Maintaining A Proper Balance of Beta-Glucuronidase for Disease and Cancer Prevention

Glucuronidation is one of several important Phase II conjugation pathways in the liver for detoxification and excretion of carcinogens, lipid soluble hormones and steroid hormones. The glucuronidation detoxification pathway uses the substance glucuronic acid to attach itself to the Phase I metabolite chemical toxin for excretion into the bile and to the intestine for removal from the body. This process is called conjugation where the toxin is packaged into water soluble compounds called glucuronides.

Beta-glucuronidase is an enzyme inducible in colonocytes and produced by anaerobic intestinal bacteria. It has many functions within the body, including:

- breaks down complex carbohydrates
- nutrients are ingested as the glucuronide conjugate of the active molecule, which must be deconjugated in order for the beneficial molecule (the “aglycone”) to be absorbed. Such nutrients include lignans, flavonoids, ceramides, and glycyrrhetinic acid.
- acts to deconjugate glucuronide molecules from a variety of toxins, carcinogens, hormones, and drugs, which are naturally glucuronidated in the liver to facilitate biliary excretion. High levels of this enzyme inhibits the conjugation process by
separating toxins from their conjugate bond and allows them to be reabsorbed

A proper balance of beta-glucuronidase is essential for good health and disease prevention:

\[ \text{Beta-glucuronidase activity must be sufficient to permit deconjugation and absorption of desirable molecules, while} \]

\[ \text{Remaining low enough to prevent widespread deconjugation and subsequent reabsorption of toxins} \]

High levels of beta glucuronidase inhibits the body's capacity through glucuronidation to detoxify both natural hormones and environmental toxins. Beta-glucuronidase can be easily measured in the stool. For those with high levels of beta-glucuronidase in their stool they may be at an increased risk for certain cancers.

High levels of beta-glucuronidase activity can be caused by a number of factors which are primarily due to poor diet:

- High meat consumption
- Processed food consumption
- High sugar consumption
- Alcohol consumption
- Antibiotic administration may also increase beta-glucuronidase due to the fact that antibiotics reduce gut bacteria.

A gut microbiome that is in dysbiosis is more likely to have high levels of beta-glucuronidase.

The following cancers have been identified due to
excessive beta-glucuronidase activity:

- Breast cancer
- Colon cancer
- Prostate cancer

In order to maintain good health and to lower the risk of the above referenced cancers, it is important to keep beta-glucuronidase activity low but sufficient enough to deconjugate ingested molecules for nutrient absorption.

After a stool test of beta-glucuronidase indicates a high level of beta-glucuronidase (above the normal range), there are certain natural substances that can be consumed to proactively lower beta-glucuronidase:

- Apple Pectin
- Calcium-D-glucarate (Calcium D-glucarate indirectly inhibits the beta-glucuronidase enzyme thus keeping the toxins inside glucuronide which can then be removed by the body)
- Cumin Seeds
- Fenugreek Seeds
- Fructooligosaccharides (FOS)
- Luteolin
- Milk thistle (Silymarin)
- Probiotics (Lactobacilli and Bifidobacteria)
- Oligomeric Proanthocyanidins (OPCs)
- Skullcap

Informational References:

Genova Diagnostics – Comprehensive Digestive Stool
Enhancing the Six Phase II Detoxification Pathways by Consuming the Necessary Nutrients

Specific Chemical Compounds in Citrus Peels Demonstrates Potential Promise in Cancer Prevention

Triterpenoid Saponins From Plants Show Potential As Chemopreventive Agents

Consume The 4 Glucosinolate Rich Foods To Produce The 4 Isothiocyanates In Order To Reduce the Risk Of Cancer

Apigenin Demonstrates Great Promise As A Natural Molecule for Cancer Prevention