Paci-PHI
Evolution-proof therapy against MDR bacterial pathogens

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PROBLEM: Antibiotic resistance crisis

- Global problem: Increasing proportion of bacteria show resistance to antibiotics.
- Pace of antibiotic discovery has not kept up with evolution of bacterial resistance.
• Phage therapy is SAFE, but bacteria can evolve phage resistance.
• INNOVATION: Use phages to select for antibiotic re-sensitivity and reduced virulence in bacterial pathogens.
**PROOF**: Treatment of MDR *P. aeruginosa* in lab, mouse model, and patient emergencies

*IN VITRO*: phages force antibiotic re-sensitivity in MDR *Pseudomonas aeruginosa*.

*IN VIVO*: phage + sub-therapeutic antibiotic rescues mice from lethal acute pneumonia.

**EMERGENCY PATIENT TREATMENT:**

Jan 2016 – Elderly man with MDR biofilm infested aortic arch graft

Dec 2017 – 22 y.o. female with CF and PDR lung infection.

**STAT Online News: In the Lab**

*A virus, fished out of a lake, may have saved a man’s life — and advanced science*

*By Carl Zimmer, December 7, 2016*
• ‘Phage composition forcing trade-off between phage resistance and antibiotic sensitivity’ – international patent filed by Yale (2016)

• Seeking U.S. FDA approval (and funding) for phase I/II clinical trial:
  ❖ Cystic fibrosis associated pulmonary infections

• Our library contains 100s of phages, with abundant candidates that force similar trade-offs in other clinically relevant bacteria:
  ❖ *Salmonella*
  ❖ *Shigella spp.*
  ❖ *Klebsiella pneumoniae*
  ❖ *Vibrio cholerae*
  ❖ Pathogenic *E. coli*

Isolation and characterization of new therapeutic candidates.

Scale up, QC/QA, GMP, CMC

Phase I/II clinical trial performed at three sites in the USA

SEEKING FUNDERS AND PARTNERS

Support for scale-up and production to develop our most promising phage-therapy candidates against *P. aeruginosa* and other MDR pathogens.
EXPERT TEAM

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