



FOOD & WATERBORNE DISEASES INTEGRATED RESEARCH NETWORK
MICROBIOLOGY AND BOTULISM RESEARCH UNIT

Key Staff Members:

| Principal Investigator | Title | FWD IRN Role |
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| Saul Tzipori, DVM, PhD, DSc, FRCVS saul.tzipori@tufts.edu | <ul style="list-style-type: none"> • Professor and Division Head of Microbiology and Infectious Diseases, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine • Professor, Division of Geographic Medicine Infectious Diseases, New England Medical Center, Tufts University | <ul style="list-style-type: none"> • Research Unit Principle Investigator • Project Co-Investigator • Emergency Response Team Leader • Enteric Protozoa Emergency Response Team member |
| Investigators | | |
| Karen N. Allen, PhD | <ul style="list-style-type: none"> • Associate Professor of Physiology and Biophysics, Boston University School of Medicine • Associate Professor of Bioinformatics Program, Boston University School of Medicine • Associate Professor, Cell and Molecular Biology, Boston University School of Medicine | <ul style="list-style-type: none"> • Project Co-Investigator |
| David W. Brown, DVM, PhD | <ul style="list-style-type: none"> • Clinical Assistant Professor, Department of Biomedical Sciences, Tufts University | <ul style="list-style-type: none"> • Project Co-Investigator • Viral Agents Emergency Response Team Member |
| Arthur Donohue-Rolfe, PhD | <ul style="list-style-type: none"> • Associate Professor, Associate Chair, Department of Biomedical science, Division of Infectious Diseases, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Project Co-Investigator • Bacterial Pathogens Emergency Response Team Member |
| John E. Herrmann, PhD | <ul style="list-style-type: none"> • Research Professor, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Viral Agents Emergency Response Team Member |
| Ira M. Herman, PhD | <ul style="list-style-type: none"> • Professor, Department of Cellular and Molecular Physiology, Tufts University School of Medicine • Professor, Department of Anatomy and Cell Biology, Tufts University School of Medicine • Professor, Department of Ophthalmology, Tufts University School of Medicine | <ul style="list-style-type: none"> • Project Co-Leader |
| Alan Jacobson, PhD, MBA | <ul style="list-style-type: none"> • President and CEO, Absolute Science Inc. | <ul style="list-style-type: none"> • Project Co-Investigator |



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| Investigators (cont'd) | | |
|-----------------------------------|---|--|
| Kim Janda, PhD | <ul style="list-style-type: none"> • Professor, Department of Chemistry, The Scripps Research Institute (TSRI) and Skaggs Institute for Chemical Biology | <ul style="list-style-type: none"> • Project Principle Investigator |
| Jean Mukherjee, DVM, PhD | <ul style="list-style-type: none"> • Assistant Professor, Department of Biomedical Science, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Project Co-Investigator |
| Jong-Beak Park, PhD | <ul style="list-style-type: none"> • Research Assistant Professor, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Project Collaborating Scientist • Project Co-Investigator |
| Abhineet Sheoran, BVSc, MVSc, PhD | <ul style="list-style-type: none"> • Research Assistant Professor, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Enteric Protozoa Emergency Response Team Member |
| Charles B. Shoemaker, PhD | <ul style="list-style-type: none"> • Research Professor, Division of Infectious Diseases, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Project Co-Leader |
| Bal Ram Singh, PhD | <ul style="list-style-type: none"> • Full Professor, Department of Chemistry and Biochemistry, University of Massachusetts Dartmouth | <ul style="list-style-type: none"> • Project Leader |
| Edward Spack, PhD | <ul style="list-style-type: none"> • Senior Director, Biologicals Development, SRI International | <ul style="list-style-type: none"> • Project Leader |
| Ross L. Stein, PhD | <ul style="list-style-type: none"> • Associate Professor, Department of Neurology Harvard Medical School • Director, Laboratory for Drug Discovery in Neurodegeneration, Brigham & Women's Hospital | <ul style="list-style-type: none"> • Project Principle Investigator |
| Sam R. Telford III, ScD | <ul style="list-style-type: none"> • Associate Professor, Department of Biomedical Sciences, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Project Leader • Tularemia Emergency Response Team member |
| David R. Walt, PhD | <ul style="list-style-type: none"> • Adjunct Professor, Department of Biomedical Engineering, Tufts University • Adjunct Professor, Department of Biochemistry and Pharmacology, Department of Chemical Engineering, Tufts University • Robinson Professor of Chemistry, Department of Chemistry, Tufts University | <ul style="list-style-type: none"> • Project Leader |
| Giovanni Widmer, PhD | <ul style="list-style-type: none"> • Associate Professor, Department of Biomedical Sciences and Infectious Diseases, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> • Enteric Protozoa Emergency Response Team Member |



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| Research Unit and Project Staff | | |
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| Zenda L. Berrada, BS | <ul style="list-style-type: none"> Graduate Research Assistant, Division of Infectious Diseases, Tufts University School of Veterinary Medicine | <ul style="list-style-type: none"> Project Research Assistant |
| Robin Butcher | <ul style="list-style-type: none"> Section Head/Hybridoma Scientist, Bioventix Ltd | <ul style="list-style-type: none"> Project Scientist |
| Peter Harrison | <ul style="list-style-type: none"> Managing Director, Bioventix Ltd | <ul style="list-style-type: none"> Project Manager |
| Lisa Johnson | <ul style="list-style-type: none"> Senior Scientist, Bioventix Ltd KS Biomedix | <ul style="list-style-type: none"> Project Scientist |
| Julia Clarke | <ul style="list-style-type: none"> Molecular Biologist, Bioventix Ltd | <ul style="list-style-type: none"> Project Assay Scientist |

General Information:

The Microbiology and Botulism Research Unit (MBRU) is located in the Division of Infectious Diseases at Tufts University, School of Veterinary Medicine in North Grafton, Massachusetts.

