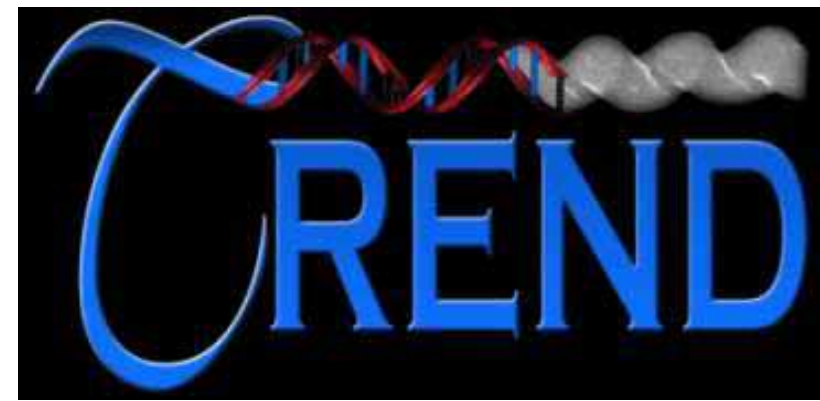


The Road to Regeneration



Center for **T**issue **R**egeneration and **E**ngineering at **D**ayton

- Learn from the classical models
- Coax stem cells to differentiate at will
- Use scaffolds to create tissues or organs
- A combination of all fields will provide solutions

1) Key expertise (Areas of Expertise and Center Leaders)

- . Tissue Regeneration, biomaterials, scaffolding for tissue engineering (bone and lens)
(Tsonis, Lafdi, Singh, Kango-Singh)
- . Growth Regulation during Organogenesis
(Singh, Kango-Singh)
- . Fruit fly Model for genome wide and chemical screens for regeneration
(Singh, Kango-Singh)
- . Nanotoxicology
(Rowe),
- . Vertebrate Fluid Homeostasis and surgical device development
(Krane)
- . Tendon Repair, Wound healing
(Joseph)
- . Stem Cells
(Tsonis, Hong)
- . Biomimetic materials development for implant coatings
(Hansen)
- . Biocompatibility of metallic biomedical implants
(Hansen)

Key Resources:

1. State of the Art Microscopy facility “NEST: Nanoscale Engineering Science & Technology laboratory” (<http://www.nestlaboratory.com/>). The Nest Lab has SEM, TEM, LSCM, Epifluorescence, Apotome, Macro imaging Scopes with image analysis workstations and platforms .
2. Vivarium, various other model systems are housed in individual laboratories (fruit flies, salamander, axolotl, oysters) .
3. Set up for Molecular biology, tissue culture, materials research, and nano-material research.

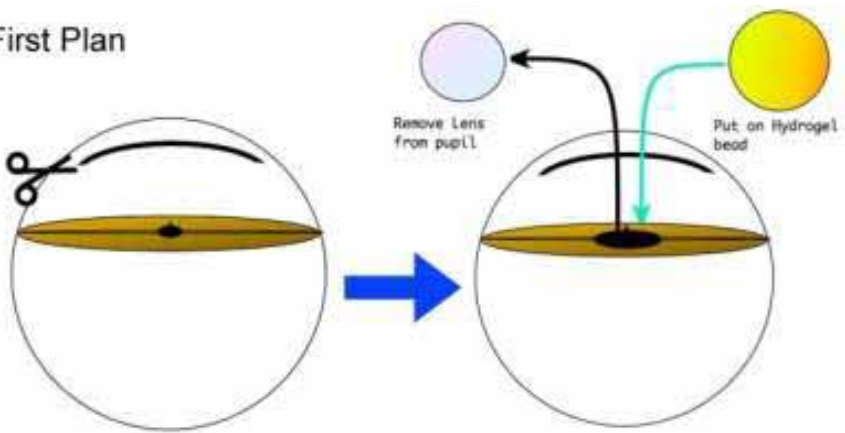
Collaborations:

1. Rice University (lens project); Miami University Vision Center (Regeneration).
2. Ethicon Harmonic R Surgical System.
3. Collaborations with the OSU, Wright State University, Industrial Research partners in Ohio.
4. Okayama University, Japan, Centre for Human Genetics, Belgium, University of Florida at Gainesville, Florida
5. M D Anderson Cancer Center, Houston

