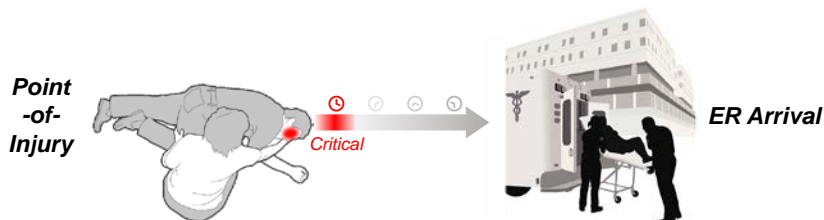


OcuDERM

Ocular drug-eluting reconstructive matrix for treating point-of-injury orbital trauma ID: 04068, 04336

Featured Innovators: Morgan Fedorchak, PhD and Jenny Yu, MD, FACS

OcuDERM aims to preserve vision by providing immediate support, protection, and therapy at the point-of-injury for the 2.5 million Americans who suffer ocular injuries each year. The standard treatment for ocular trauma — sequestering the injury with a Styrofoam cup — fails to address critical needs in the most important moments following injury. For this reason, ocular trauma has become the leading cause of monocular blindness. OcuDERM is an injectable gel that is easy to administer in any prehospital setting. It has the potential to minimize the complexity of the injury, reducing treatment costs from \$55,000 to \$800. In addition to the \$2.4 billion trauma market, OcuDERM could also be applied to aesthetics and reconstruction, leading to significantly more value after initial IDE approval and clinical testing.



Technology Description

OcuDERM is a unique injectable thermoresponsive gel which transitions from a liquid to a stable solid upon dermal application in under 5 seconds. This material is non-degradable, conforms to the volume of the damaged tissue, and provides immediate treatment via absorbed therapeutic drugs. It is protective yet easily removed and requires no specialized equipment or training. These key features showcase the unique value that our OcuDERM technology can deliver to first responders, ophthalmologists, and other specialists.

Advantages

- Point-of-injury administration for immediate stabilization and therapy.
- Reduce injury complexity and surgical costs, improve outcomes for patients.
- Inexpensive and simple manufacturing with huge follow-on market opportunities.

Applications

- Stabilization, support, and protection for acute ocular and periorbital injuries resulting from high-velocity impacts.
- Minimize the risks of infection, inflammation, and scarring through the continual release of therapeutic drugs.
- Reconstructive and aesthetic augmentation for a variety of periocular and facial pathologies.

Stage of Development

Preclinical safety evaluation and efficacy testing in large animal ocular trauma models

IP Status

Preparation of a provisional patent application is in progress.

Notable Mentions

- 2017 Chancellor's Innovating Fund plus Regional Partner match (Center for Military Medical Research), \$70k total
- 2017 First Gear Program, \$3k towards commercialization + business advising

Innovators



Morgan Fedorchak, PhD

Assistant Professor of Ophthalmology
Chemical Engineering and Clinical &
Translation Sciences
University of Pittsburgh

Dr. Fedorchak is the director of the Ophthalmic Biomaterials Laboratory and one of the founders of Selkie Therapeutics, LLC, an ocular drug delivery company developing the SoliDrop technology. Her lab's focus is in the specific application of biomaterials and drug delivery systems in ophthalmology. The highly translational work done in the Fedorchak Lab regularly intersects with the innovation ecosystem at Pitt and beyond, including the Benchtop to Bedside course, the Coulter TPII program, the Idea Foundry Life Sciences Accelerator, and the recently awarded Chancellor's Innovation Fund. Her academic research is funded by the National Eye Institute and the Cystinosis Research Foundation.

Education

PhD Bioengineering
University of Pittsburgh

BS Chemical and Biomedical Engineering
Carnegie Mellon University

Publications

- Fedorchak MV, et al. Long term glaucoma drug delivery using a topically retained gel/microsphere eye drop. *Scientific Reports*, 2017. *In press*.
- Mammen A, et al. Endophthalmitis Prophylaxis Using a Single Drop of Thermo-Responsive Controlled-Release Microspheres Loaded with Moxifloxacin in a Rabbit Model. *Transl Vis Sci Tech* 5(6):12, 2016.
- Fedorchak MV, et al. 28-day ocular delivery of brimonidine tartrate from rationally designed degradable microparticles in a rabbit model. *Exp Eye Res*, 125:210-6, 2014.
- Mealy J, et al. Development of a one-month controlled release ocular insert to treat glaucoma. *Acta Biomaterialia* 10(1):87-93, 2014.



Jenny Yu, MD, FACS

Assistant Professor of Ophthalmology
Orbital, Oculoplastics and Aesthetic
Surgery Services
University of Pittsburgh

Dr. Yu is the Vice Chair of Clinical Operations for the Department of Ophthalmology, UPMC Eye Center. Dr. Yu also serves on the Orbital, Oculoplastic, and Aesthetic Surgery Service, is an Assistant Professor of Ophthalmology and Otolaryngology, University of Pittsburgh, and is the Team Ophthalmologist for the Pittsburgh Penguins. Dr. Yu has had both clinical and basic science experience since college. She has worked on spinal cord injury research where she developed animal model protocols focusing on the healing immunology of the central nervous system. Her experience in ophthalmology has allowed her to become involved in various basic and clinical research projects including evaluating ocular structural changes after laser treatments, diagnosis of ocular diseases via imaging, and studying the effects of pharmaceuticals on the ocular surface.

Education

MD. Medicine
Ohio State University

BS Biochemistry
Ohio State University

Publications

- Duncan, KE, et al. The Utility of Image Guidance in Developing Minimally Invasive Periorbital Approaches of the Skull Base. *J Neurol Surg B*, 78(S 01), S1-S156, 2017.
- Ares WJ, et al. Gamma Knife Radiosurgery for Uveal Metastases: Report of three cases and a review of the literature. *Am J Ophthalmol*, 2017.
- Davidson EH, et al. Clinical Considerations for Vascularized Composite Allotransplantation of the Eye. *J Craniofac Surg*, 2016