Novel Nanomaterials for Anion-recognition

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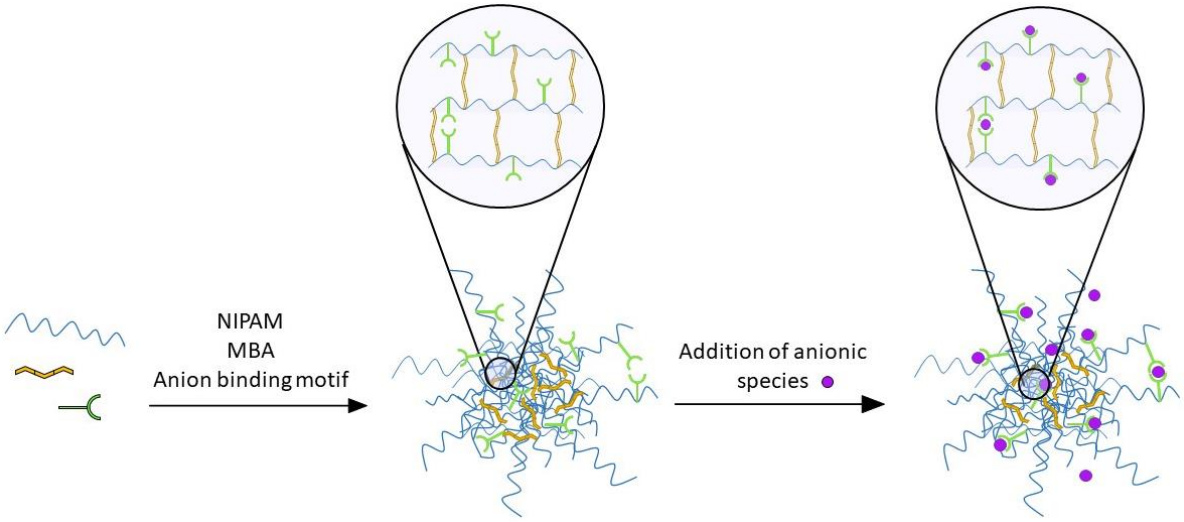
Abundant anions in the body, like chloride and sulphate, are the target of many studies involving anion recognition. In the past 30 years, different kinds of anion receptors have been intensively studied including small molecule receptors with the aim of facilitating anion transport in cells or treating diseases induced by anionic dysregulation. Nowadays, the use of some of these receptors in water remains a challenge for anion recognition due to the high solvability of anions in aqueous media and the low solubility of these neutral receptors[1]. However, polymeric receptors have not been investigated as much as small molecules receptors for anion recognition.

To overcome this problem and minimise the binding competition in aqueous media, we synthesised water-soluble crosslinked polymeric nanoparticles containing hydrophobic pockets functionalised with known anion binding motifs[2].



pNIPAM (poly-*N*-isopropylacrylamide) soft materials are known to have tuneable properties so they can be used *in-vivo*. With MBA (*N,N*-methylanebisacrylamide) as a cross-linking agent, and pendant anion binding motifs, these nanomaterials can be used in aqueous media. We will report the results of anion binding studies using these polymeric materials with anions of interest such as phosphates and sulphates. Their selectivity will help finding an application in the medical area as sensors, drug carrier or anion transporter[3]. This novelty approach will be extended to a larger series of anions and incorporate other type of anion binding motif with biologically active properties.

References:

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