TISSUE ENGINEERING AND STEM CELL THERAPY

Tissue engineering is an emerging field that takes advantage of stem cells, molecular signals, and polymer technology to build a variety of biological tissues. The current projects in our laboratory are focused on intestinal tissue engineering. The ultimate goals of these projects are to create tissue equivalents so that patients with short bowel syndrome may benefit from the regenerated intestinal tissues.

The scope of the current laboratory projects ranges from stem cell biology to animal surgery. The specific projects are as follows.

1. Mechanical force and smooth muscle cell growth.
2. Transplantation of intestinal smooth muscle cells.
3. Enteric neural crest stem cell isolation and expansion.
4. Transplantation of neural crest stem cells.
5. Enteric glial and neural cell interactions.
6. Polymer scaffold design and engineering.
7. Controlled delivery of regenerative signals.
8. Angiogenesis in implanted scaffolds.

These tissue engineering principles can be applied to a variety of organ systems. There are also collaborative projects with other UCLA investigators to regenerate bone, bladder, cardiac muscle, and neurons.

Residents interested in pursuing an M.S. or a Ph.D. degree may obtain a graduate education from the UCLA interdepartmental program in Biomedical Engineering during the research years.