



National Institute of
General Medical Sciences



IDeA Networks of Biomedical Research Excellence (INBRE)

Directory of Active Awards By State

Institutional Development Program (IDeA)

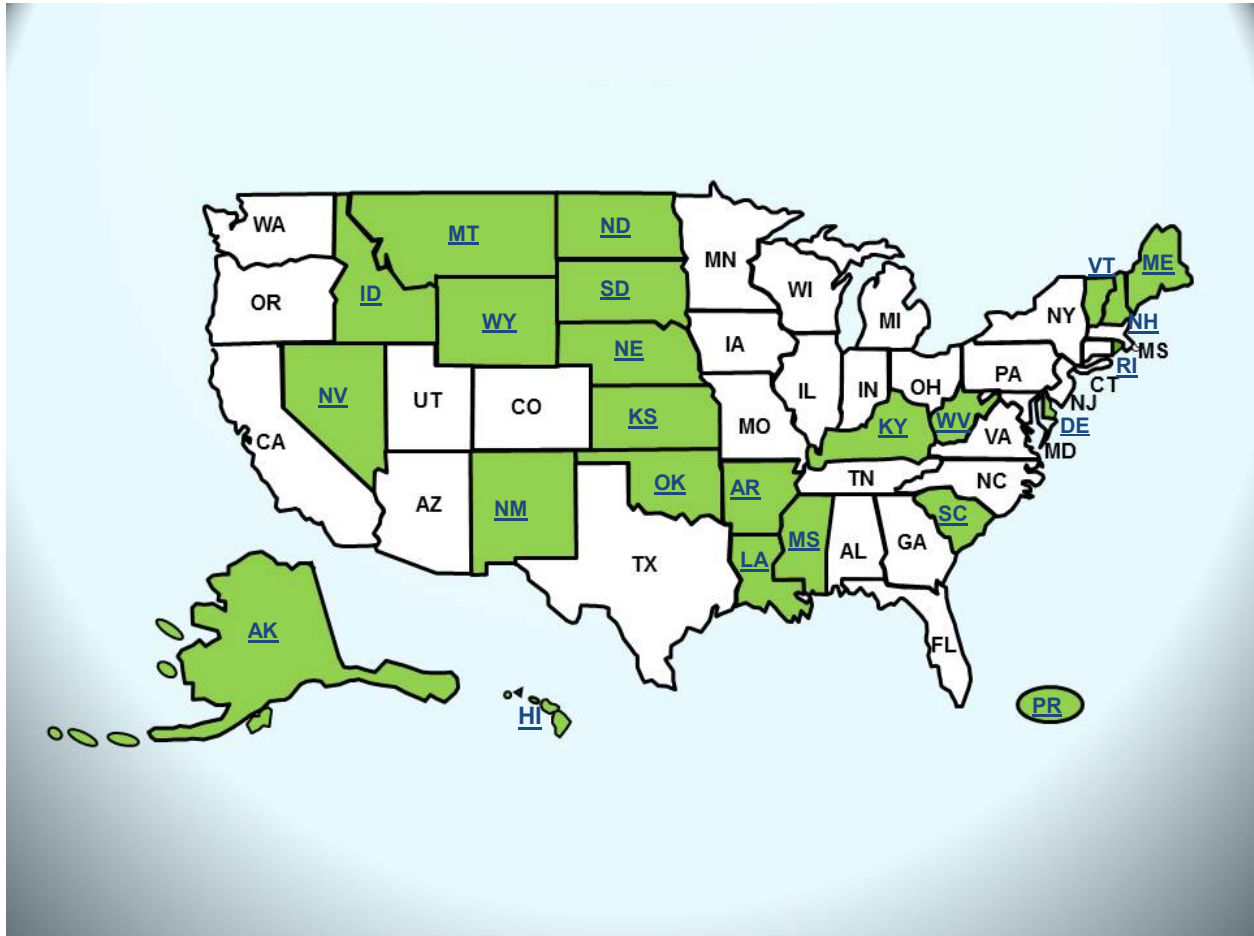
Capacity Building Branch

Training, Workforce Development, and Diversity Division

NIGMS, NIH

December 2012

Map of INBRE States



Ctrl+ Click on 2-letter state abbreviation to view INBRE program.

IDEA Networks of Biomedical Research Excellence (INBRE) enhance biomedical research capacity, expand and strengthen the research capabilities of biomedical faculty, and provide access to biomedical resources for promising undergraduate students throughout the eligible states. INBRE puts the IDEA approach into action by enhancing research infrastructure through support of a statewide system of institutions with a multidisciplinary, thematic scientific focus.

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Alaska

P20GM103395

Contaminants and Infectious Agents: Molecular Approaches

University of Alaska, Fairbanks

Principal Investigator

Cheryl Anne Frye, Ph.D.

Professor of Neuroscience

University of Alaska, Fairbanks

246 West Ridge Research Building

P.O. Box 757040

Fairbanks, AK 99775-7040

Tel: 907-474-5492

Fax: 907-474-6745

E-mail: cafrye@alaska.edu

Web: <http://www.alaska.edu/inbre>

Program Coordinator, Anchorage Campus

Jocelyn Krebs, Ph.D.

Professor of Biology

University of Alaska, Anchorage

3211 Providence Drive, CPISB 201Q

Anchorage, AK 99508

Tel: 907-786-1556

Fax: 907-786-4607

E-mail: jekrebs@mac.com

Partner Institution

University of Alaska, Anchorage

University of Alaska, Southeast

Outreach Institutions

College of Rural Alaska, Fairbanks

Program Goals

- Enlarge and sustain an inter-campus network for environmental and bio-behavioral health research
- Focus on molecular toxicology of subsistence species, infectious agents, zoonotic disease and cell/molecular basis of disease
- Support research projects of junior faculty, postdoctoral research associates and graduate students
- Provide research opportunities for undergraduate students throughout Alaska
- Provide outreach activities to students and teachers in high schools, at smaller colleges in Alaska, health corporations, hospitals and other organizations at rural sites
- Enhance science knowledge of the Alaskan workforce and expand the undergraduate student pipeline into health careers, with particular attention to Alaska Native students
- Form a core research team consisting of ten recently recruited faculty members
- Feature bioinformatics as an integral part of the program

Research Projects

- The environment, diet and metabolic syndrome
- Influenza virus-host interactions and molecular pathogenesis
- Role of tumor virus in human tumorigenesis
- Role of copper in lipid metabolism
- A1 adenosine receptor agonist-induced therapeutic hypothermia
- Impact of structural flexibility on peptide binding to HLA-DR and HLA-DM activity
- Linking gut microbial community structure and function in arctic ground squirrels
- Identification of central chemoreceptors

- Metabolic attenuation of PBDEs in Staghorn Sculpin
- Rabies virus glycoprotein interaction with nicotinic receptors
- Role of DNA double-strand break repair in neurogenesis
- Alaskan chewing tobacco iqmik: NFkB mediated induction of EMT
- Epigenetic regulators and Williams Syndrome
- Assessing toxicity of sulfolane degradation products in groundwater
- Ecological to molecular comparative cardiac physiology
- Neuronal aging: attenuation through insulin signaling and Alaskan botanicals

Resources

- DNA core laboratory
- Electrophysiology
- Cell culture
- Flow cytometer
- Biomedical computer science facility
- Central animal facility
- Scanning and transmission electron microscope facility
- Public health laboratory
- Applied science and engineering technology laboratory
- Ecosystem and biomedical health facility

Index Terms

molecular toxicology, infectious agents, zoonotic diseases, minority outreach, public health, influenza, tularemia, rural health care, environmental biology, dioxin, hepatitis B, cancer, liver disease, epidemiology, minority education, rabies, bio-behavioral health, copper, endocrine disruption, nicotine, addiction, pulmonary function, metabolic syndrome, tumorigenesis

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Arkansas

P20GM103429

Partnerships for Biomedical Research in Arkansas University of Arkansas for Medical Sciences

Principal Investigator

Lawrence E. Cornett, Ph.D.

Professor

*Department of Physiology and Biophysics
University of Arkansas for Medical Sciences
4301 W. Markham Street, # 818*

Little Rock, AR 72205-7101

Tel: 501-686-5441

Fax: 501-526-6873

E-mail: cornettlawrencee@uams.edu

Web: <http://brin.uams.edu>

Program Coordinator

Helen Beneš, Ph.D.

