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New insights in mast cell modulation by palmitoylethanolamide

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Abstract

Since its discovery palmitoylethanolamide was considered as an endogenous compound able to negatively modulate the inflammatory process. Its effects have been extensively investigated in in vitro, in vivo and in clinical studies. Notwithstanding some discrepancy, nowadays the efficacy of palmitoylethanolamide in controlling mast cell behaviour, which likely accounts for its many anti-inflammatory, anti-angiogenic and analgesic effects, is well recognized. In view of their strategic localization at sites directly interfacing with the external environment, mast cells act as surveillance antennae against different types of injury and can undergo activation, thereby regulating both innate and adaptive immune reactions through the release of several preformed and newly synthesized mediators. Mast cells are now viewed as key players in orchestrating several disorders including both acute and chronic inflammatory processes, and have a role in angiogenesis and hyperalgesia. Since mast cells exert also important physiological, homeostatic functions, the most recent goal for pharmacologists is to control, rather than block, mast cell degranulation in order to modulate the pathological scenario. The aim of the present review is to summarise the evidence regarding the role played by palmitoylethanolamide in the control of mast cell activation, starting from in vitro studies, going through in vivo evidence in animal models of disease sustained by mast cell activation, and finally reviewing recent clinical studies using this molecule.

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