Anticancer potential of Saccharomyces sp.: Model Organism to Cancer Therapeutics

Akansha Lodhi, Richa Jain

Department of Biotechnology & Microbiology, Centre for Scientific Research and Development, People's University, Bhopal (Madhya Pradesh)

ABSTRACT:

Saccharomyces cerevisiae is traditionally used for baking and fermentation. In various studies Saccharomyces cerevisiae has exhibited strong immunomodulatory properties that are useful in various cancer therapies. Various studies show that whole yeast cells, heat killed yeast, and yeast-derived components activating immune response and a bate the tumor growth. Saccharomyces, is a eukaryotic organism which has progressed from an essential model organism in biological research to a promising cancer therapeutic agent. Its immunomodulatory cell wall components, metabolites, and bioengineered Nano-carriers consists of therapeutic potential. These induce the selective cytotoxicity and apoptosis. Yeast components also induce cell cycle arrest, suppress oncogenic survival markers and elevate oxidative stress (ROS). Probiotic strains, such as Saccharomyces, and their supernatant have shown anti-proliferative effects against breast, colon and cervical cancer cell lines, has been validated in both in vitro and in vivo models. Modern bioengineering has opened the way to yeast-derived vacuoles and Nano-gold conjugates, which facilitate target drug delivery and deep tissue penetration. The present article highlights the importance of Saccharomyses sp. both as model organism for research related to anticancer compounds and as source of bioactive compounds such as β-glucan etc. which can be used to treat cancer.

KEY WORDS: Saccharomyces, yeast, β-Glucan, Anticancer, Apoptosis, Cytotoxicity