



Applications

- A research tool to study cellular signaling pathways
- A potential therapeutic

Benefits

- High specificity
- Versatile research tool

VARI IP-00003

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Conserved Diaphanous-Related Formins Autoregulatory Domain (DAD)
DAD peptides have a wide range of potential uses in research and clinical applications.

Background

Anti-cancer drugs work in different ways. One anti-cancer drug, paclitaxel (also known as Taxol), works by attacking structural elements of cancer cells to prevent proliferation. Although it is clinically effective against numerous cancers, use of paclitaxel can lead to harmful side effects that can impact patients' quality of life. While paclitaxel targets the tubulin building blocks of cell structure, a potentially safer method may be to target and develop methods of manipulating formins, the proteins responsible for cell scaffolding.

Technology

Formin homology proteins and Rho small GTPases modulate cytoskeletal remodeling during polarized cell growth and development. DAD is an autoregulatory domain found in a subset of formin proteins called mammalian Diaphanous-related (mDia) formins. Introduction of a DAD peptide into cancer cells triggers growth arrest and induction of programmed cell death. The DAD peptide constitutes a proof-of-principle novel class of anti-cancer drugs. DAD peptides can be introduced into cells as an expressed minigene or directly as peptides for use as a research tool. Modulation of formin function through the use of DAD peptides could serve as a therapeutic alternative, not just for treating cancer, but also for other diseases in which formins play a significant role.

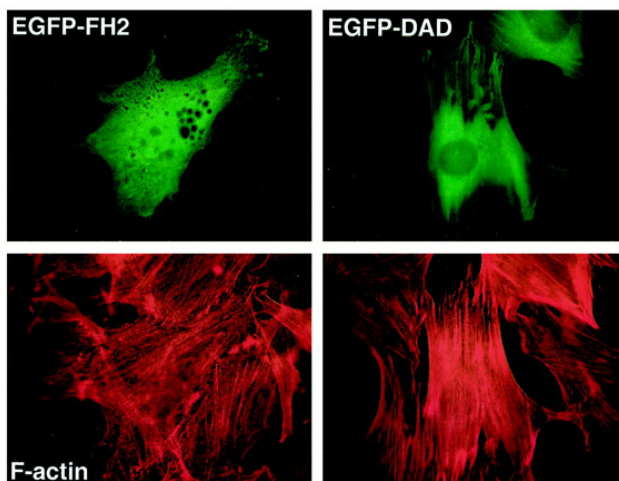


Figure 1: Actin cytoskeletal changes following expression of EGFP-DAD fusion protein. NIH 3T3 cells were previously maintained for 24 hours in 0.1 percent serum, which diminishes the appearance of actin fibers. The top panels display EGFP fusion proteins and the bottom panels show the corresponding TRITC-phalloidin staining. EGFP-DAD expression is strongly induced the formation of actin filaments in cells.

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