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Design of carboxymethyl chitosan-based heparin-mimicking cross-linked beads for safe and efficient blood purification

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Abstract:

Safe and efficient carboxymethyl chitosan (CMC)-based heparin-mimicking cross-linked beads (CMC/PAMPS) as adsorbents for the clearance of low-density lipoprotein-cholesterol (LDL-c) in blood purification were prepared through hydrogen bonding interactions followed with *in situ* cross-linking with 2-acrylamido-2-methyl-1-propanesulfonicacid (AMPS). Fourier transform infrared spectra (FTIR), two-dimensional correlation FTIR spectroscopy (2D IR), thermal gravimetric analysis (TGA) and energy dispersive X-ray spectrometer (EDS) demonstrated the successful synthesis of CMC/PAMPS beads. The porous structures of the beads may benifit the adsorption of toxins. The beads showed excellent hemocompatibility when contacted with blood, owing to their favorable hydrophilicity. The hemolysis ratios for all the beads were less than 5%, the thromboplastin time of