Research Professor

*Departments of Neurobiology and
Developmental Sciences and
Biochemistry and Molecular Biology
University of Arkansas for Medical Sciences
4301 W. Markham Street, # 510*

Little Rock, AR 72205-7101

Tel: 501-686-5782

Fax: 501-686-6382

E-mail: beneshelen@uams.edu

Lead Institutions

University of Arkansas
University of Arkansas at Little Rock
University of Arkansas for Medical Sciences

Partner Institutions

Arkansas State University
Hendrix College
Ouachita Baptist University
University of Arkansas at Pine Bluff
University of Central Arkansas

Outreach Institutions

Arkansas Tech University
Central Baptist College
Harding University
Henderson State University
John Brown University
Lyon College
Philander Smith College
University of Arkansas at Monticello

Program Goals

- Improve the ability of Arkansas scientists to compete for research funding and improve the climate for research at PUIs to positively impact the state's scientific and technological workforce
- Expand and strengthen the biomedical research infrastructure of lead and partner institutions through a multidisciplinary network
- Increase the Arkansas biomedical research base by providing research support to select faculty at partner PUIs and augment their efforts to obtain independent extramural funding
- Provide undergraduate research opportunities for the six partner PUIs, thereby serving as a "pipeline" that encourages students to choose health research careers

- Sponsor specialized outreach activities for faculty and students from PUIs that are not partners, thereby preparing other investigators for INBRE support
- Enhance the science/technology base of Arkansas's future workforce by developing a cadre of trained scientists (i.e., with biomedical research/bioinformatics expertise) and providing resources to stimulate growth of biotechnology industries in Arkansas

Research Projects

- Synthesis and testing of novel vorinostat derivatives for increased bioavailability to cancer cells
- Role of mitochondrial DNA damage in alcohol- and CYP2E1-dependent toxicity
- Effects of prenatal steroids on the fatigue properties of breathing muscles
- Cannabinoids and inflammation: relevance to multiple sclerosis
- Estrogen prevents the subunit association of vascular voltage-gated calcium channels
- Computational and biological co-design – cracking UGT structure-function relationships
- Understanding immune cell signaling: effect of retinoids on ADAM shedding
- Mechanisms leading to enhanced tolerance to oxidative stress and increased lifespan in Arabidopsis
- Studying FszA to elucidate the link between prokaryotes and mitochondria
- Nitroanisole detoxification by CYP2E1
- Targeted drug delivery of anticancer agents across the blood-brain barrier
- Prevention and treatment of cisplatin- and rhabdomyolysis-induced nephrotoxicity using metal complexes
- Structure-activity studies of novel gold (III) compounds for use in the treatment of Cisplatin-resistant ovarian cancer

Resources

- DNA damage and toxicology facility
- UAMS proteomics facility
- UAF proteomics facility
- Microscopy facility
- UAMS Bioinformatics Center
- UALR Bioinformatics Center

Index Terms

cancer, cell signaling, cell biology, genomics, microarray, proteomics, microscopy, bioinformatics, neurobiology, developmental biology

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Delaware

P20 GM103446
Delaware INBRE
University of Delaware

Principal Investigator

Karl V. Steiner, Ph.D.

*Senior Associate Provost for Research
Development*

204A Hullihen Hall

University of Delaware

Newark, DE 19716

Tel: 302-831-6703

Fax: 302-831-2828

E-mail: ksteiner@udel.edu

Web: <http://sww.inbre.udel.edu>

Program Coordinator

Steven J. Stanhope, Ph.D.

*Department of Kinesiology and Applied Physiology
University of Delaware*

5 Delaware Technology Park

Suite 300

Newark, DE 19711

Tel: 302-831-3496

Fax: 302-831-4365

E-mail: stanhope@udel.edu

Partner Institutions

- University of Delaware
- Christiana Care Health Services, Inc.
- Delaware State University
- Delaware Technical Community College
- Alfred I. DuPont Hospital for Children of the Nemours Foundation
- Wesley College

Outreach Institutions

- Delaware Technical Community College

Program Goals

- The goal of Delaware INBRE is to establish a sustainable biomedical research capability across the state. INBRE builds on the strong foundation established over the past decade of collaboration and utilizing shared biomedical research infrastructure to develop competitive faculty research and biomedically relevant education programs at the academic and clinical partner institutions
- Delaware INBRE is comprised of five cores: the Administrative Core, the Research and Mentoring Core, the Bioinformatics Core, the Shared Instrumentation Core and the Undergraduate Research and Professional Development Core
- Delaware INBRE is a statewide partnership of six academic and medical institutions comprised of the University of Delaware, Delaware State University, Delaware Technical and Community College, Wesley College, Christiana Care Health System, and Nemours/Alfred I. DuPont Hospital for Children

Research Projects

- *Cancer*
 - Inhibitors of annexin II tetramer/annexin II receptor axis as potential therapeutics for pediatric acute lymphoblastic leukemia relapse
 - Development of nanofiber membrane in situ electroporation devices for pharmacogenomics anticancer drug screening

- An immersive surgery training system using emerging 3D imaging and display technologies
- *Cardiovascular Health*
 - Kinetic mechanisms of the viscoelasticity of pathogenic sickle cell hemoglobin polymers
 - Cardiovascular risk one year following a pregnancy complicated by hypertension
 - In-silico prediction of protein-protein interaction and interaction residues: towards understanding CIB1 and JAM-A protein networks and implication in cardiovascular diseases
 - Extracellular matrix remodeling and human heart failure
- *Neurosciences*
 - Exercise intervention to increase quickness in elderly
 - Defining the role of sonic hedgehog mediated regulation of Na, K-ATPase in medulloblastoma
 - Motor learning after stroke
 - NeRevolver: a computational intelligence-based system for automated construction, tuning and analysis of neuronal models

Resources

- *Core Centers and Resources*
 - A variety of resources, including core facilities and shared research resources are available to biomedical researchers in Delaware, many which have been supported by Delaware INBRE.
 - Bioinformatics
 - DNA sequencing
 - Flow cytometry
 - Genomics
 - Histology and pathology
 - Magnetism
 - Medical imaging
 - Microarrays
 - Microscopy and imaging
 - Nuclear magnetic resonance imaging
 - Primer/oligo synthesis
 - Proteomics and mass spectrometry
 - Shared lab equipment
 - Statistics
 - X-ray diffraction
- STRiDE – Supporting Translational Research in Delaware

Index Terms

biomedical translation, bioinformatics, computational biology, biotechnology, cancer, colorectal cancer, breast cancer, public health, minority education, sickle cell anemia, lymphoblastic leukemia, bone cancer, bioengineering, neuromuscular disease, lung cancer, drug delivery system, drug synthesis, immune response, protein-protein interaction , virtual surgery, infectious diseases, women's health, anti-neoplastic agents, tumor detection, prostate tumors, cardiovascular disease, biomedical imaging, virtual surgery training, biochemistry

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Hawaii

P20GM103466

Hawaii Statewide Research & Education Partnership (HSREP)

University of Hawaii, Manoa

Principal Investigator

Eric H. Holmes, Ph.D.

Director of Research

John A. Burns School of Medicine

Adjunct Professor

Department of Cell and Molecular Biology

University of Hawaii at Manoa

651 Ilalo Street, MEB 223A

Honolulu, HI 96813

Tel: 808-692-4082

Fax: 808-692-1985

E-mail: eholmes3@hawaii.edu

Web: <http://www.inbre.jabsom.hawaii.edu>

Program Coordinator

David Haymer, Ph.D.

Professor

Department of Cell and Molecular Biology

John A. Burns School of Medicine

University of Hawaii at Manoa

1960 East-West Road, Biomed T511

Honolulu, HI 96822

Tel: 808-956-5517

Fax: 808-956-9099

E-mail: dhaymer@hawaii.edu

Partner Institutions

Chaminade University, Honolulu

Hawaii Pacific University, Kaneohe

University of Hawaii at Hilo, College of Pharmacy, Hilo

Outreach Institutions

Kapiolani Community College, Honolulu

Leeward Community College, Pearl City

UH Maui College, Kahului

Windward Community College, Kaneohe

Hawaii Community College, Hilo

Kauai Community College, Lihue

Program Goals

- Enhance the science and technology knowledge of Hawaii's workforce by creating a statewide pipeline of research opportunities including training and education experiences for young investigators and inquisitive students to inspire interest in developing biomedical research careers
- Expand and develop competitive research capacity in Hawaii by building on the institutional network foundation begun under BRIN and the first 5-year cycle of INBRE
- Develop multi-disciplinary research projects that explore basic biological processes, drug discovery and aspects of natural product discovery and activities
- Develop core competencies in molecular biology and analysis of natural product activities
- Establish teams consisting of senior investigators and mentors and junior investigators at the lead and affiliated institutions, as well as expanded opportunities for graduate and undergraduate students
- Provide outreach activities to undergraduate institutions and community colleges
- Foster the development of individual investigator careers and of institutional research capacity

- Sponsor training and mentoring workshops and seminars
- Provide academic/research work force development through bioinformatics core training activities

Research Projects

- Selenoproteins and synaptic changes in Alzheimer's disease (Bellinger)
- Structure activity relationships of TRPM7 ion channel inhibitors from semi-synthetic and synthetic analogs of waixenicin A (Berger)
- Mechanism of action of antillatoxin on recombinant NMDA receptors (Chen)
- Development of CNS therapeutics derived from natural products: smoking cessation drugs and therapeutics for the treatment of depression (Guendish)
- Diacylglycerol kinase iota links heat shock gene expression to the suppression of autophagy (Jacobs)
- Defining mechanisms of malaria resistance in a geographically-isolated natural disease system (Jarvi)
- Drug discovery of PKB inhibitors as anti-tumor agents (Kawakami)
- Angiogenic action of natural products (Konorev)
- Protective roles of selenium in HIV Infection and methamphetamine-induced damage in the central nervous system (Panee)
- Development of anti-infective agents – natural product core based library approach (Sun)
- The involvement of TMC proteins in cellular stress response (Stokes)

Resources

- Bioinformatics core facility
- Biological electron microscopy facility
- Molecular biology core facility
- Vivarium
- Tissue culture facilities
- Laboratory of molecular medicine and infectious diseases
- Retrovirology research laboratory
- Genomic research core facility

Index Terms

immunology, cell biology, developmental biology, neurobiology, cell signaling, imaging, molecular biology, genomics, proteomics, natural products, cancer, aging, infertility, neuropathy, dementia, forensics, toxicology, physical anthropology, addiction, nicotine, inflammatory diseases, asthma, arthritis, air pollutants, ozone

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Idaho

P20GM103408

**Idaho INBRE Program
University of Idaho, Moscow**

Principal Investigator

Carolyn Hovde Bohach, Ph.D.

