

# Metabolism of Xenobiotics

Phase II Metabolism  
Toxicokinetics and Dynamics

# Review: Phase I and phase II metabolic reactions

Phase I reactions modify the chemical substrate (generally a hydrophobic compound) by adding a functional structure.

This modification results in a new substrate for the Phase II enzyme to react. The Phase II covalently tags (conjugates) the new substrate with another substance that is usually hydrophilic.

Phase II reactions give products are larger molecules than the substrate and generally polar in nature (hydrophilic/water soluble). Thus, they can be readily excreted from the body. Conjugated compounds also have poor ability to cross cell membranes.

# Phase II enzymatic reactions

- Phase II biotransformation reactions include glucuronidation, sulfonation, acetylation, methylation, and conjugation with glutathione (mercapturic acid synthesis), which results in increased hydrophilicity