

What Paracelsus did not say

Poison must reach target organ

1

Absorption into the body

2

Build up to lethal levels before excretion

Mercury

1 Swallow metallic mercury



Glass mercury thermometers



Does not absorb into the body



Mercury

- 1 Swallow metallic mercury
- 2 Inject metallic mercury into bloodstream
- 3 Ingest mercurous chloride (HgCl , calomel)
- 4 Ingest mercuric chloride (HgCl_2)



More soluble in water, rapid absorption

Mercury

- 1 Swallow metallic mercury
- 2 Inject metallic mercury into bloodstream
- 3 Ingest mercurous chloride (HgCl , calomel)
- 4 Ingest mercuric chloride (HgCl_2)
- 5 Inhale mercury vapour

Fingerprints

Fibre Analysis

Poison

Blood

Inhaling mercury vapour

Absorbed very rapidly

Go straight to bloodstream

King Charles II

Many hobbies

Interested in chemistry



Lab accident



Poisoned by
mercury vapor



King Charles II

Route of Administration

Must reach target organ to be effective

DNA

Fingerprints

Fibre Analysis

Poison

Blood

Route of Administration

1 Oral administration



Absorbed through digestive tract

DNA

Fingerprints

Fibre Analysis

Poison

Blood

Route of Administration

1 Oral administration

2 Intravenous



Directly into bloodstream



Fast and efficient

Route of Administration

1 Oral administration

2 Intravenous

3 Inhalation



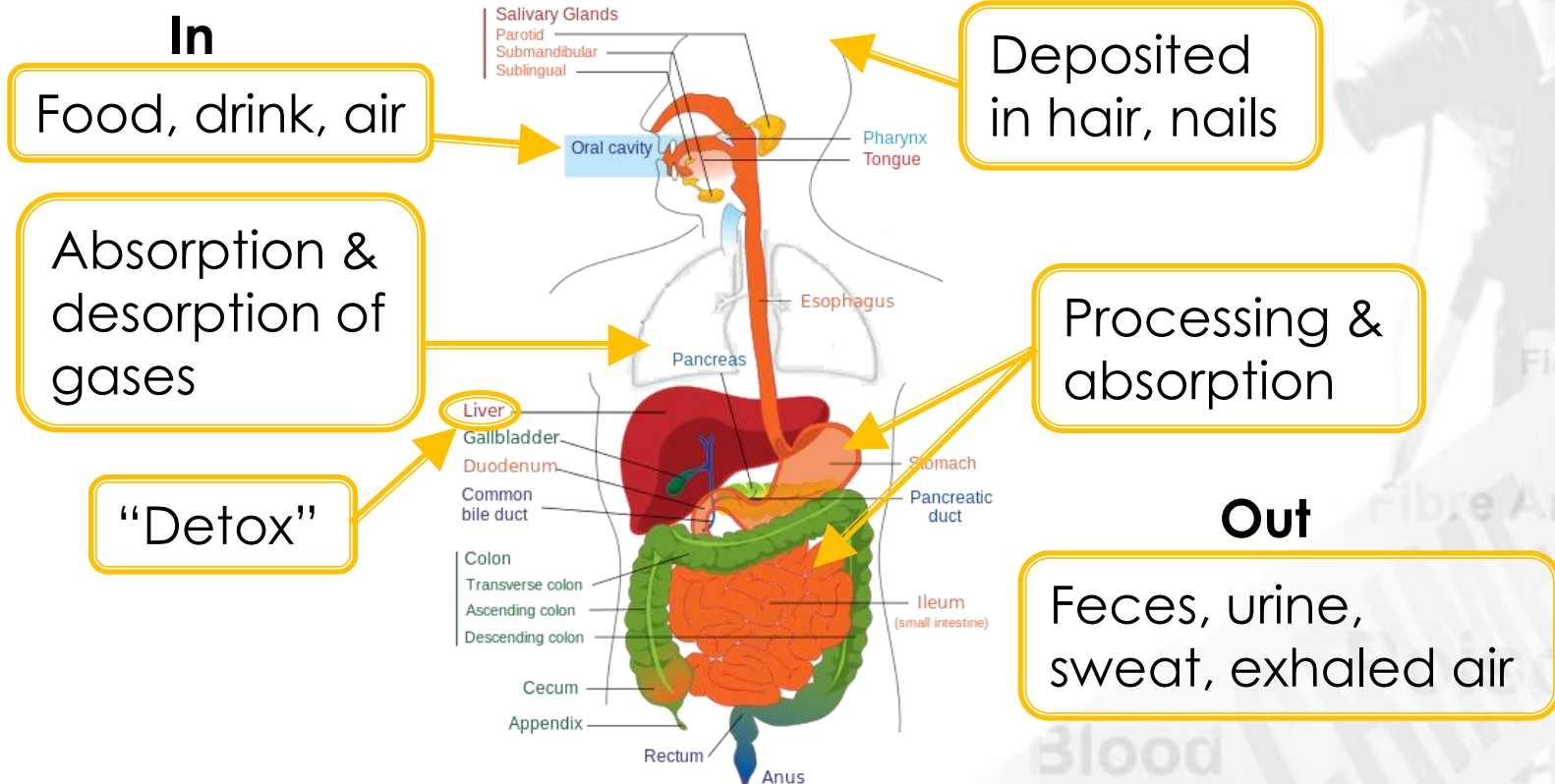
Rapidly from lungs to blood

4 Through mucus membranes

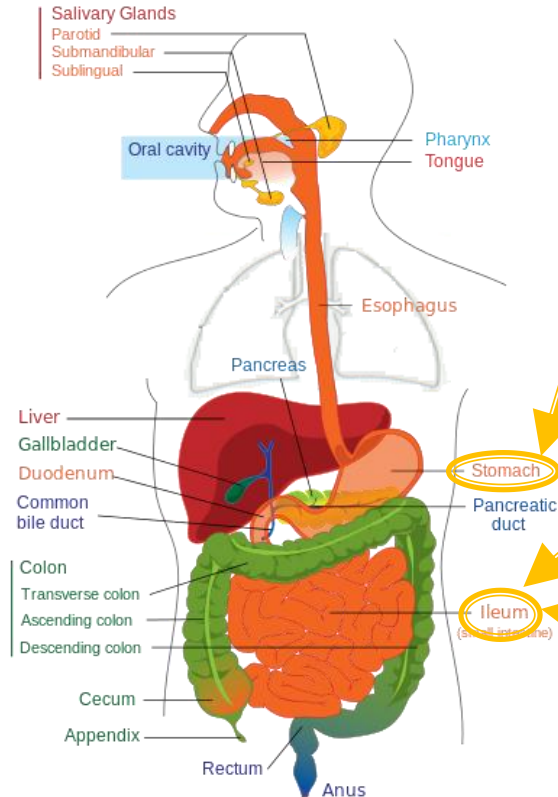


Fast and efficient

Forensic Toxicology



What happens to your food?



Proteins are broken down into peptides

Peptides broken down into amino acids

Saccharides broken down into sugars

Snake venom

Complex peptides

Drinking the venom?



