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Analysis of Homogeneous and Inhomogeneous Gelation of Alginate Derived from *Pseudomonas aeruginosa*

Mucoid strains of *Pseudomonas aeruginosa* bacteria produce the extracellular polysaccharide alginate, which forms a physical biopolymer gel upon introduction of a divalent cation. Both acetylated and de-acetylated bacterial alginate have been extracted by refining isolation procedures found in publications, and their gels analyzed using Nuclear Magnetic Resonance (NMR) techniques. Alginate gels have potential applications in the field of artificial tissue engineering due to their ability to form mesoscale structures. This system is also of interest as cystic fibrosis (CF) patients are vulnerable to chronic *P. aeruginosa* infections. Studying bacterial alginate formation and gelation provides a greater insight into the role of water molecular dynamics in gels produced by these infections. Gelation of algal alginate has previously been thoroughly examined using NMR, and a point of interest is to compare the properties of bacterial alginate gels with those of algal alginate gels. In addition, acetylated bacterial alginate isolated from *P. aeruginosa* FRD1 is shown to have different gel properties than de-acetylated alginate isolated from *P. aeruginosa* FRD1153, with the latter forming a more inhomogeneous gel using a diffusion reaction front process. In addition, homogenous gels were prepared and analyzed with the same NMR techniques.