Annual Report and Budget Proposal Guidelines

Budget Request July 1, 2015-June 30, 2016

Items I through II (combined) must not exceed three pages

Center Name: Institute of Biomedical Technology
Center Director: John G. Baust
Center Co-Directors: Robert van Buskirk

I. Center Accomplishments During Reporting Period

**Stem Cell and Tissue Engineering Initiative:** - IBT received a past grant through NYSTEM, New York State’s research organization that funded stem cell programs including the development of a set of stem cells courses at Binghamton University that focus on the science, clinical applications, bioethics, religious perspectives and federal regulations related to stem cell translational research. Two courses were developed with one (Spring 2011) focused primarily on the science of stem cells with the other (Spring 2012) designed to emphasize the business of stem cells. These two courses alternate with each other each spring. A keystone of the courses is laboratory modules co-developed in 2013 and revised in 2014 with CPSI Biotech, Inc. where students are exposed to mesenchymal stem cell differentiation and the transdifferentiation technology of converting a non-germ (somatic) cells to a human, beating cardiomyocyte (heart cell) through induced pluripotent stem cell technology.

**Lourdes – BU Proposed Regional Cancer Center and Tissue Repository** - IBT staff continued to work closely with Lourdes senior management in 2014 to assist in the ploan to establish of a Regional Cancer Center and cancer specimen biorepository. Over the course of many meetings with both physicians and administrators, IBT has guided Lourdes in the development of a level one plan to dedicate space, staff and apply for a Decker Foundation grant to launch this effort. This partnership is designed in part to facilitate BU researcher access to patient cancer tissue samples. Meetings between BU President and Vice President for Research and Lourdes President and numerous vice presidents have taken place. A grant application has been submitted by Lourdes to the Decker Foundation.

**Support of BU’s Educational Mission** - IBT has partnered with the Department of Biological Sciences and the School of Management to develop a graduate level Biotechnology Certificate Program that was formally launched with the admission of new graduate students in the fall of 2006. This Certificate Program provides students with an immersion experience in biotechnology and provides the basis for entry into an MBA program. This program, directed by Dr. Van Buskirk, Assoc. Director, for the first time, links faculty in Biological Sciences and colleagues in the School of Management in an effort to develop a new educational focus. Approximately thirty students enroll each fall in courses dedicated to this purpose.

**Summer Internship Program** – IBT partners with CPSI Biotech, Inc. to host undergraduates from quality universities as a recruitment tool for future BU graduate students. The majority of our recent recruits have come from Cornell with select others coming from Fredonia, Virginia Tech, RIT, and Buffalo.

**Contribution to the Regional Economic Base** - A.) IBT has continued to work with faculty and graduate students to develop their respective entrepreneurial talents. The IBT Director was appointed in 2013 by Gov. Cuomo as a Regional Co-Chair of the Rising NY economic and flood development program. IBT has been working with Economic Development offices from Tioga, Broome, Tompkins and Chemung Counties to develop the Incubator Node concept which would allow entrepreneur prospects to pre-incubate their technology development prior to moving into a university incubator. Tioga Co. has submitted a request for $350,000 to the State to launch this program in partnership with BU and Cornell. B.) IBT has identified a cohort of non-BU faculty who desire to organize in a “joint partnership” to address specific, translatable problems that may best be addressed by a group of individuals from different universities. IBT has approached Dean McCall and VP Sammakia with the idea of creating a “faculty without walls” concept to begin to seek extramural support. Grant submissions will be through the RF and faculty will receive research faculty appointments. C.) Assoc. Director is a member of the BU Start Up NY panel that reviews applications.

**Expansion of High-level Visibility Activities in Support of BU** - IBT staff will continue an active lecture program in low temperature medicine. Director has been named Editor-in-Chief of the cancer journal Technology in Cancer Research & Treatment (Sage Publ.). IBT staff will continue to host the journal Biopreservation & Biobanking (Mary Ann Liebert Publisher) which was founded by...
IBT staff. The Director has been re-elected to Commission President of the Intl. Inst. of Refrigeration and has a renewed appointment as the UNESCO Chair in cryomedicine. The Director was also re-elected President of the American College of Cryosurgery (ACC) and has been nominated by the Aarhus Medical University and the University of Oslo for a major award in cryomedicine. Of particular note is the organization of the annual meeting (2014) of the ACC by IBT staff. These meetings have been jointly sponsored by the Society for Cryobiology, the Cryogenic Society of America, Intl. Institute of Refrigeration and IBT. IBT has seven publications (printed and in press) in 2014 with co-authors from six collaborating institutions.

Collaborations with Government, Academic and/or Industrial Partners

IBT is working with local and State government through the Governor’s and Department of State offices under the RisingNY program to establish the incubator node concept in the Southern Tier. IBT has active academic collaborations with the Dept. of Surgery at Duke University, the Dept. of Urology at Wake Forest University, the Dept. of Urology at the University of Oslo, the Dept. of Gastroenterology at Johns Hopkins University, SUNY Stonybrook’s Department of Urology at Winthrop University Hospital and at Allegheny Gen. Hospital. IBT co-hosts an undergraduate summer internship program at CPSI Biotech, Inc. IBT has worked with CPSI Biotech to support its application to be designated a StartUp New York incubator node.

