

**The Center for Biotechnology and Genomics** (<http://www.depts.ttu.edu/biotechnologyandgenomics/>)

The Center for Biotechnology and Genomics is a collaborative, multidisciplinary center that provides instrumentation, research support, and training in various aspects of modern biotechnology and molecular biosciences. The core instrument facility and a teaching lab occupy more than 5,000 square feet in the Experimental Sciences Building.

The center offers two Masters of Science degrees in Biotechnology: a unique one-year as well as a two-year program administered by Texas Tech and the Texas Tech University Health Sciences Center (TTUHSC). The center also partners with the Texas Tech School of Law to offer a joint Masters and Law degree.

The center is staffed by researchers with expertise in the following areas:

I. Nextgen Sequencing/Genomics core facility at the Center for Biotechnology and Genomics provides sequencing services to the entire TTU community as well as outside customers. Services include sequencing library preparation from DNA/RNA, sequencing on Illumina, Miseq, and NovaSeq 6000 platforms, and primary and secondary data analysis. Services include:

- Stranded mRNA-sequencing for both prokaryotes and eukaryotes
- Small RNA sequencing
- Whole genome resequencing
- 16S metagenome sequencing
- Meta-transcriptome sequencing after target depletion
- ChIP-sequencing

II. Proteomics/Metabolomics core facility at the Center for Biotechnology and Genomics provides services to the entire TTU community as well as outside customers for analysis of proteins and metabolites from cells, tissues, or other biological samples using cutting-edge instrumentation and methods.

Services offered:

- Protein IDs by LC-MS/MS and MALDI-TOF/TOF
- Whole proteome profiling from cells, tissue, etc.
- In-gel/in-solution digestion of proteins
- Data analysis using advanced software such as MASCOT, SEQUEST, Compound Discoverer, LipidSearch, and Ingenuity Pathway Analysis (IPA)
- Protein quantification (label-free quantification, tagging)
- Analysis of post-translational modifications in proteins (e.g. phosphorylation)
- Global metabolite/lipid profiling
- Targeted metabolite analysis (identification and quantification)

III. Bioinformatics core facility at the Center for Biotechnology and Genomics provides services in the domains of genomics, proteomics, and general bioinformatics. Services include:

- Nextgen Sequencing (NGS)
- RNA-Seq analysis
- Small RNA-Seq analysis
- de novo transcriptome assembly and annotation
- Whole genome assembly
- Metagenome and metatranscriptome analysis
- Pathway analysis Proteomics
- Proteome analysis for identification of proteins
- Quantitative proteome analysis

- Pathway analysis
- Analysis of post translational modifications
- Computational proteomics
- Protein modeling
- Protein-protein and protein-ligand docking

The center also provides some consulting and technical resources to both established and startup companies located in the region. Some students in the master's degree program serve one-year internships with private sector companies.