research matters
NOW IS THE TIME

CF Research Revitalizing a Traditional Therapy

December 2011 — Antibiotic resistance is a worldwide health crisis and is estimated to cost the Canadian healthcare system as much as $200 million per year. Once considered the solution to treat infections, the misuse and overuse of antibiotics, combined with bacteria's ability to resist treatment, means that antibiotics are no longer as effective.

Researchers funded by Cystic Fibrosis Canada are searching for alternatives to treat devastating lung infections affecting thousands of Canadians with cystic fibrosis (CF) and possibly solve this global health threat.

Dr. Jonathan Dennis, at the University of Alberta, is leading this quest by exploring phage therapy to treat *Burkholderia cepacia* infections. Bacteriophages – viruses that specifically kill bacteria – were originally discovered by a Canadian scientist early in the 20th century, and are nature's way of killing bacteria.

"*B. cepacia* infections are difficult to treat and are a major health risk for individuals with CF," said Dr. Dennis. "Phage therapy offers a safe and effective treatment option, and a possible solution to the global threat of antibiotic resistance."

Dr. Dennis' phages can outsmart *B. cepacia* by killing the bacteria directly. The phages also adapt to antibiotic-resistant forms of the bacteria, offering an advantage over traditional therapies.

"Lung disease, caused by chronic lung infections, remains the number one cause of all cystic fibrosis-related deaths," said Maureen Adamson, CEO, Cystic Fibrosis Canada. "Phage therapy provides a new angle of attack that could lead to longer and healthier lives for people with cystic fibrosis, and provide a much needed solution to the antibiotic resistance crisis."

Members of the Dennis lab are also working on how to deliver phages to the lungs and have shown that aerosolized phages can be effectively inhaled into an artificial lung. Dr. Dennis' team, including Cystic Fibrosis Canada Studentship awardee Karlene Lynch, also helped develop PHAST (PHAge Search Tool), a free online database to help other researchers identify phages for treating additional multi-drug resistant bacteria.

Cystic Fibrosis Canada awarded Dr. Dennis a $213,000 grant for 2010-2013 to study phage therapy. Through a partnership with the Canadian Institutes of Health Research, Cystic Fibrosis Canada is also contributing $125,000 over five years to investigate phages targeting B. cepacia *complex, and phage delivery methods. This research provides a novel approach to drug resistance.*

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