University Distinguished Professor

School of Food Science

Director, Idaho INBRE Program

University of Idaho

875 Perimeter Drive, MS 4207

Moscow, ID 83844-4207

Tel: 208-885-5373

Fax: 208-885-6904

E-mail: cbohach@uidaho.edu

Web: <http://inbre.uidaho.edu>

Program Coordinator

Scott A. Minnich, Ph.D.

Professor

School of Food Science

Associate Director, Idaho INBRE Program

University of Idaho

875 Perimeter Drive, MS 4207

Moscow, ID 83844-4207

Tel: 208-885-5373

Fax: 208-885-6904

E-mail: sminnich@uidaho.edu

Partner Institutions

Boise State University, Boise

Boise Veterans Administration Medical Center, Boise

The College of Idaho, Caldwell

Idaho State University, Pocatello

Northwest Nazarene University, Nampa

Outreach Institutions

Brigham Young University - Idaho, Rexberg

College of Southern Idaho, Twin Falls

Lewis-Clark State College, Lewiston

North Idaho College, Coeur d'Alene

Program Goals

- Strengthen Idaho's biomedical research infrastructure and expertise by building on the established INBRE network with the scientific theme of "Cell Signaling"
- Provide support to Idaho faculty, postdoctoral fellows and graduate students to increase the research base and capacity
- Provide research opportunities to Idaho undergraduate students and serve as a pipeline for these students to continue in health research careers
- Enhance the science and technology knowledge of Idaho's workforce
- Develop bioinformatics resources as research and teaching tools
- Expand Idaho research opportunities across the western IDEa region

Research Projects

- Collagen function during development
- Impact of antibiotics on bacterial exotoxins
- Bacterial quorum sensing and virulence
- Antioxidant properties of sagebrush flavonoids
- Immunoregulation of liver regeneration

- Catecholestrogens and prolactin regulation of uterine glycogen metabolism
- Impact of LEED building on human health and behavior
- Involvement of transcription factors in inflammation in Alzheimer's disease
- Antioxidant therapy: development of new agents to prevent/treat heavy metal osteotoxicity
- Distribution of flux control between ADH and ALDH in liver ethanol metabolism

Resources

- Computational Resources Core
- Genomics Resources Core
- Optical Imaging Core (microscopy, cell separation and IVIS)
- Molecular Research Core Facility
- Biomolecular Research Center
- Biophysics Research Lab
- Surface Science Laboratory
- Physical Science/Microbiology/Cell Biology Teaching Labs

Index Terms

cell signaling, bioinformatics, extracellular matrix, collagen, bone, cartilage, infectious disease, antibiotics, exotoxin, Staphylococcus, Group A Streptococcus, Clostridium, E. coli, Klebsiella, quorum sensing, sagebrush flavonoids, aryl hydrocarbon receptor, liver regeneration, uterine glycogen metabolism, Alzheimer's disease, heavy metal poisoning, alcohol metabolism, alcoholism, neurodegeneration, inflammation, LEED

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Kansas

P20GM103418

**Kansas IDeA Network of Biomedical Research Excellence
University of Kansas Medical Center, Kansas City**

Principal Investigator

Douglas Wright, Ph.D.

Department of Anatomy and Cell Biology

University of Kansas Medical Center

Mai Stop 3051

3901 Rainbow Blvd.

Kansas City, KS 66160

Tel: 913-588-2713

Fax: 913-945-7760

E-mail: dwright@kumc.edu

Web: <http://www.kumc.edu/kinbre>

Program Coordinator

Dianne Durham, Ph.D.

Professor

Otolaryngology Head and Neck Surgery

University of Kansas Medical Center

Mai Stop 3051

3901 Rainbow Blvd.

Kansas City, KS 66160

Tel: 913-588-6731

Fax: 913-588-5677

E-mail: ddurham@kumc.edu

Partner Institutions

Kansas State University, Manhattan

University of Kansas, Lawrence

Outreach Institutions

Emporia State University, Emporia

Fort Hays State University, Hays

Haskell Indian Nations University, Lawrence

Langston University, Langston, Oklahoma

Pittsburg State University, Pittsburg

Washburn University, Topeka

Wichita State University, Wichita

Program Goals

- Build, strengthen and integrate biomedical research in Kansas
- Establish a multidisciplinary research network with a thematic research focus in cell and developmental biology
- Provide support to junior faculty at the participating institutions; highlight two to four investigators each year for career guidance and research support
- Increase the workforce of biomedical researchers in Kansas by delivering special services tailored to the needs of the outreach institutions
- Enhance science and technology knowledge of the Kansas workforce
- Provide analytic and interpretive programs and services in bioinformatics
- Develop new strategies for improving human health
- Facilitate translational research via bidirectional exchange of basic and clinical scientist training opportunities

Research Projects

- Functional analysis of Ewing sarcoma proteins EWS/FLI1 and EWS
- The role of aberrantly expressed GPR10 in uterine fibroid growth
- Toxin secretion in *Clostridium difficile*
- Role of polycystin-1/protein phosphatase-1 complex in Polycystic Kidney Disease

Resources

- Bio-Rad CFX96 Touch Real Time PCR System and a Nanodrop ND-2000 spectrophotometer
- Optimization of a PhiC31-mediated platform for rapid *in vivo* transgenesis in the mouse
- Flow Cytometry Core Laboratory-552 nm laser to the BD LSR II
- Inverted Microscope, Nikon Fluorescence System, Digital Imaging System, Motorized Stage

Index Terms

cell biology, developmental biology, bioinformatics, genomics, proteomics, lipidomics, cancer, minority education, reproductive biology

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Kentucky

P20GM103436
KY IDEa Networks of Biomedical Research Excellence
University of Louisville

Principal Investigator

Nigel G. F. Cooper, Ph.D.

Professor

*Department of Anatomical Sciences
and Neurobiology*

University of Louisville

Health Sciences Center, Room 807A

Louisville, KY 40292

Tel: 502-852-1474

Fax: 502-852-1475

E-mail: nigelcooper@louisville.edu

Web: <http://www.kbrin.louisville.edu>

Program Coordinator

Bruce Mattingly, Ph.D.

Professor

Department of Psychology

Morehead State University

433 Reed Hall

Morehead, KY 40351

Tel: 606-783-2983

Fax: 606-783-5077

E-mail: b.mattin@morehead-st.edu

Partner Institutions

Eastern Kentucky University, Richmond

Morehead State University, Morehead

Northern Kentucky University, Highland Heights

University of Kentucky, Lexington

Western Kentucky University, Bowling Green

Outreach Institutions

Bellarmine University, Louisville

Berea College, Berea

Kentucky State University, Frankfort

Kentucky Wesleyan College, Owensboro

Murray State University, Murray

Pikeville College, Pikeville

Transylvania University, Lexington

Program Goals

- Develop sustainable competitive research programs at all state institutions
- Enhance the pipeline for undergraduate students to access careers in biomedical and health-related professions
- Support centralized genomics core facility and provide access
- Develop bioinformatics infrastructure for research and service projects
- Facilitate community-based participatory research

Large Research Projects

- Dissecting functional domains of an unusual umuD allele with novel regulatory function in Acinetobacter
- Serca inhibition by hydroquinone derivatives
- Zebrafish: a model of auditory hair cell death and regeneration
- Sex dependent regulation of miRNA in cardiac remodeling
- Using Xenopus frogs to investigate successful recovery from spinal cord injury

Resources

- Genomics core
- Bioinformatics core

Index Terms

neuroscience, genomics, molecular biology, microarrays, next generation sequencing, bioinformatics, genetics, bacteria, antipsychotic drugs, brain damage, Alzheimer's disease, schizophrenia, memory loss, cardiovascular disease, diabetes, asthma, evolution, vision, eyes, retina, metabolic regulation, cancer, anti-cancer drugs, drug addiction, estrogens, osteoporosis, aging, taste, neurological development, women's health

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Louisiana

P20GM103424

Louisiana Biomedical Research Network Louisiana State University, Baton Rouge

Principal Investigator

Thomas R. Klei, Ph.D.

