

The joint virtual event of the African Light Source AfLS-2024 (7<sup>th</sup>) and the African Physical Society AfPS2024



Type: not specified

## Heterologous production, purification and crystallization of sterol 24C-methyltransferases from opportunistic pathogenic fungi

*Thursday, 21 November 2024 11:30 (30 minutes)* 

Opportunistic pathogenic fungi cause infectious fungal disease with extremely high mortality rates, especially in immune-compromised patients [1]. Antifungal resistance and multi-drug resistance have emerged against the limited number of clinically used antifungals. Because of the high HIV/AIDS incidence in Sub-Saharan Africa [2], anti-fungal drug resistance is specifically of concern; therefore, there is an urgent need to develop novel therapies.

In this study, sterol C24-methyltransferase (SMT) has been identified as a novel target for anti-fungal drug development. An expression vector library was prepared with SMT genes from four opportunistic pathogenic fungi, heterologously expressed in *Escherichia coli* and the SMT proteins purified with affinity chromatography. The SMT from *Candida albicans* was crystallised and diffraction data was collected at the Diamond Light Source synchrotron.

Expression of truncated SMT genes from all four fungi was successful, and the SMT from *C. albicans* was successfully purified and crystallised; however, diffraction was only observed at low resolution (~7Å). Purification of the SMTs from the other three pathogens is ongoing, and crystallisation of the *C. albicans* SMT is currently being optimised.

[1] Denning DW (2024) Global incidence and mortality of severe fungal disease. *Lancet Infectious Diseases.* 24(7):e428-e438.

[2] Dos Santos Abrantes PM, McArthur CP & Africa CWJ (2014). Multi-drug resistant oral *Candida* species isolated from HIV-positive patients in South Africa and Cameroon. *Diagnostic Microbiology and Infectious Disease*. 79(2), 222–227.

Primary author: TOLMIE, Carmien (University of the Free State)

**Co-authors:** Ms MPONTSHANE, Nokwanda (University of the Free State); Prof. OPPERMAN, Diederik (University of the Free State); Dr HART, Rodney (Agricultural Research Council); Ms VAN BREDA, Valmary (Agricultural Research Council); Dr FAIRHEAD, Michail (University of Oxford); Dr KOEKEMOER, Lizbe (University of Oxford); Prof. VON DELFT, Frank (University of Oxford)

**Presenter:** TOLMIE, Carmien (University of the Free State)

Session Classification: Plenary

Track Classification: AfLS