Bioinformatics at UTEP

Bioinformatics is an interdisciplinary science that offers unique opportunities for individuals with diverse backgrounds to learn and collaborate with others. There are demands for well-trained bioinformatics professionals capable of developing computational tools integrated with experimentation for solving complex biological problems. Our research areas are:

- biomolecular sequence analysis
- ecoinformatics and phylogeny
- molecular structure and dynamics
- whole exome and proteomics data analysis.

Technological improvements in instrumentation, computational abilities, information systems, and mathematical tools, with fast acquisition and availability of bioinformatics data, have transformed our understanding of life processes. Theoretical advances in complexity, dynamical systems, and uncertainty, coupled with advances in computational methods and modeling, have led to expanding bioinformatics research. This has enabled expansion in the use of mathematics and statistics beyond the traditional fields of physical science and engineering. With that expansion, life sciences and other fields are posing new questions for the mathematical sciences, stimulating further the growth of mathematical ideas.

Bioinformatics Education

Our mission in education is to provide bioinformatics (BINF) courses and research opportunities for students pursuing

- undergraduate bioinformatics training
- Master of Science in Bioinformatics
- computational bioscience for PhD in Computational Science.

The MS degree in bioinformatics at UTEP was initiated and supported in part by grants from the Sloan Foundation and Texas Workforce Commission with the concept of training science professionals. It has been part of the national effort in developing professional MS degrees to enhance our future economy through promoting innovations in science and technology. In addition to coursework, students attend the weekly bioinformatics colloquium series, with research seminars and professional training workshops, and complete an internship at a bioinformatics company or research institution.

We also aim at training PhD students in developing computational models and bioinformatics tools. As the core of bioinformatics is still largely unexplored in its mathematical theories and prediction algorithms, we thrive in preparing computational scientists with strong mathematical skills and profound insights into complex biological systems for collaborative and multidisciplinary work with biomedical and clinical researchers.

Career and Research Highlights

Employers of our recent graduates include

- ARUP Laboratories
- MD Anderson Cancer Center
- Memorial Sloan Kettering Cancer Center
- Merck Cambridge Exploratory Science Center
- National Cancer Institute
- Pfizer Global Research & Development.

Bioinformatics Laboratories

As a unit in the Research Infrastructure Core of the NIH-funded Border Biomedical Research Center (BBRC) at UTEP, research efforts at the Structural Bioinformatics Lab (SBL) and Translational Bioinformatics Lab (TBL) include

- creating web-based modules for patient education and online search engines for viral genome structure databases
- developing computational tools as part of a state-wide initiative for cancer prevention and research as well as individualized patient care in Texas.