Interim Vice Chancellor

Research and Economic Development

Louisiana State University

130 David Boyd Hall

Baton Rouge, LA 70803-1715

Tel: 225-578-6910

Fax: 225-578-5983

E-mail: tklei1@lsu.edu

Web: <http://lbrn.lsu.edu/portal>

Program Coordinator

E. William Wischusen, Ph.D.

Associate Professor

Department of Biological Sciences

Louisiana State University

104 Life Sciences Building

Baton Rouge, LA 70803-1715

Tel: 225-578-8239

Fax: 225-578-8266

E-mail: ewischu@lsu.edu

Partner Institutions

Louisiana State University, Shreveport

Louisiana Tech University

Southern University and A&M College

The University of Louisiana at Monroe

Xavier University of New Orleans

Mentor Institutions

Louisiana State University Health Sciences Center, New Orleans

Louisiana State University Health Sciences Center, Shreveport

Pennington Biomedical Research Center

Tulane Medical Center

Tulane National Primate Research Center

Outreach Institutions

Baton Rouge Community College

Centenary College of Louisiana

Delgado Community College

Dillard University

Grambling State University

Louisiana College

Louisiana State University, Alexandria

Loyola University New Orleans

McNeese State University

Nicholls State University

Northwestern State University

Our Lady of the Lake College

Southeastern Louisiana University

Southern University at New Orleans

Southern University at Shreveport

University of Louisiana at Lafayette

University of New Orleans

Program Goals

- Maintain and expand the previously established state-wide infrastructure and intellectual research network supporting interdisciplinary biomedical research
- Expand and improve the critical mass of biomedical investigators at primary PUI campuses through the support of mentored research, and enhanced communication
- Increase student interest in biomedical research careers throughout Louisiana by providing summer research opportunities to all institutions within the state
- Evaluate, assess and continuously monitor the progress within LBRN through detailed tracking of research accomplishments, the development of human resources, and productive collaborations among participating institutions

Research Projects

- *Computational and structural biology*
 - Modeling protein-substrate interactions in the lipoxygenase family using computational approaches
 - Adaptive coupled neural system model for hippocampal function restoration
 - Rule-based data mining for knowledge discovery in Alzheimer's disease using microarray databases
- *Molecular mechanisms of disease*
 - Understanding the molecular mechanism of Alzheimer's disease with proteomics
 - NR4A regulation of organ morphogenesis
 - Function of thyroid hormone and its receptor in the regulation of herpes simplex virus type 1 (HSV-1) gene expression
 - Epigenetic effects of ceramide glycosylation and drug-resistant cancer stem cell
 - Regulation of mouse ES cell differentiation into neurons by Hoxa1
- *Therapeutics and preventive medicine*
 - Development of novel anti-cancer agents
 - Assessment of the molecular target of fusarochromanone and its analogues

Resources

- Imaging facility
- Genomics facility
- Proteomics facility
- Bioinformatics core facility
- Molecular biology core facility
- Access grid facilities
- Computational facilities

Index Terms

cancer, infectious diseases, bacteria, genomics, proteomics, cell biology, molecular biology, imaging, virus, bioinformatics, breast cancer, computational biology

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Maine

P20GM103423

Comparative Functional Genomics INBRE in Maine

Mount Desert Island Biological Laboratory, Salisbury Cove

Principal Investigator

Patricia H. Hand, Ph.D.

Administrative Director

Mount Desert Island Biological Laboratory

P.O. Box 35

Old Bar Harbor Road

Salisbury Cove, ME 04672

Tel: 207-288-9880 ext. 103

Fax: 207-288-2130

E-mail: phand@mdibl.org

Web: <http://www.maineidea.net>

Program Coordinator

James Coffman, Ph.D.

Associate Professor

Mount Desert Island Biological Laboratory

P.O. Box 35

Old Bar Harbor Road

Salisbury Cove, ME 04672

Tel: 207-288-9880 ext. 444

Fax: 207-288-2130

E-mail: jcoffman@mdibl.org

Partner Institutions

Bates College, Lewiston

Bowdoin College, Brunswick

Colby College, Waterville

College of the Atlantic, Bar Harbor

The Jackson Laboratory, Bar Harbor

University of Maine, Orono

University of Maine, Honors College

University of Maine, Farmington

University of Maine, Machias

Southern Maine Community College

Outreach Institutions

University of Maine, Fort Kent

University of Maine, Presque Isle

Program Goals

The ME-INBRE will address the state's continued need to further enhance biomedical research capacity and competitiveness of our faculty and students by:

- Strengthening the lead and partner institutions' biomedical research infrastructure through a multi-disciplinary research network with a thematic scientific focus in comparative functional genomics
- Providing research support to investigators, postdoctoral fellows and graduate students
- Creating year-round research opportunities for undergraduate and community college students at network institutions
- Providing outreach activities to high school and undergraduate students
- Serving as a pipeline for students and faculty to continue in health research careers and enhancing the scientific and technical knowledge of Maine's workforce
- Significantly expanding state, regional and national collaborations with other IDeA, NIGMS and NIH-supported programs

Research Projects

- Studies of interchromosomal gene regulation in *Drosophila melanogaster*
- Comparative functional analysis of a vertebrate genomic Cis-regulatory region involved in embryonic organogenesis
- Dissection of microRNA function during heart regeneration
- Identification of hydrogen peroxide-dependent transcriptional pathways pivotal for peripheral sensory axon regeneration
- Regulation of genomic function by prenatal choline availability to confer protection against behavioral and neural outcomes in rat models of depression
- DNA repair events associated with carbamoylating anticancer agents
- Translational regulation of ribosomal protein and RNA polymerase subunit synthesis in diverse bacterial species
- Genomic interrogation and perturbation of natural fungal-host cell surface dynamics
- Genomic analysis and comparative transcriptomics of growth pathways and cancer susceptibility genes in the soft-shell clam *Mya arenaria*

Resources

- Animal resources
- Bioinformatics
- Cell culture
- Electrophysiology
- Biological imaging
- DNA sequencing and microarray

Index Terms

genomics, proteomics, cell signaling, cell biology, disease resistance, developmental biology, respiratory physiology, regeneration, comparative genomics, functional genomics, immunology, fungal-host dynamics, translational regulation, DNA repair, organogenesis, gene regulation

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Mississippi

P20GM103476

Mississippi INBRE

University of Southern Mississippi, Hattiesburg

Principal Investigator

Glen Shearer, Ph.D.

Professor and Chair

Department of Biological Sciences

University of Southern Mississippi

P.O. Box 5018

118 College Drive

Hattiesburg, MS 39406-5018

Tel: 601-266-4748

Fax: 601-266-5797

E-mail: glen.shearer@usm.edu

Web: <http://www.msinbre.org>

Program Coordinator

Mohamed Elasri, Ph.D.

Associate Professor

Department of Biological Sciences

University of Southern Mississippi

P.O. Box 5018

118 College Drive

Hattiesburg, MS 39406-5018

Tel: 601-266-6916

Fax: 601-266-5797

E-mail: mohamed.elasri@usm.edu

Partner Institutions

Alcorn State University, Lorman

Millsaps College, Jackson

Mississippi University for Women, Columbus

Tougaloo College, Jackson

Outreach Institutions

Delta State University, Stoneville

Mississippi College, Clinton

Mississippi Gulf Coast Community College, Perkinston

Mississippi Valley State University, Itta Bena

Rust College, Holly Springs

Jackson State University, Jackson

Belhaven University, Jackson

Holmes Community College, Goodman

Program Goals

- Develop functional genomics of cancer and of microbial pathogenesis as primary research foci
- Enhance core research facilities in high-throughput genomics, proteomics, cellomics, imaging instrumentation and bioinformatics and make them available for use state-wide
- Strengthen biomedical research and training in Mississippi via a multifaceted approach directed toward both faculty and students
- Provide training and mentoring activities through workshops on subjects such as bioinformatics, grant writing and management, publication and presentation, and research techniques
- Prepare a workforce of researchers trained in collection and analysis of massive datasets
- Make the bioinformatics core training tools and software more available through an expanded Web site

- Support and mentor eight promising faculty researchers at the partner undergraduate institutions
- Establish experienced scientists as mentors to facilitate development of independent research projects at partner undergraduate institutions
- Enhance undergraduate science training at outreach colleges through summer research awards and workshops

Research Projects

- Estrogen receptor dimerization and breast cancer
- Impact of obesity on melanoma
- Detection methods for amyloidosis related to multiple myeloma
- DNA and histone modifications in cancer
- Cell cycle regulation and cancer
- Photodynamic agents for cancer therapy
- Identification of lipid markers in breast cancer and prostate cancer
- Low birth weight as a risk factor for high blood pressure
- Mitochondrial DNA maintenance
- Protein mis-folding and amyloid diseases
- Functional genomics of IcsA, a pathogenic determinant in Shigella
- Functional genomics of microbial pathogenesis
- CFTR trafficking in cystic fibrosis

Resources

- Imaging facility
- Genomics facility
- Proteomics facility
- Cellomics facility
- Pharmacogenomics facility
- Bioinformatics core facility
- Animal facility
- Molecular biology core laboratory

Index Terms

cancer, infectious diseases, bacterial pathogenesis, pulmonary infections, genomics, proteomics, cell biology, molecular biology, imaging, cystic fibrosis, Alzheimer's disease, cancer therapy, lung cancer, breast cancer, prostate cancer, melanoma, minority education, obesity, HBCU, undergraduate summer research program, health disparities.

