TECHNOLOGY

CONTACT: ipm@innovatecalgary.com | 403.284.6400

A novel class of anti-inflammatory molecules

Technology ID# 316.7

Background

Inflammatory conditions continue to place a tremendous burden on health care providers and new therapeutics in this area are badly needed. Researchers at the University of Calgary have designed a di-acylated lipopeptide, named GML (for GM1-targeted, Linoleate-containing TLR2 ligand), to specifically inhibit pathogenic neutrophil recruitment to sites of inflammation in the body. GML acts through a previously unknown anti-inflammatory pathway involving both TLR2 and PPARγ. The lipid component of the molecule is engineered to bind the pattern recognition receptor TLR2, which targets it to immune cells, and the peptide component targets the ganglioside GM1, resulting in its rapid internalization and localization to the golgi-apparatus. This internalization pathway inhibits the capacity of TLR2 to signal in a pro-inflammatory manner. The lipid component of GML, linoleate, is modified within an inflamed microenvironment, such that it acts as a PPARγ agonist. PPARγ activation results in multiple anti-inflammatory activities including a dramatic reduction of neutrophil recruitment to sites of inflammation in the body. As such, GML represents a novel class of anti-inflammatory molecules with therapeutic potential to treat multiple inflammatory diseases associated with neutrophil recruitment.

Areas of Application

- A novel anti-inflammatory molecule designed to treat inflammatory tissue damage associated with pathologic neutrophil recruitment.

Competitive Advantages

- Acts through a previously unknown anti-inflammatory pathway involving both TLR2 and PPARγ.

Stage of Development

- Proof of concept demonstrated.
- Molecule tested in mouse models of inflammatory bowel disease (IBD) and sterile tissue injury.

Intellectual Property Status

- Provisional patent application filed.

Publications

- Proc. Natl. Acad. Sci. USA. 2011. 108, 16357-62