

PGSE NMR studies on complex formulation of aminoacid deriving polymers and sodium deoxycholate micelle

Federica Lazzari,^a Amedea Manfredi,^a Jenny Alongi,^a Peter Griffiths,^b
Elisabetta Ranucci,^a and Paolo Ferruti^{a,c}

^a *Dipartimento di Chimica, Università degli Studi di Milano, via Golgi 19, 20133-Milano, Italy*

^b *Department of Pharmaceutical, Chemical and Environmental Science, University of Greenwich, Central Avenue, ME44TB-Chatham, United Kingdom*

^c *National Interuniversity Consortium of Materials Science and Technology (INSTM), Via Giusti 9, 50121-Firenze, Italy
Email: federica.lazzari@unimi.it*

The design of chiral synthetic polymers capable of self-assembling in solutions is receiving increasing attention for its biological implications. In this field, polyamidoamino acids (PAACs) are an emerging class of stimuli-responsive bioinspired synthetic polymers obtained by the stepwise polyaddition in pH > 9 aqueous solution of α -amino acids with N,N'-methylenebisacrylamide. The first example of this family, ARGO7, obtained from L- and D-arginine polyaddition, proved capable of self-assembly in aqueous solution into rigid pH dependent conformations [1]. For all ARGO7 isomers, self-diffusion coefficients probed by pulsed-gradient spin-echo nuclear magnetic resonance (PGSE-NMR) reported values between 3×10^{-10} and 9×10^{-11} m²/s and R_h of 0.9 - 2 nm, consistent with compact random coils. It remains to be ascertained if selective chirality driven interactions may arise by mixing the D- or L- form of PAACs with soft chiral surfaces. As an example of the latter, sodium deoxycholate was chosen for its ability to form chiral micelle in aqueous solution, capable of interacting with protein and fatty acids in biological system [2].

[1] A. Manfredi, N. Mauro, A. Terenzi, J. Alongi, F. Lazzari, F. Ganazzoli, G. Raffaini, P. Ferruti, *ACS. Macro Lett.* **6** (2017) 987-991.

[2] R. Holm, A. Mullertz, H. Mu, *Int. J. Pharm.* **453** (2013) 44-55.