



*Non-Confidential Description*  
**A Polymer for Non-Fouling or Fouling-Release Type Coatings**

*Technology Case: RFT-283*

### Invention Summary

Scientists at NDSU have recently invented a novel zwitterionic/amphiphilic pentablock copolymer coating that exhibits superior anti-fouling and fouling release properties.

The invention combines the low surface energy of polydimethyl siloxane (PDMS) and the protein resistance properties of both zwitterionic and amphiphilic compounds.

Since the amphiphilic substance has both hydrophobic and hydrophilic moieties on one compound, the polymer forms nanoscale heterogeneities, creating a surface topography that is unsuitable for the proliferation and adsorption of proteins and marine micro-foulers.



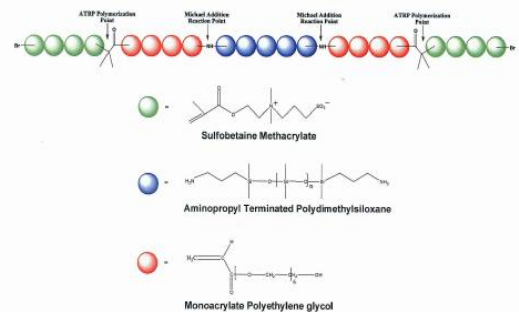
*Fig. Depicting the Coating System*

### Benefits

Exhibit superior anti-fouling and fouling release properties due to unique surface topography  
 Pseudo-barnacle measurement demonstrates a weak adhesion at surface of the coatings  
 High water contact angle values indicates a surface enriched with polydimethyl siloxane (PDMS)

### Invention Premise

This invention is directed toward the synthesis of a novel amphiphilic triblock copolymer of polydimethyl siloxane (PDMS) and polyethylene glycol, the synthesis of a novel initiator for atom transfer radical polymerization (ATRP), and the formation of a novel pentablock copolymer through the polymerization of SBMA ([2-(Methacryloyloxy) ethyl] dimethyl-(3-sulfopropyl) ammonium hydroxide), using the novel triblock initiator.



The synthesis is carried out in several steps and the pentablock copolymers are incorporated into a polyurethane coating formulation.

## Patents

This technology is patent pending with fully preserved world-wide patent rights available for licensing/partnering opportunities.

## The Lead Inventor



**Dean Webster, PhD**

### **Dept of Coatings and Polymeric Materials**

Dean.webster@ndsu.edu

Dr. Webster worked for Sherwin-Williams Company where he was involved in resin development for industrial coatings as well as long-range research in new resins and crosslinking chemistry. While in Chicago, he helped develop the Coatings Technology program at DePaul University and taught a course in coatings resin technology. In 1993, he moved to Eastman Chemical Company where he led project teams in the areas of applications development for new monomers, new chemistry for coatings systems, and polymer development for coatings. He joined the Coatings and Polymeric Materials Department at NDSU in the fall of 2001.

## Inquiries

Jaideep Goswami, Licensing Associate, MBA  
NDSU Research Foundation, Fargo, ND 58108-6050  
Phone: 701-231-7886 Fax: 701-231-6661  
Email: [jaideepGoswami@ndsurf.org](mailto:jaideepGoswami@ndsurf.org)  
Web: [www.ndsuresearchfoundation.org](http://www.ndsuresearchfoundation.org)