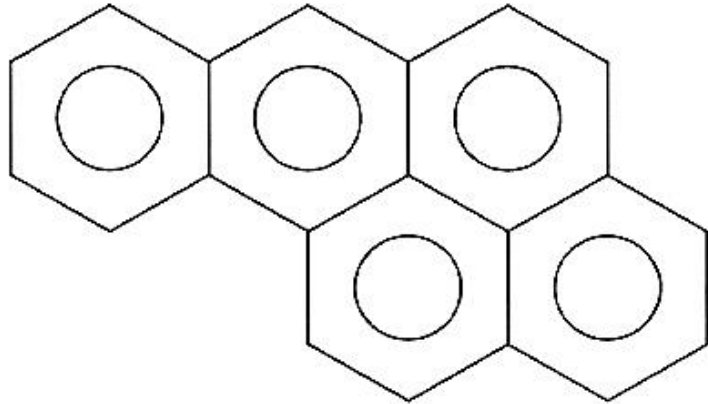
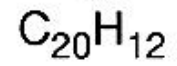


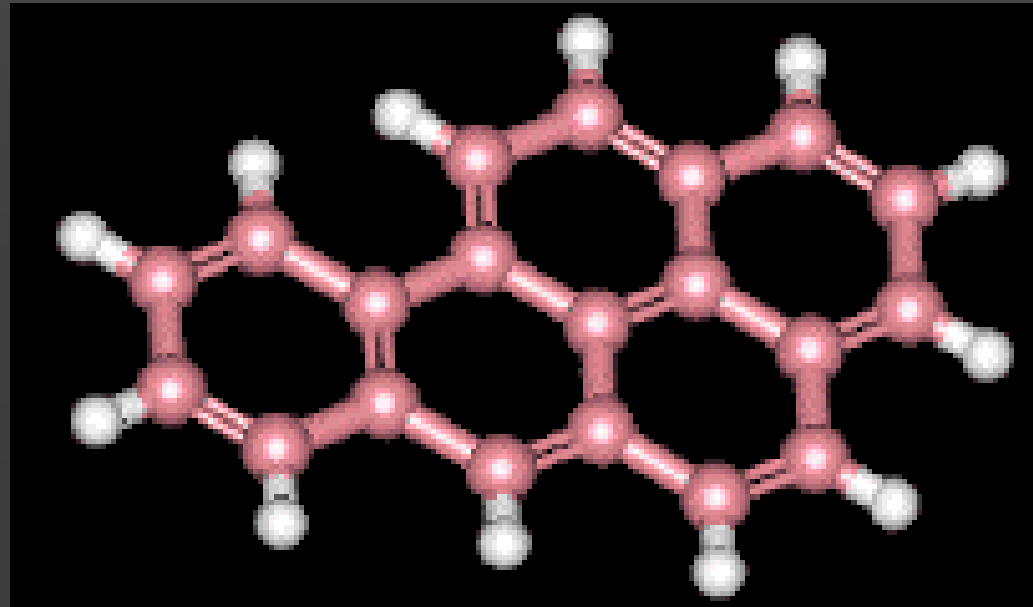
Polycyclic Aromatic Hydrocarbons (PAH)



Benzopyrene

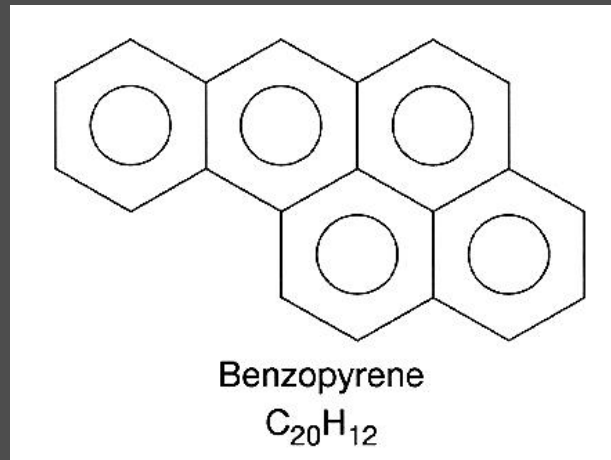
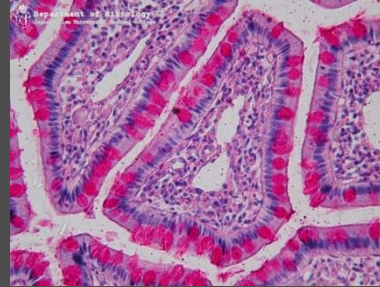


Note: PAHs are NOT PCBs !



