



Case #695

Supramolecular Multi-Stimuli Responsive Alginate for Biomedical Applications

Critical to the success of the next generation of drug delivery and regenerative medicine bioengineering technologies will be the development of sustainable materials that provide better treatment targeting with lower toxicity. This technology is a novel biomaterial derived from naturally occurring alginate that is chemically modified to produce hydrogels with adjustable mechanical properties. Generation of the material does not depend on synthetic compounds, thereby preserving its biocompatibility and yielding a nontoxic polymer. Additionally, the mechanical properties of the material can be tuned by slight modifications of the functional groups. Using novel thermal and light-based crosslinking, the materials can be manufacture into microspheres for drug delivery or used to encapsulate cells for multiple therapeutic applications.

Applications:

- Tissue regeneration.
- Drug delivery.
- Cell encapsulation.
- Theranostics.
- Implant coatings.

Advantages:

- Safer – material is non-toxic and manufacturing of material does not rely on synthetic chemicals.
- Biocompatible – the materials are non-toxic and easily integrate with biological systems.
- Non-immunogenic – does not contain animal or human derived products.
- Environmentally sustainable – brown algae can be cultured for high yield harvesting.
- Flexible – the properties of the material can be modified via functional group changes.
- Configurable – materials can be generated into multiple shapes via crosslinking methodologies.

Intellectual Property and Development Status:

US Non-Provisional Application 16/381,718

Ready for research and development collaboration and licensing.

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