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Montana

P20GM103474

**Montana Network of Biomedical Research Excellence
Montana State University, Bozeman**

Principal Investigator

Allen G. Harmsen, Ph.D.

*Department of Immunology and Infectious
Diseases*

College of Agriculture

Montana State University

P.O. Box 173610

Bozeman, MT 59717-3610

Tel: 406-994-7626

Fax: 406-994-4303

E-mail: gharmsen@montana.edu

Web: <http://inbre.montana.edu>

Program Coordinator

Ann Bertagnolli, Ph.D.

Montana State University

P.O. Box 173500

Bozeman, MT 59717-3500

Tel: 406-994-5214

Fax: 406-994-3406

E-mail: abertagnolli@montana.edu

Partner Institutions

Aaniiih Nakoda College, Harlem

Blackfeet Community College, Browning

Carroll College, Helena

Chief Dull Knife College, Lame Deer

Fort Peck Community College, Poplar

Little Big Horn College, Crow Agency

Montana State University, Billings

Montana Tech of The University of Montana, Butte

Rocky Mountain College, Billings

Salish Kootenai College, Pablo

Stone Child College, Rocky Boy Agency

The University of Montana, Missoula

The University of Montana-Western, Dillon

Program Goals

- Mentor and develop the growing number of infectious disease, environmental health and health disparities investigators at principally undergraduate institutions, tribal colleges and the state's two research universities to sustain and grow an even more productive and competitive biomedical research network
- Develop and support community-based participatory research (CBPR) initiatives led by Montana tribal colleges working in collaboration with tribal communities and health boards on Montana Indian reservations to develop the infrastructure needed to reduce health disparities in Native American communities
- Strengthen the state's biomedical and bioinformatics infrastructure through continued development of shared facilities, research collaborations, focused working groups and training opportunities
- Expand research opportunities for students and enhance biomedical curricula from K-12 through graduate education to strengthen the pipeline to careers in health research and increase the scientific and technological knowledge of the state's workforce

Research Projects

- *Infectious Disease Research*
 - *Borrelia burgdorferi*: inducible gene expression in an experimental enzootic cycle
 - Spatial epidemiology of West Nile virus infection risk across Montana
 - Interactions of climate change, infectious diseases and reservoir ecology
 - Role of sulfur metabolism in *Pseudomonas aeruginosa* iron uptake and virulence
 - Investigation of the early secretory pathway in *Candida albicans*
 - The phage pipeline: from dirt to genomics, middle school through graduate school
 - Investigating the role of BH31 in inhibiting fungal morphogenesis
 - West Nile research project at Aaniiih Nakoda College
 - West Nile research project at Chief Dull Knife College
 - West Nile research project at Little Big Horn College

- *Education Outreach*
 - Electron microscopy in the classroom and research laboratory
 - Increasing biomedical career interests of students at Rocky Mountain College
 - Undergraduate student research program at Montana Tech

- *CBPR and Health Disparities Research*
 - CBPR assessment of contaminants in domestic and cultural water sources
 - Improving Stone Child College's health enhancement program
 - Blackfeet fitness and health: a community based program starting with BCC
 - Health and education impacts on stress reduction and health improvement among the Fort Peck Indian Community
 - Perceptions of health and well-being
 - Historical trauma and unresolved grief: a culturally anchored intervention
 - Fort Belknap Reservation/MSU early childhood caries project
 - Hospitals as health care delivery systems and health disparities
 - MRSA on the Apsaalooke Reservation
 - Risk communication for native health
 - Assessing attitudes toward treatment options for depression and suicidal ideation among youth in a rural community
 - Evaluating stress, depression, suicidal ideation and social support levels among youth in a rural community; understanding the buffering effect of social support between stress and disease
 - GIS virtual reality mapping of environmental health risks in a rural Superfund site
 - Entangling GXE: Understanding gene-environment interactions in high risk rural communities
 - Investigating the etiology of juvenile-onset myopia through the analysis of modern human variation in the neurocranium, frontal cortex and eye in myopes and emmetropes
 - Miles City community-based media project

Resources

- Proteomics and biological mass spectrometer facility
- Functional genomics core facility
- Environmental chemistry laboratory
- Bioinformatics core facility
- Electron microscopy facility

Index Terms

epidemiology, pathogenesis, infectious diseases, environmental health, Candida, hantavirus, biodefense, antibiotics, biofilms, minority education, water quality, mycology, bioinformatics, health disparities, CBPR

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Nebraska

P20GM103427

**Nebraska Research Network in Functional Genomics
University of Nebraska Medical Center**

Principal Investigator

James B. Turpen, Ph.D.

*Professor and Associate Vice Chancellor of
Academic Affairs
Executive Associate Dean for Graduate Studies
Department of Genetics, Cell Biology,
and Anatomy
College of Medicine
University of Nebraska Medical Center
986395 Nebraska Medical Center
Omaha, NE 68198-6395
Tel: 402-559-4388
Fax: 402-559-3400
E-mail: jturpen@unmc.edu
Web: <http://www.unmc.edu/inbre>*

Program Coordinator

William G. Chaney, Ph.D.

*Professor
Department of Biochemistry
and Molecular Biology
College of Medicine
University of Nebraska Medical Center
985870 Nebraska Medical Center
Omaha, NE 68198-5870
Tel: 402-559-6657
Fax: 402-559-6650
E-mail: wchaney@unmc.edu*

Partner Institutions

Creighton University College of Arts and Sciences
Creighton University Medical Center, Omaha
Doane College, Crete
Nebraska Wesleyan University, Lincoln
University of Nebraska, Kearney
University of Nebraska, Lincoln
University of Nebraska, Omaha

Outreach Institutions

Chadron State College, Chadron
Little Priest Tribal College, Winnebago
Wayne State College, Wayne
Western Nebraska Community College, Scottsbluff
College of Saint Mary, Omaha

Program Goals

- Establish a multidisciplinary research network with scientific themes of cell signaling, infectious disease, and structural biology and biophysics
- Build and increase Nebraska's research base and capacity
- Provide research opportunities for undergraduate students and serve as a pipeline for students to enter health research careers
- Promote research collaborations
- Provide outreach to underrepresented minority students to bring them into the research enterprise and support disease-specific initiatives
- Enhance the science and technology knowledge of Nebraska's workforce
- Support an emerging biotechnology industry in Nebraska

Research Projects

- *Cell signaling*
 - The role of TIMP-2 in neural crest pathfinding
 - Intracellular and epigenetic mechanisms underlying neurotrophic properties of activated microglia
 - Zinc finger-inspired fluorescent chemosensors operating via conformational restriction
 - Transcriptional and epigenetic regulation of human N-cadherin gene expression
 - TLR3 signaling in pulmonary mucosal epithelial cells
 - Utilization of *Streptomyces* to study quorum sensing in *Mycobacterium smegmatic*
 - Candidate aging gene analyses of large *Drosophila melanogaster* populations
 - Isolation and characterization of extremozymes from alkaline lakes in Nebraska
 - CCR4-NOT co-activator's post-transcription functions
 - Hormonal mechanisms of alternative reproductive tactics
 - Analysis of genome utilization during root gravitropism in six conditions
 - Preserving and strengthening native lines of *Zea mays* L
- *Infectious diseases*
 - Roles of Type III chaperones in the Type III protein secretion system of *Pseudomonas syringae*
 - Novel gene discovery from nucleocytoplasmic large DNA viruses (NCLDV)
 - Modulation of bovine leukemia virus replication by antiviral drugs and other compounds
 - Bioprospecting for medicinally important compounds using endophytic organisms
 - Virulence determinants in the Coxsackie virus B3 genome
 - Investigation of two virulence mechanisms of *Pseudomonas aeruginosa*
 - Identification and characterization of S-nitrosylated proteins in the Lyme disease spirochete *Borrelia burgdorferi*
 - Characterizing novel compounds active against the human brain parasite *Toxoplasma gondii*
 - Filamentation and cell wall integrity in the pathogenic fungus *Candida albicans*
- *Structural Biology*
 - Understanding genetic regulation through structural studies of riboswitch-metabolite complexes
 - Assessment of cellular energetics by NADH FLIM
 - Optically-enhanced sensing arrays to screen for metabolic diseases
 - Roles and mechanisms of non-collagenous proteins in biomineralization
 - An innovative technique for classification of fungal sequences using restriction enzyme cut order
 - Alignment-free approach in genomic sequence comparison
 - Ontology development and database annotation for influenza informatics
 - Temporal and spatial mining of heterogeneous data
 - Degeneration of group II introns

Resources

- Bioinformatics core research facilities
- Mass spectrometry proteomics core facility
- Genetic sequence analysis facility
- Peptide chemistry core facility
- cDNA microarray core facility
- Mammalian cell culture facility
- Histology facility
- Mouse genome engineering core laboratory
- Molecular biology core facilities
- Laser-scanning confocal microscopy imaging facility
- Flow cytometry core facility
- Structural bioinformatics/proteomics
- CD and VCD spectroscopy
- Molecular dynamics simulations

Index Terms

cell signaling, infectious diseases, structural biology and biophysics, genomics, proteomics, cancer, bone, bacteria, ecosystems, heart disease, exercise training, myocardial infarction, virus, HIV, immune response, respiratory infections, antibiotics, drug discovery, diabetes, minority education, neural crest, zinc finger proteins, toll like receptor signaling, large DNA viruses, riboswitches, biomineralization, sequence analysis, enterovirus, toxoplasma, candida

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Nevada

P20GM103440

IDEA Network of Biomedical Research Excellence

University of Nevada School of Medicine

Principal Investigator

James Kenyon, Ph.D.

