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Galectin-3-targeted HPMA-copolymers bearing glycan ligands

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In the present study we describe the synthesis and structure-activity relationship of conjugates of N-(2-hydroxypropyl) methacrylamide (HPMA) copolymers decorated with varying amounts of GalNAcβ1,4GlcNAc (LacdiNAc), which is a specific ligand of galectin-3 (Gal-3). Gal-3 is overexpressed in many cancer types and plays an important role in metastasis, tumorigenesis and tumour angiogenesis. Also, the synthetic water-soluble carriers based on HPMA copolymers represent an effective tool for site-specific targeting of drugs or other active agents *in vivo*. The multivalent presentation of glycans enhances the affinity for the lectin biological target, and thus allows preferential accumulation of the polymer conjugate at the desired site. First we synthesized polymer precursors by controlled radical reversible addition fragmentation chain transfer (RAFT) polymerization, then, the glycans were conjugated to the statistic HPMA copolymers by click chemistry. Here, we present synthesis and physico-chemical characterization of the prepared glycopolymers differing in the LacdiNAc content, type of spacer between saccharide and polymer carriers and also in the polymer chain length. Results of binding studies regarding the affinity of the tested glycol polymers to Gal-3 showed significantly higher affinity than the respective free saccharide. The acquired data will help to develop advanced glycopolymers to target Gal-3 as a therapeutic goal in cancerogenesis and other disorders.

Biography

Marina Rodrigues Tavares is currently a PhD student of Macromolecular Chemistry in the Department of Biomedical Polymers at the Institute of Macromolecular Chemistry of the Czech Academy of Sciences. She has completed her graduation in Pharmaceutical Sciences by Federal University of Rio de Janeiro, Brazil, with part of her studies and master thesis being carried out in Trinity College Dublin, Ireland. Her Master's degree is in the field of Polymer Sciences and Technology and research interests mostly cover the areas of synthesis of biodegradable polymers, target therapies, smart materials for drug delivery, immuno oncotherapy and controlled drug release.

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