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Catalysis-Enabled Concise Total Synthesis of the Tricyclic Prostaglandin D2 Metabolite Methyl Ester

An efficient and scalable chemical synthesis route enables the high-yield production of a difficult-to-obtain metabolite crucial for the clinical detection of inflammatory prostaglandin D2 levels.

Researchers at Purdue University have discovered a new synthesis route for the tricyclic prostaglandin D2 metabolite methyl ester. This compound is used to detect prostaglandin D2 in urine. Prostaglandins are crucial signaling molecules in acute inflammatory response; their upregulation can be detrimental and linked to multiple diseases. Prostaglandin D2 activates mast cells, which can cause inflammation or, worse, anaphylaxis and multi-organ failure. By virtue of their short half-lives, most conventional methods for the detection of prostaglandins rely on the detection of metabolites that can be traced to the prostaglandin of interest. With four contiguous stereocenters, tricyclic prostaglandin D2 metabolite methyl ester has been difficult to synthesize, with past attempts resulting in low yields and/or poor stereoselectivity. The synthesis developed by the Purdue researchers is efficient and scalable and can solve the problem of low availability of tricyclic prostaglandin D2 metabolite methyl ester for clinical use.

Related Publication: Catalysis-Enabled Concise and Stereoselective Total Synthesis of the Tricyclic Prostaglandin D2 Metabolite Methyl Ester. Chem. Int. Ed. 2022, 61, e202115633.

Technology Validation: The mechanism used by the researchers accumulated more than 75 mg of pure tricyclic prostaglandin D2 metabolite methyl ester.

Advantages

-High yield

-Selective

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Category
Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics
Pharmaceuticals/Pharmaceutical Packaging & Delivery Systems
Pharmaceuticals/Computational Drug Delivery & Nanomedicine
Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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View online

-Non-toxic

-Scalable

Applications

-Urinary detection of prostaglandin levels

TRL: 2

Intellectual Property:

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