PURDUE INNOVATES | Office of Technology Commercialization

Nicotinamide-based Compounds as Potent Inhibitors of Translational- and Transcriptional-related Kinases

Novel drug analogs with dramatically improved potency effectively inhibit therapeutic targets like CDK2, CDK12, and FLT3 for treating cancer, inflammation, and neurological diseases.

Researchers at Purdue University have designed molecules to concurrently inhibit two proteins important in tumorigenesis, MNK1/2 and p70S6K. Pharmaceutical companies have pursued MNK1/2 and p70S6K as individual targets; however, drugs targeting these proteins performed poorly as monotherapies. By inhibiting both MNK1/2 and p70S6K with a single molecule, the Purdue researchers' orally bioavailable compounds potently inhibit several solid tumor cancer cell lines, including breast, ovarian, lung, and colon cancer cells.

Technology Validation: At 200 nM, one of the drugs designed by the researchers completely inhibited the growth of Caki-1 (renal cancer) and MDA-MB-231 (breast cancer) cells. Compounds were tested against the NCI-60 cell line panel.

Advantages

- Targets two oncogenic proteins with a single molecule

- Effective against multiple solid tumor cell lines

- Orally bioavailable

Applications

- Anticancer drugs

Publication:

https://www.sciencedirect.com/science/article/pii/S0045206825001786

Technology ID
2022-SINT-69726

Category
Pharmaceuticals/Drug Delivery & Formulations
Pharmaceuticals/Other

Authors
Neetu Dayal
Herman O Sintim

Further information
Joe Kasper
JRKasper@prf.org

Nathan Smith
nesmith@prf.org

View online

TRL: 3

Intellectual Property:

Provisional-Patent, 2022-04-06, United States | NATL-Patent, 2023-04-06, Japan | NATL-Patent, 2023-04-06, China | NATL-Patent, 2023-04-06, Canada | NATL-Patent, 2023-04-06, Europe | PCT-Patent, 2023-04-06, WO | NATL-Patent, 2024-10-04, United States

Keywords: MNK1/2 inhibitor, p70S6K inhibitor, dual protein inhibitor, anticancer drug, solid tumor cell lines, orally bioavailable compound, breast cancer cells, ovarian cancer cells, lung cancer cells, colon cancer cells