Polycyclic Aromatic Hydrocarbons (PAH)

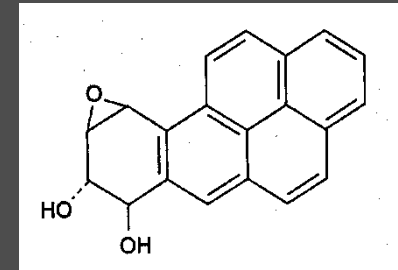
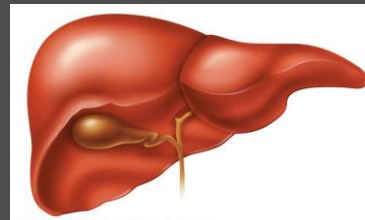
Intestine



CYP
(P450, MFO)



Liver



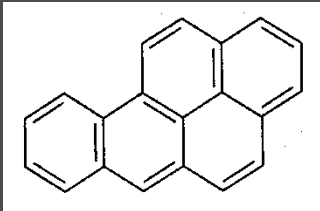
CYP and cancer

Cytochromes CYP (P450):

- System of enzymes: universal in mammals
- Incorporate an O atom from O_2 into a substrate

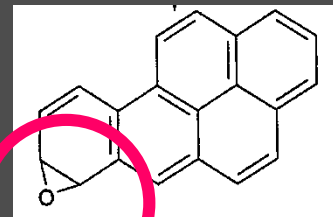
= monooxygenase

Benzo[a]pyrene



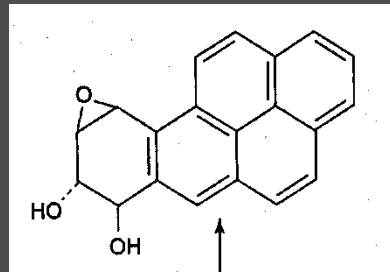
CYP ↓ O_2

Benzo[a]pyrene-7,8-epoxide



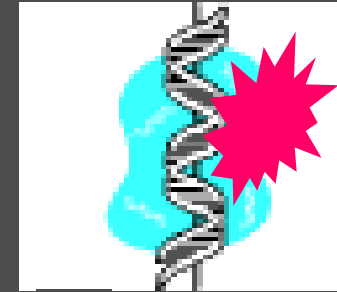
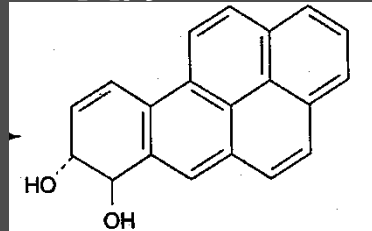
Epoxide hydrolase

