Dr. Yong Li’s Lab:

Our team has developed several novel techniques for molecular, cellular and small animal-based research to focus on two major areas of study: 1) exploring the properties of the dedifferentiation/transformation of terminally differentiated cells into various stem cells for regenerative medicine and tissue engineering applications; 2) studying the processes involved with fibrous scar formation and prevention in the injured and diseased tissues of the neuron and musculoskeletal system; and 3.) Bioengineering to build 3D softy tissues (muscle & tendon) to repair wound defect with scarless healing. The laboratory is also interested in translational study and clinical application of stem cells and engineered tissue for treating congenital diseases and traumatic injuries. We have also set up classic amphibian models of tissue regeneration; newts and salamanders can rebuild most missing body parts such as limbs, liver, lens and heart after amputation injury. However, injured mammalian tissue, including that of humans, is usually replaced with fibrotic scar tissue at the end of the healing process. Our aim is to determine the mechanism(s) behind the regenerative process in amphibians and ascertain the relationship(s) to human tissue or organ regeneration. We will investigate the cellular dedifferentiation process for increasing the stem cell population and methods of preventing fibrotic scar tissue formation during wound healing. Our expectation is to transfer our learning from amphibian regenerative models to enlarge stem cell pool for regenerative medicine applications, and to build various functional human tissues/organs for human patients’ demand.

Current Research Project:

1. Children’s Regenerative Medicine: The project will use various cell sources combined with bioengineering scaffolds to build functional tissues for repair of pediatric defects, such as children’s diaphragmatic hernia.

2. Dedifferentiation and Stem Cell Populations: The project aims to enlarge the stem cell pool without genetic modification as a cell source for regenerative medicine.

3. Adult Embryonic Potential Stem Cells and Application: Obtain natural embryonic potential stem cells from adult tissue for utilization in tissue engineering and regenerative medicine, such as central neurologic disorder and disease.

4. Fibrosis and Prevention Studies: Investigate the mechanism behind the fibrosis process after injuries and diseases, and seek methods for prevention of fibrous scar tissue formation.

5. Newt model: Combination of mammalian cells with amphibian cells to investigate the potential of tissue/organ regeneration process in the Newt model and the mechanisms.

Open Position:

The laboratory is recruiting various researchers at level from junior faculty, postdoc and student researcher. Person interests to our project listed above can directly send your application with your research interesting and update CV to: jobseekerinli@gmail.com