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## Functionalized copolymer matrix based on poly(maleic anhydride-co-3,9-divinyl-2,4,8,10-tetraoxaspiro (5.5) undecane) with potential biomedical applications

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Utilization of polymers as biomaterials is greatly impacted the progress of modern medicine. In order to fit functional demand, materials with desired physical, chemical, biological, biomechanical and degradation properties must be selected. Luckily, a wide range of natural and synthetic degradable polymers are investigated for biomedical applications with novel materials constantly being developed to meet new challenges. The present study is focused on the poly(anhydride maleic-co-3,9-divinyl-2,4,8,10-tetraoxaspiro[5.5]undecane) new copolymer synthesis by radical polymerization in dioxane, using 2,2'-azobis(2-methylpropionitrile) as free-radical initiator. The polymer matrix is subsequently modified with meso-erythritol to open maleic anhydride ring with the aim to afford supplementary functions necessary for polymer matrix coupling with bioactive substances. Antioxidant characteristics are conferred too. Both comonomers are able for generating special effects as for example network formation, biodegradability and biocompatibility, gel formation capacity, binding properties, amphiphilicity, good oxidative and thermal stability, good film formers and temperature and pH sensitivity. The resulted structure is evidenced by common spectroscopic analyses, while the dual pH and temperature sensitivity is evaluated by determining the hydrodynamic radius and zeta potential. The antioxidant character is evaluated measuring the scavenger properties of the functionalized copolymer with erythritol against the 2,2-diphenyl-1-picrylhydrazyl radicals. The acute toxicity of the synthesized macromolecular compounds is estimated *in vivo* by mice oral administration followed by medial lethal dose determination (LD<sub>50</sub>). The obtained data include the compounds into the group of moderately toxic accordingly to Hodge and Sterner toxicity scale.

## **Biography**

lordana Neamtu has published more than 50 papers in quotated journals and participated in more than 15 Romanian projects.

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