

Title: Promoting tissue healing and regeneration using peptide-modified glycosaminoglycans

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Abstract: Proteoglycans play an important role in extracellular matrix remodeling, homeostasis, and signaling. Due to their negatively charged glycosaminoglycan chains as well as distinct core protein structures, they interact with a variety of molecules, including matrix proteins, growth factors, cytokines and chemokines, pathogens, and enzymes. Here we focus on two bioconjugates that were designed to mimic features of existing proteoglycans. The first models the biological activity of the small leucine-rich proteoglycan, decorin. Like native decorin, our decorin mimetic plays a key role in collagen organization and wound healing. Recently, we have augmented the decorin mimetic with peptide ligands to the $\alpha_v\beta_3$ integrin receptor found on endothelial and endothelial progenitor cells. The $\alpha_v\beta_3$ ligand confers angiogenic activity to the decorin mimetic and supports wound healing in an ischemic environment in diabetic animals. The second mimetic is designed to target inflamed endothelium to restore physical barrier function of the endothelial glycocalyx. By restoring barrier function, the glycocalyx mimetic reduces intravascular thrombosis and inflammation thereby improving healing outcomes following ischemia reperfusion injury in animal models.

Short Biography: Dr. Panitch received bachelor's degrees from Smith College in Biochemistry and from the University of Massachusetts-Amherst in Chemical Engineering. She completed her Ph.D. in Polymer Science and Engineering from the University of Massachusetts. After a postdoctoral fellowship at the Swiss Federal Institute of Technology (ETH) and University of Zurich she accepted a position of Assistant Professor in the Harrington Department of Bioengineering at Arizona State University. In 2006 she joined the faculty in the Weldon School of Biomedical Engineering at Purdue University and in 2013 was named the Leslie A. Geddes Professor of Biomedical Engineering. In January 2015 she accepted a position as Vice Provost for Faculty Affairs at Purdue University. In this position she oversaw faculty hiring and retention for the university, updated the promotion and tenure policies, procedures and guidelines, and led professional development efforts. In June, 2016 she was appointed as the Edward Teller Professor and Chair of Biomedical Engineering at University of California Davis, and she currently serves as the Executive Associate Dean in the College of Engineering at the University of California Davis. She is a member and Fellow of the Biomedical Engineering Society, the American Institute for Medical and Biological Engineers (AIMBE) and the National Academy of Inventors. She also serves as the Secretary and Treasurer and on the Executive Board for AIMBE and as an Editor for the Journal of Colloids and Surfaces B: Biointerfaces.