Colloidosomes tailored by water-in-water emulsion

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Water-in-water emulsions found their interest in the sequestration of fragile molecules as the internal and external phases are constituted of water. Typically, all aqueous phase separation occurs when two water soluble molecules are mixed together. This phenomenon also called coacervation has the ability to sequestrate spontaneously various entities from small molecules to complex cells. Nevertheless, the stability of such coacervates is not efficient and required the use of stabilizing agents such as colloids.
We have exploited ampholyte polymer chains to create highly stable micrometric coacervates stabilized by colloidal particles. The main advantage of these complex assemblies results from their ability to sequestrate spontaneously fragile molecules such as DNA, proteins. This phenomenon was highlighted by introducing fluorescent molecules as illustrates in Figure 1A. Moreover, we have noticed the regular deposition of polymer microgels around the coacervate surface as presented in Figure 1B & 1C. These hybrid self-assembly, compatible with physiological media, found their application in drug delivery or sensors.

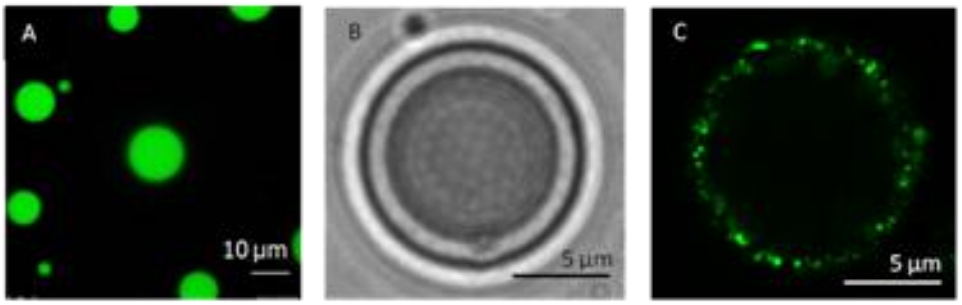

Figure 1 : A) Confocal image of coacervates containing fluorescent polymer chains. Microscopic pictures of the regular organization of fluorescent microgels B) Optical microscopy, C) Confocal image.