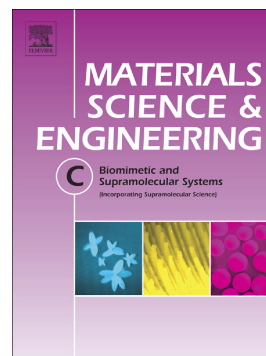


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The biocompatibility of polyaniline and polypyrrole: A comparative study of their cytotoxicity, embryotoxicity and impurity profile

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Abstract:

Conducting polymers (CP), namely polyaniline (PANI) and polypyrrole (PPy), are promising materials applicable for use as biointerfaces as they intrinsically combine electronic and ionic conductivity. Although a number of works have employed PANI or PPy in the preparation of copolymers, composites, and blends with other polymers, there is no systematic study dealing with the comparison of their fundamental biological properties. The present study, therefore, compares the biocompatibility of PANI and PPy in terms of cytotoxicity (using NIH/3T3 fibroblasts and embryonic stem cells) and embryotoxicity (their impact on erythropoiesis and cardiomyogenesis within embryonic bodies). The novelty of the study lies not only in the fact that embryotoxicity is presented for the first time for both studied polymers, but also in the elimination of inter-laboratory variations within the testing, such variation making the comparison of previously published works difficult. The results clearly show that there is a bigger difference between the biocompatibility of the respective polymers in their salt and base forms than between PANI and PPy as such. PANI and PPy can, therefore, be similarly applied in biomedicine when solely their biological properties are considered. Impurity

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