Ras-Specific Bacterial Protease for Cancer Treatment Applications

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Technology description

Novel Bacterial protease with Ras and Rap1 specific proteolytic activity
#biomedical #researchtool #reagent #therapeutics #cancer
Northwestern researchers have discovered a novel bacterial protein that is able to proteolyze Ras and Rap1. These two small proteins are implicated in several oncogenic processes and are known to contribute to development of colon, breast and lung cancers. Inhibition of Ras in particular, has been cited as one of the biggest obstacles toward developing effective cancer treatments. The novel Ras and Rap1 specific protease (RRSP) discovered in Prof. Satchell's laboratory is able to quickly cleave both of these proteins at very low concentrations. Furthermore, in laboratory experiments, RRSP has been shown to completely disable signaling through the ERK1/2 pathway, which is crucial for survival of cancer cells. Several cancer cell types were susceptible to RRSP, including those harboring a mutated Ras protein associated with cancer development. The discovery of RRSP could facilitate the development of Ras-targeting cancer therapeutics, as well as facilitate several lines of inquiry into small GTPase biology.

Publications

Antic I, Biancucci M, Zhu Y, Gius D, Satchell KJ (2015). Site-specific processing of Ras and Rap1A Switch I by a MARTX toxin effector domain.Nature Communications, In Press.
Antic I, Biancucci M, Satchell KJ (2014) Cytotoxicity of the Vibrio vulnificus MARTX toxin effector DUF5 is linked to the C2A subdomain,Proteins, 82: 2643-56.

Application area

Therapeutic for Ras and Rap1-driven cancers
Research tool for investigation of Ras and Rap1 dependent processes

Advantages

Specificity for isoforms of Ras including modifications found in cancerous cells
Proteolysis is an irreversible therapeutic approach

Institution

Northwestern University

Inventors

Karla Satchell*