

Scientists have debunked the notion of non-filamentous *Candida albicans* as safe

By Dr. Bilqeesa Bhat



Institute of Life Sciences (ILS), Bhubaneswar

Research group headed by Dr. Narottam Acharya at the Department of Biotechnology's autonomous institution, the Institute of Life Sciences (ILS), Bhubaneswar have explained the severity and disease causing property of non-filamentous *Candida albicans* strain in cell-based and animal systems, and ruled out the notion that the non-filamentous *C. albicans* are non-pathogenic and safe.

Candida albicans is an opportunistic pathogenic fungus having various forms/types ranging from round to rod shape. Based on presence or absence of filaments on their surfaces, *C. albicans* strains are filamentous structures (hyphae), non-filamentous (non-hyphae) or pseudohyphae types. Non-filamentous *C. albicans* are broadly considered as safe and does not cause any infections/diseases.

Research team has developed a non-filamentous strain *C. albicans* rad30 Δ by deleting a particular type of enzyme called DNA polymerase eta (Rad30/Pol η) from genome of a pathogenic filamentous yeast *C. albicans*. Study have successfully shown that despite the morphological differences, both wild type- and recombinant strain rad30 Δ *C. albicans* were pathogenic in nature and caused infection in mice (animal models) to different degree.

Dr. Acharya's team noted that mice with Th1-immunity (cell mediated response against bacteria and viruses) were comparatively less prone to fungal infections than the mice with Th2 immunity (immune response against extracellular parasites).

Therefore, it was asserted that shape of *C. albicans* is not the only criteria for systemic candidiasis i.e., infection caused by candida fungus in blood or the membrane lining the heart muscle or membranes around the brain. Study indicated that many fungal and human factors play an important role in appearance of such infections.

Candida albicans often causes mucosal and blood stream fungal infections with a higher disease incidences and death rates among people with weak immune system. Healthy individuals also get infected by Candida, but such infections are mostly superficial and are treatable.

Earlier studies at Dr. Acharya's lab provide an understanding about the role of DNA replication in Candida biology and the manner in which it causes infection. In some of their initial studies, they found that DNA polymerase eta (CaPol η) of *C. albicans* plays a vital role in genome stability, its shape and drug resistance. They have reported that in the absence of CaPol η , the *C. albicans* strains are affected by DNA damaging agents such as amphotericin B.

Thus, the study clearly suggests that the modes of interaction between morphologically different *C. albicans* strains with the host immune cells and infection development varies with genetic background and several other factors, and is not limited only to the shape of *C. albicans*.

Contact Person:

Dr. Mamoni Dash (Communication Officer),
Dr. Narottam Acharya (Scientist E),
Institute of Life Sciences (ILS), Bhubaneswar