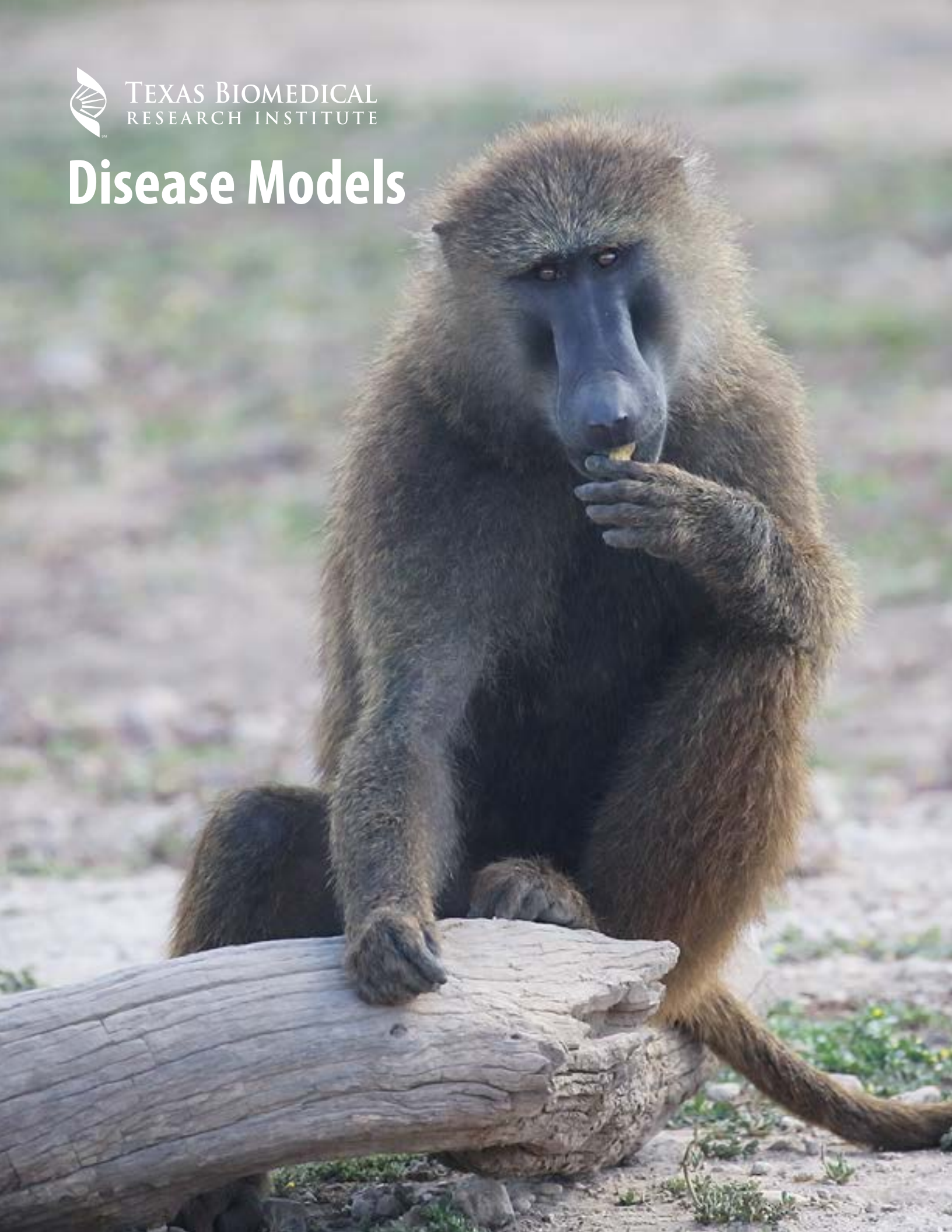

Texas Biomedical
Research Institute
Disease Models

TEXAS BIOMEDICAL RESEARCH INSTITUTE

HEALTH STARTS WITH SCIENCE

ABOUT US

Texas Biomedical Research Institute (Texas Biomed) is dedicated to protecting the global community from infectious diseases. Through basic research, preclinical testing and applied innovation, we accelerate diagnostics, therapies and vaccines for a wide range of pathogens, from Anthrax to Zika. Texas Biomed is the nation's only nonprofit, independent research institute with the highest-level biocontainment laboratories, a national primate research center and over 80 years of experience. Scientists at our 200-acre campus collaborate with academic institutes, the military, pharmaceutical companies, the National Institutes of Health (NIH), biotech start-ups and many others.

