NITheCS Colloquium

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National Institute for Theoretical and Computational Sciences

Four Decades of Cytochrome P450 Research in Africa: Past, Present and Future

Prof Khajamohiddin Syed *(University of Zululand)*

Monday, 31 August 2026 | 16h00–17h00 SAST

HOW TO ATTEND:

In person (main venue):

- Road House Cinema (Neelsie)
  Stellenbosch University

Watch at satellite venues:

- MITP Boardroom P215, 2nd Floor Physics Building
  University of the Witwatersrand
- Seminar Room K310
  Physics Building G5
  North-West University

Online (live stream)

--- Please note, a recording of the lecture will be published on the NITheCS YouTube channel following the event ---

ABSTRACT

Cytochrome P450 enzymes are among the most versatile proteins in biology, playing essential roles in drug metabolism, hormone synthesis, detoxification, and the production of valuable natural compounds. Over the past four decades, African researchers have made important contributions to this globally significant field, yet the evolution and impact of African-led P450 research have never been examined comprehensively.

In this colloquium, I present the first historical and bibliometric analysis of African P450 research spanning 1987 to 2025. Using large-scale analyses of publications from PubMed and Web of Science, I explore how the field has grown from a handful of pioneering studies into a continent-wide research enterprise involving scientists from 31 African countries and extensive collaborations worldwide. The findings reveal remarkable growth in research output, with major advances in pharmacogenomics, structural biology, insecticide resistance, microbial biotechnology, and drug discovery.

Beyond celebrating these achievements, the talk highlights how computational biology and bioinformatics have transformed enzyme discovery, genome-wide annotation, and evolutionary analysis, creating new opportunities for precision medicine and biotechnology. I conclude by discussing the key remaining research gaps and how interdisciplinary approaches-including AI, large-scale biological data analysis, and international collaborations can help shape the next generation of cytochrome P450 research in Africa.

BIOGRAPHY

Prof Khajamohiddin Syed is a Full Professor of Biochemistry at the University of Zululand whose research integrates bioinformatics, comparative genomics, structural biology, and computational approaches to understand the evolution and function of genes and proteins across the tree of life. He is internationally recognised for pioneering contributions to the study of cytochrome P450 enzymes, including their genome-wide annotation, evolutionary analysis, and applications in drug discovery, including the development of the P450ATLAS online resource.

Professor Syed has published extensively in leading journals, including *Science, PNAS*, and *Current Biology*. He has supervised numerous postgraduate students, led nationally and internationally funded research projects, and serves on the NRF Natural and Life Sciences standing panel, contributing to the growth of bioinformatics and computational biology research across Africa.

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