

Bankhead-Coley Cancer Research Program

Shibata, Yoshima

Department of Biomedical Science

Florida Atlantic University

*2006 Program
Shared Instrument Grant
(1-year project)*

Project Title: High-Speed Cell Isolation by FACS in FAU Cancer Research

Project Summary: The Cancer Research Program at Florida Atlantic University received a fluorescence activated cell-sorter (FACS) to support their funded research and to permit rapid completion of pilot programs with high probability of federal support. FAU recently established the Charles E. Schmidt College of Biomedical Sciences, which houses the new regional campus of the University of Miami Medical School and active research and training in biomedical research.

Plans for cancer research at FAU: The breadth of cancer-related research at FAU includes development of novel chemotherapies from the sea, cancer-regulated anti-angiogenic gene therapy, anti-apoptotic protease inhibitors, agents preventing damage to cellular DNA, and enzymes repairing damage to key proteins. This grant focuses on using a FACS machine to research the role of COX2 enzymes in the ability of macrophages to suppress cancers, the effect on T-lymphocytes of high levels of CCL-2 (a chemotactic peptide for macrophages and T-cells that is associated with increased survival in breast cancer patients), and the activation of androgen receptors in prostate cancer cells. A FACS is also essential to develop pilot data on ways to noninvasively target common fatal brain tumors, teach patients' immune cells to destroy their tumors, and identify leukemias at early (and most treatable) stages.

Use of a FACS for Cancer Research at FAU: A basic principle in cancer research is comparison of cancer and normal cells. Such comparisons can only be accomplished by isolating pure populations of cancer cells and normal cells. A fluorescent antibody is used to mark cells in the population that have on their surface a protein found only in cancer. The FACS draws the cells into a fine tube, examines them one at a time, and places cancer cells with fluorescence in one test tube, normal cells in another. In 5 minutes, a FACS will separate over 20 million cells into pure populations and verify their purity.

Impact of FACS on Biotechnology Research Capacity at FAU: FAU has state-of-the-art equipment in many areas of biomedical research, including core facilities in proteomics, nucleic acid analysis, an Affymetrix gene chip facility, and a Center for Molecular Biology and Biotechnology. The addition of FACS to the FAU campus supports the development of stronger interdisciplinary teams and boosts the prospects of establishing strong, extramurally funded program project grants. Finally, the FACS encourages stronger research collaborations with the highly trained oncologists in the community.