Neoteric Solvents Assisted Sustainable Strategies for Enhanced Protein Packaging with Improved Stability and Activity

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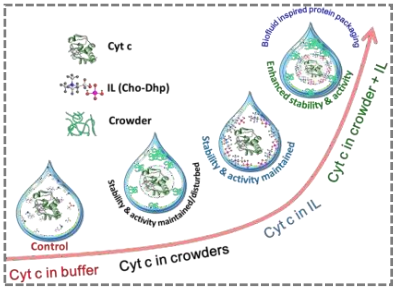
Abstract: This talk will be focused on two different topics which are (i) strategies for improving the stability and activity of enzymes for facile biocatalysis and (ii) vision for the department of plant nanotechnology and its proposed structure within the scope of NANOPLANT project. Enzymatic biocatalysis has been recognized as key process applied in diverse fields of applications including synthesis of valuable pharmaceutical intermediates and biofuels from renewable resources.[1] However, the fact that enzymes have evolved to work in cellular environments and are therefore usually unstable to harsh process conditions such as temperature, pressure, use of organic solvents and etc.—the major barrier to the use of the enzyme in industrial biotechnology.[2] Consequently, there is a clash between low- temperature aqueous processing (optimal conditions for enzyme stability and selectivity), and organic solvent or high-temperature processing (which favor high substrate solubility and immensely improved reaction kinetics, respectively). First part of the talk majorly will focus fundamentals of protein packaging and some of the interesting results that we developed in our laboratory. We developed a facile protocol for sustainable protein packaging platform using biomass derived functional carbon materials as host and also via manipulation of solvent environment using molecularly crowded ionic liquids.[3]



References

(1) Damborsky and co-workers, *ACS Catal*., 2013, 3, 2823. (2) Ferna´ndez-Lafuente and co-workers, *Chem. Soc. Rev*., 2013, 42, 6290. (3) Mondal and co-workers, *Green Chemistry* 2017, 19, 4900-4911; Mondal and co- workers, *Green Chemistry* 2018, 20, 3711-3716; Mondal and co-workers, *Chemical Communication*, 2019, 55, 5747-5750; Mondal and co-workers, *Adv. Optical Mater*., 2020, 1902022; Mondal and co-workers, *Chem. Commun*., 2020, 56, 9659-9662.