Overview of the Organization

The University of Oklahoma Biomedical Engineering Center (OUBC) was initially formed in 1998 as a joint venture of the College of Engineering on the OU-Norman campus, the OU-Health Sciences Center campus, and the Oklahoma Medical Research Foundation (OMRF) with a $1M Special Opportunity award from the Whitaker Foundation. The mission of the OUBC is to:

1. provide interdisciplinary training to the next generation of biomedical engineers and scientists,
2. serve as a catalyst for innovative interdisciplinary research at the interfaces of biology, engineering, and medicine,
3. be the platform through which new discoveries in biomedical sciences and engineering are translated into clinical therapies for the prevention, detection, diagnosis and treatment of disease.

Current research themes include Biomedical Imaging, NanoMedicine, Tissue Engineering, Drug Delivery, Neuroscience, Robotics, Cell Adhesion, and Mechanobiology.

Recent Highlights

- The OUBC offered a 2nd round of the interdisciplinary Seed Grant program with the Charles and Peggy Stephenson Cancer Center (SCC) in 2013 to promote interdisciplinary cancer research between OUBC and SCC faculty. Two grants (totaling over $107,000) were awarded in January 2014.
- Dr. Pete Heinzelman received a R21 award from NIH to pursue a drug development research project entitled “Directed Evolution of Blood Brain Barrier – Traversing Granulocyte Colony-Stimulating Factor Variants as Alzheimer's Disease Therapeutics”.
- Two OUBC Faculty (Drs. O’Rear & Schmidtke) received a grant of $346,974 from NIH to investigate the blood trauma that occurs as blood flows through ventricular assist devices.
- Dr. Sikavitsas was awarded a three-year grant from OCAST totaling $135,000 to study the creation of bone grafts that exhibit enhanced osteoinductive properties providing a superior alternative to the current therapies in patients with large bone defects.
- In January 2014, OUBC graduate student Katrin Guillen received a 2nd place award for her poster entitled “Selective Targeting and Treatment of Metastatic Pancreatic Cancer via Three Fusion Protein/Prodrug Systems” in the graduate student competition at the annual Stephenson Cancer Center Research symposium.
- The OUBC continued its Summer Research Fellowship Program in Biomedical Engineering by awarding 5 fellowships ($7,500 each) to undergraduate students in Summer 2013.
- The OUBC initiated an Undergraduate Research Fellowship program in Spring 2013 to provide funds ($750) that allows undergraduate students to perform biomedical engineering research. (Spring 2013 = 4 awards, Spring 2014 = 3 awards)

Activities Planned for 2014

- The OUBC plans to start an interdisciplinary seminar series to provide a weekly forum for research presentations by OUBC faculty, OU-HSC faculty, and invited guest speakers of national and international prominence.
- The OUBC will continue its Summer Research Fellowship Program for undergraduate students in Summer 2014.
- The OUBC will continue its Undergraduate Research Fellowship program in Fall 2014.
• In conjunction with the OU-HSC Stephenson Cancer Center, the OUBC is planning a symposium on NanoMedicine in Fall 2014.
• In conjunction with the Oklahoma Center for Neuroscience, the OUBC is pursuing collaborative projects in Neuroscience and Neuroengineering.

**Linkages and Partnerships**

The OUBC has several existing and developing partnerships with the OU-HSC. Ongoing collaborations include Dr. Hong Liu and the OU-HSC Genetics Laboratory, Dr. Roger Harrison with OU-HSC Hematology/Oncology faculty, Dr. Andrew Fagg and Dr. David Miller with faculty in the OU-HSC Department of Rehabilitation Sciences, and Dr. Rong Gan with colleagues in the OU-HSC Department of Pediatrics. Other growing partnerships include Dr. Lei Ding’s collaboration with Dr. Jerzy Bodurka and other researchers at the Laureate Institute for Brain Research in Tulsa and Dr. O’Rear and Dr. Schmidtke’s collaboration with Dr. Trevor Snyder at Integris Advanced Cardiac Care Unit and VADovations. On the OU-Norman campus OUBC will continue its strong interdisciplinary activities with colleagues in the Department of Chemistry/Biochemistry, Physics, and the School of Chemical, Biological, and Materials Engineering.

**Recent Publications and Presentations**


**Impacts and Outcomes of OUBC**

Biomedical Engineering by its very nature is a highly interdisciplinary field. In order to solve complex medical problems, a major role of Biomedical Engineers is to link the medical, basic sciences, and engineering communities. Thus Biomedical Engineers work with a wide range of professionals including surgeons, clinicians, physicians, basic laboratory scientists and engineers from other disciplines. A brief look at the list of OUBC partnerships illustrates this point as well as the impact the OUBC is having on healthcare. OUBC researchers have and will continue to develop therapeutic strategies with significant economic value for the state of Oklahoma. Companies have been formed and technologies have been licensed as a result of our work. The Bioengineering program not only impacts the health and economic vitality of the state through its various partnerships but also provides interdisciplinary research and educational opportunities to students at OU. The OUBC is unique among centers at OU in that it offers both M.S. and Ph.D. graduate degrees. In addition, the cutting edge biomedical research of OUBC faculty provides research opportunities for undergraduate students as well.