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. 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.

<table>
<thead>
<tr>
<th>Liver Detoxification Pathway</th>
<th>Responsible for clearing</th>
<th>Inhibitors</th>
<th>Activators</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE I Detoxification Pathway</td>
<td>• Bacteria • Pesticides • Medications • Heavy metals • Caffeine • Hormones • Alcohol • Pollutants</td>
<td>• Curcumin (found in turmeric) • Grapefruit • Nutritional deficiency • Toxic exposure • Medications such as acetaminophen (brand name Tylenol) • Alcohol consumption • Low protein intake that depletes glutathione</td>
<td>• Riboflavin (B2) • Niacin (B3) • Magnesium</td>
</tr>
<tr>
<td>PHASE II GLUTATHIONYLATION</td>
<td>• Pesticides • Paracetamol (painkiller) • Heavy metals such as mercury, lead, and cadmium • Penicillin • Tetracycline (antibiotics) • Petroleum distillates • Alcohol • Bacteria</td>
<td>• Low levels of: iron, zinc, B vitamins, selenium • Fluoride • Aspirin</td>
<td>• 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</td>
</tr>
<tr>
<td>PHASE II METHYLATION</td>
<td>• Estrogen • Dopamine • Histamine • Heavy metals: lead, mercury, arsenic</td>
<td>• Alcohol • Low folate • Low vitamin B12</td>
<td>• 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</td>
</tr>
</tbody>
</table>

1 The Path August 2012 edition
2 Women's International Pharmacy
protector. Impacts the immune, digestive and nervous system.

<table>
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<tr>
<th>PHASE II</th>
<th>SULPHATION</th>
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</table>
| 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 |

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<tr>
<th>PHASE II</th>
<th>GLUCURONIDATION</th>
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</table>
| 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  
• Limonene found in lemon, lime and orange  
• Glucuronic acid found in agar agar gel and apples  
• Milk thistle  
• Green tea  
• SAMe supplement |

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<tr>
<th>PHASE II</th>
<th>ACETYLATION</th>
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| 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 |

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<tr>
<th>PHASE II</th>
<th>AMINO ACID CONJUGATION</th>
</tr>
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</table>
| 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) |