DESIGN AND SYNTHESIS OF ADENOSINE RECEPTOR LIGANDS

Adenosine is a nucleoside produced following tissue injury involving ischemia and hypoxia. The production of extracellular adenosine and its subsequent signalling through adenosine receptors (ARs: A1, A2A, A2B and A3) play an important role in orchestrating injury responses in multiple organs. ARs have long been considered promising therapeutic targets in a wide range of conditions, ranging from cerebral diseases to cancer, including inflammatory disorders. Thus, the ongoing research project encompasses the design and the synthesis of new ligands for each AR subtype, primarily for their therapeutic potential but also as pharmacological tools in receptor studies.

GOALS

- Development of new A1 AR allosteric enhancers as potential cardioprotective agents.
- Development of new A2A AR agonists or antagonists (potentially useful for the treatment of Parkinson's disease and inflammation).
- Development of new A2B AR agonists or antagonists (potentially useful for the treatment of cardiac disease and asthma).
- Development of new A3 AR agonists or antagonists (potentially useful for the treatment of cancer and eye disorders).

INSTRUMENTS AND METHODS

The compounds will be designed and synthesized with the standard equipment technology for traditional liquid phase synthesis. The chemical structures and purity of the synthesized compounds will be determined with NMR, electrospray mass, UV and IR techniques.

MAIN SUBJECTS

Medicinal chemistry, organic chemistry, pharmacology, molecular biology

RESEARCH GROUP

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