

Targeting Adenosine Receptors in Health and Disease

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Adenosine and its receptors are among the most ancient and highly preserved in the genome. The regulatory effects of adenosine receptors are felt in nearly every cell and tissue; adenosine levels are highly regulated; they rise rapidly with stress and return to baseline levels almost immediately after the stress is relieved. Among the prominent processes regulated by adenosine are vascular tone (A_{2A} receptors), cardiac rhythm (A₁ receptors), inflammation (A_{2A} and A₃ receptors), hepatic steatosis and steatohepatitis (A₁, A_{2B} receptors), sleep (A₁ and A_{2A} receptors). There are a number of drugs which, either directly or indirectly, target adenosine receptors. Caffeine, theophylline and aminophylline are adenosine receptor antagonists used to treat asthma and other problems. Adenosine and regadenoson are used as vasodilators during cardiac stress testing. Low dose methotrexate promotes adenosine release which suppresses inflammation in Rheumatoid Arthritis and other similar disorders. We will briefly review these targets for therapy and other potential targets for adenosine-based therapies.