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Design and synthesis of new imidazopyridine derivatives as selective COX-2 inhibitors

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Background and Aims: Nonsteroidal anti-inflammatory drugs (NSAIDs) are among the most widely used therapeutics, for the treatment of pain and inflammation. Classic NSAIDs act by non-selective inhibiting of cyclooxygenase enzyme(COX). Therefore , long-term use of such NSAIDs, most often has side effects on gastrointestinal tract. While selective COX-2 inhibitors may be considered as anti-inflammatory drugs which do not have side effects. For this reason novel scaffolds with high selectivity for COX-2 inhibition need to be found and evaluated for their anti-inflammatory effects.
Hence, in this research based on the structure-activity relationship of selective COX-2 inhibitors, a new group of imidazopyridine derivatives were designed and synthesized. The molecular modeling shows that these compounds bind in the primary binding site such that the para-SO2Me substituent inserts into the secondary pocket present in COX-2 isozyme.
The target molecules were synthesized during multi-step reactions and purified by chromatographic methods. The purity of synthesized compounds were confirmed with TLC, using different solvents. The structure of synthesized compounds were characterized by IR, 1H NMR ,Mass spectra and CHN analysis. Biological activity of imidazopyridine derivatives is under evaluation.

Keywords: COX-2 inhibitors; Inflammation; Imidazopyridine