

Welcome to the Shi Lab!

Research you will be involved

We have many different projects to work with, so you have flexibility to choose your favorite project for your graduate study. Some projects are more molecular genetics starting from genetic mutant characterization, map-based cloning and then gene functional analysis, while others can be more biochemical oriented, for example, proteomics and chromatin-based research. In any case, you will be exposed to cutting-edge research tools and learn many molecular and biochemical techniques. We expect to train graduate students to be multitasking, well-skilled, and with broad knowledge.

Facility and equipment

The Shi lab has over 2000 square feet lab space equipped with two temperature controlled plant growth rooms and two confined rooms for radioactive materials. Equipment in the Shi lab include: Four ThermoCyclers for polymerase chain reaction, hybridization oven, X-ray film processor, Beckman LS6500 scintillation counter, electrophoresis and gel documentation system, incubators, incubated shakers, electroporator for bacterial transformation, desktop and floor-stand high-speed centrifuges, spectrophotometer, Bio-Rad 1-D and 2-D gel system, -80°C and -20°C freezers, laminar flow hoods for tissue culture, Andor CCD camera system for fluorescence and luminescence imaging, inverted fluorescent microscope equipped with phase contrast, stereo microscope, luminometer, fluorometer, atomic absorption spectrometer, equipments for intracellular ion measurement including WPI Duo 773 electrometer, PC-10 glass electrode puller, 1300M beveler and 3D micromanipulator, Shimadzu HPLC system and fraction collector, and an array of specialized equipment for molecular biology research.

The Department of Chemistry and Biochemistry has cold-rooms, computer labs and core facilities for chemical and biochemical research. Please visit here for details: <http://www.depts.ttu.edu/chemistry/Facilities/index.php>. Available within the Center of Biotechnology and Genomics at Texas Tech University (<http://www.depts.ttu.edu/biotechnologyandgenomics/>) are genomics and proteomics facilities including DNA sequencers, oligo synthesizers, microarray scanner, protein sequencing, and mass spectrometers.

Techniques you can learn from here

Molecular genetics techniques including EMS mutagenesis, mutant screening, mutant phenotyping, map-based cloning, DNA sequencing, genetic complementation, etc; Luciferase imaging based techniques; DNA, RNA, and protein isolation; Northern hybridization and qPCR; Western blotting; Protein expression and purification in E. coli; Plant transformation; Plasmid vector construction; DNA methylation analysis; Yeast two-hybrid assay and other protein-protein interaction techniques; HPLC techniques; Ion content measurements; Fluorescent microscopy; Basic bioinformatics tools; and many other specific molecular and biochemical techniques.

Courses you can take (6 lecture courses are required for a PhD student)

The biochemistry division within the department offers several biochemistry courses for our graduate students: Proteins (Chem 5333), Lipids (Chem 5336), Enzymes (Chem 5337), Nucleic Acids (Chem 5339), Physical Biochemistry (Chem 5335), and Biochemistry topics (Chem 5304). In addition, the Department of Biological Sciences (<http://www.biol.ttu.edu/default.aspx>) offers an array of courses you can opt to take.

How to apply: <http://www.depts.ttu.edu/chemistry/Graduate/apply.php>

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