

## Production of *Lactobacillus salivarius*, a new probiotic strain isolated from human breast milk, in semi-industrial scale and studies on its functional characterization

### Abstract:

Probiotic are living microorganisms when applied to humans or animals, beneficially affect the health of the host by influencing activity of microflora of the gastrointestinal tract or indigeneous microbial balance. For industrial production of probiotics belong to lactobacilli, it is necessary to obtain high biomass in a short time and low cost. Seven media screened for effective production of high biomass were evaluated using shake flask and incubated at 37°C, pH 7.0. The best medium supports high biomass and low lactic acid was further used to optimized using different concentrations of medium components. Furthermore, the optimized medium was used for batch cultivation of *L. salivarius* in bioreactor under controlled and uncontrolled pH conditions. This medium was composed of (g L<sup>-1</sup>): glucose, 20.0, yeast extract, 20 and meat peptone, 35: Data showed that *L. salivarius* grew well in this medium with specific growth rate of about 0.179h<sup>-1</sup> in shake flask, and 0.249 h<sup>-1</sup> in controlled pH bioreactor. The maximum biomass of 5.71 g L<sup>-1</sup> and 7.57 g L<sup>-1</sup>, were obtained in shake flasks and controlled pH bioreactor, respectively. To evaluate the potential use of this lactobacilli strain as probiotics, studies on the effect of gastric juice, pH and bile salts were conducted. Cell tolerance to acidity and bile salt are important factor that affect the probiotics to remain and exert their potential functionalities in a host. *L. salivarius* showed higher resistant to SGJ with cell viability of 22.9%, 38.8%, 63% and 65% at pH 1,2,3 and 4, respectively. *L. salivarius* also has good functionality because of its tolerant to wide range bile salt concentrations ranged from 0.5% to 4%. Moreover, *L. salivarius* was susceptible to antibiotics like erythromycin, rifampicin, ampicillin, and resistance to streptomycin and gentamycin. In conclusion, *L. salivarius*, new isolated from mother milk, has a big potential use as starter culture probiotic application based on its high stability and could has potential use especially as probiotic supplement for infant milk formulation