SPECIES AVAILABLE RELATIVE TO BIOSAFETY LEVELS AND PATHOGENS

The translation of basic biomedical knowledge to prevention or treatments of human diseases often requires the use of animals, tissues or cells as models. Such models provide valuable insights into the basic biology of disease, diagnosis and treatment in humans. New and evolving animal models are needed to better recapitulate human disease phenotypes and to broaden the utility of these models for biomedical research. Measurable animal phenotypes, which may be different from or related to particular human disease conditions, are valuable for understanding the etiology of disease and for testing potential therapies.

At Texas Biomed and our Southwest National Primate Research Center (SNPRC), we specialize in animal research to aid in the study of a number of infectious diseases, as well as chronic human disease conditions such as diabetes, heart disease and cancer. We can adapt our expertise to many species for the purposes of discovery, refinement and pre-clinical applications. Our team of highly skilled scientists, veterinarians and technical staff is available to accommodate needs and has the necessary resources and skills to work with prospective clients in the development of new and improved platforms to suit all areas of biomedical research.

Texas Biomed has developed a vast array of rodent and nonhuman primate (NHP) animal models and interventions for Biosafety Level 2, 3 and 4 agents. We have acquired and are proficient with many of the CDC Select Agent list of pathogens, including both viral and bacterial select agents. We have the capacity to perform telemetry on several of our animal models. We have a sophisticated and experienced veterinary staff that is cross-trained to work with pathogens of interest.

SNPRC has two scientific divisions: "Infectious Diseases Immunology and Control" and "Comparative Medicine and Health Outcomes." SNPRC is supported by the NIH to fulfill the mission of providing NHP resources to scientists nationally. These resources include the development of NHP models in these broad areas of research, and providing expertise and resources to collaborating investigators. The SNPRC Research Advisory Committee (RAC) oversees all NHP model development according to the guidelines provided by the NIH.

Abbreviations Key

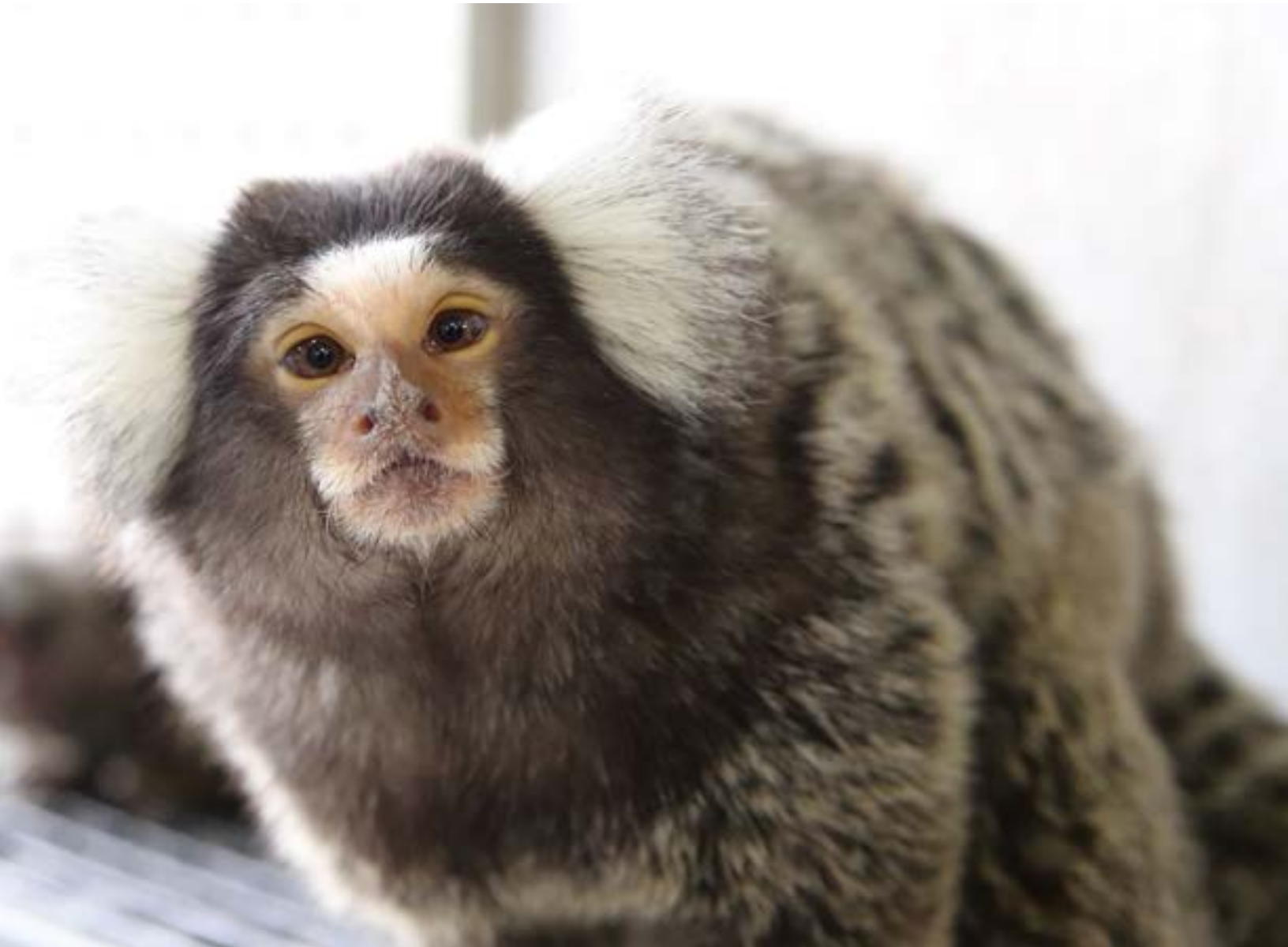
IB = Intrabronchial
IC = Intracochlear
ICranial= Intracranial
ID = Intradermal
IM = Intramuscular
IN = Intranasal
IP = Intraperitoneal
IT = Intratracheal
IV = Intravenous
O = Oral
SC/SQ = Subcutaneous
R = Rectal
V = Vaginal

