Xenobiotics (Part 4)

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Xenobiotics

Elimination of the toxicant:

- Elimination of the toxicant of storage depots takes place through biotransformation and excretion.

Biotransformation:

- The biochemical reactions involved in the conversion of foreign, toxic and water insoluble molecules to non toxic, water soluble and excretable forms are called Detoxification /Biotransformation reactions

Xenobiotics

Biotransformation (contd…);

- The overall purpose of the two phases of metabolism of xenobiotics is to increase their water solubility (polarity) and thus excretion from the body.
- In certain situations these reactions may instead increase the toxicity of a foreign compound, then these are called, Entoxification reactions

Xenobiotics

Purpose of Biotransformation reactions:

- Converts lipophilic to hydrophilic compounds ◦
- Facilitates excretion
- Consequences :
- Changes in solubility characteristics ◦
- Detoxification
- Metabolic activation

Xenobiotics

Biotransformation reactions:

Phase 1 reaction:

- phase 1 reactions can convert xenobiotics from inactive to biologically active compounds (Metabolic activation).
- In these instances, the original xenobiotics are referred to as "prodrugs" or "procarcinogens.

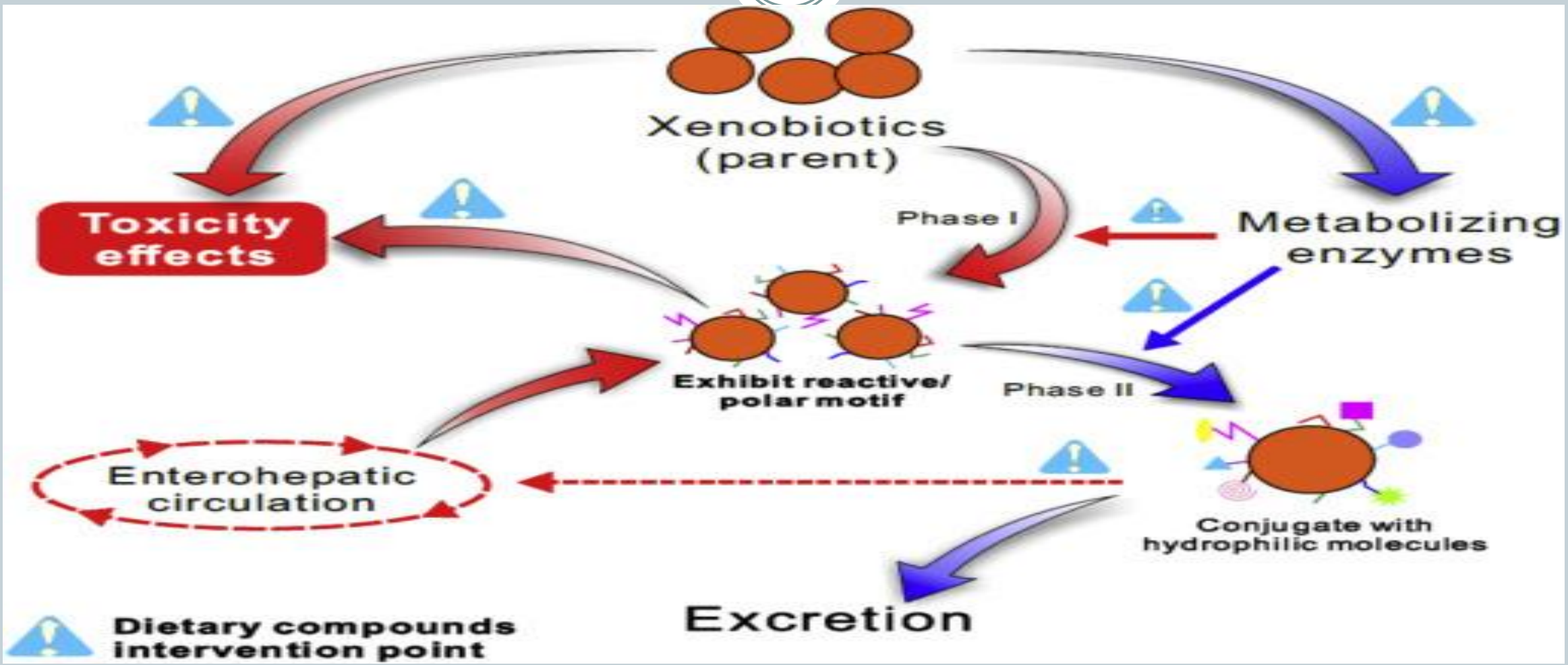
Xenobiotics

Biotransformation reactions:

Phase 2 reaction :

- Phase 2/conjugation reactions can convert the active products of phase 1 reactions to less active or inactive species, which are subsequently excreted in the urine or bile.
- In a very few cases, conjugation may actually increase the biologic activity of a xenobiotic (Metabolic activation).

Elimination of Xenobiotics



Biotransformation - Phase 1 & 2 Reactions

Thank You