Insider attacks: Purdue developing new treatment options for millions with autoimmune diseases

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Living with an autoimmune disease can feel like an insider is attacking your body. An estimated 24 million people in the United States are

affected by autoimmune diseases, a group of diseases in which the person's immune system attacks part of the person's own body.

Now, Purdue University researchers have developed a series of molecules that may provide more reliable relief with fewer side effects for people with any of several autoimmune diseases. The new molecules overcome difficulties with current drugs in targeting, for purposes of inhibiting, the appropriate form of Janus kinase, which has four forms affecting cell signaling and gene expression.

The new inhibitors may provide relief for people suffering from rheumatoid arthritis, psoriasis, myelofibrosis and other autoimmune diseases with a reduction in side effects compared with current therapies. The research appears in the November edition of the *Journal of Medicinal Chemistry*.

"Our new molecules fit within the emerging field of therapeutically useful Janus kinase inhibitors that have attracted a lot of attention and excitement within the medicinal chemistry community and the general field of medicine," said Mark Cushman, a distinguished professor of medicinal chemistry in Purdue's College of Pharmacy, who leads the research team. "Our compounds contribute a new structural chemotype that is expected to have unique pharmacological properties relative to the other known Janus kinase inhibitors."

Cushman, a member of the Purdue University Center for Cancer Research, said the new molecules also show potential to allow for more treatment options for people with autoimmune diseases. Abnormalities of the immune system often lead to autoimmune diseases or cancer.

Researchers filed a patent with the Purdue Office of Technology Commercialization and the technology is available for licensing.

More information: Mohamed S. A. Elsayed et al, Application of Sequential Palladium Catalysis for the Discovery of Janus Kinase Inhibitors in the Benzo[c]pyrrolo[2,3-h][1,6]naphthyridin-5-one (BPN) Series, *Journal of Medicinal Chemistry* (2018). DOI: 10.1021/acs.jmedchem.8b00510