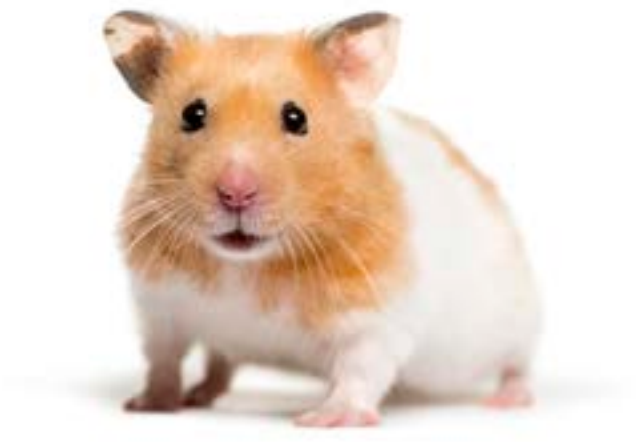
Biosafety Level-2

DISEASE MODELS / INTERVENTIONS	SPECIES	ROUTE
Adenovirus (gene therapy, viral vaccines, oncolytic cancer therapy)	Mouse Rat	IM | IN | IV | Intratumoral
Aging	African green monkey Baboon Marmoset	Natural Process
Alzheimer's	Baboon Marmoset	Natural Process
Anaplasma phagocytophilum	Mouse	IP
Aspergillus fumigatus	Mouse	IN | IT
Autism	Marmoset	SQ
Bordetella pertussis (Whooping cough)	Baboon	IN | IT
Delayed Type Hypersensitivity (DTH)	Cyno macaque	ID | IM
Diabetes	Baboon Marmoset	IV
Drug Addiction (methamphetamine, cannabinoid, cocaine)	Rhesus macaque	
Ehrlichia chaffeensis	Mouse	IP
Endometriosis (also see Menstrual endothelium)	Baboon	IN | IP (menstrual tissue) | IT
Epilepsy	Baboon	Natural Process
Experimental Autoimmune Encephalomyelitis/Multiple Sclerosis	Marmoset	SQ (Freund's adjuvant)
Hypercholesterolemia, Nonalcoholic Steatohepatitis (NASH), Nonalcoholic Fatty Liver Disease (NAFLD)	Baboon Rhesus macaque	High-fat, high-protein diet
Immunological recall studies, BCG vaccination and tuberculin skin testing	Baboon, Mouse Rhesus macaque	ID | SQ
Influenza A and B viruses	Mouse	IN
Kaposi's Sarcoma-Associated Herpesvirus (KSHV)	Marmoset	IM
Legionella pneumophila	Mouse	IT
Liver Cancer (tumor formation)	Baboon	Direct liver injection | SQ
Malaria (Plasmodium falciparum)	Mouse	IV
Menstrual endothelium	Baboon	IP
Osteoporosis	Marmoset	Natural Process
Parkinson's	Marmoset	IM
Prostate Cancer	Rabbit	IM
Schistosoma mansoni (Schistosomiasis)	Hamster, Mouse	ID
Sindbis Virus	Mouse	ICranial | IN | SQ
SIV/SHIV	Cyno macaque Pigtail macaque Rhesus macaque	IV | O | R | V
Streptozotocin	Baboon Marmoset	IV
Streptococcus pneumoniae	Mouse Rat	IN | IT
Trypanosoma cruzi (Chagas Disease)	Baboon Rhesus macaque	
Zika Virus	Marmoset pregnancy Male Baboon/Marmoset Mouse	IM

