Yeasts is used in a lot of day-to-day applications including in various baking and beverages products. But how many of us know its utilization in pharmaceutical industry for protein production like protease? Unfortunately, optimal production of protease in yeasts still can be improved and strategies need to be developed to produce protease with higher yield. My master's project involves evaluation of such strategies expression of protease in yeast strain. Also, my project is part of a bigger project that aims to figure out the possibility of finding novel enzymes which have specific function and applications in various industries.

Yeasts Saccharomyces cerevisiae known as brewer's yeast has been widely used in food industry and is an important ingredient in baking as well as brewing products. However, these organisms also have applications pharmaceutical and molecular biology sector. In addition, due to ease in genetic manipulation of yeast, they are used as an excellent host for expressing specific proteins. These proteins formed are referred to as recombinant proteins since they are formed by genetic manipulation and have wide range of application including in synthesis of pharmaceutical products, enzymes for treatment of diseases and utilization in drug delivery systems.

Proteases have wide range of application in food, detergent, and pharmaceutical industries. In this project the expression of proteases in yeast was performed with the help of GFP-based fusion technology. Let's understand what this term is! so green fluorescent protein (GFP) is isolated from jellyfish and are actively used in research studies. This has a unique ability to absorb blue light and re-emit green light, producing bioluminescence. The gene coding for GFP in combination with gene that produces protease is fused together (hence called GFP-fusions) and is inserted into yeast cell with the help of different strategies. Since GFP produces fluorescence, by measuring it we could infer that the protease gene is being expressed by the yeast cells. In my master's thesis project, different approaches/strategies to express protease for a collection of different yeast strains was evaluated. GFP-fusions having different protease gene encoded, were used in this study to evaluate the strategies for high protease expression. Our results showed that, when different strategies were adopted, different protease expression was observed in each GFP-fusion protease, meaning that, each protease showed varying expression on the yeast strains. However, this work could be an aid when constructing collection of genetically modified yeast strains (called genetic library) which express protease for future research work. Furthermore, the results obtained represent an important step towards building a platform for producing novel enzymes with high specificity.