PURDUE INNOVATES | Office of Technology Commercialization

Design & Evaluation of Dibenzo[c,h][1,6]naphthyridines as Topoisomerase I Inhibitors and Potential Anticancer Agents

A novel, efficient, and scalable synthetic route has been developed for compounds that inhibit Topoisomerase I, offering potent anticancer properties and cytotoxicity for use in treating proliferating tumors.

Topoisomerase enzymes are involved in the restructuring of DNA during synthesis to give other enzymes easy access to copy the two strands. DNA synthesis is an important step, occurring only when a cell is proliferating. Continual proliferation is a key characteristic of cancerous cells, and thus, topoisomerases are ideal targets for cancer therapeutics. Scientists are currently attempting to synthesize topoisomerase inhibitors that have differing target sites to more effectively eliminate cancer cells. Finding novel binding sites for inhibitors becomes paramount for overcoming drug resistance.

Scientists at Purdue University have developed novel compounds to inhibit Topoisomerase I that are intended to cease DNA synthesis and cause cell death. These inhibitors will be used as the primary treatment or in a synergistic manner to treat proliferating tumors. This innovation provides a novel, efficient, and scalable, synthetic route to these compounds that possess and express Top I inhibition and cytotoxicity.

Advantages:

-Anticancer properties

-Cytotoxicity to a variety of cancers

-Topoisomerase 1 is a proven target for cancer therapy

Potential Applications:

-Medical/Healthcare

Technology ID

65643

Further information

Joe Kasper
JRKasper@prf.org

Nathan Smith
nesmith@prf.org

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-Cancer Treatment

-Pharmaceuticals

-Drug Development

TRL: 2

Intellectual Property:

Provisional-Patent, 2010-08-17, United States | PCT-Patent, 2011-08-17, WO | NATL-Patent, 2013-02-14, United States

Keywords: Topoisomerase I inhibitor, cancer therapeutics, DNA synthesis inhibitor, anti-cancer properties, cytotoxicity, drug development, pharmaceutical, medical/healthcare, proliferating tumors, novel binding sites