Sustainable Synthesis: Advanced C(sp³)–N Bonding for Precision Molecule Development Across Industries

Tech ID: 34491 / UC Case 2025-138-0

TECHNOLOGY DESCRIPTION

UCSF inventors have developed an innovative platform that introduces a groundbreaking methodology for constructing C(sp³)–N bonds, enabling efficient and sustainable synthesis of nitrogen-containing molecules, which are present in over 59% of FDA-approved drugs. By addressing challenges of traditional methods—such as limited substrate scope, harsh reaction conditions, and inefficiencies in forming saturated carbon frameworks—the technology expands accessible chemical space and supports the synthesis of structurally diverse and complex molecules. Leveraging mild, cost-effective, and eco-friendly conditions, the platform delivers high-yield, regioselective reactions while adhering to green chemistry principles. Validated through proof-of-concept studies, it has demonstrated success in synthesizing medicinally relevant compounds and is adaptable for both small-scale research and industrial-scale production. With applications across pharmaceuticals, agrochemicals, and materials science, this scalable methodology accelerates drug discovery, streamlines workflows, and reduces costs, providing biotech companies, pharmaceutical innovators, and venture capitalists with a transformative solution for advancing precision molecule synthesis.

RELATED MATERIALS

- Radical Strategy to the Boron-to-Copper Transmetalation Problem: N Alkylation with Alkylboronic Esters, PMID: 40550745, doi: 10.1021/jacs.5c07856 - 07/02/2025

PATENT STATUS

Patent Pending

CONTACT

Jessica Chan

jessica.chan2@ucsf.edu

tel: .

OTHER INFORMATION

KEYWORDS

Drug discovery tools, Scalable molecule synthesis, Precision synthesis methodology, Cost-effective synthesis methods, Medicinal chemistry innovation, Green chemistry solutions, Structural diversity in synthesis, Biotech innovation, Nitrogen-containing molecules, C(sp³)–N bond formation, Sustainable chemical synthesis

CATEGORIZED AS

- **Biotechnology**
  - Other

- Medical
  - New Chemical Entities, Drug Leads
  - Research Tools
  - Screening
- Research Tools
  - Screening Assays

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ADDRESS

UCSF

Innovation Ventures

600 16th St, Genentech Hall, S-272,

San Francisco,CA 94158

CONTACT

Tel:

innovation@ucsf.edu

https://innovation.ucsf.edu

Fax:

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