The Role of the Liver in Detoxification

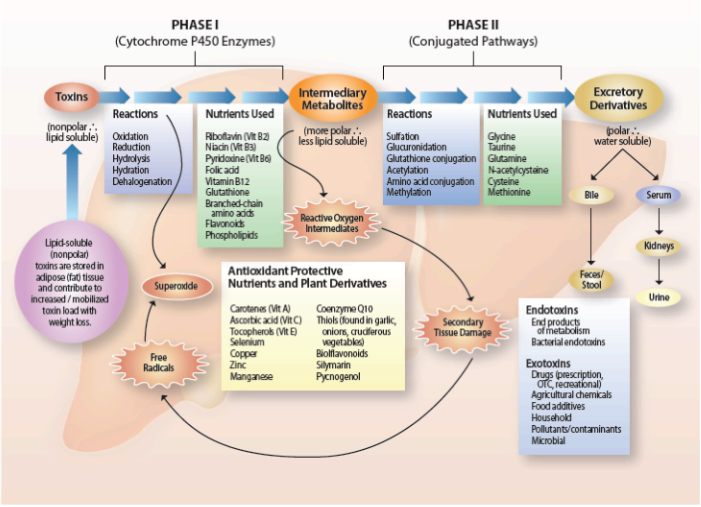
Every day, your body is exposed to harmful chemicals. Your liver, kidneys, large intestine, lymphatic system, and sweat glands work together to reduce the buildup of these chemicals. This process is called detoxification, or detox. Of these organ systems, the liver plays one of the largest roles. The liver performs hundreds of functions and is needed to process nutrients and hormones, as well as remove waste products created as the result of normal body functions.

The liver also aids in breaking down and removing external toxins (naturally occurring) and toxicants (man-made):

- Farm chemicals, air pollutants, and chemicals from personal care products
- Both prescription and over-the-counter medications
- Food additives, colorings, flavor enhancers, preservatives, and artificial sweeteners
- Alcohols
- Volatile organic compounds such as those found in fragrances and air fresheners

Phases of Detoxification in the Liver

Phase I Liver detoxification is the first line of defense against toxins/toxicants. Phase I functions as a result of a group of enzymes known as the Cytochrome P450 family. These enzymes help neutralize substances such as caffeine and alcohol, and also help convert chemicals into forms that can be more easily removed from the body. If these toxic intermediates are allowed to build up, however, they can damage DNA and proteins. Phase II Liver detoxification's role is to help neutralize these intermediates and transform them to compounds that can be removed by the body through a process known as conjugation.



Baker SM, Bennett P, Bland JS, et al. Textbook of functional medicine. Gig Harbor, WA: The Institute for Functional Medicine; 2005: p. 278.

Supporting the Work of the Liver

In Functional Medicine, diet is used to support the work of the liver in its detox processes. Various nutrients are required to fuel detox pathways. A shortage or deficiency of any one of them could mean an increased body burden, or buildup of chemicals. Additionally, specific foods can support metabolic processes of changing toxic chemicals and waste products to less harmful forms and assist in their elimination. Therefore, the dietary plans to support detox generally focus on adding in natural and whole foods to support, regulate, start, or stop various processes related to Phase I and Phase II detoxification in the liver. For individuals with genetic variability in the Cytochrome P450 system, enzyme activity may be impaired or reduced. In these cases, detox food plans that improve Phase I metabolism and Phase II conjugation are recommended.

References

1. Sears ME, Genuis SJ. Environmental determinants of chronic disease and medical approaches: Recognition, avoidance, supportive therapy, and detoxification. J Environ Public Health. 2012;2012:356798. doi:10.1155/2012/356798.