

*MOF bio-composites for biocatalysis*

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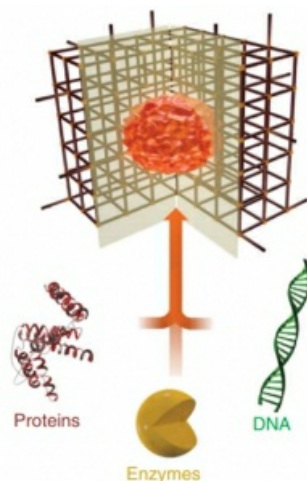
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Among the different classes of Metal-Organic Framework (MOF) composites prepared during recent years using ceramic, metallic and polymeric nanoparticles, a new emerging type of MOF composite has been recently obtained by encapsulating bio-macromolecules.[1,2] Different water-based synthetic approaches such as co-precipitation and biomimetic mineralization methods, were used to self-assemble different types of MOFs around bio-active compounds (e.g. enzymes). These new bio-catalytic porous compounds have shown unprecedented properties for the protection and release of enzymes.[1] Biomimetic mineralization methods overcome the need for MOFs with pores larger than the hosted biomolecules, and enable one-pot syntheses as an alternative preparation route to post infiltration methods.[8] Thus, MOFs are now considered promising materials for biotechnological applications as the encapsulation technique is rapid and inexpensive.[1] In this presentation, the progress from the encapsulation of enzymes [9] up to their combination with cells for their preservation. The functional properties of these composites will be disclosed providing examples of other methods used for the encapsulation of enzymes within MOFs.[3] Comparison of the protective properties will be illustrated and the applications of proteins for the controlled localization of MOFs discussed.

[1] Liang, Ricco, Doherty, Styles, Bell, Kirby, Mudie, Haylock, Hill, Doonan, Falcaro, Nat.Commun. 6 (2015) doi:10.1038/ncomms8240

[2] Liang, Coghlan, Bell, Doonan, Falcaro, ChemCommun 52, 473 (2016)

[3] Jeong, Ricco, Liang, Ludwig, Kim, Falcaro, Kim, Chem.Mater. 27, 7903 (2015).



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