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Department of Chemistry

Special Seminar

4 p.m. Friday, November 9, 2012 • 331 Smith Hall



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Biomaterials for the Prevention of Postsurgical Adhesions

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Abstract

Adhesion formation is a common side effect of surgical intervention. Postsurgical adhesions are fibrous bands of scar tissue forming unwanted attachments between adjacent tissue planes. Serious postoperative complications attributed to adhesion formation in the abdominal and pelvic area include bowel obstruction, infertility, and chronic pain. The biology of adhesion formation is complex and multifactorial. It is widely accepted that a decrease in fibrinolytic activity and an exuberant inflammatory response are factors that contribute to adhesion formation.

The prevention of adhesions provides an opportunity for intervention with a biomaterial as a barrier device. The properties considered to be most important for an effective adhesion barrier include adherence to the injury site, compliance with soft tissue, low inflammatory response, and ability to provide tissue separation during the critical early wound repair process. Seprafilm®, a sterile, bioresorbable, translucent membrane composed of chemically modified hyaluronic acid and carboxymethyl cellulose is indicated for use as an adjunct in abdominal and pelvic surgery for reducing the incidence, extent and severity of postoperative adhesions at the site of placement. Seprafilm® has been used successfully to prevent surgical adhesions since its approval by the FDA in 1996. The polymer chemistry of Seprafilm® will be reviewed along with more recent extensions and improvements to this technology. Prospects for future therapeutic approaches will also be described, including in situ forming hydrogel materials with tunable physical properties, and the combination of biomaterials with therapeutic agents.

Host: Professor Theresa Reineke