

Overview of the Galveston National Laboratory



The Galveston National Laboratory

Galveston National Laboratory



- One of two national laboratories constructed with support from NIH.
- The GNL is a global leader in the study of highly pathogenic microbes.
- UTMB's investigators are working to solve some of the most difficult health concerns of our time.
- They are also producing solutions to problems which will benefit the health of the world community.

Our Mission

The mission of the Galveston National Laboratory is to assist the NIAID and the nation by conducting basic and applied research designed to improve the prevention, diagnosis and treatment of naturally emerging and purposefully disseminated infectious diseases.

BSL-2



BSL-3



BSL-4

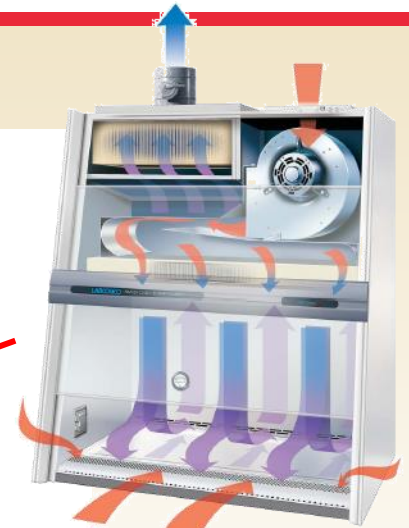
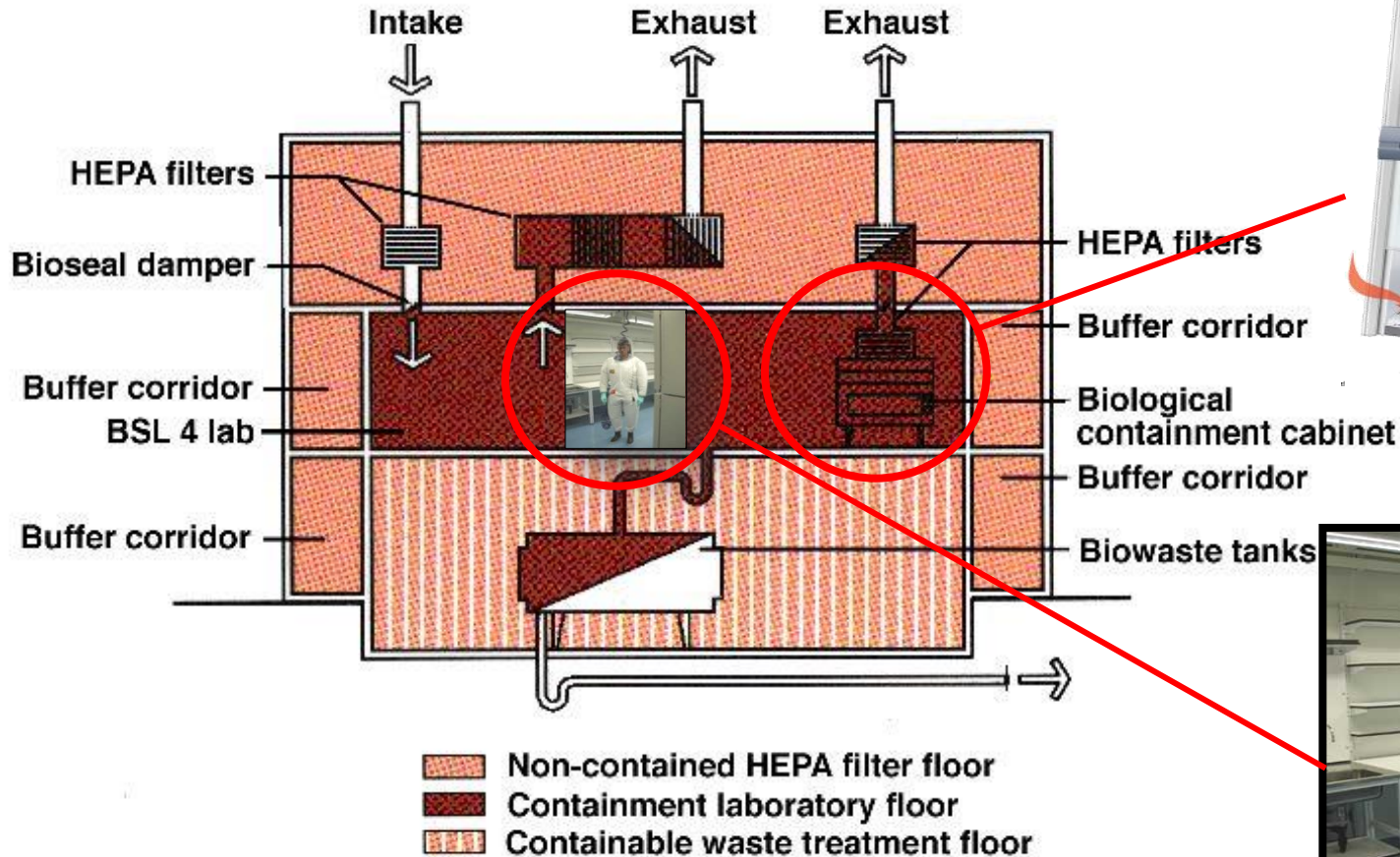


