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Novel Amination Method for Medicinally Important Compounds

A novel, transition metal-free diamination reaction uses readily available reagents under mild conditions to selectively incorporate diverse amine functional groups into vicinal diamine compounds, potentially enhancing pharmaceuticals and agrochemicals.

Vicinal diamines form scaffolds in pharmaceuticals, agrochemicals, and natural products. Purdue University researchers developed a diamination reaction to synthesize beta-gamma diamino acid derivatives, which are important types of vicinal diamines. The synthesis of vicinal diamines from olefins, especially synthesizing such compounds with two distinct amine groups, remains challenging. Such reactions often require dangerous and expensive starting materials and catalysis and require many synthetic steps. Under mild conditions, without transition metal catalysts, and using readily available reagents, the diamination reaction developed at Purdue facilitates the selective incorporation of a wide scope of amines and more complex amine-containing functional groups, as proven with 22 different types of such groups. The researchers have also demonstrated the reaction's capability to incorporate the structure of FDA-approved drugs into the final product's structure, potentially improving the function of lifesaving drugs.

Technology Validation: The synthesis method has been used to synthesize products including those incorporating FDA-approved drugs.

Advantages

-Selective addition of two amines

-Scalable

-Mild reaction conditions

Applications

Technology ID

2021-DAI-69172

Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics

Pharmaceuticals/Drug Discovery & Development

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Pharmaceuticals/Small Molecule Therapeutics

Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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-Pharmaceuticals

-Agrochemicals

-Natural products synthesis

TRL: 4

Intellectual Property:

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