Biosafety Level-2

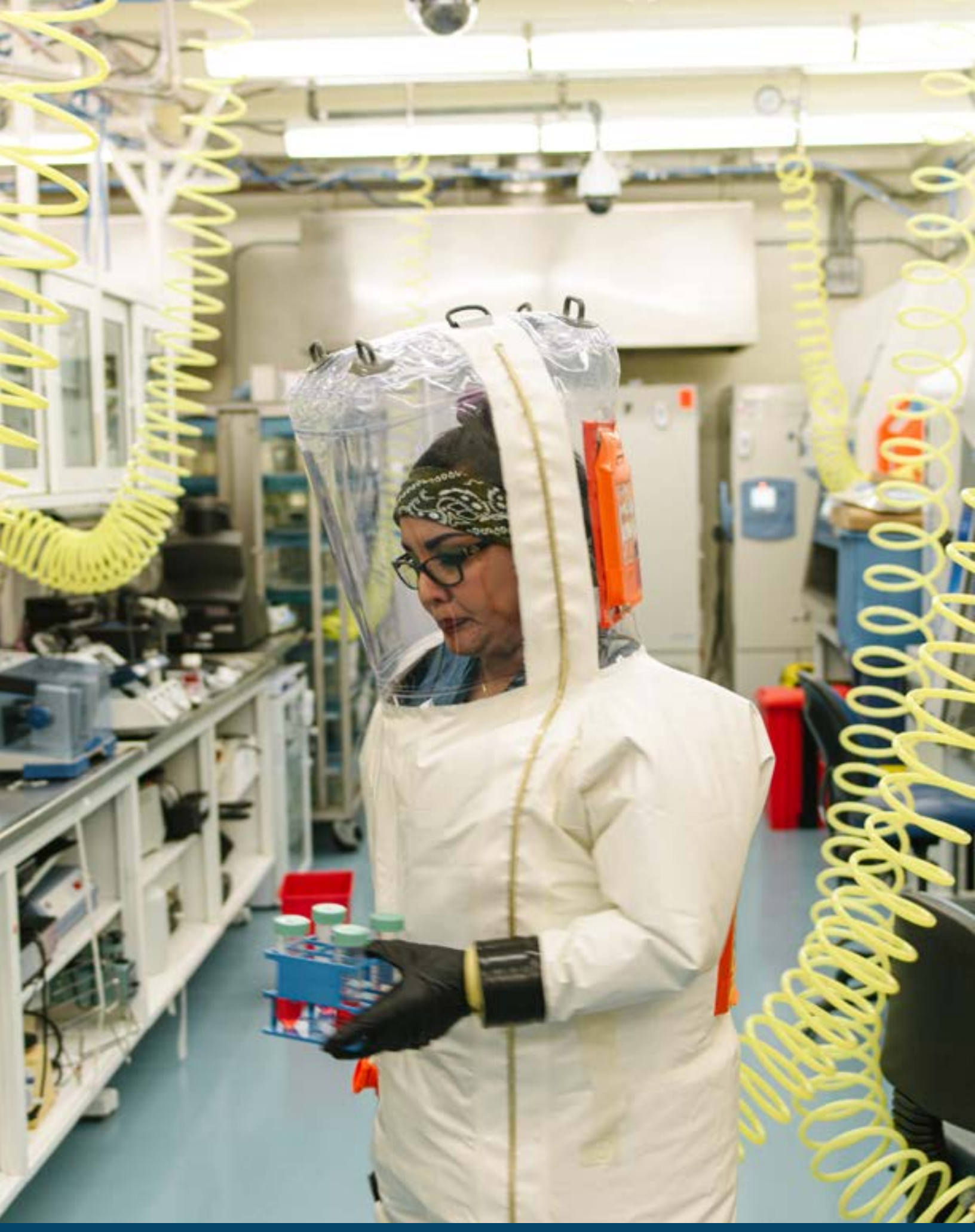
DISEASE MODELS / INTERVENTIONS	SPECIES	ROUTE
6-OHDA (induce Parkinsonism)	Mouse Rat	ICranial
AAV (e.g., gene therapy - deafness)	Baboon	IC, Liver Delivery
BMAA (induce Parkinsonism)	Marmoset	O
Experimental Autoimmune Encephalomyelitis (EAE), Freund's Adjuvant (Multiple Sclerosis)	Marmoset	SQ
High fat and/or high sugar diet (e.g., CV, metabolic, hypercholesterolemia, NASH, NAFLD)	Baboon	O | IV
Intrauterine growth restriction	Baboon Marmoset	Dietary energy restriction, marmoset multi-fetus litters
MPTP (induce Parkinsonism)	Baboon Marmoset	IM
Poly ICLC (Autism symptoms)	Marmoset	SQ
Transplant (transplant biology)	Baboon	





