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Biodegradable Photopolymers based on vinylester and vinylcarbonate

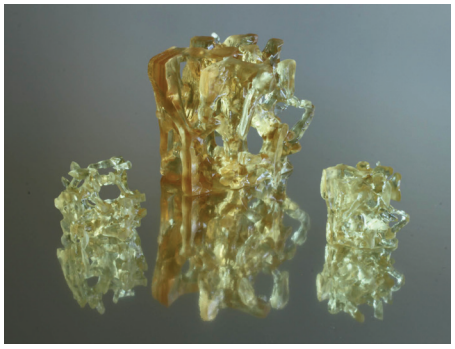
A new generation of biocompatible and biodegradable polymers for tissue engineering has been developed. The liquid precursors can be either cured in vivo or printed by additive manufacturing technology. The mechanical properties and degradation times can be tuned over a wide range. Materials can be designed to lead to non-toxic, FDA approved degradation products.

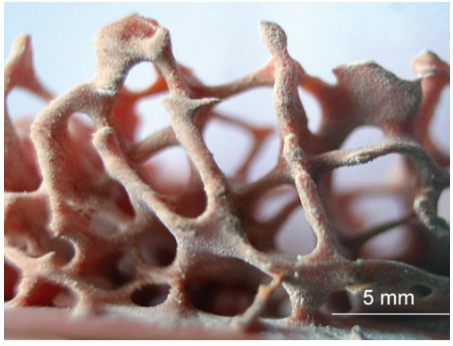
BACKGROUND

Biocompatible and biodegradable polymers based on polylactic acid (PLA) or similar polymers are state of the art materials for tissue engineering but suffer from several disadvantages such as bulk erosion leading to fast loss of mechanical properties, inflammation reactions due to the release of acidic degradation products, mechanical properties cannot easily be tuned, in-vivo curing or high resolution additive manufacturing is not possible.

TECHNOLOGY

A new generation of curable polymers based on vinylesters and vinylcarbonates as polymerizable group has been developed that avoid nearly all of the disadvantages of state of the art biopolymers for tissue engineering. In a simple one step synthetic approach several nontoxic natural derived or synthetic components (carbohydrates, proteins, polyethylene glycols,...) can be modified to give liquid curable formulations that can be hardened in vivo or be processed by rapid prototyping.





BENEFITS

- Tunable mechanical properties
- Tunable degradation profile
- New generation of low toxic polymers
- FDA approved degradation products
- In vivo curing possible
- Patient specific structures by Rapid Prototyping

APPLICATIONS:

- Bone replacement materials
- Cartilage repair
- Vascular grafts
- Plastic surgery

KEYWORDS:

- tissue engineering
- rapid prototyping
- biocompatible polymers
- biodegradable
- photopolymerization/ hydrogel

IPR:

Austrain patent granted, international patent application submitted

OPTIONS:

R&Dcollaboration, licence agreement, patent selling

INVENTORS:

Prof. Dr. Robert Liska,
Prof. Dr. Jürgen Stampfl et.al

CONTACT:

Hildegard Sieberth
TU Wien
Research and Transfer Support
Vienna, Austria
T: +43.1.58801.415243
hildegard.sieberth@tuwien.ac.at
www.rt.tuwien.ac.at

TU WIEN TECHNISCHE UNIVERSITÄT WIEN