Relatively safe



Peptides converted to amino acids



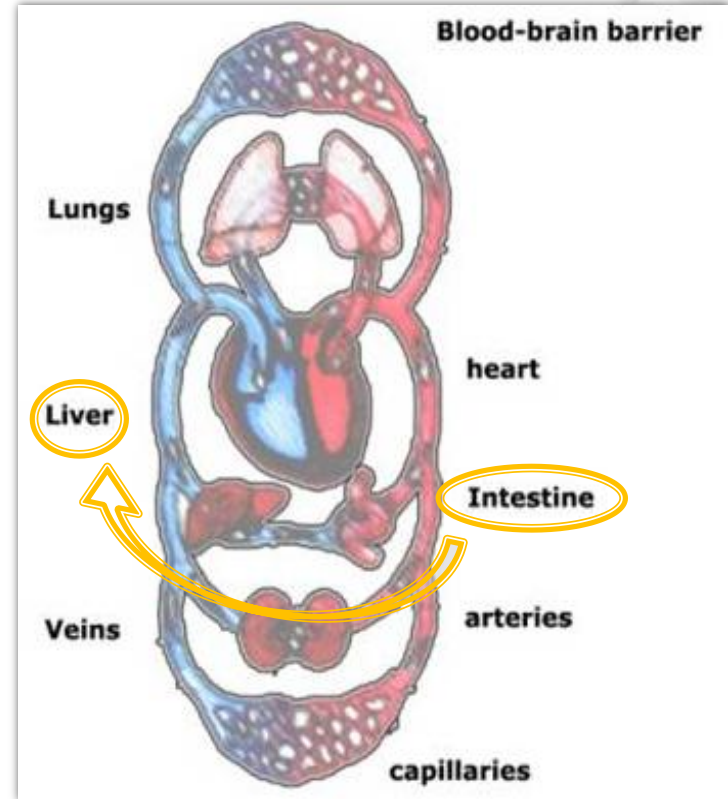
Milking snake venom

Forensic Toxicology

Enter bloodstream
after digestion

Liver = detox factory

Get past liver to go to
the rest of the body

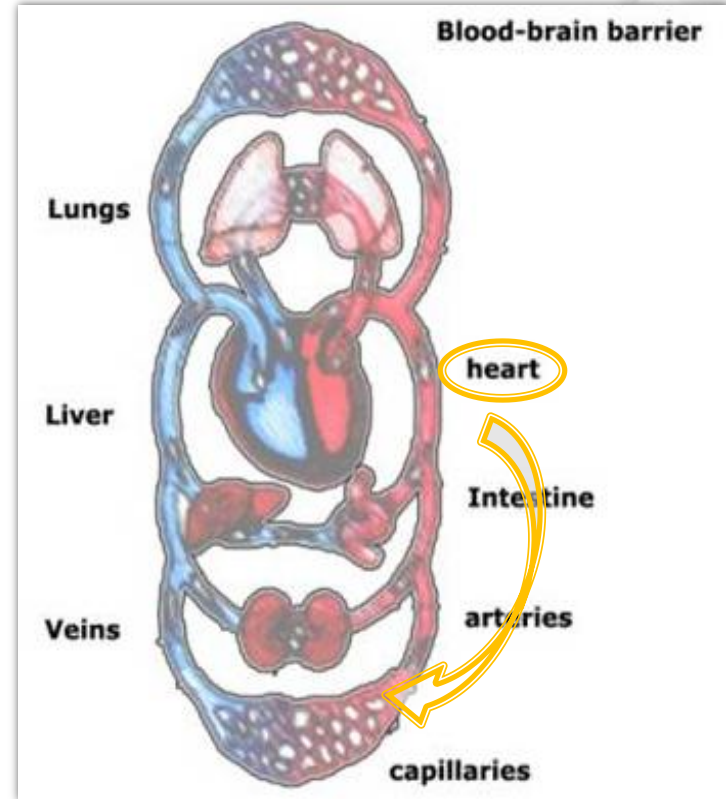


Forensic Toxicology

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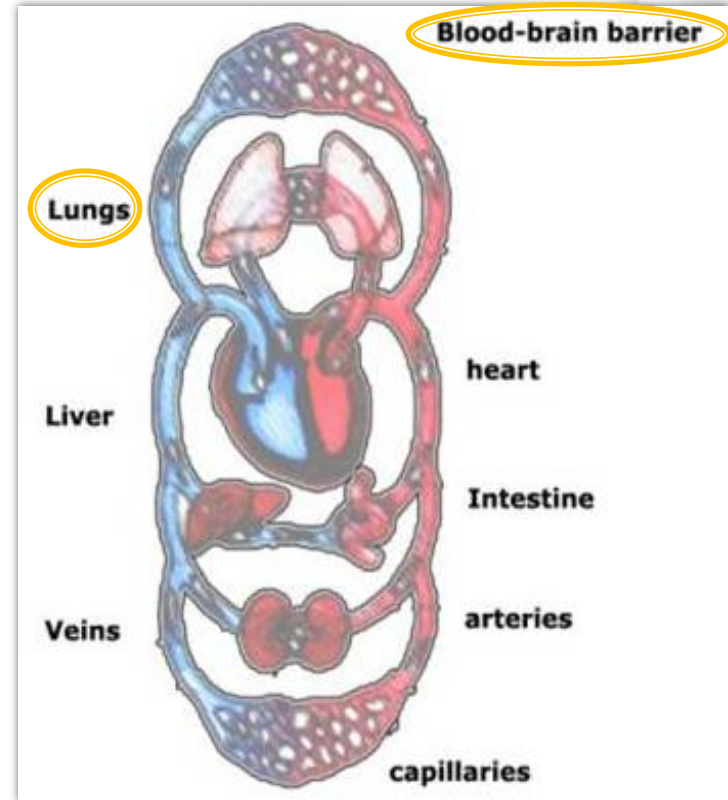


