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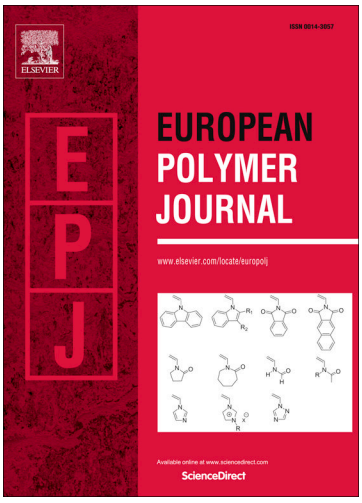

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Co-transfection of star-shaped PDMAEMAs enhance transfection efficiency of protamine/pDNA complexes in the presence of serum

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Abstract

In previous studies, we have found that un-complexed free cationic polymers greatly promote gene transfection efficiency of pDNA complexes. Dividing the gene transfection system into two parts, bound chains and free chains, we exploited mixing different biomaterials as the second component of our designed system to improve gene transfection outcome. In this study, we investigated the effectiveness of star-shaped poly(2-(dimethylamino)ethyl methacrylate) (PDMAEMA) with different arm numbers as free chains (i.e., co-transfection agent) while using natural salmon protamine as bound chains. We explored the gene transfer ability of the system in both serum free and complete cell culture medium. Our results reveal that the star-shaped PDMAEMAs enhance gene transfection efficiency of protamine/pDNA complexes, in the same range and even better than the gold standard polyethyleneimine (PEI, branched type with 25 kg/mol molar mass) in serum-free and serum containing medium conditions, respectively. From