



**Grants and Contracts Received as a Direct Result of
VIIBRE Funding or Activities¹**

September 2014

1. Massively Parallel, Multi-Phasic Cellular Biological Activity Detector (MP²-CBAD), DARPA, PI: Wikswo, \$1,934,298 (This grant was received concurrently with the creation of VIIBRE and funded much of the core VIIBRE technology and some of the facilities.)
2. NanoBioReactor for Monitoring Small Cell Populations, NIH/Nanodelivery, PI: Baudenbacher, \$29,544
3. Instrumenting and Controlling the Single Cell: An Educational Program in Biomedical Engineering, Whitaker Foundation, PI: Wikswo, \$999,948
4. Support for "BioMEMS, New Frontiers and Emerging Technologies" Track at the 2003 BMES Meeting, AFOSR, PI: Wikswo, \$5,000
5. High Resolution Multimodal Imaging of Neuronal Circuits in Hippocampal Slices, DARPA, PI: Baudenbacher, \$350,000
6. Improved Imaging of Brain White Matter, NIH, PI: Anderson, \$1,169,459
7. Characterizing MRI Parameters of Iron-Loaded Tissues, NIH, PI: Does, \$749,390
8. Artificial Cellular Receptors: Interfacing Nanostructured Hard and Soft Materials, UT-Battelle/DOE, PIs: Feldman, Cliffel, Wikswo, \$25,000
9. Correlations between Single-Cell Signaling Dynamics and Protein Expressions Profiles, AFOSR/DARPA, PI: Wikswo, \$199,842
10. Multiscale Mathematical Modeling of Cancer Invasion, NIH, PI: Quaranta, \$11,991,800
11. Nanoprobes for Dynamic Clinical Diagnosis, Pria Diagnostics, PI: Wikswo, \$135,000
12. Metabolic Discrimination of Unknown Bacterial Pathogens, NIH, PI: Wikswo, \$5,476,851
13. Nanoprobes for Sensing and Controlling Cellular Signaling, DARPA/AFOSR, PI: Wikswo, \$805,000
14. Integrating the Genetics, Mechanics and Phenomenology of Embryonic Wound Healing, Human Frontier Science Program, PIs: Hutson (VU), Brodland (Waterloo), Jacinto (Lisbon), \$1,050,000 total, \$350,000 VU
15. Interferometric Nano-Sensing for Biochemical Analysis, NIH, PI: Bornhop, \$1,467,656
16. Transdermal Delivery of Anti-Cancer Agents, M. D. Anderson Cancer Center, Biomedical Research Foundation (Gift), PI: Shastri, \$18,000
17. Formation and Characterization of Photo-Curable and/or Chemically-Curable Biomaterials, Bioplant R & D, LLC, PI: Shastri, \$98,000
18. Development of Neural Protectants against Organophosphorus Compound Toxicity, Army/CFDRC, PI: Cliffel, \$20,000
19. Biomagnetic Signals of Intestinal Ischemia, NIH, PI: Richards, \$1,504,068

¹ We have made every attempt to ensure the accuracy of this list, but it may contain inadvertent errors. If errors are identified, please inform Allison Price at Allison.Price@vanderbilt.edu.

20. CAREER: Forces Underlying Germ Band Retraction in *Drosophila* Embryogenesis, NSF, PI: Hutson, \$832,833
21. Biomagnetic Characterization of Gastric Dysrhythmias, NIH, PI: Bradshaw, \$1,422,069
22. Systems Biology and Bioengineering Undergraduate Research Experience (SyBBURE), Gift of Gideon Searle, PI: Wikswo, \$2,520,045
23. The Role of Changing of Ion Concentration in Fibrillation and in Cardiac Shock Response, AHA, PI: Sidorov, \$260,000
24. Hacking Morphogenesis: Integrated, Complex Systems for Controlling Embryonic Pattern Formation, NSF/University of Michigan, PI: Boczko, \$75,352
25. Transdermal Delivery of Anti-Cancer Agents, Clayton Foundation, PI: Shastri, \$191,414
26. SPARTAN: Single Protein Actuation by Real-Time Transduction of Affinity in Nanospace, DARPA, PI: Wikswo, \$1,472,000
27. Thick Matrix Capillary Perfused Bioreactor for Studying Angiogenesis and Metastasis in Breast Cancer, Army BCRP, PI: Wikswo, \$776,668
28. Career: Fundamental Investigation and Thermal-Electrical Control of Ion, Fluid, and Biomolecular Transport through Nanochannels, NSF, PI: Li, Deyu, \$400,000
29. IDBR: EcoChip: A Microfluidic Device to Characterize Microbial Responses to Habitat Structure, NSF, PI: Shor, \$397,910
30. Surface Engineering of Cardiovascular Stents, Abbott Vascular, PI: Shastri, \$50,000
31. IDBR REU: EcoChip: A Microfluidic Device to Characterize Microbial Responses to Habitat Structure, NSF, PI: Shor, \$33,125
32. The Biological Basis of Diffusion MRI of the Brain, NIH, PI: Anderson, \$1,308,708
33. Topical Drug Delivery Using Avicin-Based Formulations, Clayton Foundation, PI: Shastri, \$1,005,000
34. Chemokine Receptor Studies: Defining the Dynamics of the Chemosynapse, NIH, PI: Richmond, \$1,479,440
35. Parallel Capillary Bioreactors for Leukocyte Transendothelial Migration, NIH, PI: McCawley, \$337,700
36. Ephrin-A1 in Tumor-Endothelial Interaction during Metastasis, NIH/NCI, PI: Chen, \$1,476,073, 2008-2014
37. MRI: Development of a Nanoparticle Trap for Student Training and Nano-Spectroscopy, NSF, PI: Wikswo (assumed leadership after original PI left Vanderbilt), \$546,897 (amount not included in VIIBRE totals)
38. Multianalyte Microphysiometry of Human Cell Lines to Replace Animal Toxicology, Alternatives Research and Development Foundation, PI: Cliffel, \$33,000, 2008-2009
39. Biology on Demand: External Control of a Complex Cellular System, *S. cerevisiae*, PI: Wikswo, \$50,000, 2009-2011
40. Automated Characterization of the Interaction Dynamics between Toxic Chemicals and Biological Agents and Biomolecules and Cells of Blood and Lymph, Defense Threat Reduction Agency, PI: Wikswo, \$1,999,852, 2009-2013
41. Skin Regeneration with Stem Cells and Scaffolds, NIH, PI: Davidson, \$3,525,048, 2009-2014
42. Stem Cell Behavior in Complex Microfluidic Gradients, NIH, PI: Opalenik, \$412,188, 2009-2010

