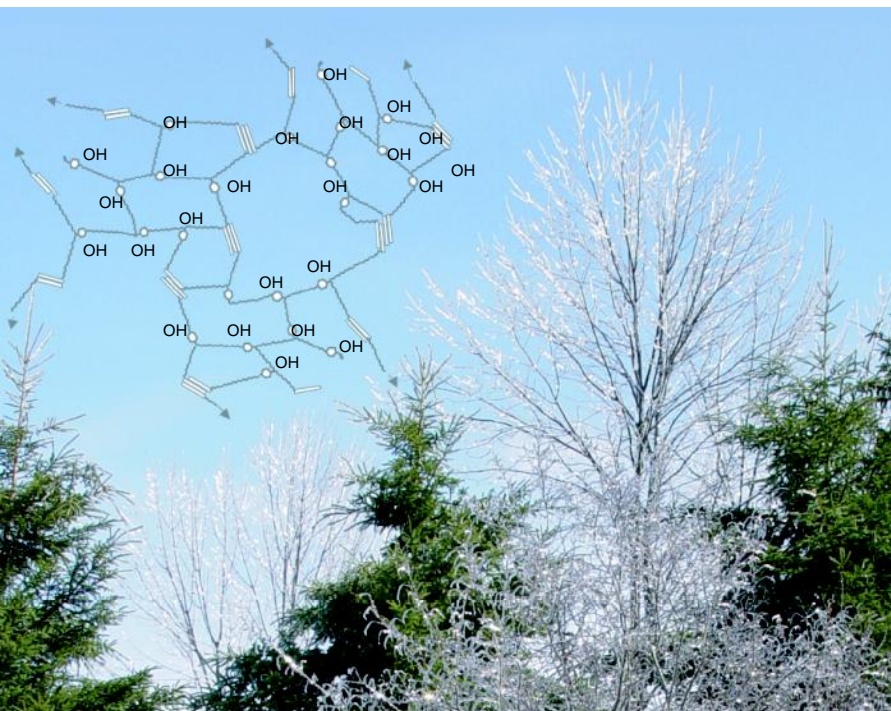




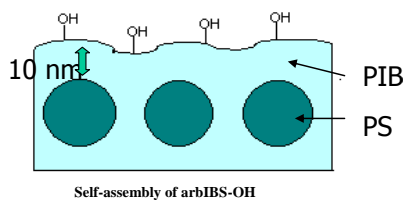
Synthesis and Characterization of Novel Double-Functionalized Surface Modified Thermoplastic Elastomers



The Puskas group DMR #0509687
Program officer: Dr. Andrew J. Lovinger

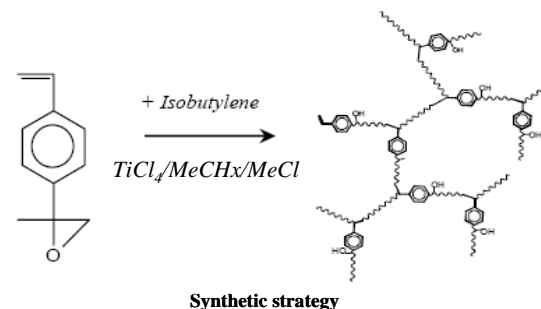


Dendritic (arborescent or tree-like) (polyisobutylene-polystyrene block copolymers (*arb*IBS) are the third generation of polyisobutylene (PIB)-based nanostructured biomaterials. The first generation from this class of polymers, linear tri-block polystyrene-*b*-polyisobutylene-*b*-polystyrene (SIBS), is FDA-approved and currently used as the polymeric coating on drug-eluting coronary stents (<http://www.taxus-stent.com/#>, Device Details, Interactive Overview). XPS and AFM studies of SIBS and *arb*IBS biomaterials demonstrated that a 10 nm layer of pure PIB segregated to the surface during self-assembly of the nanostructure. Arborescent polyisobutylene has been synthesized by inimer-type living carbocationic polymerization of a newly synthesized inimer (*initiator-monomer*, IM), 4-(1,2-epoxyisopropyl)styrene with isobutylene (IB) using TiCl_4 as coinitiator. This IM yielded *arb*PIBs with $M_n \sim 100,000$ g/mol with 3-8 branches. Blocking of this material with polystyrene will yield *arb*IBS whose surface is decorated with -OH groups, further improving biocompatibility.



Students:
Elizabeth Foreman (US)
Mustafa Sen (Turkey)
Lyn Munoz Robledo (US)

PDF:
Kevin Cong (China)



Outreach Activities



The Puskas group DMR #0509687
Program officer: Dr. Andrew J. Lovinger



International collaborators

Polymer Engineering, Bayreuth, Germany



Supporters



(Rubber Division, Bayer Inc.)



38895-AC7



Canada

DFG

Germany



Prof. Miroslawa El Fray



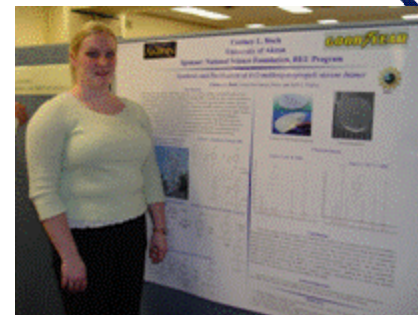
Technical University
Szczecin, Poland



Prof. Volker Altstädt

REU Program

Posters on the Hill 2006
Cortney L. Hoch



Puskas, Dr. Maden (Sen. Kennedy's office), Hoch



Billi F. Copeland (Director, McNair Scholars),
Hoch, Prof. Coleen Pugh (REU Director)