Synthesizing Natural Products to Treat High Blood Cholesterol

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Technology description

Indole is one of the most abundant heterocycles in pharmaceuticals and bioactive natural products, such as indometacin, a non-steroid anti-inflammatory drug, and vincristine, a natural product used to treat a number of types of cancers. Given the importance of indoles, much effort has been devoted to preparing them from a variety of starting materials. However, inefficiency, low selectivity and low yield remain a problem for polysubstituted indoles or when the indole is in a complex polycyclic system. UW–Madison researchers have developed an efficient method to synthesize indole compounds, specifically polysubstituted dimeric indoles. These compounds have potential health benefits because they are able to reduce the amount of PCSK9 in cells. PCSK9 is an enzyme known to play a major role in controlling the concentration of LDL cholesterol in the bloodstream.

Some of the compounds have been testedin vitrofor their ability to increase the secretion of a potent blood sugar hormone in the body called glucagon-like peptide 1 (GLP-1). Others have the ability to selectively inhibit the secretion of interleukin-17 (IL-17), which is essential in many autoimmune diseases including arthritis, multiple sclerosis, psoriasis and inflammatory bowel disease.

The synthesis process involves a cascade reaction with transition metal catalysts. The resulting compounds can be further functionalized to yield more substituted indoles.
The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing indole compounds to treat health problems associated with high blood cholesterol.

Application area

Synthesizing indole compounds to treat ailments in mammals connected to GLP-1, PCSK9 and/or IL-17

Advantages

More efficient than other methods
Potential health implications are significant – from treating hyperglycemia to high cholesterol and autoimmune diseases.

Institution

Wisconsin Alumni Research Foundation

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