27 February 2023

CFWA Top Up Scholarship

Project Title: Studying how Pseudomonas aeruginosa Becomes Resistant to Phage Therapy to Identify how to Prevent it Occurring

Project Update: For my project, the top 20/250 phages were selected because they killed the greatest number of *P. aeruginosa* isolates. These phages have had their suitability for therapeutic use determined through morphological and genomic analysis and their stability tested in varying conditions. The top four phages were selected and used at a range of concentrations to treat three *P. aeruginosa* isolated derived from two adults and a child with CF (all with varying antibiotic resistance). Phages were seen to effectively treat the *P. aeruginosa* isolates before the bacteria eventually became resistant to the phages. It was observed that the levels of resistance were different between the three bacterial isolates and also between phages. Resistant bacteria isolated after treatment then had their antibiotic susceptibility tested to several commonly used antibiotics and it was found that the bacteria had become more susceptible to tobramycin. Combining tobramycin with the best phage showed that they were able to work together to kill a tobramycin resistant CF-*P. aeruginosa* isolate. Further work is needed to determine whether this tobramycin/phage combination can prevent phage-resistance and that it doesn't induce inflammation in the airway. How *P. aeruginosa* becomes resistant to phage treatment is also currently being investigated.