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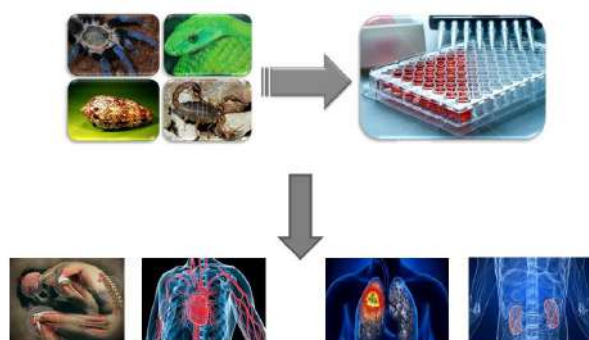
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Therapeutic potential of venom peptides interacting with GPCRs and ion channels

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An extraordinarily diverse range of animals (snakes, spiders, scorpions, cone snails...) have evolved venoms for predation, defense, or competitor deterrence. The major components of most venoms are enzymes and highly stable disulfide-rich peptides that have been selected during the evolutionary process in order to confer to venomous animals the ability to subdue their prey and defend themselves against predators. These compounds act predominantly on few, well characterized and physiologically-relevant molecular targets of the envenomed animals. Recruited by convergent evolution, toxins affect more particularly the haemostatic, nervous and cardiovascular systems of the preys. Nevertheless, despite their debilitating effects, peptides present in venoms have proved their potential to become live-saving drugs. Indeed, some of these molecules have become valuable as pharmacological tools and/or therapeutics, due to their extremely high specificity and potency for particular molecular targets. There are currently six FDA-approved drugs derived from venom peptides or proteins and dozens in clinical phases. Surprisingly, several peptides present in venoms are devoid of any toxic effect but retain high affinity and selectivity for specific receptors, high stability and low immunogenicity, highlighting their therapeutic potency. In this presentation, the different strategies to identified new peptides with potential therapeutic interest will be presented, major example of toxin-derived drugs will be detailed as well as peptides presently studied in our laboratory for their potential efficacy in the treatment of pain or kidney diseases, due to their interaction with specific ion channels and G protein-coupled receptors (GPCRs).



Peptides isolated from venoms as potential therapeutic drugs

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