43. Correlative Multimodal Imaging of Cardiac Electrophysiology and Metabolism, NIH, PI: Wikswo, \$1,117,078, 2009-2012 (ARRA)
44. The Tumor Biopsy Motel: A Microfluidic Device to Maintain Native Breast Cancer Tumor Biopsy Samples Under Tumor Microenvironmental Conditions Ex Vivo, DOD/BC087336, PI: McCawley, \$75,000, 2009-2010
45. Elucidation of Leukocyte and Macrophage Biomarker Signatures from Drugs of Abuse, NIH/NIDA, PI: Mclean, Wikswo, Lipson, \$2,661,005, 2009-2012 (ARRA)
46. High Speed Multimodal Fluorescence Imaging System for Isolated Mouse Hearts, NIH, PI: Baudenbacher, \$323,932, 2009-2010
47. A Multichannel Vector Biomagnetometer to Characterize Gastrointestinal Slow Waves, NIH, PI: Bradshaw, \$342,000, 2010-2011
48. Automated Microscope for Long-Duration, Quantitative Dynamic Imaging, NIH, PI: Wikswo, \$500,000, 2010-2012
49. Develop and Build Transconductance Amplifiers for Defibrillation Research, FDA, PI: Wikswo, \$42,110, 2010-2011
50. Breast Cancer Tissue Bioreactor for Direct Interrogation and Observation of Response to Antitumor Therapies, DOD, PI: McCawley, \$190,000, 2010-2012
51. Biomagnetic Characterization of Gastric Dysrhythmias, NIH 2R01DK058697-09A1, PI: Bradshaw, \$957,084, 2010-2013
52. Matrix Metalloproteinase Regulation of Leukocyte Infiltration during Wound Repair, NIGMS, PI: McCawley, ~\$1,510,000, 2010-2015
53. The EMD Millipore Research Associate in Automated Systems Biology, EMD Millipore Corporation, PI: Wikswo, \$85,565, 2011-2012
54. Molecular Effects of Maternal Immune Activation: The Story of Placental, Glial, and Neuronal Interactions, Vanderbilt University Discovery Grant Program, PI: Wikswo, \$50,000, 2012-2014
55. MRI: Development of Advanced Multiplexed Structural Mass Spectrometer for Research and Training, NSF, PI: McLean, \$500,822, 2012-2015
56. Integrated Human Organ-on-Chip Microphysiological Systems, DARPA, PI: Ingber (Harvard), \$1,991,809, 2012-2017
57. Neurovascular Unit on a Chip: Regional Chemical Communication, Drug and Toxin Responses, NIH/NCATS, PI: Wikswo, Janigro, Niswender, Webb, \$2,070,530, UH2 phase: 2012-2014; \$3,165,696, UH3 phase: 2014-2017
58. Integration of Novel Technologies for Organ Development and Rapid Assessment of Medical Countermeasures (INTO-RAM), DTRA, PI: Iyer (Los Alamos National Laboratory), \$10,705,521 total anticipated subcontracts to Vanderbilt, 2012-2017
59. Inner Blood-Retinal Barrier-on-a-Chip: Implications for Ocular Disease, NIH/NCATS administrative supplement to Neurovascular Unit on a Chip project (#57), PI: Wikswo, \$145,500, 2013-2014
60. Optimal Design of Challenge-Response Experiments in Cardiac Electrophysiology, NIH, PI: Shotwell, \$1,506,001, 2013-2017
61. Chemokine Signals in Premetastatic Niche Inhibit Metastasis, NIH, PI: Richmond, \$353,230, 2013-2018
62. Chemical Threat Assessment by Rapid Molecular Phenotyping, DARPA, PI: Caprioli, \$5,581,661, 2014-2015 (and 3 pending option periods)

63. Vanderbilt Pittsburgh Resource for Organotypic Models for Predictive Toxicology (VPROMPT), EPA, PI: Hutson, \$6,000,000 (award documents in preparation; exact funding amount pending), 2014-2018
64. A 3-D Biomimetic Liver Sinusoid Construct for Predicting Physiology and Toxicity, NIH/NCATS, PI: Taylor (University of Pittsburgh), \$243,750, 2014-2017
65. A Tissue Engineered Human Kidney Microphysiological System, NIH/NCATS, PI: Himmelfarb (University of Washington), \$243,750, 2014-2017