"DENDRIMER HYDROGELS" VCU #08-056

Applications

- Controlled release for drug and gene delivery
- Tissue regeneration
- Wound dressing

Advantages

- Amphiphilic properties
- Multifuctionality
- Variable structural strength based on need
- Non-toxic and non-immunogenic
- Controlled drug release based on pH change

Inventors

Hu Yang, Ph.D.
Pooja Desai

Contact

T. Allen Morris, Ph.D., MBA
Associate Director
amorris5@vcu.edu
Direct 804-827-2211

Market Need

With the development of new advanced therapeutic molecules and agents, there has been an increased need for effective drug delivery to targeted sites for disease treatment. Researchers have been working on controlled and targeted drug delivery systems that protect the material and prevent side effects to the body during transport.

Hydrogels have generated great interest in the fields of drug delivery and tissue regeneration. Existing hydrogels are created of natural or synthetic polymers and are able to encapsulate molecules such as various therapeutic agents. Dendrimers have also have also been studied due to its well-defined, highly branched nanoscale architecture with many reactive surface groups. For the field of drug delivery, dendrimers provide an ideal platform where the highly clustered surface groups allow for high drug payload to enhance therapeutic effectiveness.

Technology Summary

This is a novel method to synthesize dendrimer-based hydrogels with various controlled physical and chemical properties. Because of the high structural adaptability of these hyrdogels, it can be used in the delivery of a variety of therapeutics including hydrophilic or hydrophobic drugs, proteins, genes and other materials. The hydrogels have been developed to allow controlled release of materials based on the pH changes in its surroundings. The degradation rate of the hydrogel can also be controlled based on the need and use of the structure. This novel dendrimer-based hydrogels are able to integrate both the structural and functional advantages of both dendrimers and hydrogels.

Technology Status

Patent Application Published: 13/022974

Desai, P.N. & Yang, H. "Synthesis and Characterization of Photocurable Polyionic Hydrogels." *Materials Research* (2008).

This technology is available for licensing to industry for further development and commercialization.