© Hedrich Blessing Photography 2009

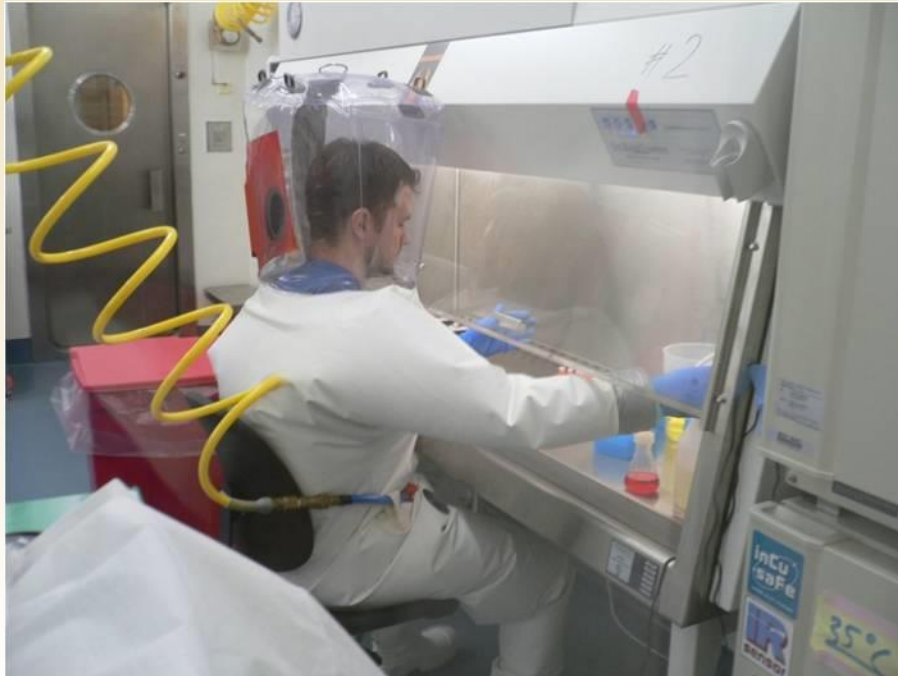
Galveston National Laboratory



BSL4 Maximum Containment



BSL-4 laboratory PPE



Sperian suit

(8-10 lbs; HEPA filter integrated into suit;
polyamide/polyvinyl chloride)

ILC Dover suit
(10-18 lbs; external HEPA filter;
Chlorinated polyethylene)