Professor

Department of Physiology and Cell Biology

School of Medicine

University of Nevada, Reno

Mail Stop 0352

Reno, NV 89557

Senior Associate Dean for Research

Office of Medical Research

University of Nevada, Reno

Mail Stop 0338

Reno, NV 89557

Tel: 775 784 1649

Fax: 775-784-6903

E mail: jlkenyon@unr.edu

Web: <http://www.unr.edu/inbre>

Program Coordinator

Carl Reiber, Ph.D.

Vice Provost for Academic Affairs

Professor of Life Sciences

Office of the Provost

University of Nevada, Las Vegas

Mail Stop 1099

Las Vegas, NV 89154-1099

Tel: 702-895 2342

Fax: 702-895 3670

E-mail: carl.reiber@unlv.edu

Partner Institutions

University of Nevada, Las Vegas

University of Nevada, Reno

Nevada State College

Outreach Institutions

College of Southern Nevada

Great Basin College

Truckee Meadows Community College

Program Goals

- Develop the research base and capacity at the host and partner institutions with targeted hires of new researchers and by providing research and mentoring support to faculty, postdoctoral fellows and graduate students
- Support and develop research service cores in bioinformatics, genomics, proteomics, cytometry, confocal microscopy, histology and live animal imaging that will serve researchers and students at the host, partner and outreach institutions
- Enhance the INBRE student development pipeline by increasing mentoring and research programs for undergraduate students, supporting small grants for faculty development at the outreach institutions and initiating a program to equip and support science teachers in K-12

- Develop a clinical pipeline in collaboration with the UC Davis Clinical and Translational Science Center that will provide training in clinical and translational research for medical students, medical residents and faculty at the host and partner institutions
- Expand research opportunities across the western IDeA region by jointly funding collaborative interstate seed grants, undergraduate student interstate research opportunities, regional scientific and programmatic meetings, and a regional resource exchange

Research Projects

- Coronary heart disease and risk factors among Filipino-Americans, Dr. Alona Dalusung-Angosta, UNLV
- Determining the molecular mechanism of the SCF ubiquitin ligase, Dr. Gary Kleiger, UNLV
- The role of translin in metabolic regulation of sleep, Dr. Alex Keene, UNR

Resources

- Bioinformatics core
- Proteomics core
- Flow cytometry core
- Imaging core
- Histology core
- Central services core

Index Terms

cell growth and differentiation, cancer, immunology, developmental biology, neurodevelopment, cell signaling, genomics, proteomics, bioinformatics, economically disadvantaged, minority education

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New Hampshire

P20-GM-103506

New Hampshire IDEa Network of Biomedical Research Excellence (NH-INBRE)

Dartmouth Medical School

Principal Investigator

Ron Taylor, Ph.D.

Department of Microbiology and Immunology

Dartmouth Medical School

7550 Vail

Hanover, NH 03755-3841

Tel: 603-650-1632

Fax: 603-650-1318

E-mail: Ronald.K.Taylor@Dartmouth.edu

Program Coordinator

Steven Fiering, Ph.D.

Department of Microbiology and Immunology

Dartmouth Medical School

Rubin Building

1 Medical Center Drive

Lebanon, NH 03756

Tel: 603-653-9966

Fax: 603-653-9952

E-mail: Steven.fiering@dartmouth.edu

Web site under development

Lead Institutions

Dartmouth Medical School

University of New Hampshire, Durham

Partner Institutions

Colby Sawyer College, New London

Franklin Pierce University, Rindge

Great Bay Community College, Portsmouth

Keene State College, Keene

New England College, Henniker

Plymouth State University, Plymouth

River Valley Community College, Claremont

St. Anselm College, Manchester

Program Goals

- Develop a statewide multidisciplinary and thematic biomedical research network
- Build and increase the state's biomedical research capacities
- Provide undergraduate faculty and students with research support and serve as a pipeline to health research careers
- Enhance the state's science and technology knowledge base and economy

Research Projects

- Cellular and molecular biology
- Identification and characterization of a putative histamine receptor in drosophila photoreceptor cells
- A yeast-based screen for identification of mammalian genes that regulate ploidy
- Molecular and cellular mechanisms of circadian and circatidal rhythms
- Properties of a circadian pacemaker and its regulation of locomotion

- An analysis of α -catenin functions in transfected DLC1 carcinoma cells
- Microbiology and environmental biology
- The role of ecological, chemical and landscape factors in determining methyl mercury bioaccumulation in stream food webs
- Metal dependent regulation of *A. naeslundii* biofilm formation and virulence genes
- Genetic transformation of the toxic diatom *pseudo-nitzschia multiseries*
- A molecular characterization of the structure and function of aromatic hydrocarbon degrading microbes present in the tidal wetlands of the Great Bay estuary
- The effects of PAH exposure on early development
- Behavioral science
- Pavlovian and operant interactions of discriminant stimulus effects of nicotine and ETOH in rats: Analyses of conditioned reinforcement, extinction and response recovery
- Clinical research
- Health and its association with physiologic distress and bystander intervention in domestic violence
- Reliability of center of foot pressure in the older adult population
- The influence of body mass index on changes in macular pigment, serum carotenoids and c-reactive protein.

Resources

- *Dartmouth*
 - Molecular biology core facility
 - Genomics and microarray laboratory
 - Biostatistics shared resource
 - Bioinformatics shared resource
 - Herbert C. Englert Cell Analysis Laboratory Imaging Resource
 - Immune monitoring shared resource
 - Transgenic and genetic construct shared resource
 - Irradiation services
 - Pharmacology shared resource
 - Pathology translational research shared resource
 - Advanced clinical imaging shared resource
 - Office of Clinical Research
 - Trace element analysis core facility
 - Monoclonal antibody production shared resource
- *University of New Hampshire*
 - Glycomics center biotechnology shared resource
 - Hubbard Center for Genomic Studies
 - UNH Center for Xenon Imaging (MRI)
 - Center for Comparative Molecular Endocrinology
 - Advanced Polymer Science Training and Education Center
 - University instrumentation center shared resource

Index Terms

research training, genetics, molecular biology, cellular biology, environmental biology, microbiology, behavioral science, bioinformatics, clinical research and training, research opportunities, undergraduate research, minority education, technology core facilities

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New Mexico

P20GM103451

**New Mexico IDeA Networks of Biomedical Research Excellence
New Mexico State University, Las Cruces**

Principal Investigator

Jeffrey B. Arterburn, Ph.D.

Professor

Department of Chemistry and Biochemistry

New Mexico State University

MSC 3C, P.O. Box 30001

Las Cruces, NM 88003-8001

Tel: 575-646-2738

Fax: 575-646-2649

E-mail: jarterbu@nmsu.edu

Web: <http://www.nminbre.org>

Program Coordinator

Jeffrey Griffith, Ph.D.

Professor

Senior Advisor to the Dean, School of Medicine

Basic Medical Sciences Building, Suite 177

MSC08 4670

1 University of New Mexico

Albuquerque, NM 87131-0001

Tel: 505-272-2321

Fax: 505-272-6581

E-mail: jkgriffith@salud.unm.edu

Partner Institutions

Eastern New Mexico University, Portales

National Center for Genome Resources, Santa Fe

New Mexico Highlands University, Las Vegas

New Mexico Institute of Mining and Technology, Socorro

San Juan College, Farmington

University of New Mexico, Albuquerque

Outreach Institutions

University of New Mexico - Gallup

Diné College – Shiprock Campus

Diné College – Tsaile Campus

Program Goals

The NM-INBRE champions biomedical and community based research excellence in the state of New Mexico through the development of innovative, supportive and sustainable research environments for faculty and students, community engaging health initiatives, while building a network of lead scientists and educators at the state, regional and national level.

