Phage Therapy for Restoring Antibiotic Sensitivity to Bacterial Pathogens

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Description:

- Increasing prevalence and severity of multi drug-resistant (MDR) bacterial infections requires novel antibacterial strategies.
- *P. aeruginosa* causes infections that are notoriously difficult to manage due to low permeability of the outer membrane and antibiotic multi-drug efflux (Mex) system which pumps out the antibiotic molecules and confers resistance to several antibiotic classes.
- We isolated a lytic bacteriophage, OMKO1 that utilizes the outer membrane porin M as a receptor-binding site and interferes with Mex mechanism.
- Bacteriophage-induced selective pressure can reverse antibiotic resistance in multi-drug resistant bacteria.
- **Lead Innovator:** Paul Turner, Ph.D.

Fig. 2. Phage OMKO1 selects against the expression of OprM and, consequently, the function of the mexAB/OprM efflux systems. Average cell densities (OD600) of PAO1-ΔmexR and PAO1-ΔoprM over time in the presence of Tetracycline (10 μg/mL) and phage OMKO1 (green and red lines). PAO1 ΔmexR (blue, green) overexpresses mex-OprM and readily grows in TET to high densities alone due to active efflux of TET (blue) but is susceptible to phage infection (green). PAO1 ΔoprM grows poorly in the presence of TET (red) but is resistant to phage OMKO1 (yellow).

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