## Chiral recognition in D-, L-arginine derived polyamidoamino acids and sodium deoxycholate solutions

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Nowadays the spontaneous self-organization of a polymer into an ordered structure is a sought-after property of many smart materials, whose applications might range from catalysis<sup>1</sup> to drug-delivery<sup>2</sup>. However, literature regarding the role played by these specific conformations in chiral recognition remains scarce. In this context, polyamidoamino acids (PAACs) are an emerging class of stimuli-responsive bioinspired synthetic polymers able to self-assemble into pH depend conformations.<sup>3,4</sup> Arginine based PAACs, named ARGO7, were obtained in water at pH 8-9 from the stepwise polyaddition of *L*- or *D*-arginine to *N*,*N*<sup>2</sup>-methylenebisacrylamide. Results indicated Mn 8500, PDI 1.4 and *Rh* of 1.2 nm.<sup>3</sup>

Molecular dynamics (MD) and circular dichroism (CD) showed ARGO7 folded into a rigid structure, reminiscent of the hairpin conformation, solely driven by the polymer main chain. Due to its ability to self-assemble in solution forming chiral structures, *L*and *D*-ARGO7 may selectively interact with biological components.

To assess chiral recognition, sodium deoxycholate (NaDC), one of the components of bile salts, was chosen as a chiral model surface. In aqueous solution, NaDC showed three different pH dependent behaviour: homogeneous solution (pH>8), gel phase (pH 7-8) and aggregation/flocculation (pH<6.5).

Notwithstanding the ability of NaDC to self-assemble into different conformations at each pH interval, signs of chiral recognition were found in NaDC gel phase only. Conformational modifications were probed by circular dichroism spectroscopy: both *D*- and *L*-ARGO7 changed shape and magnitude of the CD pattern, whereas *D*,*L*-ARGO7 did not modify the CD spectra of NaDC. After 8 days, NaDC compact structure loosened, ended up being fluid and the CD pattern were completely modified due to NaDC and *D*- or *L*-ARGO7 interactions. Incoming SANS studies will probably highlight the mechanisms and dynamics of the chiral interactions in these polyelectrolyte-micelle systems.

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