken down into protein, fats, and carbs. It also has settings for various diets, such as Paleo or Ketogenic. If you want to lose or gain weight, it adjusts for that as well. I learned a lot about my eating by using this app. Available on the app store of your phone. <https://cronometer.com>
- **HRV4Training.** A great phone app that tracks your HRV via your cellphone camera. <http://www.hrv4training.com>
- **Nutrient Optimiser.** Ties in with CRON-O-Meter to inform you what you should eat, what you shouldn't eat, and what you should eat more of—with the goal of getting all your nutrients from food. A fantastic program designed by Marty Kendall. <https://nutrientoptimiser.com>
- **ÖURA ring.** A hard-working and effective gadget. I had no idea how bad my sleep was until I started tracking it. ÖURA ring woke me up to the fact I wasn't sleeping well. I made changes, and now my sleep is fantastic (unless I work late or eat late!). This app also tracks your readiness to exercise (how hard you can exercise, or if

you need to take it easy for the day based on HRV, heart rate, and body temperature) and your actual exercise (how much, intensity, when). It's a good-looking and durable ring as well. I get a lot of compliments! Use code "aejxo2" at ouraring.com to save 10 percent.

- **Sleep Cycle app.** A great starting app to measure the quality of your sleep. It gives you some insight, but the ŌURA ring is more precise. Available on the app store of your phone. <https://www.sleepcycle.com>
- **WISE. What should I eat?** Tired of people telling you what you can't eat? Answer a few questions about what foods give you symptoms, and about your health more generally, and receive a report in minutes about what you *can* eat. Expand your report into customized recipes prepared by a professional chef! Try WISE (What I Should Eat). www.drbenlynch.com