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STIMULABLE, STABLE AND BIOCOMPATIBLE W/O/W EMULSIONS FOR ENCAPSULATION AND CONTROLLED DELIVERY OF DRUGS

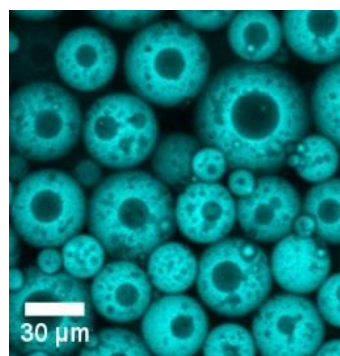
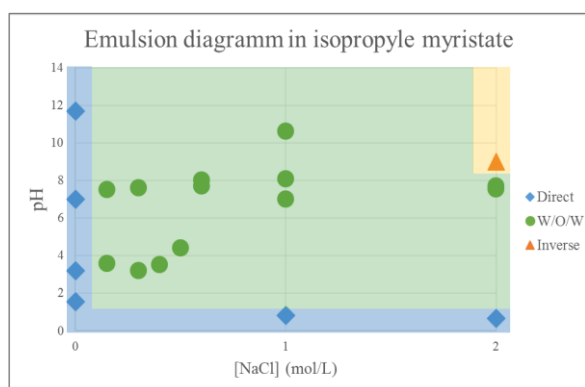
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Water-in-oil-in-water (w/o/w) emulsions are promising systems for encapsulation and controlled delivery of drugs. A new amphiphilic copolymer (PDMS-*b*-PDMAEMA) was developed as an emulsifier for preventing the notorious instability of those emulsions and was capable of stabilizing multiple emulsions for more than a year¹. This polymer is stimuli responsive, allowing the formation in a single mixing step, of direct, inverse and w/o/w emulsions, depending on the pH and ionic strength of the aqueous phase. Consequently, by changing pH, w/o/w emulsions can be destabilized and a compound encapsulated in the internal water phase is released in a controlled way. The use of microfluidic PDMS chips for a better control of the size and the morphology of the emulsions was also studied.



Left: Emulsion diagram showing the type of the emulsion obtained in a single mixing step as function of pH and ionic strength – Right: Confocal microscopy image of a w/o/w emulsion (oil appears in blue)

The aim is to use this promising system to coencapsulate and protect two molecules of interest for health: catechin, an hydrophilic molecule from green tea, and curcumin, an hydrophobic molecule from turmeric. These two antioxidants have lots of potential health benefits^{2,3} but are very fragile and difficult to deliver: formulating them in a double emulsion will allow to preserve them during storage and should improve the absorption.

References:

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