

ISID Fellowship Program Final Report

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Molecular characterization of virulence factors of five isolates of *Cryptotrichosporon anacardiense* (CBS 9549, CBS 9550, CBS 9551, CBS 9552 and CBS 9553), a new basidiomyceteous yeast genus from Nigeria

The human pathogenic yeast *Cryptococcus neoformans* is known to be associated with many tree species. In June of 2002, I began an ecological investigation into the environmental sources of *C. neoformans* in Nigeria. I recovered some yeast colonies that later yielded 5 different isolates of a new encapsulated basidiomyceteous yeast species. The isolates were from the fresh flowers of the cashew tree (*Anacardium occidentale*) from Nnobi in Anambra State, Nigeria. This yeast formed pale brown colonies on Niger seed agar. This was a very interesting discovery, because the yeast also phenotypically resembled *C. neoformans* by growing at 37°C, expressing a polysaccharide capsule, and forming melanin pigments with exogenous phenolic substrates. These three characteristics are important virulence factors of *C. neoformans*.

With the support of ISID, the Albert Einstein College of Medicine (AECOM, New York, USA), and in collaboration with other workers at the National Institutes of Health (Maryland,

USA), and Centraalbureau voor Schimmelcultures (CBS, the Netherlands), we were able to establish morphological, biochemical, and molecular biological characteristics of this new yeast isolate. We were also able to generate phylogenetic trees based on the ITS region and the D1/D2 domains of the 26S rDNA from the Nigerian isolates, which enabled our taxonomic placement of the yeast among the trichosporonales, where the 5 isolates formed a basal lineage cluster. Our work on the yeast is being peer-reviewed for publication. As the yeast could not be identified with any known genus or species, we proposed the name *Cryptotrichosporon anacardii* gen. nov. et sp. nov.

The skills I acquired at AECOM include DNA isolation, polymerase chain reaction (PCR), nucleic acid sequencing, and molecular techniques for characterization of virulence factors. These skills will not only assist me in the completion of my PhD program, but will become an invaluable asset to my research career as a whole. ❖



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Ikechukwu Okoli completed his BS and MS at Nnamdi Azikiwe University, Awka, Nigeria, where he is currently an Assistant Lecturer and a PhD student at the Department of Applied Microbiology. His major interests are the epidemiology and ecology of pathogenic fungi in Nigeria.