



Distribution and diversity of cytochrome P450 monooxygenases in the fungal class *Tremellomycetes*

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Abstract:

Tremellomycetes, a fungal class in the subphylum *Agaricomycotina*, contain well-known opportunistic and emerging human pathogens. The azole drug fluconazole, used in the treatment of diseases caused by some species of *Tremellomycetes*, inhibits cytochrome P450 monooxygenase CYP51, an enzyme that converts lanosterol into an essential component of the fungal cell membrane ergosterol. Studies indicate that mutations and over-expression of CYP51 in species of *Tremellomycetes* are one of the reasons for fluconazole resistance. Moreover, the novel drug, VT-1129, that is in the pipeline is reported to exert its effect by binding and inhibiting CYP51. Despite the importance of P450s, the P450 repertoire in species of *Tremellomycetes* has not been reported to date. This study intends to address this research gap. Comprehensive genome-wide P450 analysis revealed the presence of 203 P450s (excluding 16 pseudo-P450s) in 23 species of *Tremellomycetes* that can be grouped into 38 P450 families and 72 P450 subfamilies. Twenty-three P450 families are new and three P450 families (CYP5139, CYP51 and CYP61) were conserved across 23 species of *Tremellomycetes*. Pathogenic cryptococcal species have 50% fewer P450 genes than non-pathogenic species. The results of this study will serve as reference for future annotation and characterization of P450s in species of *Tremellomycetes*.



Biography:

Olufunmilayo Olukemi Akapo graduated from Rivers State University of Science Technology, Nigeria where she obtained a BSc degree with second class upper division. She obtained her MSc degree in Biochemistry from University of Zululand. She is presently a PhD candidate at the University of Zululand South Africa, under the Supervision of Prof Khajamohiddin Syed; a researcher who is well known with P450s enzyme researches. Her on-going research is focused on the role of P450s in relation to Cryptococcal disease, a disease which majorly affects immunocompromised patients. She has been able to present her different research results in conferences and symposiums.

5th Annual Congress on Infectious Diseases; October 16-17, 2019; Barcelona, Spain.

Citation: Olufunmilayo Olukemi Akapo; Distribution and diversity of cytochrome P450 monooxygenases in the fungal class *Tremellomycetes*; October 16-17, 2020; Barcelona, Spain