Benzo[a]pyrene-7,8-dihydrodiol-9,10-epoxide



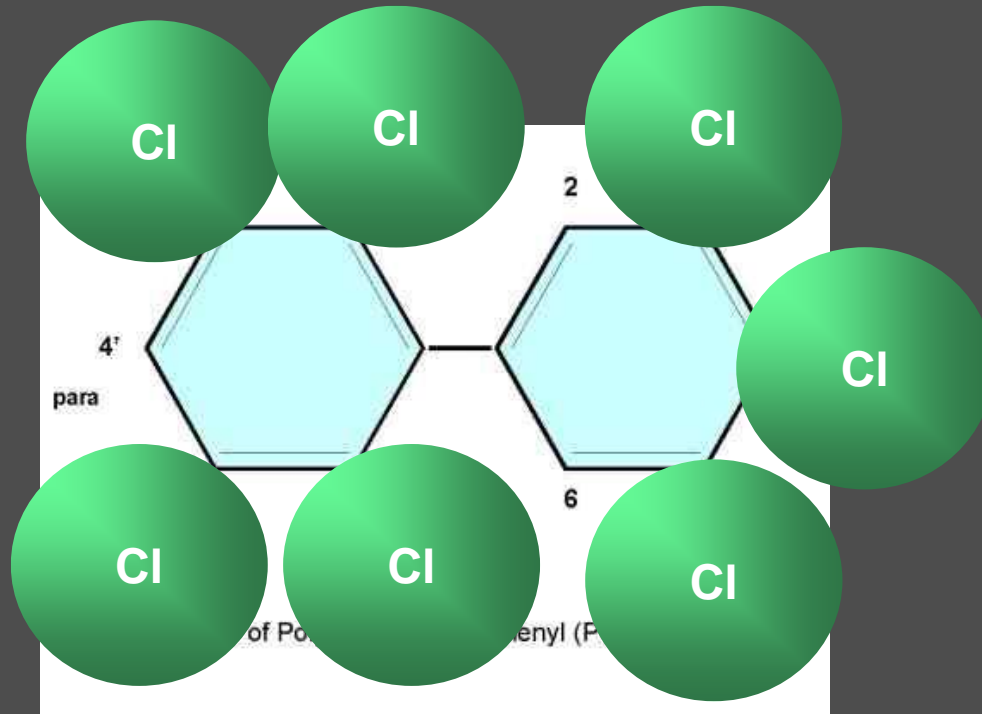
CYP ↑ O_2

Benzo[a]pyrene-7,8-dihydrodiol



Organochlorine compounds

Polychlorinated biphenyls (PCBs)

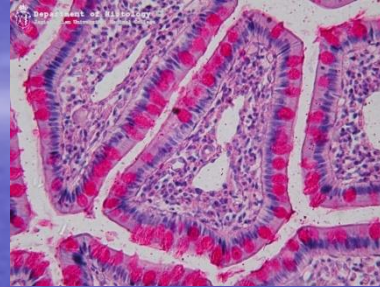


Cyp↑

- Norstrom R et al 1992, Mar Env Pol
- Wilson JY et al 2005, Env Health Perspect

Polycyclic Aromatic Hydrocarbons (PAH)

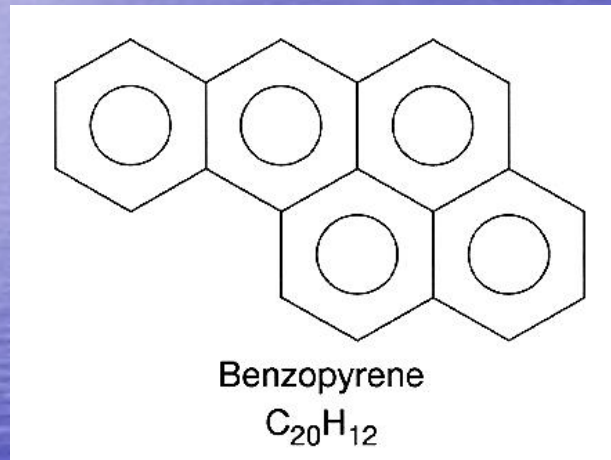
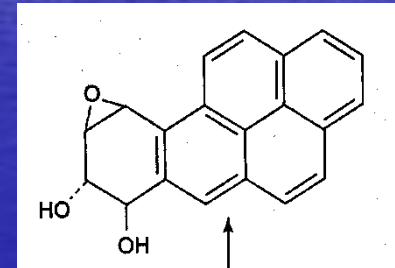
Intestine



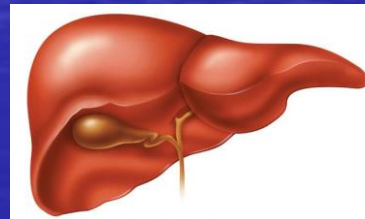
CYP
(P450, MFO)



diol-epoxide



Liver



Polycyclic Aromatic Hydrocarbons (PAH)

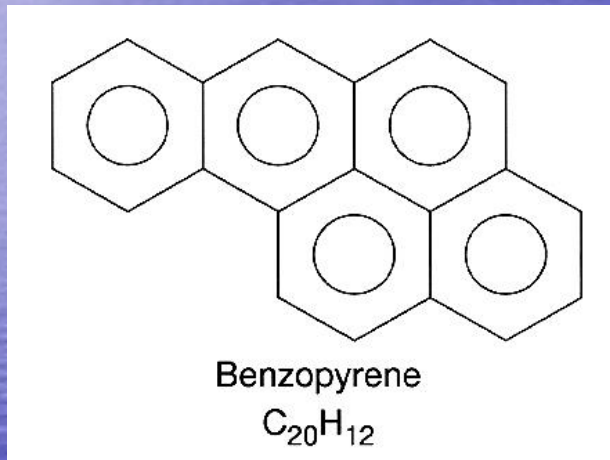
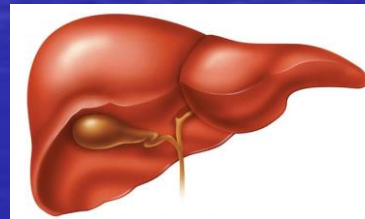
Intestine



