

PESTICIDES

- **USE:**
 - insecticides
 - high toxicity, rare
- herbicides,
- fungicides,
- molluskocides
- rodenticides
 - low toxicity, frequent



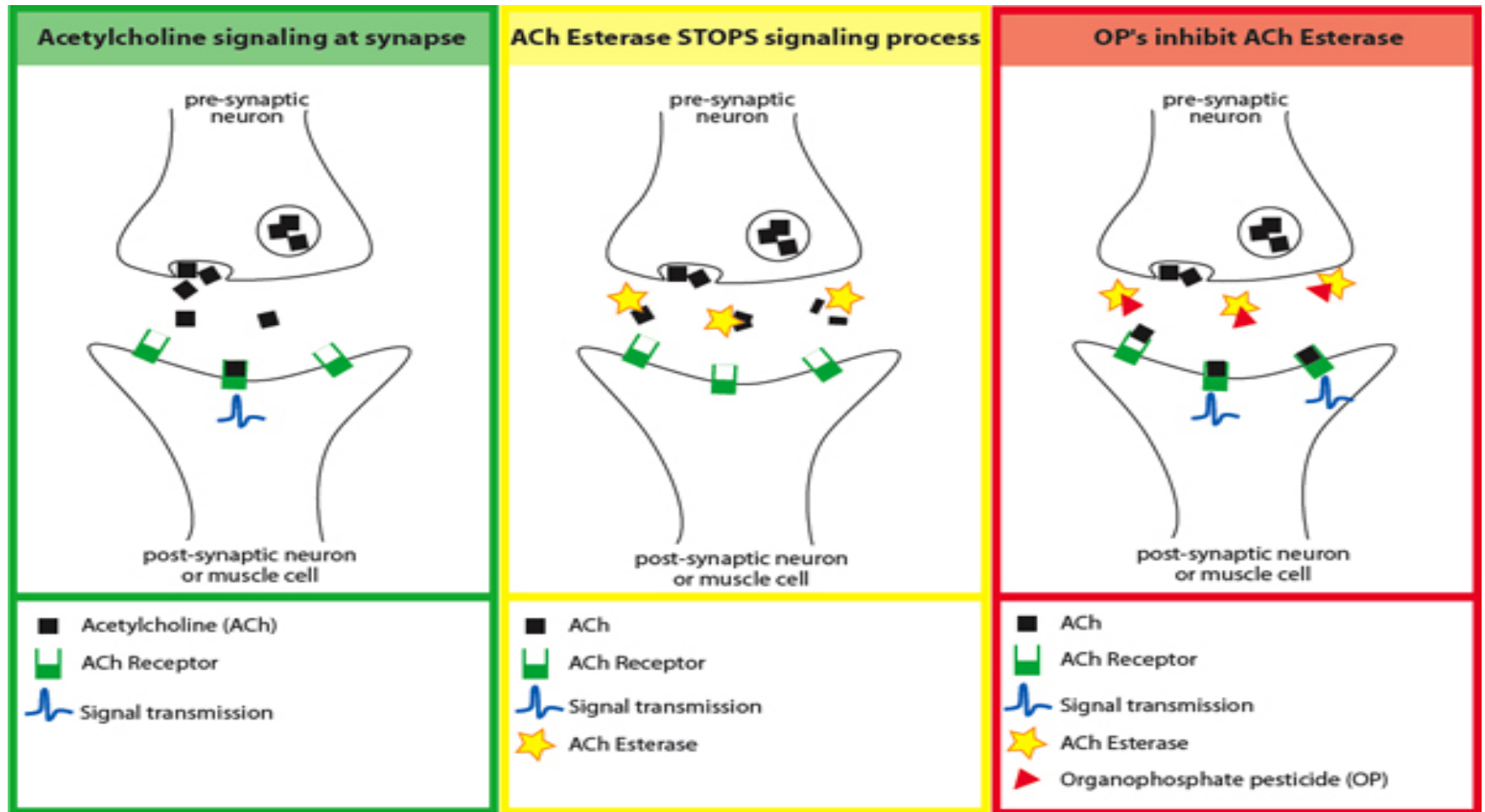
1. ORGANOPHOSPHATE INSECTICIDES



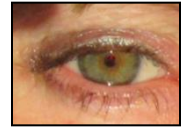
- High toxicity
- Rarely used in Europe
- May be used by terrorists



AchE inhibitors inhibit hydrolysis of Ach, which is then increased in the synapses



ORGANOPHOSPHATE INSECTICIDES-1



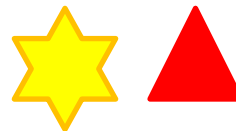
Irreversible inhibition of erythrocyte AChE- accumulation of excessive ACh at

- 1) **muscarinic receptors** (cholinerg. effector cells): salivation, sweating, vomiting, diarrhoea, **miosis**, bronchospasm, bradycardia

pharmacological antidote: ATROPINE –repeated doses

- 2) **nicotinic receptors** (neuromuscul.junctions): muscle fasciculations, weakness, diaphragm paresis

- **antidotes: ENZYME REACTIVATORS:** pralidoxime (Protopam), obidoxime (Toxogonine) - in first 24 hours
- antidote able to break the bound (treat all symptoms)
- Later - irreversible phosphorylation of the enzyme.



ORGANOPHOSPHATE INSECTICIDES-2

3) CNS symptoms: confusion, coma

- **Laboratory:** Erythrocyte acetylcholine esterase activity (decreased in intoxication, may be unmeasurable)
- **Emergency and supportive care** at intensive care unit

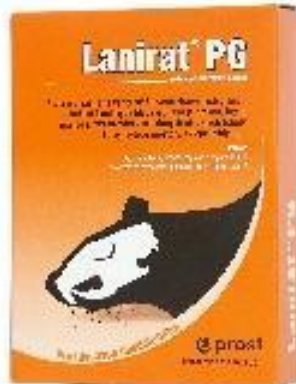
CARBAMATE INSECTICIDES

pirimicarb, carbofuran

- - **reversible** inhibition of AChE
 - lower toxicity
 - milder symptoms
 - treatment with **atropine** only
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- dogs, birds poisoned
 - poisoned eggs – illegal poison for martens



SUPERWARFARIN RODENTICIDES





SUPERWARFARIN RODENTICIDES

- coumarin derivatives
- **Pathogenesis:** inhibit hepatic synthesis of vitamin K
- dependent coagulation factors (II, VII, IX, X),
- effect starts after 10-more hours, **peak after 24-60-more hours**
- **warfarin**
- **brodifacoum**
- **bromadiolone**
- **Toxicity is low**, rodenticides contain about 0,05 % of warfarin, LD is 1-10 kg, depending on the product.
- **BUT A CUMULATIVE POISON!**



SUPERWARFARIN RODENTICIDES



- Rodents die
- But human patients / often children are usually asymptomatic
- **Laboratory:** INR (Quick test)
- **Therapy:**
- usually **charcoal** sufficient for the bait ingestion
- **in suicidal attempts** - antidote - **K₁ vitamin** (phytomenadion)