# Novel ultra-short peptide hydrogel as a potential drug nanocarrier

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Hydrogels endow a pristine soft-materials class of a large variety of applications, ranging from magnetic resonance imaging and drug delivery to catalysis and as template materials [1]. Particularly, self-assembled biocompatible peptide-based hydrogels have shown promising properties and results as nanocarriers for antitumor drugs [2-4]. Here, a stimulus-responsive self-assembled intertwined fibrillar structure is achieved through the cooperative effect of different non-covalent intra- and intermolecular interactions [1].

Lately, the development of hydrogelators with optimum drug delivery and mechanical properties at low cost and minimalist length has been a main challenge [2,3], which requires a cautious structure design. Such properties are not only desired for the pristine material hydrogel but also in the combination with composites [4]. Hereby, considering structural aspects required to favour hydrogelation and empirical knowledge on the self-assembly of dipeptides, a new hydrogelator comprising a methionine residue and a dehydrophenylalanine residue was designed and synthesised through a low-cost synthesis route.

The hydrogel was characterized using fluorescence-based techniques (fluorescence emission, excitation and anisotropy). A critical gelation concentration of 0.1 wt% was obtained (Figure 1), which is very advantageous for a hydrogelator with only two aromatic moieties. The developed nanosystem exhibited promising results as a competitor to current available ultra-short hydrogelators.

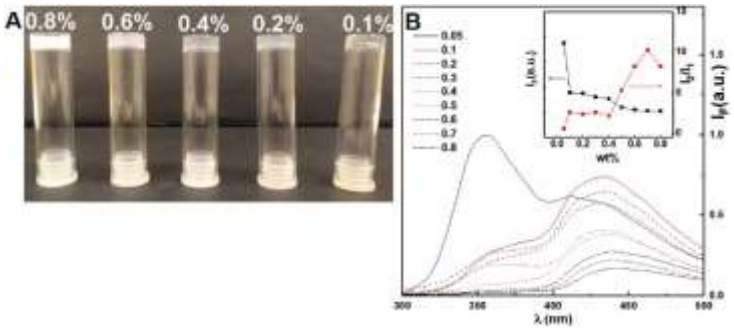


**Figure 1.** (**A**) Image of the hydrogels in the concentration range 0.1-0.8 wt%. (**B**) Fluorescence emission spectra of the hydrogels in the concentration range 0.1-0.8 wt%. Inset: Monomer fluorescence emission (360 nm) and aggregate band (440 nm) to monomer band emission ratio dependence on the hydrogelator concentration.

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