Forensic Toxicology

Blood flows past the lungs to rest of body

Membrane around brain

Prevent molecules from going into brain



Xenobiotics

“Strange” molecules



Pharmaceuticals



Illegal drugs



Natural substances



Nicotine, caffeine

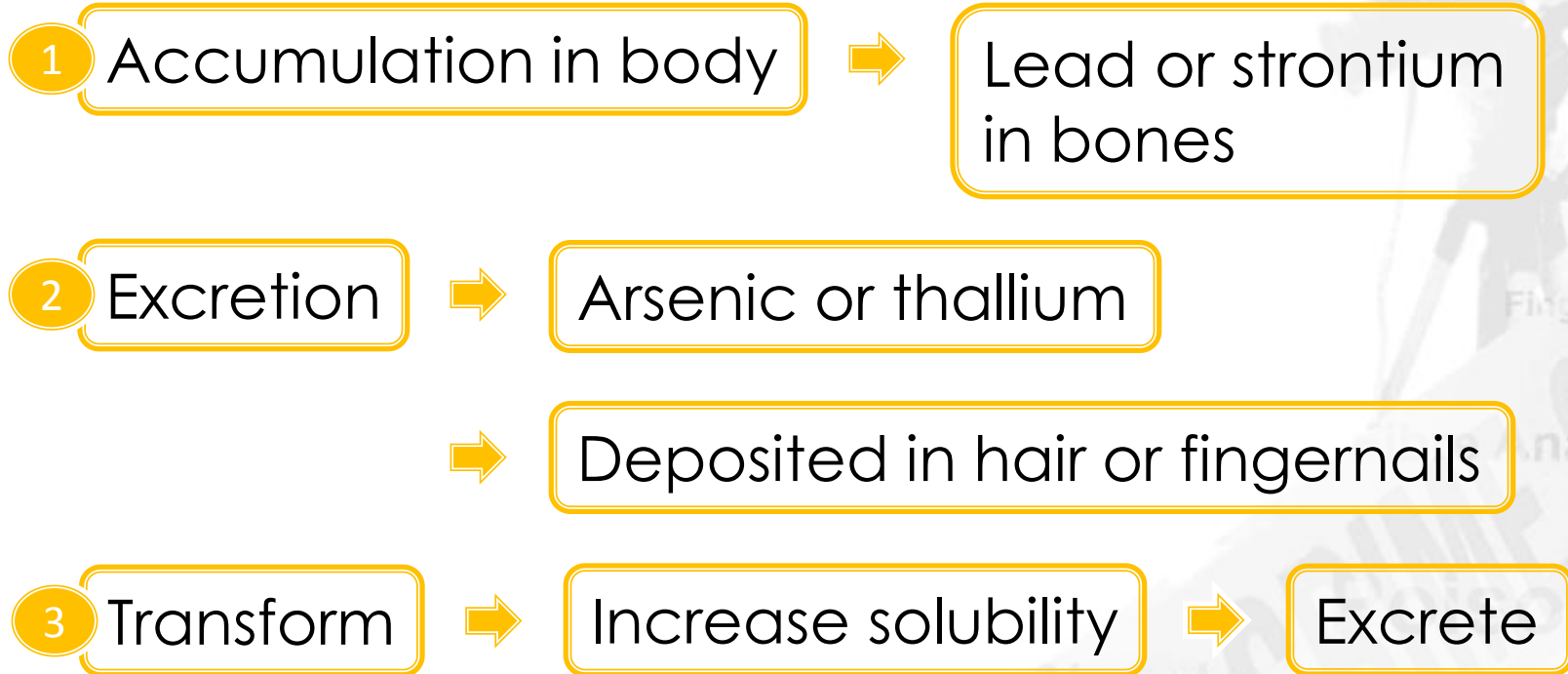


Other substances

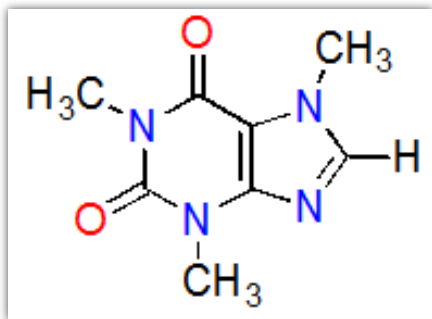


Ethanol

Xenobiotics



Xenobiotics



Caffeine

Xenobiotics

Caffeine that is ingested



Goes into bloodstream

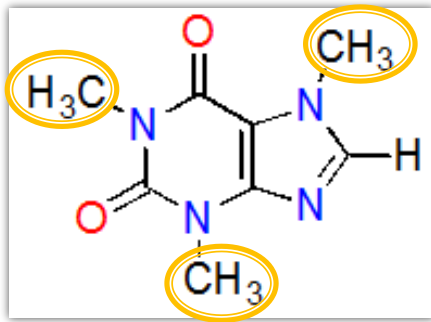


Stimulates brain

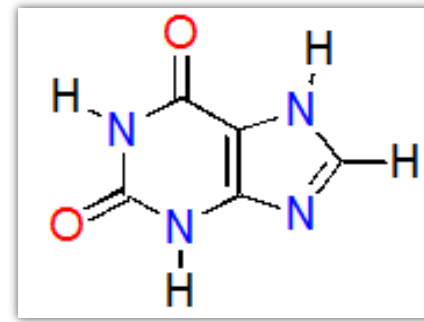


Coffee berries

Xenobiotics



Caffeine



Liver wants to remove caffeine



Transform it