Biosafety Level-3

DISEASE MODELS / INTERVENTIONS	SPECIES	ROUTE
Bacillus anthracis (Anthrax)	Mouse Rabbit	IN | SQ
Bordetella pertussis (Strain D420)	Baboon	IN | IT
Eastern Equine Encephalitis	Marmoset Mouse	IN
Francisella tularensis (Tularemia)	Mouse	IN | SQ
Mycobacterium tuberculosis (susceptible, MDR, XDR, XXDR strains)	Cyno macaque Mouse Rhesus macaque	Aerosol (low/mid/high dose) IB | IN | IP | IT | IV
Mycobacterium tuberculosis CDC1551 (high dose-100-200 cfu)	Rhesus macaque	Aerosol
Mycobacterium tuberculosis CDC1551 (high dose-100-200 cfu)	Cyno macaque	Aerosol
Mycobacterium tuberculosis CDC1551 (low-dose-5-10 cfu)	Rhesus macaque	Aerosol
Mycobacterium tuberculosis CDC1551 (moderate dose-25-50 cfu)	Rhesus macaque	Aerosol
Mycobacterium tuberculosis Erdman (high dose-100-200 cfu)	Rhesus macaque	IB
Mycobacterium tuberculosis Erdman (high dose-100-200 cfu)	Cyno macaque	IB
Mycobacterium tuberculosis latent (susceptible, MDR, XDR, XXDR)	Mouse	Low aerosol infection IN | IP | IT | IV
Rift Valley Fever Virus	Mouse	IN
SARS-CoV-1 Urbani	Hamster Mouse	IN
SARS-CoV-2 WA South African P1	Baboon hACE2 Mouse Hamster Rhesus macaque	IN | IN (rodents) | IT (NHPs)
West Nile Virus	Mouse Rhesus macaque	SC
Western Equine Encephalitis Virus	Cyno macaque	Aerosol
Yersinia pestis (Plague)	Chikungunya mouse	IN | SQ



Biosafety Level-4

DISEASE MODELS / INTERVENTIONS	SPECIES	ROUTE
Anthrax	Mouse Rabbit	IN | SC
Ebola Zaire Virus	Cyno macaque Guinea pig Mouse Rhesus macaque	IM | IN | IP (rodent)
Japanese Encephalitis Virus	Rhesus macaque	Aerosol | SC
Junín	Guinea pig	SC
Lassa Virus	Guinea pig Marmoset Rhesus macaque	Aerosol | SC
Marburg Virus	Cyno macaque Guinea pig Mouse Rhesus macaque	Aerosol | IM | IP (rodent)
Plague	Mouse	IN | SC
SARS-CoV-1	Mouse	IN
Sudan Virus	Cyno macaque Rhesus macaque	Aerosol | IM
Tularemia	Mouse	IN | SC
* Nipah Virus (under development)	African green monkey Ferret Hamster	Aerosol | IT

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