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Discovery and Design of Selective Ubiquitin Specific Protease (USP) Inhibitors

New molecules offer selective inhibition of the key enzyme USP7, providing broad potential for developing therapeutics to treat multiple myeloma, cancer, and immunological disorders.

Multiple myeloma is a cancer formed by malignant plasma cells. Normal plasma cells found in bone marrow are an important part of the immune system (American Cancer Society). In 2017, the American Cancer Society estimates approximately 30,280 new multiple myeloma cases diagnosed in the United States with approximately 12,590 deaths expected. Current methods of treatment include immunomodulatory drugs, stem cell transplants, and proteasesome inhibitors. However, multiple myeloma remains incurable. Current treatment methods have issues with side effects and the potential for the development of resistance. Thus, there is an urgent need for the development of novel therapeutic agents.

Researchers at Purdue University have uncovered a new set of molecules that selectively inhibit ubiquitin specific protease 7 (USP7) without affecting similar enzymes. Inhibition of USP7 is important for the treatment of multiple myeloma, as well as for other diseases characterized by aberrant ubiquitin-mediated processes, such as many cancer, inflammation, and immunological disorders. The molecules identified by Purdue researchers have broad potential for the development of therapeutics to treat cancer and other diseases.

Advantages:

-Selective inhibition

-Targets key enzymes

Potential Applications:

-Pharmaceutical industry

-Drug development

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-Treatment for cancer and other diseases

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