

# Alginate Hydrogel and Aerogel

Ajith James Jose\*, Kavya Mohan and Alice Vavachan

*Postgraduate and Research Department of Chemistry, St. Berchmans College,  
Changanassery, Kerala, India*

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## **Abstract**

Alginate, a natural block polysaccharide with carboxylic functions, has increasingly drawn attention as an attractive compound in the world of research. Its excellent biocompatibility, biodegradation, and nontoxicity enable its application in a variety of fields like pharmaceutical and biomedical. Hydrogel microspheres of alginate play a significant role in wound dressing. Alginate-incorporated hydrogels play a well-defined role in bioengineering research to stimulate brain tissue enabling regeneration and also in bone reconstruction. Preservation of the dispersion of the gel by supercritical drying facilitates the formation of alginate aerogel. Unlike regular superabsorbents, alginate aerogel absorbs more saline compared to distilled water. This unique property opens a window for the development of nonsteroidal anti-inflammatory drugs. The biomedical applications of hydrogel and aerogel forms of the alginate are discussed in this chapter.

**Keywords:** Alginate, hydrogel, aerogel, biomedical applications

## **4.1 Introduction**

Biomaterials traditionally remain inert and do not interact with the host. But recently, biomaterials began to be replaced with synthetic materials such as polymers, ceramics, and metal alloys, because of their improved performance, compared to natural materials. Recent studies are going on the evaluation, treatment, augmentation, replacement, and regeneration of function of the body. Naturally derived materials are regaining their attention because of their inherent biocompatibility properties [1]. Alginates are now trending. They are naturally occurring anionic polymers, obtained from brown seaweed

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\*Corresponding author: [ajithjamesjose@gmail.com](mailto:ajithjamesjose@gmail.com)