

## Microencapsulation of Probiotics

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We report two novel ways of microencapsulation of yeast cells into sporopollenin and colloidosome microcapsules; Sporopollenin prepared from *Lycopodium Clavatum* plant by phosphoric acid extraction. Yeast cells were encapsulated inside the cavity of sporopollenin microcapsules by exposing compressed sporopollenin samples to yeast cells dispersions in water-ethanol mixtures followed by filtration of the excess of cells and the growth of the encapsulated cells in a culture media. The encapsulated cells were observed under scanning electron microscopy after treating the capsules with liquid nitrogen and cracking them open by mechanical treatment. Colloidosomes were made from emulsion templates stabilised with cationic latex nanoparticles of average diameter 300 nm and strengthened the droplet's stability by interlocking the latex nanoparticle monolayer around the water droplets by either cross linking them with polystyrene sulfonate, or yeast cells coated with anionic polyelectrolyte. Transition of the water droplets containing encapsulated cells from the oil to water phase was achieved by evaporation of the organic solvent and freezing process followed by a transfer in water. The process was facilitated by addition of calcium carbonate microparticles in the oil phase of the emulsion which act as spacers between the droplets during the freezing process which allows the frozen droplets to be redispersed in water after filtration. It was observed that yeast cells preserve their viability in the colloidosomes. We investigated the effect of ethanol on viability of yeast cells for encapsulation purposes. The method can find applications in microencapsulation of probiotics in food industry as well as biomedical applications, e.g. live vaccines, tissue engineering, etc.