The Nanoprecipitation Process or the Simplicity in Making Complex Colloids

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In this presentation, we report on some recent works undertaken in our laboratory (IMP@INSA) in the field of nanoprecipitation and colloids. We show how careful examination of phase diagrams for polymer/water/solvent and/or oil/water/solvent systems allows for identifying conditions in which monodisperse polymeric nanocapsules or nanoparticles can be straightforwardly designed through simple solvent shifting procedures(see **Fig 1**). We further establish that this robust, straightforward and easy-to-handle approach offers unique advantages to tune on demand the dimensions, the chemical composition, the structuration and the peripheral functionalization of the colloids in mild conditions.[i] Finally, we present some applications of the resulting colloidal systems.

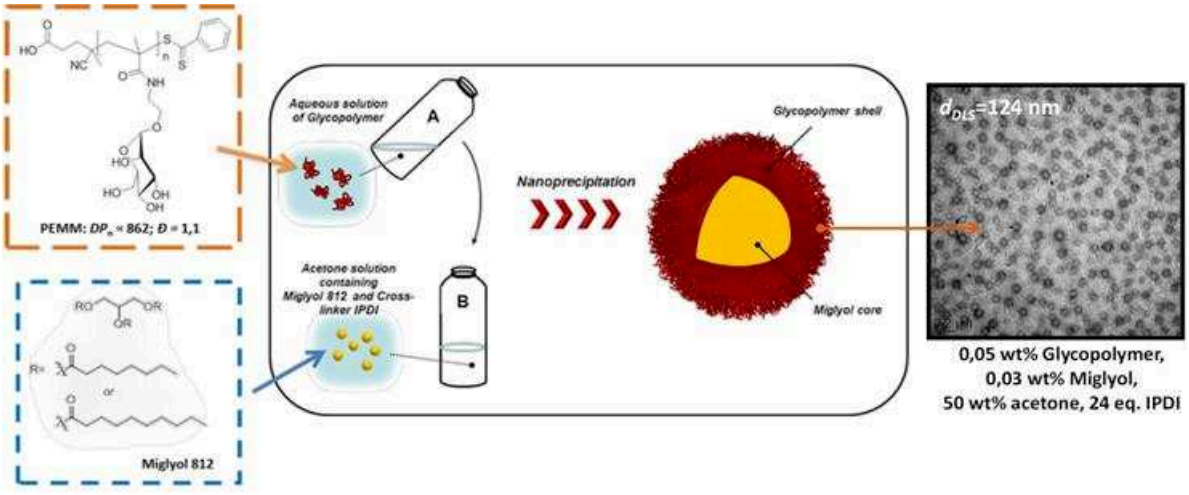

***Figure 1**. Route to nanocapsules through nanoprecipitation*

[i] X. Yan,; M. Delgado; A. Fu, ; J. Katz, ; Gouin, S. ; E. Fleury ; F. Ganachaud ; J. Bernard *Angew. Chem. Int. Ed.* **2014**, *53*, 6910; b) X. Yan, P. Alcouffe, G. Sudre, L.David, J. Bernard, F. Ganachaud *Chem Commun* **2017**, *53*, 1401; c) X. Yan, R. Ramos, E. Hoibian, C. Soulage, P. Alcouffe, F. Ganachaud and J. Bernard *ACS Macro Letters* **2017**, *6*, 447;d) X. Yan, A. Sivignon, P. Alcouffe, B. Burdin, S. Favre-Bonté, R. Bilyy, N. Barnich, E.Fleury, F. Ganachaud, J. Bernard *Chem Commun* **2015,** *51***,** 13193.