UNIVERSITY OF ALBERTA
TECHNOLOGY TRANSFER SERVICES

Bone-targeted Compounds for Treatment of Bone Infections

ID# 2025-055

HIGHLIGHTS

- Bisphosphonate-conjugated beta lactamase inhibitors with potential to enhance antibiotic treatment efficacy of bone infections including osteomyelitis

OPPORTUNITY

Researchers at the University of Alberta have developed bone-targeting beta-lactamase / beta lactamase inhibitor compositions to treat bone infections. *In vitro* studies show that, when administered with piperacillin, bisphosphonate conjugated tazobactam shows equivalent MIC against beta lactamase producing *E. coli* compared to tazobactam + pipercillin without bisphosphonate. This technology may increase antibiotic levels within the osteocyte-lacunar-canalicular network (OLCN) of bone, reducing systemic antibiotic accumulation. Lower systemic antibiotic concentration is projected to mitigate the risk of adverse effects, such as hypokalemia, nephrotoxicity, and jaundice, while aiding in the prevention of drug-resistant organisms.

Osteomyelitis (OM) is an inflammatory process of the bone caused by an infectious organism(s) that can quickly become limb- or life-threatening. OM has long been a clinical challenge and burden to healthcare, limited by the poor bone distribution of standard antimicrobial therapy. This technology may address the pharmacokinetic barrier by accumulating antimicrobials at high concentrations around the infection site, increasing their efficacy.

COMPETITIVE ADVANTAGE

- Targeted drug delivery to infected bone, enabling prolonged release of therapeutic agents.
- Potential to enhance antimicrobial efficacy in OM, which may in turn decrease systemic doses, adverse effects, OM relapse rates, healthcare costs, and lead to improved patient outcomes.

STATUS

- Patent pending

INVENTORS

- Dr. Michael Doschak and team

MORE INFORMATION

Joanna Preston
Director, Technology Transfer Services, University of Alberta
780.265.1075
jpreston@ualberta.ca