WANT TO GEEK OUT A LITTLE ABOUT THE ROLE OF EACH DETOXIFICATION PATHWAY?

This table sums up the works of the different detoxification pathways and how to support them with food and supplements. [12] If you suffer from a specific hormonal imbalance such as estrogen dominance, please use this table to pick the right foods or supplements to support your liver.

Liver Detoxification Pathway	Responsible for clearing	Inhibitors	Activators
PHASE I Detoxification Pathway	• Bacteria • Pesticides • Medications • Heavy metals • Caffeine • Hormones • Alcohol • Pollutants	• Curcumin (found in turmeric) • Grapefruit Nutritional deficiency • Toxic exposure • Medications such as acetaminophen (brand name Tylenol) • Alcohol consumption • Low protein intake that depletes glutathione	• Riboflavin (B2) • Niacin (B3) • Magnesium
PHASE II GLUTATHIONYLATION The primary Phase II detoxification pathway helps to detoxify and eliminate poisons in the liver, lungs, intestines, and kidneys.	• Pesticides • Paracetamol (painkiller) • Heavy metals such as mercury, lead, and cadmium • Penicillin • Tetracycline (antibiotics) • Petroleum distillates • Alcohol • Bacteria	• Low levels of: iron, zinc, B vitamins, selenium • Fluoride • Aspirin	• Glycine, glutamine and cysteine • Methionine (from meat, fish, and dairy) • Fish oil • Limonene (citrus rind) • Cruciferous vegetable • Vitamins B2, B6, and C • Selenium • Milk thistle • NAC supplement (glutathione precursor) • SAMe supplement • DIM (di-idolyl-methane) supplement • Whey protein, if tolerated
PHASE II METHYLATION Most powerful liver and brain detoxifier and	• Estrogen • Dopamine • Histamine • Heavy metals: lead, mercury, arsenic	• Alcohol • Low folate • Low vitamin B12	• Choline; found in eggs, non-GMO soy lethicin and avocado (in lesser amounts) • Vitamins B6 from whole grains and nuts • B12 from offal and meat

[1] The Path August 2012 edition

[2] Women's International Pharmacy

protector. Impacts the immune, digestive and nervous system.	• Air pollutants • Pesticides		• Folate from green vegetables • Beets and leaves • SAMe supplement
PHASE II SULPHATION Binds steroid hormones and transforms them into a more soluble form that can be excreted in the urine or bile.	• Estrogen • Progesterone • Thyroid • DHEA • Melatonin • Histamine • Dopamine • Adrenalin • Noradrenalin	• NSAIDs such as Ibuprofen, Motrin or Advil • Yellow food dye	• Sulphur-rich foods: garlic, onions, cabbage • Cruciferous vegetables • Eggs, if tolerated • MSM supplement
PHASE II GLUCURONIDATION Estimated to account for 33% of all drugs metabolized by Phase II detoxification	• Sex hormones; estrogens, cortisol, and androgens • Paracetamol • Pollutants, food additives • NSAIDs such as aspirin and Tylenol • Antidepressants	• Oral contraceptives • Aspirin • Pesticides	• Calcium d-glucarate • Magnesium • Zinc • Vitamin B complex • Essential Fatty Acids • Limonene found in lemon, lime and orange • Glucuronic acid found in agar agra gel and apples • Milk thistle • Green tea • SAMe supplement
PHASE II ACETYLATION Acetyl Co-A is attached to toxins to make them less harmful and easy to excrete	• Primary way to eliminate sulfa drugs	• Low vitamins B2, B5 and C • Cigarette smoking	• Acetol-CoA, derived from normal metabolism
PHASE II AMINO ACID CONJUGATION The conjugation of toxins with amino acids	• Salicylates (high in aspirin and pain medications) • Environmental pollutants • Food preservatives	• Low protein diet	• Mainly glycine (found in gelatin and bone broths), taurine and glutamine (found in animal proteins)