Contribution ID : **192** Type : **Poster**

Cholesterol catabolism: An exploitable weakness in mycobacterial infections?

Thursday, 25 November 2021 18:36 (1)

Following the development of modern antibiotics and the net improvement of health care systems globally, tuberculosis (TB), a contagious and pathogenic bacterial infection caused by *Mycobacterium tuberculosis*, has been largely eliminated from developed countries. Despite this improvement TB remained a top 10 cause of death globally in 2020, which, when combined with the rise in multi-drug resistant tuberculosis (MDR-TB), represents an urgent global health concern. Other pathogenic mycobacteria including *Mycobacterium ulcerans*, the causative agent of Buruli Ulcer and *Mycobacterium abscessus*, a bacterium that affects cystic fibrosis patients, are also emerging public health threats. Mycobacteria are unique in their ability to metabolise host cell cholesterol, and this pathway has become a target for new antibiotic treatments to drug-resistant infections. The cytochrome P450 enzymes of the CYP125, CYP142 and CYP124 families initiate cholesterol metabolism. There are different numbers of cholesterol metabolising P450s in each Mycobacterium species. For example, *Mycobacterium ulcerans* and *Mycobacterium tuberculosis* have one of each CYP125, CYP142 and CYP124 enzymes, while *Mycobacterium abscessus* has four different CYP125 enzymes and no copies of CYP142 and CYP124. The reasons for different P450 profiles between mycobacteria remain unknown, as does a mechanistic understanding of the P450-mediated cholesterol oxidation. This project aims to understand the structural, evolutionary and mechanistic differences between enzymes of these three families. Also, screening of these enzymes as targets for a new class of cholesterol-based, anti-tubercular inhibitors will be undertaken.

Level of Expertise

Student

Presenter Gender

Man

Pronouns

He/Him

Which facility did you use for your research

National Deuteration Facility

Students Only - Are you interested in AINSE student funding

Yes

Do you wish to take part in the Student Poster Slam

Yes

Condition of submission

Yes

Primary author(s) : Mr DOHERTY, Daniel (The University of Adelaide); Prof. BELL, Stephen (The University of Adelaide); Ms GHITH, Amna (The University of Adelaide)

Presenter(s) : Mr DOHERTY, Daniel (The University of Adelaide)

Session Classification : Poster Session

Track Classification : Chemistry, Soft Matter & Crystallography