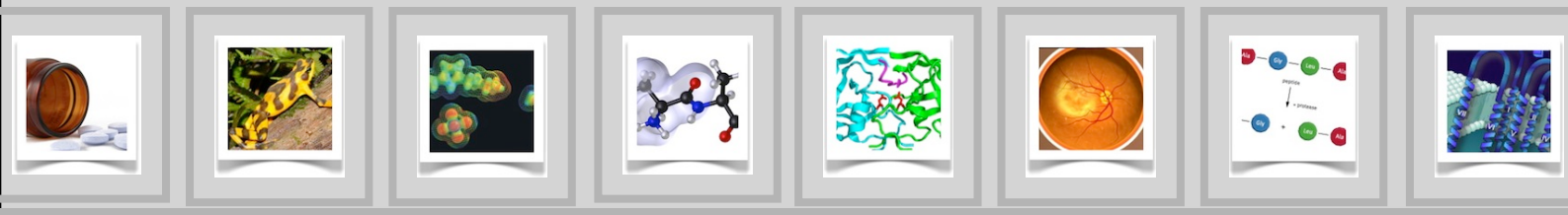

School of Pharmacy PhD Projects 2014

Project Title A genomic approach to determining antibiotic resistance and virulence among *Pseudomonas aeruginosa* isolates from Cystic Fibrosis

Supervisors Dr D Gilpin, Dr M. Tunney, Prof S Elborn (Centre for Infection & Immunity)

Description *Pseudomonas aeruginosa* is the predominant pathogen in the lungs of people with Cystic Fibrosis (CF). Once acquired, chronic infection is usually established, resulting in decreased lung function and ultimately worse outcomes for the patient. A wide variety of bacterial virulence factors allow *P. aeruginosa* to evade host defences and antibiotics and establish persistent infection. However, determination of antibiotic susceptibility profiles and virulence factor expression *in vitro* does not always accurately reflect the *in vivo* situation.
This study will use rapid whole genome sequencing to compare the "resistome" (i.e. antibiotic resistance genes) of *P. aeruginosa* isolates from early and late stages of CF lung disease, and also from non-CF associated isolates, with published core-genome reference sequences. The molecular resistome will be compared with phenotypic measurements of antibiotic susceptibility (by determination of minimum inhibitory concentration). Determination of the presence of virulence genes, known to contribute to disease progression and their phenotypic expression, will also be investigated. Ultimately, this type of data will provide useful clinical information in a relevant time frame. This 3-year project will provide extensive training in molecular biology including next-generation sequencing techniques and analysis and routine bacteriology with an important clinical focus, as part of an internationally renowned research team.

Start Date 1 October 2014

Keywords Cystic Fibrosis, *Pseudomonas aeruginosa*, bacteria, next-generation sequencing, molecular biology, antibiotic resistance.

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How to Apply
Postgraduate applications should be made using Queen's Online:
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