Summarize any other information…

IBT’s Assoc. Director (RVB) was named Chair of the NIH Study Section (IMST-J15) Cell Biology, Computational Biology and Molecular Biology.

II. Future Directions

IBT was established in 2000 to accomplish a set of very complex goals delineated in the originating IBT proposal. The IBT is designed to increase our institutional competitiveness and attract a biotechnology industry to the region in full accord with Chancellor Zimpher’s stated mission for SUNY. IBT began working without a regional corporate foundation and related infrastructure (i.e., biotechnology or bioengineering companies) or a campus experience in biotechnology. Accordingly, IBT’s challenges arise both from within and beyond the boundaries of the campus. The objectives of the IBT are listed below.

1. Catalyze the organization of new inter-departmental and inter-college undergraduate and graduate programs designed to increase competitiveness through entrepreneurship.
2. Enhance the quality of graduate and research programs within BU in an effort to raise our regional and national image thereby leading to improved NRC recognition
3. Serve as a regional core facility in support of “technology matchmaking” and contract services
4. Advance the discipline by responding to the challenges faced by society
5. Establish a foundation upon which University and corporate interaction can be facilitated
6. Grow a campus-wide applications-based research program
7. Provide an avenue supporting the flow of non-traditionally derived research revenues to University-based research programs
8. Transfer IBT-originated technology to the corporate sector through industrial partnerships, licensing, short courses and workshops
9. Establish problem-directed “research hubs” that will ensure functional interdisciplinary activities through the exploitation of unique combinations of faculty talents.
10. Secure resources for the provision of “seed grants” to campus faculty interested in IBT programs
11. Diversify the State’s and region’s economic base through the development of a biotechnology industry with a primary focus in medical-based problems in order to link unique regional research activities that are complementary to similar programs across the State.

A long range goal of the IBT is to help foster entrepreneurial leadership in the high technology sciences by sharing with others our incubator models in starting and maintaining biotechnology companies. IBT continues to work with two State programs (New York Rising and StartUp New York) to encourage start up company development in the Greater Binghamton Region.
ATTACHMENTS

1. Center Personnel - John G. Baust, Director
   Robert Van Buskirk, Associate Director

   Graduate Students - Kim Santuchi
   Ken Bowman
   Anthony Robilotto

   Post Doctoral Fellow - William Corwin

2. Center Productivity

Publications: Peer Reviewed

http://dx.doi.org/10.1016/j.cryobiol.2013.11.001


Publications: Book Chapters


Symposia, Meetings and Lectures:

Differential Activation of Stress Pathways in Human Mesenchymal Stem Cells Following Cryopreservation. ACCryo2014. Joint meeting of Society for Cryobiology and American College of Cryosurgery (January) Key Largo, FL.

The Effects of a Novel Cryosurgical Device on the Molecular Mechanisms of Cell Death. ACCryo2014. Joint meeting of Society for Cryobiology and American College of Cryosurgery (January) Key Largo, FL.


Rapid Induction of Apoptosis at Ultra Low Temperatures Enhances the Efficacy of Prostate Cancer Cryoablation. ACCryo2014. Joint meeting of Society for Cryobiology and American College of Cryosurgery (January) Key Largo, FL.

Androgen Receptor Protein Expression Influences Freeze Sensitivity of Prostate Cancer Cells. ACCryo2014. Joint meeting of Society for Cryobiology and American College of Cryosurgery (January) Key Largo, FL.

Mechanisms of Cancer Cell Death Following Cryoablation. Soc. Thermal Medicine (May) Minneapolis, MN.

Image Guided Thermal Therapy. President’s Symposium. Soc. Thermal Medicine (May) Minneapolis, MN.

Molecular Levels of Cell Death Following Cryosurgery and the Impact of Supercritical Nitrogen. World Forum on Biology. Joint Meeting of the Society for Cryobiology and Society for In Vitro Biology (June) Savannah, GA.

Monitoring the Effects of Dual Thermal Ablation on Pancreatic Cancer Cell Line PANC-1. World Forum on Biology. Joint Meeting of the Society for Cryobiology and Society for In Vitro Biology (June) Savannah, GA.

Freezing Response Characteristics of Pancreatic Cancer Cell Lines BxPC-3 and PANC-1. World Forum on Biology. Joint Meeting of the Society for Cryobiology and Society for In Vitro Biology (June) Savannah, GA.

3. Current Sources of Support/Space
   a. Support for the Center is provided by a $2,000 BU award. All other budgetary requirements are provided by Director and Assoc. Director personal funds.
   b. Description of space currently occupied by center - none.

4. New Budget Request and Justification (if applicable)
   Budget request is for $2,000 to support administrative-related supplies (i.e. paper, photocopying, postage, etc.)