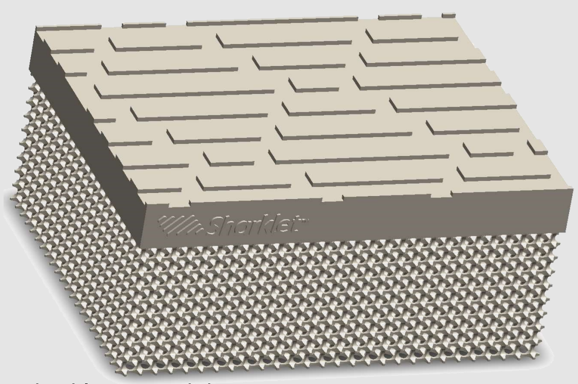
Center for Bioengineering Innovation Lecture Series Fall 2016

Friday, September 23, 1-2pm

Biology (building 21 at 617 S Beaver St) room 256

Development and Evaluation of a Bilayered, Micropatterned Dressing for Full-Thickness Wound Healing

Nearly 12 million wounds are treated in emergency departments throughout the United States every year. The limitations of standard-of-care for complex, full-thickness wounds are the driving force for the development of new wound treatment devices that result in faster healing of dermal and epidermal tissue concurrently. At Sharklet Technologies, Inc. we have developed a bilayered, biodegradable hydrogel dressing that uses microarchitecture to guide two key steps in the proliferative phase of wound healing: re-epithelialization and revascularization. The Sharkskin dressing was evaluated *in vitro* in a cell migration assay and *in vivo* in a bipedicle ischemic rat wound model. Results indicate that the micropatterned apical layer of the dressing increased artificial wound coverage by up to 64%, p=0.024 *in vitro. In vivo* evaluation demonstrated that the bilayered dressing construction enhanced overall healing outcomes significantly compared to untreated wounds and that these outcomes were not significantly different from a leading clinically available wound dressing. All dressings exhibited increases in composite mean wound healing scores compared to no treatment at 7 (22% increase, *p*£0.05), 10 (32% increase, *p*£0.001) and 14 (31% increase, *p*£0.05) days post-wounding. Collectively these results demonstrate high potential for this new dressing to effectively accelerate wound healing using physical guidance cues.



Sharklet wound dressing

Dr. Chelsea M. Magin is currently the Director of Product Development at Sharklet Technologies, Inc. in Aurora, Colorado. In this role she leads the completion of research and development for medical devices that use the bio-inspired Sharklet surface texture to control biological adhesion. Dr. Magin received her BS in Materials Science and Engineering and PhD in Biomedical Engineering from the University of Florida, where her doctoral research focused on developing Sharklet micropatterns to control adhesion of both marine fouling organisms and mammalian cells. She subsequently completed an NIH Postdoctoral Fellowship at the University of Colorado at Boulder in the Anseth Research Group where she developed user-controlled, dynamically tunable biomaterials to study mesenchymal stem cell differentiation and the progression of heart disease in a valvular cell model. Her work has been published (13) and presented (24) in internationally recognized venues including the International Congress on Marine Corrosion and Fouling where she received an award for best poster and the World Biomaterials Congress. She recently edited and contributed a chapter to the first book in the Wiley-Society for Biomaterials Series entitled "Bio-inspired Materials for Biomedical Engineering." Dr. Magin is also an Adjunct Professor of Bioengineering at the University of Colorado, Denver, where she teaches the Biomaterials Laboratory and mentors Senior Design teams. She is an active member of the Colorado Bioscience Association Education Committee and the Charles C. Gates Center for Regenerative Medicine. Dr. Magin is also a graduate of Impact Denver 2016 and serves on the Board of Directors for the nonprofit Jovial Concepts.

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