



Contribution ID : 110

Type : Poster

Synchrotron Fourier Transform Infra-red (FTIR) spectroscopy applied to distinguish between various intraerythrocytic lifecycle stages of Plasmodium knowlesi infected red blood cells

While malaria has been eradicated in first-world countries it continues to be a pandemic for hundreds of millions of people worldwide; impacting on health systems, economies and countless of individual lives. Plasmodium knowlesi is a species of malaria parasite prevalent throughout southeast Asia and sub-Saharan Africa and can cause severe infection including death. Although synchrotron FTIR spectroscopy has been extensively investigated, especially in the context of P. falciparum; there have not been any studies applied to P. knowlesi, (to the best of our knowledge).

Synchrotron FTIR spectroscopy was applied to investigate a clinical isolate of fixed P. knowlesi infected red blood cells and spectra were recorded throughout the erythrocytic life cycle. A Principal Component Analysis (PCA) scores plot showed separation of the spectra for the different intraerythrocytic lifecycle stages of P. knowlesi including the ring, trophozoite and schizont stages. Furthermore, the spectra of each intraerythrocytic stage, showed changes between each stage. In the second-derivative spectra changes in the CH₂/CH₃ stretching region between 2800 – 3100 cm⁻¹ were observed. In particular, the band assigned to the asymmetric (CH₂ acyl chain lipids) at approximately 2930cm⁻¹ was blue shifted throughout the various stages. The presence of intensified CH stretching bands in late stages of P. knowlesi infection demonstrates the presence of higher lipid content when compared to the early stages. This could be the result of the presence of parasitic lipids in later stages of P. knowlesi infection. This study shows that P. knowlesi parasites exhibit similar chemical changes to P. falciparum as the parasites progress through the intraerythrocytic life cycle.

Level of Expertise

Student

Presenter Gender

Woman

Pronouns

She/Her

Do you intend to attend UM2022

In person - Melbourne

Students Only - if available would you be interested in student travel funding

No

Students Only – Do you wish to take part in the Student Poster Slam

No

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Yes

Primary author(s) : Ms CH'NG, Serena (Monash university)

Co-author(s) : Prof. WOOD, Bayden R. (Centre for Biospectroscopy, Monash University, Clayton, Victoria 3168, Australia.); CHAKKUMPULAKKAL PUTHAN VEETIL, Thulya (PhD student); VONGSVIVUT, Jitraporn (Pimm) (Australian Synchrotron)

Presenter(s) : Ms CH'NG, Serena (Monash university)

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