Current and Past FWD IRN Activities:

- Diagnosis of Food and Water-Borne Virus Infections (J. Herrmann, project leader)
- Sensitive Detection of Tularemia in Clinical Samples (S. Telford, project leader)
- Establishment of a Botulism Therapeutics Testing Facility (J. Mukherjee, project leader)
- Pre-clinical and Clinical Development Plans for Monoclonal Antibody Therapies (G. Segar, project leader)
- Recombinant Nontoxic Botulinum Neurotoxins and Chains (B. Singh, project leader)
- Discovery of Inhibitors of Botulinum Proteases (C. Shoemaker, project leader)
- High Affinity Sheep Recombinant Antibodies to BoTN (C. Shoemaker, project leader)
- Development of Small Molecule Inhibitors of Botulinum Neurotoxin Protease Using Computational Methods in Conjunction with Combinatorial Library Design (C. Shoemaker, project leader)
- Development of In Vitro Assays to Evaluate the Anti-BoNT Effects of Potential Therapeutic Agents (J. Park, project leader)
- Antibiotic Treatment of EHEC Infections (A. Donohue-Rolfe, project leader)
- Curing Botulinum Intoxication by Targeted Toxin Proteolysis: Subprojects 1 & 2 (C. Shoemaker, project leader)
- High Affinity Sheep Monoclonal Antibodies to BoTN (C. Shoemaker, project leader)
- Development of a Sensor Array for Detecting Food and Water Pathogens (D. Walt, project leader)
- Antibody Therapy in Stx Intoxication and Clearance of Stx/Antibody Complexes (A. Sheoran, project leader)
- Proteomic Analysis of Neuronal Cell Responses to BoNT/A, B and E (C. Shoemaker, project leader)

FWD IRN Mission and Expertise:

This Research Unit (RU) is well equipped to perform tasks that require expert knowledge, skills, equipment and resources to conduct diagnostic and investigational procedures in microbiology, immunology and infectious diseases in animals and humans, and to identify waterborne pathogens. This includes in particular, the detection, identification and molecular characterization of many enteric viruses, enteric bacteria and enteric protozoan pathogens. The RU currently has biosafety level 2 facility and has capabilities in isolation and identification of several NIAID Categories B priority viral, protozoa and bacterial pathogens. Commission of a biosafety level 3 facility is in progress. The Division of Infectious Diseases houses ten medium size laboratories



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(immunology, molecular genetics, histopathology, bacteriology, parasitology, and hybridoma production). They also have a large laboratory for molecular biology work, two tissue culture rooms, an oocyst purification room and a dark room. They are also equipped with a state-of-art rodent and rabbit housing facility that includes twelve animal holding rooms, a biocontainment suite with a pass-through cagewasher, and a quarantine/isolation suite.

The Microbiology and Botulism Research Unit has specific expertise including:

- Detection of gastroenteritis viruses by monoclonal antibody ELISA
- Detection of gastroenteritis viruses by RT-PCR techniques
- Epidemiologic surveillance of animal transmitted infections
- Exploration of BoNT/A H chain
- Drug discovery through multidisciplinary and collaborative efforts in enzymology, high through-put screening, medicinal chemistry, structural biology, and molecular modeling and bioinformatics.
- Investigation of enteric infections and host response
- Development of novel therapy against BoNT intoxication
- Use of American Bioscience DIGE system to understand molecular mechanisms mediating EPEC pathogenesis
- Involvement with Data and Safety Monitoring Plans for Phase I, II, or III clinical trials

Current Collaborators:

- Absolute Science, Inc.
- Bioventix Ltd., UK
- Boston University School of Medicine
- Brigham & Women's Hospital
- Harvard School of Public Health
- Harvard University Laboratory for Drug Discovery
- The New England Medical Center
- The Scripps Research Institute (TSRI)
- Specialty Risk International (SRI)
- University of Alaska
- University of Massachusetts Dartmouth

Links:

1. Massachusetts Biotechnical Council: <http://massbio.org/>
2. Tufts University School of Veterinary Medicine/Faculty Research: http://www.tufts.edu/vet/faculty_research/
3. Tufts University School of Veterinary Medicine/General: <http://vet.tufts.edu/>
4. Drug Discovery & Development: Reed Business Information: <http://www.dddmag.com/ShowPR.aspx?PUBCODE=016&ACCT=160000100&ISSUE=0410&RELTYPE=PR&ORIGRELTYPE=CVS&PRODCODE=00000000&PRODLTT=C>
5. Tufts University School of Veterinary Medicine: http://www.tufts.edu/vet/biomed/infectious_diseases.htm
6. Tufts University School of Veterinary Medicine/Faculty Face page: http://www.tufts.edu/vet/facpages/rolfe_ad.html
7. Absolute Science Inc.: <http://www.absolutescience.com/>
8. Bioventix Limited: <http://www.bioventix.com>