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Technology Management & Industry Relations

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AVAILABLE FOR **LICENSING & FURTHER DEVELOPMENT:**

# Novel Therapeutic Inhibitors and Targeted Delivery System
# 13UMC070 & 16UMC041

## Innovation

Researchers at the University of Missouri have developed compounds and a targeted delivery system that enables individual or combined targeting of a common set of biological pathways important in T cell function, activation of innate inflammation, ischemic reperfusion injury, HIV release and oncogenesis. The compounds target Plenty of SH3s (POSH), which is a ubiquitously expressed multi-domain scaffold protein involved in the regulation of a number of essential cellular functions. In vitro testing led to death of 4/4 T cell and 4/4 B cell lymphomas, and 17/17 T and B cell leukemias without impacting T/B cell homeostasis.

## Background

JNK signaling plays a central role in T cell activation, differentiation, proliferation, survival, and death. The POSH/JIP-1 scaffold critical in assembling components of signaling pathways that regulate basic cell biological processes of division, survival, death, development and differentiation. Deregulation of these pathways is implicated in cancer, autoimmunity, inflammation, as well as the function and development of T cells and neurons. The compounds generated by inventors at the University of Missouri were designed keeping in mind that their application in a therapeutic mode could impact numerous therapeutic areas.

These inhibitors are effective when used individually or in combinations targeting multiple points within a pathway, providing increased efficacy while minimizing potential issues of resistance. Targeted delivery is enabled using micelles loaded with novel peptide inhibitors and functionalized with aptamers that bind cell-specifically. This technology enables a platform approach for effective and targeted therapy of a variety of conditions.

## Advantages

- High selectivity
- Minimizes issues of resistance
- Can target multiple points of the same pathway
- Targeted delivery

## Applications

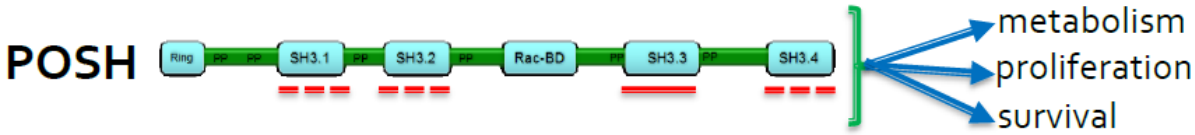
- Cancer therapy
- Autoimmunity reactions
- Ischemic reperfusion injury
- Reducing or preventing viral assembly
- Anti-inflammatory

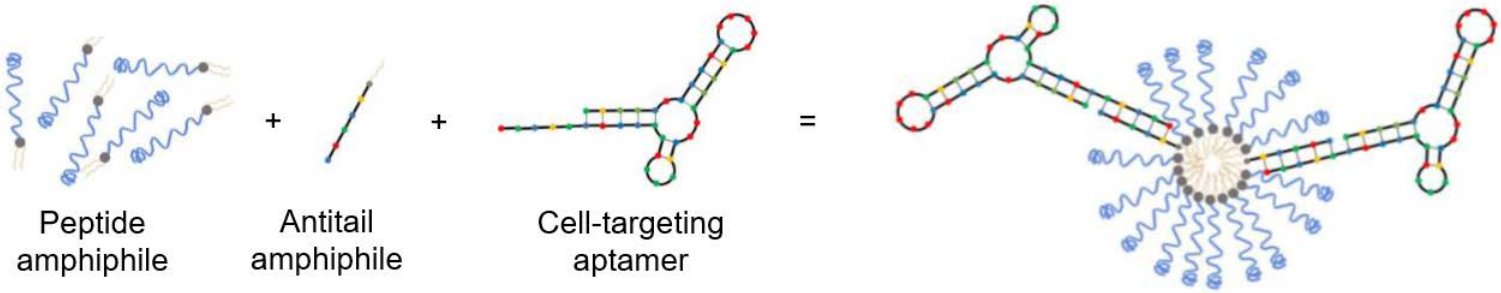
## Inventors

- Mark Daniels
- Bret Ulery
- Josiah Smith
- Erin Newcomer
- Leah Cardwell

## Publications


- Smith JD, Cardwell LN, Porciani D, Nguyen JA, Gallazzi F, Tata RR, Burke DH, Daniels MA, Ulery BD. *Aptamer-displaying peptide amphiphile micelles as a cell-targeted delivery vehicle of peptide cargoes*. Phys Biol. 2018 Oct 22;15(6).
- Porciani D, Cardwell LN, Tawiah KD, Alam KK, Lange MJ, Daniels MA, Burke DH. *Modular cell-internalizing aptamer nanostructure enables targeted delivery of large functional RNAs in cancer cell lines*. Nat Commun. 2018 Jun 11;9(1):2283.
- Cunningham CA, Cardwell LN, Guan Y, Teixeiro E, Daniels MA. *POSH Regulates CD4+ T Cell Differentiation and Survival*. J Immunol. 2016 May 15;196(10):4003-13.
- Cunningham CA, Knudson KM, Peng BJ, Teixeiro E, Daniels MA. *The POSH/JIP-1 scaffold network regulates TCR-mediated JNK1 signals and effector function in CD8(+) T cells*. Eur J Immunol. 2013 Dec;43(12):3361-71.



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