



School of Pharmacy PhD Projects 2014

Project Title Understanding Host-Pathogen Interactions in *Proteus mirabilis*

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Description

Proteus mirabilis is an opportunistic pathogen of the urinary tract and an important causative pathogen in infections of implanted urinary medical devices such as catheters and stents, leading to biofilm and encrustation formation on the device surface. *P. mirabilis* produces a secreted metalloprotease, mirabilysin, or ZapA, a critical virulence factor in host-bacterial interactions. ZapA is a 54-kDa metalloprotease known to degrade a range of substrates including antimicrobial peptides and host receptor ligands.

Recently, our group have demonstrated the critical function of this important enzyme in virulence (*Infect. Immun.* 76(11):4859-64), and in blunting the immune response through interaction with a number of human receptors, including members of the Protease Activated Receptor (PAR) family. We have also described the inhibitory profiling of this important protease virulence factor (*Biochemie* 93(10):1824-7; *Biochem. Biophys. Res. Commun.* 422(2):316-20).

This programme of research seeks to elucidate the mechanisms of ZapA mediated immune evasion by *P. mirabilis* in a range of pathologies. The successful candidate will join our experienced research groups and become proficient in a range of advanced techniques in protease enzymology, synthetic chemistry, microbiology, molecular biology and tissue culture, including development of host-biofilm co-culture models.

Start Date January 2015

Keywords *P. mirabilis*, biofilm, protease, ZapA, PARs, virulence, inflammation, immune response.

Contact Details

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How to Apply

Postgraduate applications should be made using Queen's Online:

<http://go.qub.ac.uk/pgapply>

Please note that there are two application processes: one for admission to the university and another for postgraduate awards.

Further Information

Additional information for prospective postgraduate students can be found on the School of Pharmacy website:

<http://www.qub.ac.uk/pha>

and the Queen's Postgraduate website:

<http://www.qub.ac.uk/home/ProspectiveStudents/PostgraduateStudents/>