Novel synthetic inhibitors of eosinophils with potential anti-asthmatic activity

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Asthma is a major public health issue with high and increasing prevalence rates and a concomitant increase in morbidity and mortality. Asthma is estimated to affect 300 million people, with an expected increase to 400 million worldwide by 2025. Many factors may have contributed to the rise of the problem of bronchial asthma. Increasing air pollution, fast modernization, and widespread construction work are some of the reasons for asthma to thrive. The situation is complicated by poor access to medical services and high price of effective drugs.Asthma is a chronic inflammatory condition, triggered by environmental factors in genetically predisposed individuals, and is characterized by mast cell, T lymphocyte, and eosinophil infiltrates in the bronchial mucosa. Eosinophils are recruited to sites of specific inflammatory reactions, especially during allergic diseases and are correlated with asthma severity. In spite of their numerous adverse effects inhaled glucocortocoids have been established as the standard treatment for asthma. Therefore, an urgent need exists for alternative treatments to overcome these undesirable side effects of steroid therapy and to provide another effective agent for the treatment of asthma. Lidocaine was reported to inhibit interleukin-5 (IL-5)-mediated survival and activation of human eosinophils. It can replace inhaled glucocorticoids for the treatment of asthma; however, lidocaine has many undesired side effects mainly due to its sodium channel activity including anesthesia. Accordingly, the current work aims to modify lidocaine structure to obtain analogs with minimum sodium channel and enhanced IL-5 inhibitory activity. The hypothesis supported by ligand-based pharmacophore modeling generated using different molecular modeling programs.

Speaker Biography

Tarek Aboul-Fadl is a Prof. of Medicinal Chemistry at Faculty of Pharmacy, Assiut University/Egypt. Dr Aboul-Fadl received his PhD in Pharmaceutical Medicinal Chemistry from Assiut University (1994) under the channel system and joint supervision scheme between Assiut University and Josai University/Japan. Dr Aboul-Fadl performed his postdoctoral training as a postdoctoral research fellow and Scientist at Institute of Pharmaceutical Chemistry, University of Vienna, Austria (1997- 1998), Institute of Pharmacy and Food Chemistry, University of Erlangen-Nürnberg, Germany (1999 and 2013) and Department of Medicinal Chemistry, University of Utah, USA (2001-2002 and 2004-2005). Dr Aboul-Fadl joined Department of Medicinal Chemistry as an assistant Prof. in 1994, then promoted to associate Prof. in 1999 and to Professor in 2004. Dr Aboul-Fadl is a member of Egyptian Syndicate of Pharmacists since 1984, Egyptian Society of Pharmacists since 1994, American Chemical Society since 2002 and The Stop TB Partnership Working Group on New TB Drugs (WGND) since Feb. 2010

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