Dehydropeptide-based self-assembled hydrogels with incorporated Gd^{3+} chelates: potential Contrast Agents for MRI?

Teresa Pereira[a], Juan Gallo[b], Manuel Bañobre-López[b], Loic Hilliou[c], Paula M.T. Ferreira[a], and José A. Martins[a]

[a] Centre of Chemistry, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal; jmartins@química.uminho.pt

[b] International Iberian Nanotechnology Laboratory (INL), Av. Mestre José Veiga s/n, 4715-330 Braga, Portugal

[c] Institute for Polymers and Composites, Department of Polymer Engineering, University of Minho, Campus de Azurém, 4800-058 Guimarães, Portugal

Magnetic Resonance Imaging (MRI) is at the forefront of clinical imaging. Paramagnetic relaxers (Gd^{3+} and Mn^{2+} chelates, iron oxide nanoparticles) shorten the relaxation times ($T_{1,2}$) *i.e.* enhance the relaxation rates ($R_{1,2}$= $1/T_{1,2}$) of the water protons in their vicinity yielding significant contrast enhancements-contrast agents. Supramolecular (self-assembled) hydrogels based on low molecular weight peptides are the new paradigm biomaterials: porous soft biocompatible materials made of highly hydrated fibrous 3D nanostructures, reminiscent of the extracellular matrix. Our research group developed self-assembled hydrogels based on dehydrodipeptides *N*-capped with naproxen (Npx, a NSAID drug). Dehydropeptide-based hydrogels exhibit resistance to proteolysis, are biocompatible and suitable nanocarriers for delivery of incorporated drugs. Recently, we demonstrated that incorporation of SPION endows dehydropeptide-based hydrogels with magnetic properties (magnetogels): hyperthermia and MRI reporting properties. In this communication we report novel supramolecular hydrogels prepared by co-assembly of dehydropeptides and Gd^{3+} chelates. The hydrogels are characterised regarding co-assembly (fluorescence, CD spectroscopy) and micro- nano-structure (STEM) and rehologial properties. The co-assembled hydrogels are characterized also as Contrast Agents for MRI by ^{1}H relaxometry (60 MHz, 37ºC) and MRI (120 MHz, 37 ºC).

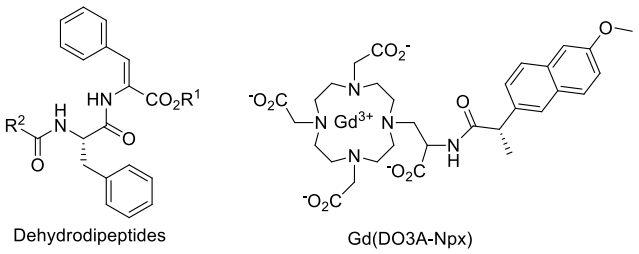

Figure 1

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