SMALL MOLECULE ACTIVATORS OF GTP HYDROLYSIS FOR MUTANT RAS-DRIVEN CANCER

Tech ID: 34208 / UC Case 2026-007-0

PATENT STATUS

Patent Pending

BRIEF DESCRIPTION

Oncogenic mutations in the Ras family of small GTPases (like K-Ras, H-Ras, and N-Ras) are major drivers of many human cancers, yet they remain one of the most challenging targets in oncology. These mutations often trap the Ras protein in its active, GTP-bound state, leading to continuous, unchecked cell proliferation. To address this, UC Berkeley researchers have developed a novel class of Small Molecule Activators of GTP Hydrolysis for Mutant Ras-driven Cancer.

These compounds accelerate the natural, but often disabled, guanosine triphosphate (GTP) hydrolysis process in mutant Ras, essentially forcing the protein back into its inactive, GDP-bound state. The compounds utilize a modular, "plug-and-play" structure. This modular platform is unique in its ability to reactivate the intrinsic GTPase function of mutant Ras, offering a promising, direct-acting therapeutic strategy against previously intractable Ras-driven cancers.

SUGGESTED USES

»

As a therapeutic agent for various Ras-driven cancers, including pancreatic, colorectal, and lung cancer.

»

Development of precision medicines specifically targeting different Ras oncogenic mutants (e.g., K-Ras G12D, G12V) through modification of the targeting moiety (R).

»

Drug design platform for accelerating GTP hydrolysis in other medically relevant GTPases implicated in disease.

»

Used in combination therapies with existing chemotherapy or immunotherapy regimens to enhance efficacy against Ras-mutated tumors.

ADVANTAGES

»

Directly addresses the fundamental mechanism of Ras oncogenicity by reactivating the protein's native GTPase function, rather than merely inhibiting downstream signaling.

»

Provides a modular, plug-and-play drug design platform, allowing for rapid synthesis and screening of analogs with varied specificity for different Ras mutants and improved pharmacokinetic properties.

»

The mechanism is catalytic, meaning one small molecule can facilitate the hydrolysis of multiple GTP molecules, potentially leading to higher efficacy compared to simple stoichiometric inhibitors.

CONTACT

Laleh Shayesteh
lalehs@berkeley.edu
tel: 510-642-4537.

INVENTORS

» Zhang, Ziyang

OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**

» Health

» **Medical**

» Disease: Cancer

» New Chemical Entities, Drug Leads

» Therapeutics

» **Research Tools**

» Reagents

RELATED CASES

2026-007-0

»

Offers a novel approach to targeting Ras, which has historically been considered "undruggable," opening up new avenues for precision oncology.

RELATED MATERIALS

University of California, Berkeley Office of Technology Licensing
2150 Shattuck Avenue, Suite 510, Berkeley,CA 94704
Tel: 510.643.7201 | Fax: 510.642.4566
https://ipira.berkeley.edu/ | otl-feedback@lists.berkeley.edu