

PROTEIN NANOCAGES AS NOVEL BIOSURFACTANT IN THE FORMULATION OF PICKERING EMULSION AND GEL

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Protein nanocages have been shown to be versatile for multitude of applications in biomedicine [1]. Our group has recently reported that the self-assembling protein nanocages localize at oil-water interface and stabilize 200-400 nm nanoemulsions [2]. The protein nanocages are produced using microbial fermentation and purified using conventional chromatography technique. The protein nanocage-stabilized Pickering emulsion are produced by facile sonication technique. The emulsion has been shown to be pH responsive when the pH is switched between 4 and 8. The switch is reversible up to 6 times. The emulsion is stable for more than 2 years. Varying the mass fraction of the protein nanocages/oil results in a shift in rheology from emulsion to gel. The unique properties of the protein nanocages emulsions have attracted industrial interests and we are currently working with our industry collaborators to encapsulate their cosmetic ingredients. We have shown the potential of protein nanocages as a novel biosurfactant that are of interests to the cosmetic industry.

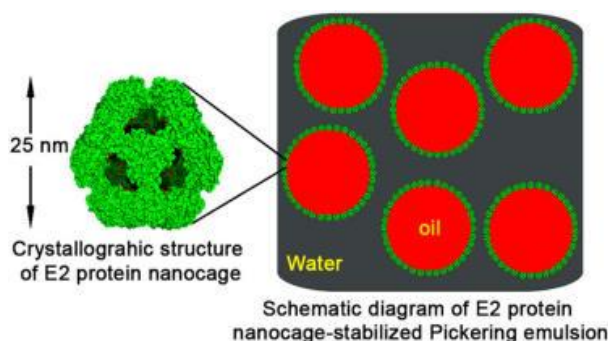


Figure 1. E2 protein nanocages organize around oil droplets in aqueous environment showing its potential as a novel biosurfactant.

References:

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M Sarker, N Tomczak, S Lim, Protein Nanocage as a pH-Switchable Pickering Emulsifier, ACS Applied Materials & Interfaces 9 (12), 11193–11201.