THE NM-INBRE

- Grows and sustains a competitive, biomedical research base in the state of New Mexico through faculty development, student training, internships, scientific conferences and strong, dynamic research collaborations
- Funds biomedical research projects at institutions across the state and prepares faculty and students for competitive participation in national research initiatives, while increasing the state's acquisition of external funding opportunities

- Delivers a cohesive structure of undergraduate and graduate training programs that form a pipeline to engage and prepare a diverse student population for New Mexico's career opportunities in education, industry and public health
- Provides New Mexico's faculty and students with biomedical research infrastructure, consisting of instrumentation and technical services that support the full integration of cutting edge bioinformatics analysis into research and education, leading to novel discoveries and interventions
- Advances our understanding of disease and treatments through programmatic emphasis on the structure and function of biomolecules, pathogens, cell and organismal biology, and community based participatory research, with health related research areas including cancer, infectious disease and immunity, brain and behavioral illnesses, cardiovascular and metabolic disease, as well as child and environmental health. These research areas are further aligned with the educational and community focus of the University of New Mexico Clinical and Translational Science Center
- Promotes collaborative community engagement research by establishing/expanding community based infrastructure for clinical and translational research addressing health disparities in medically underserved areas, including health promotion, disease prevention research and dissemination
- Builds a nationwide, multi-disciplinary research network through synergistic partnerships and collaborations with biomedical and health related programs funded by the National Institutes of Health, thereby positioning New Mexico at the forefront of biomedical research

Research Projects

- *Structure and function of biomolecules*
 - Spectroscopic studies of nitric oxide synthase
 - V-ATPase pumps in prostate cancer: regulatory and functional studies
 - Optimization of binding affinity kinetics and specificity of SH3-domain binding peptides
- *Cell and organism*
 - Biomarker and target discovery in human prostatic tissues – an integrated approach
 - Gene networks in *Drosophila melanogaster* eye development
 - AGOLGA3, a protein essential for spermatogenesis
 - Novel radiolabeled peptides for non-invasive breast cancer imaging
 - Silicon microsphere terminated conducting polymers for neural interfaces
 - Development of novel small molecule inhibitors of aurora B kinase signaling
 - Ultrasound theranostic agents
 - Hybrid antimicrobial peptides (hAMPs) as potential novel therapeutics
- *Pathogens*
 - *Impact* of RNA interference on quasispecies evolution in vector-borne flaviviruses
 - Inhibition of antibiotic-induced mutation in bacteria
- *Community-based participatory research*
 - Zuni health initiative pilot study

Resources

- New Mexico State University core facilities, Las Cruces
- University of New Mexico core facilities, Albuquerque
- National Center for Genome Resources Next Generation Sequencing and Bioinformatics Core, Santa Fe

Index Terms

antibiotics, Aurora B kinase, bacteria, biodefense, bioinformatics, biomarkers, breast cancer, cardiovascular disease, cell biology, cell division, dengue fever, diabetes, DNA repair, drug discovery, drug resistance, endothelial dysfunction, flavivirus, gene expression, genome sequencing, hypertension, imaging, immunology, infectious disease, inflammation, kidney disease, memory, neural interfaces, neuron cell motility, next generation sequencing, nitric oxide synthase, obesity, pathogens, photosensitizing agents, prostate cancer, RNA interference, signaling pathways, SNPs, spermatogenesis, Staphylococcus aureus, V-ATPase pumps, WNT signaling

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North Dakota

P20GM103442

North Dakota INBRE: Health and the Environment

University of North Dakota School of Medicine and Health Sciences, Grand Forks

Principal Investigator

Donald A. Sens, Ph.D.

Professor

Department of Pathology

University of North Dakota School of Medicine

501 Columbia Road North

Grand Forks, ND 58202-9037

Tel: 701-777-6258

Fax: 701-777-3108

E-mail: donald.sens@med.und.edu

Web: <http://ndinbre.org>

Program Coordinator

Donald P. Schwert, Ph.D.

Director, Center for Science

and Mathematics Education

Dept. 2780

P.O. Box 6050

North Dakota State University

Fargo, ND 58108-6050

Tel: 701-231-7496

Fax: 701-231-5924

E-mail: donald.schwert@ndsu.edu

Partner Institutions

Dickinson State University, Dickinson

Mayville State University, Mayville

Minot State University, Minot

North Dakota State University, Fargo

Valley City State University, Valley City

Cankdeska Cikana Community College, Fort Totten

Turtle Mountain Community College, Belcourt

Program Goals

- Build biomedical research capacity in North Dakota by serving research universities, baccalaureate institutions and Tribal Colleges in the state
- Initiate competitive, sustainable research programs at six predominantly undergraduate institutions (PUIs)
- Increase the number of students from PUIs who choose to pursue advanced training in the biomedical sciences
- Empower Tribal Colleges and Communities to participate fully in the Nation's research and training portfolio
- Enhance bioinformatics core facilities to provide computational resources and increase state-wide access to electronic resources for biomedical research
- Enhance existing proteomics and ionomics core facilities at the research universities to make them sustainable and effective training and service centers for the scientific network
- Develop research programs at the PUIs with a thematic focus on the role of the environment and its influences on the health and economic well-being of the citizens of North Dakota
- Develop community participatory research initiatives that improve the rural populations understanding of the role of the NIH in promoting human health and well-being

Research Projects and Outreach

- Functional genomics of populations: relating gene expression to cadmium risk
- Genetic polymorphisms and preeclampsia
- Heavy-metal complexes of novel formamide ligands
- Cadmium, connexins and the human renal proximal tubule
- Environmental toxicants and NAD(P)H homeostasis
- Development of common bean cultivars enhanced with micronutrients
- Environmental health aspects of coal fly ash utilization for plant media
- Membrane transport of Cd⁺⁺ and Zn⁺⁺ in roots of two species of Arabidopsis
- Community Research Education and Tribal Empowerment (CREATE): a program to develop tribal research capacity
- Indians into Medicine Summer Academy (7th through 12th grades)
- Indians into Medicine Pathways Program (Summer enrichment for Tribal College transfer students to UND)
- ND INBRE support for the science and engineering fairs
- Transfer Stars, a program to encourage Tribal College graduates to complete the bachelor's degree at UND
- Research experience for UND undergraduates (REFUNDU) and other undergraduate research programs

Resources

- Bioinformatics core facilities
- Community-based participatory research core
- Proteomics core facility
- Metal analysis core
- Minot molecular biology core

Index Terms

heavy metals, environment, biomarkers, cadmium, arsenic, zinc, remediation, eclampsia, kidney, proximal tubule, plants, salamanders, fly ash, honey, pollen, nectar, bees, enzymes, beans, nutrition, Tribal College empowerment, community-based participatory research, cancer, renal disease, undergraduate research, K-12 research education

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Oklahoma

P20GM103447

**Oklahoma IDeA Network of Biomedical Research Excellence
University of Oklahoma Health Sciences Center, Oklahoma City**

Principal Investigator

Darrin R. Akins, Ph.D.

*Professor, Microbiology and Immunology
Associate Dean for Research, College of Medicine
Director, Oklahoma INBRE Program
President's Associates Presidential Professor
University of Oklahoma Health Sciences Center
940 Stanton L. Young Blvd., BMSB 1005
Oklahoma City, OK 73104
Lab: 405-271-2133 ext. 46640
Office: 405-225-9459
E-mail: darrin-akins@ouhsc.edu
Web: <http://okinbre.org>*

Program Coordinator

John Barthell, Ph.D.

*Dean, College of Mathematics and Science
University of Central Oklahoma
100 N. University Drive, Box 177
Edmond, OK 73034
E-mail: jbarthell@uco.edu
Tel: 405-974-2481
Fax: 405-974-3824*

Partner Institutions

Cameron University, Lawton
Langston University, Langston
Northeastern State University, Tahlequah and Broken Arrow Campuses
Oklahoma Medical Research Foundation, Oklahoma City
Oklahoma State University, Stillwater
Southeastern Oklahoma State University, Durant
Southwestern Oklahoma State University, Weatherford
University of Central Oklahoma, Edmond
University of Oklahoma - Norman

Outreach Institutions

Comanche Nation College, Lawton
Oklahoma City Community College, Oklahoma City
Redlands Community College, El Reno
Tulsa Community College, Tulsa
University of Tulsa, Tulsa

Program Goals

- Build capacity for biomedical research in Oklahoma by supporting promising new faculty, recruiting students into biomedical research careers and sustaining vital core facilities
- Create a network of institutions that perform biomedical research, teach and provide patient care; this network includes a Historically Black College, a Tribal College and several other institutions with large enrollments of students from underrepresented minority groups
- Develop research strengths in the thematic areas of microbiology and immunology, cancer and developmental biology

- Enhance opportunities for investigators at the lead institutions and partner undergraduate institutions to develop independent research programs
- Encourage and mentor participating investigators to develop new NIH grant applications within 18 months
- Provide summer internships for students to participate in faculty research projects and enroll in new educational programs in bioinformatics and genomics
- Support core facilities in functional genomics and bioinformatics
- Develop a new core facility for functional magnetic resonance imaging in animal research to support statewide research initiatives in cancer and neuroscience

Research Projects

- TopBP1 complexes in DNA replication and the chemotherapy response
- The role of SOD1 in docosahexaenoic acid-induced cytotoxicity in cancer cells
- Autonomic and microvascular functions and pressure ulcers in spinal cord injury
- Arsenic exposure and gestational diabetes
- Cyclen based novel antimalarial agents
- An intelligent system for clinical guidance on power seat function usage
- Applications of novel marine fungal siderophores
- Low cost clot-dissolving protein from transgenic plants for stroke treatment

Resources

- Molecular biology resource center
- Flow and image cytometry laboratories
- Genomics support core facility
- Medical glycobiology center
- Laboratory for macromolecular crystallography
- Laser mass spectroscopy facility
- Animal care facilities
- Imaging facility
- BIACORE core facility
- DNA sequencing facility
- Microinjection core facility
- Protein expression core facility
- Microarray core facility

Index Terms

microbiology, immunology, cancer, developmental biology, neuroscience, genomics, bacteria, nutrition, Streptococcus, brain, minority education

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Puerto Rico

P20GM103475

**Advancing Competitive Biomedical Research in Puerto Rico
University of Puerto Rico, San Juan**

Principal Investigator

Sandra Peña de Ortiz, Ph.D.