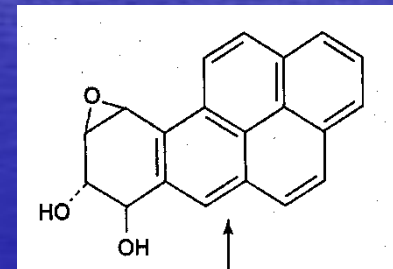
CYP ↑
(P450, MFO)



Liver



diol-epoxide ↑



PAHs in the Saguenay River

- Aluminium industry present in the Saguenay region since 1926
- 40,000 tons of PAHs released in the Saguenay watershed

« ...serious chronic hazard to this environment and its inhabitants »

- Smith and Levy 1990, (Fisheries and Oceans Canada)



PAHs in beluga

- BaP adducts detected in St Lawrence beluga
- none detectable in Arctic beluga

Martineau et al 1988, J Comp Pathol

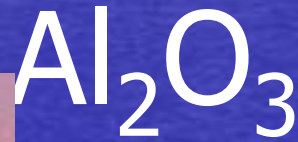
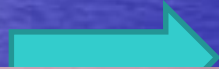
Aluminium

- most abundant metal on the planet (in silicate) BUT bound to oxygen

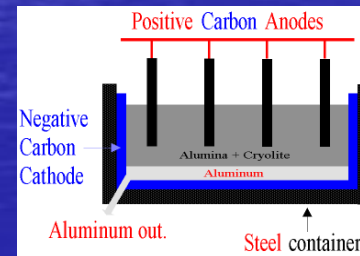


Bauxite: rock composed of hydrated aluminum oxides

Aluminium production



Alumina

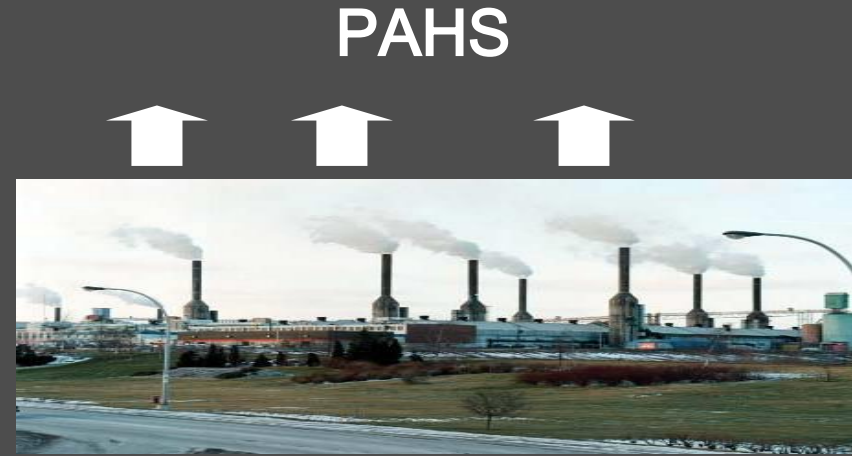
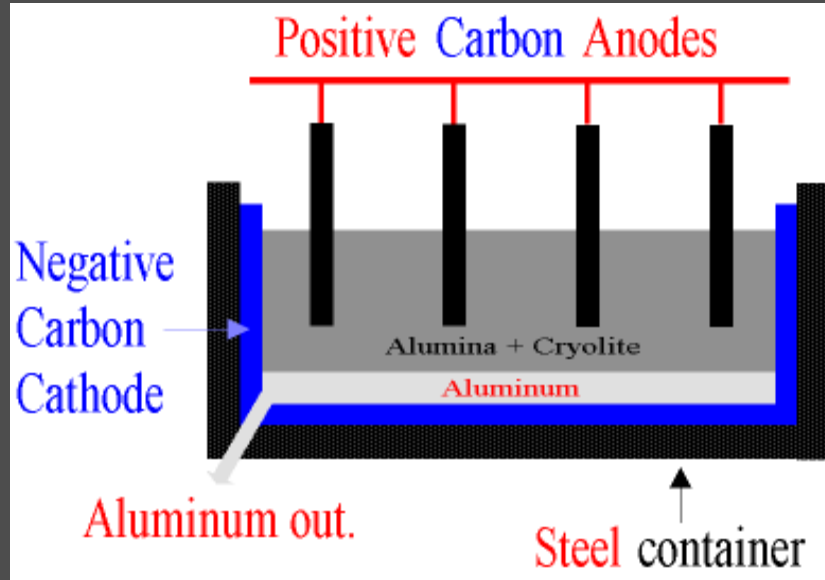


Aluminium

Production of aluminum
= electrolysis of alumina

Söderberg process:

Anodes = mixture of tar



PAHS

Alcan. Alma

Alcan: Arvida

