PHARMACOCHEMICAL STUDY OF HYBRIDS OF BIOLOGICAL ACTIVE MOLECULES

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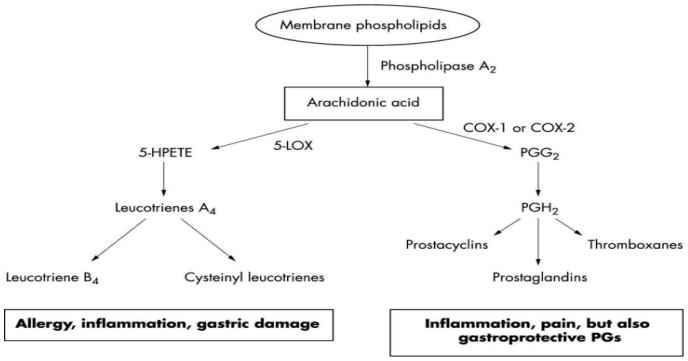
Inflammation is a body's response to different factors such as harmful stimulus, infection or tissue injury in order to restore body's homeostasis. Through the pathway of arachidonic acid, cyclooxygenases and lipoxygonases are released. These enzymes and the arachidonic acid's derivatives are associated with the propagation of inflammation. Chronic inflammation is correlated with complex diseases, like Alzheimer, atherosclerosis and type 2 diabetes (Medzhitov, 2008).



Arachidonic acid metabolic pathway

The pharmacological treatment of many diseases often requires the administration of more than one drug. Hybrid drugs contain two or more pharmacophore groups in the same molecule in order to treat multifactorial diseases and reduce side effects. Hybridization has attracted great interest in recent years.

Cinnamic acids are chemical compounds with a multitude of biological activities, like anti-inflammatory, antioxidant, antibacterial, neuroprotective etc. The development and synthesis of hybrids of cinnamic derivatives with bioactive molecules are new strategies in the scientific community (Ruwizhi and Aderibigbe, 2020).

According to the above-mentioned data, the goal of this study is the molecular design, *in silico* prediction of COX and LOX inhibition, *in silico* prediction of ADMET properties, druglikeness and synthesis of substituted cinnamic acids hybrids with paracetamol, a common analgesic and antipyretic drug. The selected cinnamic acids were previously showed a potent *in vitro* profile. The synthesis was carried out using microwave conditions and green chemistry and the final products were spectrophotometrically identified and characterized. In vitro evaluation is in progress as COX, LOX and lipid peroxidation inhibitors.

References

1. Medzhitov, R. Origin and physiological roles of inflammation. *Nature* **454**, 428–435 (2008).
2. Ruwizhi N, Aderibigbe BA. Cinnamic Acid Derivatives and Their Biological Efficacy. IJMS. 2020 Aug 9;21(16):5712