Model Name
Pseudomonas aeruginosa SPM-1 (FDA-CDC AR-BANK#0064), Lung Infection Model, CFU/g

Item Number
608642

Introduction
This assay assesses the antimicrobial efficacy of test articles in a lung infection model with a carbapenem resistant strain. The microbial counts in tissue are measured. P. aeruginosa can cause life-threatening lung, wound, and urinary tract infections as well as peritonitis and septicemia. This carbapenem resistant strain carries the following antimicrobial resistance (AMR) genes: aadA7, cmx, catB7, OXA-50, OXA-56, PAO, SPM-1 and sul1. The carbapenem resistance may be due to expression of the SPM-1 metallo β-lactamase. It is resistant to β-lactam antibiotics, aminoglycosides, and quinolones. It is susceptible to colistin and amikacin. The FDA-CDC Antimicrobial Resistance Isolate Bank supplied this strain and the genome sequence annotation of AMR genes.

Procedure Summary
Groups of 5 neutropenic mice are used. Animals are intranasally inoculated with pathogen suspension then test articles or vehicle are administered at time points after inoculation. (Doses may be administered IV, SC, PO, IM, IP or by IV infusion.) At 24 after the first treatment, animals are humanely euthanized and tissue is aseptically removed. Tissue is homogenized and pathogen counts are determined by plating to agar medium. Pathogen counts from treatment groups are compared to vehicle groups and the significance of an effect is determined.

Turnaround Time(s)
5 weeks from sample receipt

Literature

Optional Services
Analysis of cytokines (with Luminex) and PK exposure can be performed upon request. Histopathology of tissue samples may also be performed.

Related Assay(s) (Item # - Assay Name - Species)
614079* - Pseudomonas aeruginosa, SPM (FDA-CDC AR-BANK#0064) MIC – Bacteria
608652 - Pseudomonas aeruginosa SPM-1 (FDA-CDC AR-BANK#0064), Thigh Infection Model, CFU/g - Mouse
608640 - Pseudomonas aeruginosa (ATCC 27853), Lung Infection Model, CFU/g – Mouse
*provided by partner lab Eurofins Pharma Discovery Services

Modified Protocols
We will readily accommodate client-specified alterations.

Laboratory
These assays are performed at our AAALAC accredited BSL2 laboratory in Taipei, Taiwan.

Animal Welfare
All aspects of this work is performed in general accordance with the Guide for the Care and Use of laboratory animals (National Academy Press, Washington, DC, 2011). The study protocol was approved by the Pharmacology Discovery Services IACUC and is performed with the oversight of veterinarians to assure the humane treatment of laboratory animals.

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Reference Compound(s)
Colistin

Graph(s)

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