HEPA exhaust filters



Effluent Decontamination System

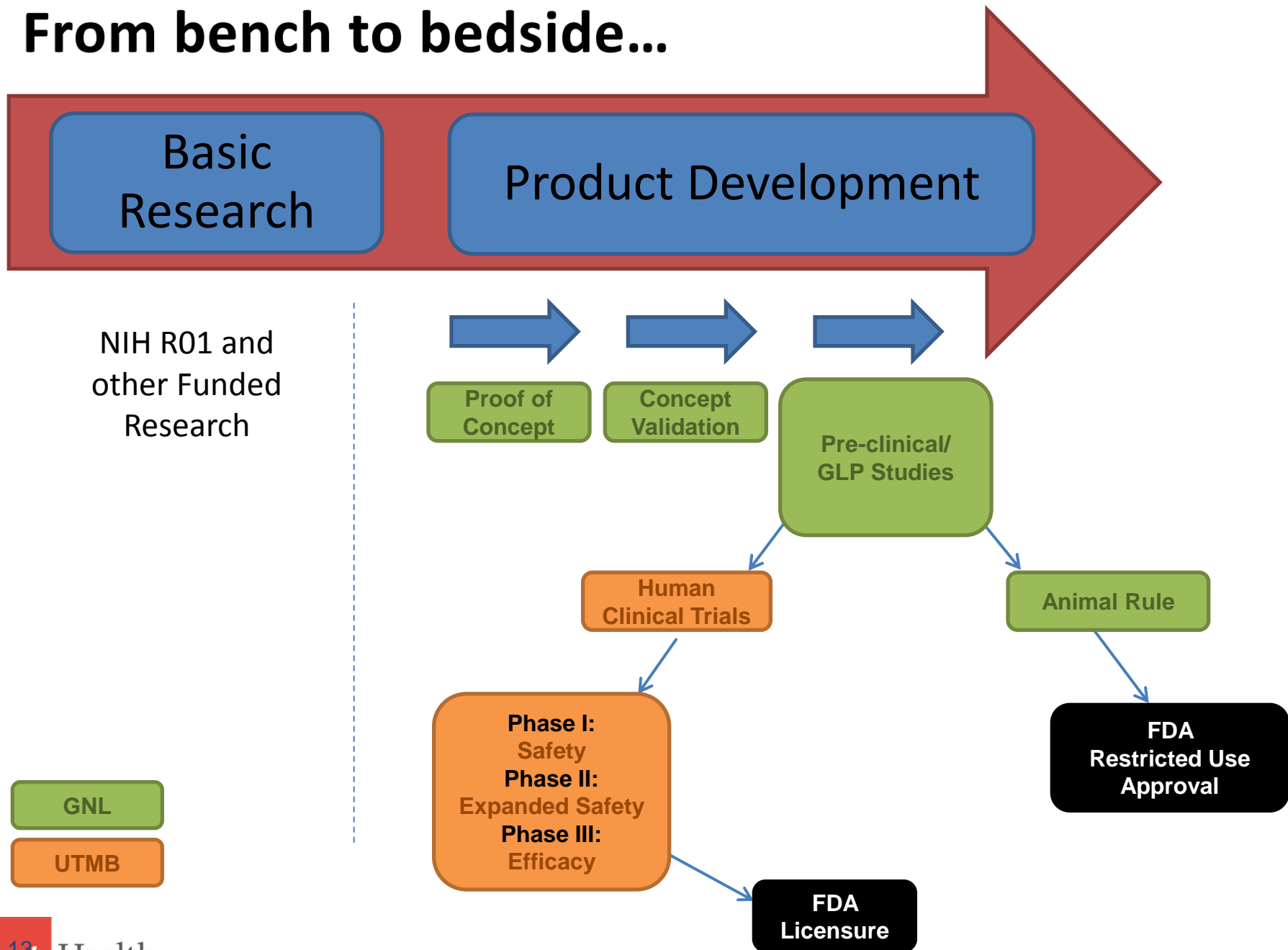


Emergency power for the entire lab

© Hedrich Blessing Photography 2009



From bench to bedside...



What are we doing now?

- New drugs to treat Ebola**
- Vaccines to protect against H5N1 avian influenza**
- Therapeutics for inhalation anthrax**
- Discovery of novel causes of childhood respiratory infections**
- Improved treatment of TB, including XDR-TB**
- Basic research on hepatitis C virus replication**

Currently studied BSL-4 agents at GNL

- **Avian H5N1 Influenza**
- **Filoviruses (Ebola, Marburg)**
- **Bunyaviruses (RVFV, CCHFV)**
- **Arenaviruses (LASV, GTOV, JUNV, MACV, Lujo)**
- **Flaviviruses (CEEV, RSSEV, OHFV, KFDV, ALKV)**
- **Henipaviruses (NiV, HeV)**

Services Divisions

Services available to researchers in biodefense and emerging infectious diseases:

- ❖ Aerobiology
- ❖ Assay Development
- ❖ Experimental Pathology
- ❖ Imaging
- ❖ Insectaries Services
- ❖ Preclinical Studies

Species Currently Supported

- ❖ Mice
- ❖ Rats
- ❖ Hamsters
- ❖ Guinea Pigs
- ❖ Ferrets
- ❖ Rabbits
- ❖ Chinchillas
- ❖ Nonhuman Primates
- ❖ Avian Species
- ❖ Gerbils
- ❖ Insect Species



Mosquito species:

