

The University of Texas at Arlington
TECHNOLOGY-LED ECONOMIC DEVELOPMENT
IN THE DALLAS/FORT WORTH REGION

Research Overview

A tiny protein that helps patients battle cancer. Non-invasive imaging technology that delays or prevents blindness in diabetics. New drugs that relieve chronic pain. These and many other groundbreaking explorations take place at The University of Texas at Arlington. The University's mission to achieve Tier I research status focuses on four areas: 1) building collaborations with industry government and other research universities in the region; 2) improving and expanding our research infrastructure; 3) establishing recognized research centers of excellence on campus; 4) increasing research faculty hires in specific areas. In the last two years, UT Arlington has hired more than 75 new faculty members. Faculty hires and research centers of excellence are targeted in the six economic clusters identified as being important to sustained economic growth in Arlington, the Dallas/Fort Worth region, and Texas.

Following are three major research initiatives at UT Arlington and specific programs aligned with them:

Biotechnology and Health Care

- ◆ Advanced optical medical imaging devices for non-invasive, painless, early detection of disease, more reliable diagnoses, and quantitative monitoring and analysis of treatments.
- ◆ Minimally invasive devices for surgical procedures.
- ◆ Smart Hospital for advanced nurse training and rural medical training to help alleviate the shortage of nurses.
- ◆ New cancer treatment drugs and new radiation protection drugs.
- ◆ New pain management techniques and therapies for cancer patients.
- ◆ Tissue engineering for damaged organ replacement and repair.

Manufacturing and Chemical Processes

Manufacturing

- ◆ Intelligent micro-manufacturing techniques to keep American manufacturing globally competitive with labor-intensive, off-shore approaches.
- ◆ Automation and controls for the next generation of automotive, aircraft, and other types of assembly plants.
- ◆ UT Arlington, in collaboration with Hanson Pipe Products in Grand Prairie, will build one of the world's largest materials engineering and testing structure analysis laboratories for development of advance structural materials to withstand terrorist attacks, natural disasters, and other threats.

Chemical Processes

- ◆ Low-cost, efficient, and easily configurable micro-reactors to make diesel fuel from bio-feedstocks like vegetable oils and waste animal fats. These reactors can be located behind feed stores, poultry processing plants, on farms, or other "on-site" locations to generate diesel fuels without large transportation costs.

Nanotechnology

Electronics and Semiconductor Technologies

- ◆ Chemical, pressure, infrared, and millimeter sensors that can detect bombs, chemical devices or potentially dangerous sources of radiation.
- ◆ Strong nanomagnetic materials with thousands of electronic applications.
- ◆ Drug delivery and nanotherapeutics that produce greater efficiency of treatment and fewer side effects.
- ◆ New software for multiple device and sensor integration with applications in homeland security and wide area surveillance with minimal human interaction.
- ◆ Reliable copper interconnects and semiconductor packaging materials for higher density and longer life devices.
- ◆ Nanostructured semiconductor materials for faster and higher computational capacity devices.
- ◆ New semiconductor materials for smaller, faster, more powerful computer chips.
- ◆ RFID technology for commerce tracking, hazardous product tracking, and military weapons inventory and tracking.

Energy

- ◆ Solar cells, advanced piezoelectric designs for micro windmills, and mechanical energy harvesting for conversion to electrical energy.
- ◆ Hydrogen production, storage, and conversion in fuel cells for clean electrical energy production and transportation.
- ◆ Ultra-strong magnetics for use in lightweight, energy efficient, miniature actuators and motors (micro machines).

Aerospace and Defense

- ◆ Hypersonic research and aircraft design.
- ◆ Novel structural composites for airframes and helicopter rotors.
- ◆ Reconfigurable sensors and detectors for use on the battlefield, in homeland security, and for multiple threat detection and analysis.
- ◆ Chemical gas detection and analysis.
- ◆ Multiple threat analysis software and massive grid computing.