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Novel family of thermoset poly (diol-co-tricarballylate) biodegradable matrices for use in tissue engineering & other biomedical applications

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B iodegradable elastomers have attracted recently much attention for their use in biomedical tissue engineering and implantable drug delivery systems. Elastomers possess many advantages over other fabricated tough polymers as their mechanical properties can be manipulated to be as soft as body tissues and withstand the mechanical challenges. To investigate the synthesis and *in vitro* characterization of a novel family of thermoset biodegradable poly (diol-co- tricarballylate) (PDT) elastomeric polymers for the purpose of their use in implantable drug delivery and tissue engineering applications. PDT prepolymers were synthesized via polycondensation reaction of tricarballylic acid with alkylene diols of varying chain lengths at 1400C for two hours under vacuum; then after purification, the formed prepolymers were further crosslinked at 1200C for 18 hours. The prepolymers and elastomers were characterized for their structural features, thermal and mechanical properties. PDT elastomeric films were subjected to cytocompatibility studies on human mesenchymal stem cells (MSCs) and Murine renal adenocarcinoma cells (RENCA). 1H-NMR and FT- IR analysis confirmed the chemical structure and purity of the prepolymers. The obtained elastomers were stretchable and rubbery and swell rather than dissolve in most of organic solvents. Mechanical properties were found to be dependent on the number of methylene groups in the chain of precursor diol. The cytocompatability studies showed that the elastomeric films supported the growth and adhesion of the cells. Biodegradable, polyester elastomeric matrices were successfully prepared and characterized. The family of thermally crosslinked PDT biodegradable polyesters has promising use in drug delivery and other biomedical applications including tissue engineering.

Biography

Youmna is a senior master student at college of Pharmacy, Qatar University. She got her Bachelor degree from College of Pharmacy, Ain Shams University, Cairo, Egypt. She has presented her graduation projectwork in both international and national conferences such as:

- American Association of Pharmaceutical Scientists in 2013 San Antonio, Texas, USA.
- 6th International Conference on Drug Discovery & Therapy in Dubai, February 11th, 2014.
- ARC'13 Annual Research Conference at Qatar National Convention Center in 2013.

She is looking forward to graduation aiming to work and continue in the research field where she finds her passion.

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