Aedes aegypti,
Aedes albopictus,
Culex pipiens,
Anopheles gambiae

Tick species:

Amblyomma americanum
Amblyomma cajennense
Amblyomma imitator
Dermacentor andersoni
Dermacentor variabilis
Dermacentor variabilis
(Symbiont-free)
Ixodes ovatus
Ixodes pacificus
Ixodes persulcatus
Ixodes scapularis
Rhipicephalus sanguineus
(North Carolina strain)
Rhipicephalus sanguineus
(Israeli strain, pathogen-free)
Rhipicephalus sanguineus
(Israeli strain infected with
Rickettsia conorii)



Specialized Equipment & Resources

Equipment	BSL2	BSL3	BSL4
FluoView 1000 Confocal Microscope	X	X	
Molecular Imager VersaDoc MP 4000 System	X		
Molecular Imager Gel Doc XR System	X		
Personal Molecular Imager (PMI) System	X		
CereTom CT Scanner		X (ABSL)	
microPET Focus 220 PET Scanner		X (ABSL)	
IVIS Imaging System 200 Series		X (ABSL)	X
Point-of-Care CR-ITX 560 Digital X-ray System		X (ABSL)	
TECAN Freedom EVO	X		
Canto Flow Cytometer			X
TITAN Portable Ultrasound System		X (ABSL)	
InFlux Cell Sorter		X	
Ibis T5000 Universal Biosensor	X		



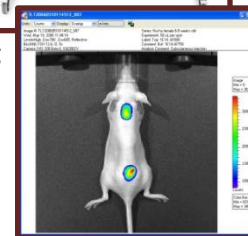
TECAN Robotics System



Ibis T5000



IVIS Imaging



Canto Flow Cytometer

Resources

Aerobiology Facilities

Good Laboratory Practices (GLP) Capabilities

National Biocontainment Training Center



PET/CT
18

Multidisciplinary *research themes*

- Understanding disease mechanisms
- Host immune response
- Molecular biology of infectious agents
- Epidemiology
- Vector biology
- Ecology of the infectious agents
- Structure-function relationships of infectious agents
- Vaccinology

National Biocontainment Training Center (NBTC)

- Supported through a grant from the U.S. Department of Defense
- Collaborative effort of the safety professionals of the Environmental Health and Safety Office and the scientists of the GNL.
- Offers didactic and practical (mock lab) training to prepare scientists for work with infectious agents [BSL-2 to BSL-4 and ABSL-3]
- Two fellowship programs:
 - ❖ Laboratory fellowship
facilitate the development of select junior scientists' in high containment infectious disease research
 - ❖ Engineering fellowship
develop high containment facility operation personnel

The National Biocontainment Training Center

- A national and international resource.
- To date, we have successfully **trained more than 4,500 individuals** to work in local, national and international BSL2, BSL3 and BSL4 labs.
- The NBTC offers 5 standard training courses.
- In addition to training laboratory staff at UTMB, the NBTC has trained staff from 40+ U.S. universities, federal agencies and corporations.
- Internationally, the NBTC has trained staff from laboratories in 20+ countries including Argentina, Panama, Egypt, Israel and Taiwan.
- The NBTC also offers a unique training and fellowship opportunities for biocontainment facility engineers.



Select Agent Research Program at UTMB

Select Agent Facilities

BSL-2 5,200 net ft²

BSL-3 & ABSL3 29,713 net ft²

BSL-4 & ABSL4 14,330 net ft²

~350 SRA-approved Employees

[~100 Tier 1 Employees]

FY12 Security Costs: > \$4,000,000

Focus: Basic pathogenesis and discovery research

Product development and evaluation

GLP validation of vaccines and therapies

Key Contacts

Director:

James W. LeDuc, Ph.D.

Scientific Director: Scott C. Weaver, Ph.D.

Associate Director for Research & Operations:

Joan Nichols, Ph.D.

Assistant Director: Andrew G. McNees, Ph.D.

Director of Containment Operations:

Thomas G. Ksiazek, D.V.M., Ph.D.

Director of Institutional Biocontainment

Resources: Miguel A. Grimaldo

Director of Strategic Initiatives: Alisha Prather

Director of Information Technology:

Bryan Fisher

External Research Coordinator: Efthalia L.

Bataki, Ph.D.

Nadezhda Yun, MD: neyun@utmb.edu



Galveston National Lab • Main: 409-266-6500

www.utmb.edu/gnl