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**Multiscale modelling of polymers at soft-bio interface**

PAOLA CARBONE[1], The University of Manchester

The behaviour of polymers at a liquid/liquid interface has become increasingly technologically important in recent years. For example, many of the self-assembly processes involving macromolecules occur at such interfaces and one of the most common chemical processes used to produce polymer nanoparticles −the solvent displacement method− involves the diffusion of the polymer chains from a good solvent, where the polymer initially dissolves, to a non-solvent where the nanoparticles are formed. Finally, polymer-based drug nanocarriers (either nanoparticles or micelles) are becoming increasingly popular in drug delivery and their behaviour at fluid interfaces (such as a lipid/water boundary) should be properly understood in order to predict their biological activity. Here we show how using a multiscale approach it is possible to gain a detailed picture of the thermodynamic stability of homo- and co-polymers at fluid interfaces spanning from universal rules valid to any polymer systems at high dilution to the specific cases of amphiphilic linear and branched polymers.

[1]School of Chemical Engineering and Analytical Science