REGIONAL BIOCONTAINMENT LABORATORY

THE UNIVERSITY OF TENNESSEE HEALTH SCIENCE CENTER

REGIONAL BIOCONTAINMENT LABORATORY (RBL)

FACILITY

The Regional Biocontainment Laboratory (RBL) is a 17,000 sq.ft. facility that provides leadership and support in the discovery and development of new drugs, vaccines and diagnostics that would protect the general population from emerging and reemerging infectious diseases and bioterrorism. Our facility is approved by the CDC for work with select agents. The RBL provides support for projects requiring biosafety level 2 or 3, but we also provide support for research that does not include infectious agents because of the unique instrumentation and skills of the staff. The staff currently support projects in collaboration with the government, commercial and academic entities (from UTHSC and elsewhere).

The RBL was recently awarded $11.9 million from the National Institutes of Allergy and Infectious Disease grant to establish the Antiviral & Antimicrobial Countermeasures Discovery Core (A^2CD^2C). The core's focus is to facilitate biomedical research targeted toward the discovery and/or development of countermeasures for prophylactic or therapeutic treatment of human biosafety level 2 and 3 (BSL-2 and BSL-3) pathogens that mandate select agent control. The A^2CD^2C is unique in that it provides an efficient, integrated, and comprehensive platform to facilitate studies from the initial discovery phase through preclinical development.

CAPABILITIES

The UTHSC RBL offers state-of-the-art essential services in four discovery areas; antiviral discovery and development, vaccine and biologics, pathogenesis, and immunology and biomarkers. Some of our most frequently requested assays are:

Antiviral Discovery & Development

- High Throughput Screening
- Titer Reductions
- Time of Addition
- Evaluation of Small Molecules for Safety and Efficacy in Small Animals
- Pharmacokinetics and Pharmacodynamics (LC-MS available in BSL-3 containment suite)

Vaccine& Biologics Discovery

- Neutralizing Antibody Titers
- Immunoglobulin Quantitation and Subtyping
- B and T Cell Responses
- Immunophenotyping

Pathogenesis Discovery

- Biomarkers
- Sequencing
- High Throughput Biology
- Virus Isolation
- Virus Propagation
- Identification of pathogens in animal, human, and environmental samples

Immunology & Biomarker Discovery

- Hematology
- Clinical Chemistry
- Multiplex Assays
- ELISpot
- Spectral Cytometer
- Cell Sorter

Animal Services

- Broadly, the scope of our animal services include: (1) production and characterization of the pathogens for challenge; (2) determination of optimal route and dose for pathogen challenge; (3) natural history of infection in small animal models; (4) determination of the best indicators of infection and correlates of immunity; (5) development and standardization of non-GLP Animal Models; (6) safety and efficacy of small

- Instrumentation available for studies includes a VEVO3100 (ultrasound), Molecubes CT (computed tomography), Perkin Elmer IVIS (fluorescent and luminescent whole animal imaging) and a UltraMicroscope Blaze for next-generation light sheet imaging, high content imaging, and a LC mass spectrometer. The RBL is equipped with histopathological instruments and provides services starting from organ collection, processing and embedding, to customized sectioning and H&E staining. Lastly, we also have GLP capabilities in support of both in vitro and in vivo services.

**This list is not exclusive, please contact us to inquire about additional studies.*

PATHOGENS (EXISTING OR ANTICIPATED)

- SARS-CoV-1, SARS-CoV-2
- Old and New World hantaviruses
- Oropouche virus
- Mayaro virus
- Venezuelan equine encephalitis virus
- Eastern equine encephalitis virus
- Western equine encephalitis virus
- Madariaga virus, Chikungunya virus
- Sindbis virus
- Pichinde virus
- Influenza A viruses
- Influenza B viruses
- Zika virus
- West Nile virus
- St. Louis Encephalitis virus
- Respiratory syncytial virus A2
- Picornavirus
- Adenovirus VR-7

