PURDUE INNOVATES | Office of Technology Commercialization

Tetrahydro-3H-pyrazolo[4,3-f]quinolone and tetrahydro-3H-pyrrolo[3,2-f]quinoline - Containing Compounds as Anticancer Agents

Novel compounds synthesized via an optimized multi-component reaction demonstrate potent anti-proliferative effects across various cancer cell lines, offering promising candidates for future therapeutic development.

Purdue University researchers have developed compounds that are anti-proliferative against multiple cancer cell types. Cancer results from genetic alterations that impose uncontrolled proliferation of cells. Therefore, developing molecules to debilitate cellular proliferation would prove an effective treatment for cancers. Purdue researchers optimized a synthetic method to quickly synthesize a library of compounds containing combined cancer drug scaffolds via a multi-component Povarov reaction. The researchers investigated the anti-proliferative effects of the compounds by a primary screen in the MDA-MB-231 triple-negative breast cancer cell line. Analogs of the most potent compounds were further tested against the NCI-60 cancer cell panel and exhibited anti-proliferative effects on melanoma, leukemia, breast, lung, and renal cancer cell lines with GI50 values at sub micromolar concentrations. These molecules are also promising because they have a high fraction of sp3 carbons increasing their drug like characteristics. The compounds' potency toward multiple cancer cell lines and drug like properties make them promising candidates for future therapeutic development.

Advantages:

-Combined Anti-Cancer Scaffold

-Easily Synthesized Compounds

-Increased Drug-Like Characteristics

Applications:

-Cancer Therapies

Technology ID

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics
Biotechnology & Life Sciences/Bioinformatics & Computational Biology
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation
Pharmaceuticals/Small Molecule Therapeutics
Pharmaceuticals/Pharmaceutical Manufacturing & Methods

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-Cancer Relapse Therapies

Related Publication:

HSD1787, a Tetrahydro-3H-Pyrazolo[4,3-f]Quinoline Compound Synthesized via Povarov Reaction, Potently Inhibits Proliferation of Cancer Cell Lines at Nanomolar Concentrations

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Keywords: Anti-proliferative compounds, cancer cell types, uncontrolled proliferation, therapeutic development, synthetic method, multi-component Povarov reaction, NCI-60 cancer cell panel, sub micromolar concentrations, drug like characteristics, anti-cancer scaffold