Molecular imprinting is a technique for preparing polymeric scaffolds (Molecularly Imprinted Polymers, MIPs) that act as synthetic receptors and show affinity and selectivity towards a target analyte [1]. When MIPs are downsized to the nanoscale (nanoMIPs), they show an increase in the number of accessible imprinted binding cavities per material weight and an enhanced molecular recognition ability, leading to faster binding kinetics, higher affinity and selectivity [2,3]. Being the recognition properties of the nanoMIPs strictly correlated to the effective formation of the imprints in the chosen synthetic conditions, a deeper comprehension of the polymerization at the nanoscale is required.

Here we present a study of the best conditions to form imprints at the nanoscale when the synthesis occurs by a precipitation polymerization protocol, using as target analyte the peptide of Troponin I, clinical marker of cardiac failure [4]. By exploring a range of monomers combinations, polyacrylamide-based MIP nanogels having homogeneous nano-dimensions and a low number of binding sites per nanoparticle were synthesized. To this purpose, we evaluated the influence of the monomer composition and the total monomers to template molar ratio on the hydrodynamic sizes and on the recognition properties, respectively, defining the conditions to tune the nanoMIP dimensions (from 60 to >600 nm) and to improve the efficacy of the imprinting process.

**INTRODUCTION**

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**CONTROL OF THE POLYMERIZATION AT THE NANOSCALE**

**IMPRINTED BINDING SITES IN NANOGELS**

**REFERENCES**