VALIDATED ANIMAL MODELS

- Influenza BSL-2 strains, HPAIV (intranasal)
- Old World hantaviruses
- Severe acute respiratory syndrome Coronavirus 1 (SARS CoV-1)
- Severe acute respiratory syndrome Coronavirus 2 (SARS CoV-2)
- Middle-East respiratory syndrome Coronavirus (MERS CoV)
- Respiratory Syncytial virus (intranasal)
- Venezuelan equine encephalitis viruses (subcutaneous and intranasal)
- Western equine encephalitis viruses (subcutaneous and intranasal)
- Eastern equine encephalitis viruses (subcutaneous and intranasal)
- Other- available on request

Models with ferret:

- Influenza BSL-2 strains (intranasal)
- Influenza HPAI BSL-3 strains (intranasal)
- SARS-CoV-1 and SARS-CoV-2 BSL-3 strains (intranasal)

MAJOR EQUIPMENT

- Respons®910VET Chemistry Analyzer (RBL-ABSL-3)
- X•pedite™ HEM³ VET Hematology Analyzer (RBL-ABSL-3)
- Agilent Bioanalyzer (RBL-BSL-2)
- Agilent Fragment Analyzer (RBL-BSL-3)
- QuantStudio 6 real-time PCR (96- and 384-well blocks) (RBL-BSL-3)
- Biotek Multiflo FX (RBL-BSL-3)
- Eppendorf PCR (RBL-BSL-3)
- Synergy (RBL-BSL-2; RBL-BSL-3; RBL-ABSL-3)
- Biotek Plate Washer (RBL-BSL-2)
- EnVision Reader (RBL-BSL-3; RBL-BSL-2)
- Luminex® 200 (RBL-BSL-2)
- Magpix® System with Milliplex® Analyst software (RBL-BSL-3)
- KingFisher (RBL-BSL-3)
- Illumina MiSeq (RBL-BSL-2- in select agent space)
- QBIT (RBL-BSL-3)
- Mindray ultrasound system with an Ultrasonic Transducer (RBL-ABSL-3)
- Vevo 3100 Ultrasound (RBL ABSL-3)
- IVIS Spectrum (RBL-ABSL-3)
- Molecubes CT (RBL ABSL-3)
- Miltenyi Biotec BLAZE (RBL-BSL-2- in select agent space)
- Olympus APEX (RBL-BSL-3)
- Yokogawa CQ1 system (RBL-BSL-2- in select agent space)
- EVOS fluorescent microscope (RBL-BSL-3)
- Phase microscopes (RBL-BSL-3)
- Miltenyi Biotech - MACSQuant Tyto Cell Sorter (RBL-BSL-3)
- Cytek Aurora Spectral Cytometer (RBL-BSL-2- in select agent space)
- C.T.L. EliSpot Analyzer (RBL-BSL-3)
- 10 X Genomics Chromium X (RBL-BSL-3)
- Emulate, Inc. - Zoe & Orb (RBL-BSL-3 – currently at BSL-2 as conditions set up)
- AB Sciex, LLc - QTRAP 5500+ mass spectrometer (RBL-BSL-3)
- Leica Microtome (RBL-BSL-2)
- Leica Paraffin Embedding Work Station (RBL-BSL-2)
- Refrigerated Centrifuges with biocontainment rotors (RBL-BSL-3)
- -80°C Freezers (RBL-BSL-3)
- Beadmill Homogenizer (RBL-BSL-3)
- CO2 incubators (RBL-BSL-3)

STAFF

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Dr. Jonsson is professor and Van Vleet Chair of Excellence in Virology, director of the RBL, and director of the Institute for the Study of Host-Pathogen Systems at UTHSC. She is the program director for an NIH awarded Center of Excellence for Encephalitic Alphavirus Therapeutics. She has over 28 years of experience in the study of highly pathogenic human viruses represented in more than 169 publications and 5 patents. Her research program focuses on basic and translational research targeting respiratory, encephalitic and hemorrhagic fever viruses. As RBL director she brings a unique blend of professional experience and leadership skills gained from her positions over the past 40 years in industry, academics and not-for-profit institutes. She has led several major cross-institutional, multi-disciplinary efforts funded by NIH, DoD, and NSF in drug discovery and virus ecology/discovery.

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For more information:

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