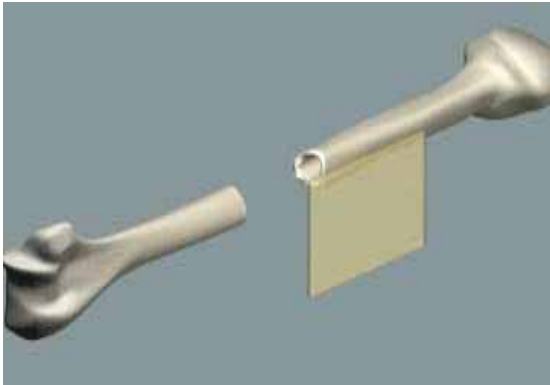
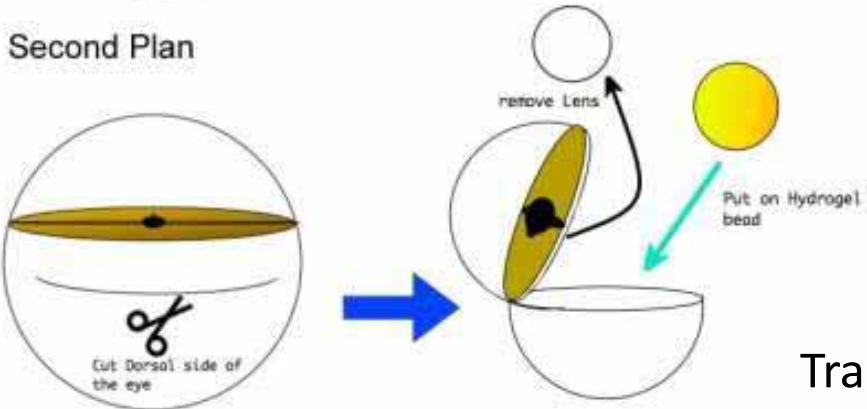
3) Key Technology

Material synthesis unique experimental models for regeneration

First Plan



Second Plan

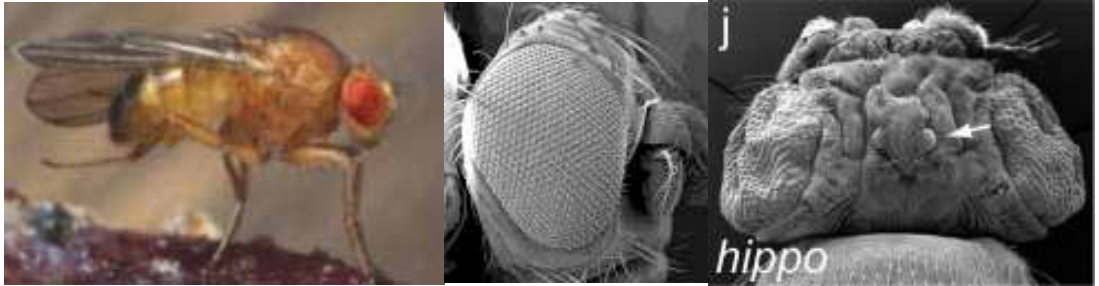


Tissue Engineering

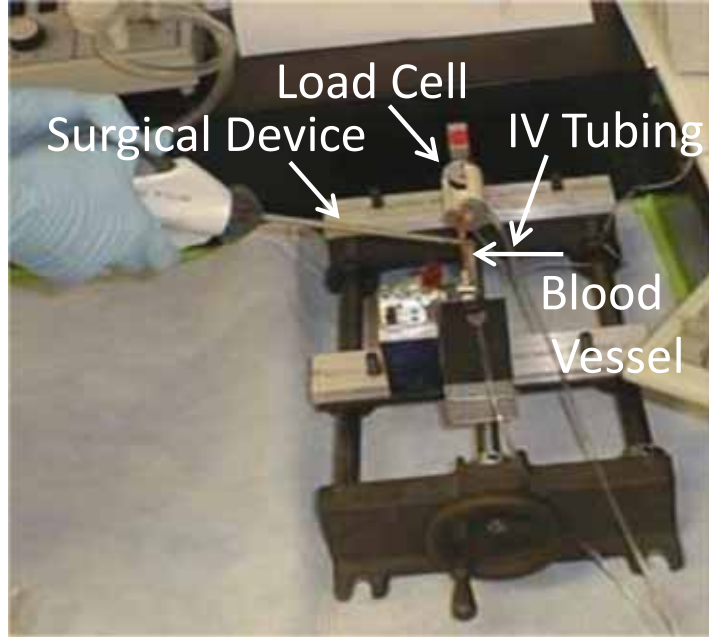


Prototypic Blood Vessel Tensioning Device for Surgical Instrument R&D

Transgenic animals



HOMOPHILA
Human Disease to
Drosophila Gene Database



4) Unique processes:

- Unique blend of research team members comprising of undergraduates, graduates, postdocs and research investigators.
- Researchers at TREND are representatives from Engineering, Biology, Clinical research, and sports medicine field which provides unique perspective to our discussions and interactions in the field of tissue regeneration and engineering that encompass basic biology (developmental, cellular and molecular) and advanced material engineering.
- Interdisciplinary research with collaborators from UD Departments of Biology, Math, Engineering.

Strong interaction with the

- Local community (Tissue Center; Center for Neuroscience at WSU),
- Regional (Vision Center, University of Miami)
- National and international collaborators.
- Our strength is in the diversity of specializations of researchers in our group.