*Professor of Molecular Neuroscience,
Molecular and Cellular Cognition Laboratory
Department of Biology
University of Puerto Rico
Río Piedras Campus
P.O. Box 23360
San Juan, PR 00931-3360
Tel: 787-764-0000 ext. 7957
Fax: 787-764-3875
E-mail: sandra@hpcf.upr.edu
Web: <http://aabre.hpcf.upr.edu>*

Program Coordinator

Ida Mejias, Ph.D., MT(ASCP)

*Associate Professor and Director
Program in Medical Technology
Inter American University of Puerto Rico,
Metropolitan Campus
P.O. Box 191293
San Juan, PR 00919-1293
Tel: 787-250-191 ext. 2406
Fax: 787-767-5081
E-mail: iamejias@metro.inter.edu*

Partner Institutions

Inter American University of Puerto Rico - Bayamón Campus
Inter American University of Puerto Rico - San Juan Campus
Ponce School of Medicine
Universidad Central del Caribe, Bayamón
Universidad del Este (Ana G. Méndez System)
University del Turabo (Ana G. Méndez Sistem)
Universidad Metropolitana at San Juan (Ana G. Méndez Sistem)
University of Puerto Rico- Bayamón Campus
University of Puerto Rico - Cayey Campus
University of Puerto Rico - Humacao Campus
University of Puerto Rico - Mayaguez Campus
University of Puerto Rico - Rio Piedras Campus
University of Puerto Rico School of Medicine, San Juan

Outreach Institutions

Carlos Albizu University, San Juan
University of Puerto Rico - Bayamon

Program Goals

- Enhance and strengthen the scientific infrastructure and research competitiveness in Puerto Rico in three specific research areas: neuroscience, molecular medicine/cancer and drug design and development, deemed to be key to the Island's biomedical and behavioral research capacity
- Elevate the productivity, competitiveness and number of human resources needed to attract established investigators in those research areas
- Promote the development of research skills of talented junior investigators and gifted students, using the alliances created during the past funding cycle with three distinct

institutional types, namely mentoring, primarily undergraduate institutions (PUIs) and outreach institutions

Research Projects

- *Neuroscience*
 - New methodologies for the synthesis of alcohols and amino derivatives as nicotinic receptor agonists (also within the drug design theme)
 - Examination of protein aggregation and amyloid fibril formation in nanopolymeric materials
 - Effect of androgens on behavior through NPY modulation

- *Molecular medicine/cancer*
 - Reductive and photosensitized activation of tumor-targeted quinones
 - Screening of different sources of plasminogen activators, their inhibitors and development of new techniques for isolation of plasminogen activators
 - Mitochondrial damage and apoptosis induction of quinolines on tumor and normal cells
 - In vitro differentiation of skin progenitor cells: changes in gene and protein expression patterns induced by demethylating agent 5-azadeoxycytidine
 - Conformational studies of beta hairpins using ¹³C labeling

- *Drug design and development*
 - Understanding protein crystal confinement in polymeric systems
 - Development of a virus-free DNA vaccine against smallpox
 - Hydrolase stability enhancement and its application to siRNA

Resources

- High performance computing facility
- Bioinformatics resource center
- Internet2
- Computational nanoscience resource center
- Centralized research instrumentation core
- Functional genomics and microarray center
- Sequencing and genotyping facility
- Human genetics center
- Protein X-ray crystallography core
- Clinical proteomics discovery
- The Protein Mass Spectrometry Core
- Zoological museum
- Herbarium and greenhouse
- Animal care facility
- Tissue and cell culture facilities
- NMR facility
- Biotesting facility
- Laser and spectroscopy facility
- Surface microscopy and spectroscopy facility
- Time resolved-resonance raman spectroscopy facility

- Caribbean Primate Research Center

Index Terms

neuroscience, molecular and cellular cognition, drug design, drug delivery, molecular medicine, cancer, genomics, functional genomics, proteomics, cancer, anticancer drugs, biotechnology, malaria, drug resistance, cataract, hyperglycemia, tuberculosis, carcinogens, pollutants, asthma, sinusitis, cystic fibrosis, bronchitis, artificial blood, minority education, environmental health

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Rhode Island

P20GM103430

**Rhode Island Network for Excellence in Biomedical and Behavioral Research
University of Rhode Island, Kingston**

Principal Investigator

Zahir A. Shaikh, Ph.D.

Professor

*Department of Biomedical
and Pharmaceutical Sciences*

Director, Center for Molecular Toxicology

495F College of Pharmacy

7 Greenhouse Road

University of Rhode Island

Kingston, RI 02881

Tel: 401-874-5036

Fax: 401-874-2646

E-mail: zshaikh@uri.edu

Web: <http://www.uri.edu/inbre>

Program Coordinator

Keykavous Parang, Ph.D.

Professor

*Department of Biomedical
and Pharmaceutical Sciences*

495E College of Pharmacy

7 Greenhouse Road

University of Rhode Island

Kingston, RI 02881

Tel: 401-874-4471

Fax: 401-874-2646

E-mail: kparang@uri.edu

Partner Institutions

Brown University, Providence

Providence College, Providence

Rhode Island College, Providence

Roger Williams University, Bristol

Salve Regina University, Newport

Bryant University

Outreach Institutions

City Campus, Providence

Community College of Rhode Island, Warwick

Program Goals

- Develop research capacity at the doctoral degree granting and baccalaureate institutions in Rhode Island
- Enhance the capacity of junior investigators to compete for extramural research funds for individual or collaborative projects
- Build a productive, collaborative research program in molecular toxicology, cell biology and behavioral science
- Train a cadre of undergraduate and graduate students in research instrumentation and methodology for careers in the biomedical sciences
- Maintain and provide inclusive access to state-of-the-art analytical instrumentation through a centralized research facility core
- Establish an effective outreach program for recruiting, training and mentoring underrepresented scientists and students

- Assist investigators with data mining, data processing and molecular modeling needs through development of bioinformatics core resources
- Organize seminars and workshops on topics of interest to Network participants

Research Projects

- *Molecular toxicology*
 - The tumorigenicity potential of LRH1 in pancreatic cancer
 - Synthesis of new polyamines for siRNA complexation and delivery
 - Photothermal-chemotherapy of melanoma with targeted Cisplatin-loaded hollow gold nanospheres
 - NAMPT regulation through post translational modification
 - Defining a role for Bcp1 in the DNA damage response of *Saccharomyces cerevisiae*
 - Anaerobic enzymes as targets of novel anti-infective therapeutics
 - Nano-biomarker arrays for cancer diagnostics
 - Small regulatory RNAs genes in the metal-reducing bacterium *Shewanella oneidensis*
 - Microinjection of rat brain synaptosome into xenopus oocytes
 - The design, synthesis and biological evaluation of potentially novel anti-infective agents
 - Mercury contamination in Rhode Island estuarine and coastal fisheries
 - The molecular mechanism of the resistance to oxidative stress in melanoma cells
 - Arylphosphonium salt conjugates: diagnostic, cell-imaging anticancer agents; synthesis and screening
- *Cell biology*
 - Distribution and regulation of the amyloid precursor protein of Alzheimer's (AD)
 - Bacterial glycome as antibacterial targets
 - Examination of UFD2a/UBE4B function during myogenesis in vivo
 - The physiological role of plant phenolics in plant and mammalian cell growth
 - Genetic characterization of Bax Inhibitor (BXI1) function in the budding yeast, *Saccharomyces cerevisiae*
 - Experimental test of the myogenic code hypothesis
 - Identification of differentially expressed genes among *Leishmania* species
- *Behavioral science*
 - Anti-inflammatory intervention and neurobehavioral outcome in neonatal ischemia
 - Effects of autonomy-relatedness and stress response on adolescent risk behavior
 - A novel animal model of non-suicidal self-injury (NSSI)
 - The cognitive representation of pretense
 - Assessing comprehension in young children
 - The effects of perceiver motivation and visual attention training on reduction of cross race facial recognition bias

Resources

- Centralized research facility core – proteomics; genomics; cell biology; imaging; spectrometry; radioactivity detection; elemental analysis
- Bioinformatics core facility
- DNA sequencing facility
- Animal care facility
- NMR facility
- Electron microscopy facilities

Index Terms

toxicology, cell biology, behavioral science, proteomics, genomics, cancer, mutagenesis, amoebiosis, leishmaniosis, heavy metals, pesticides, cell signaling, skin cancer, brain cancer, pancreatic cancer, chemotherapy, Alzheimer's Disease, ultraviolet radiation, nanotechnology, biomarkers, minority education, undergraduate research

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South Carolina

P20GM103499

**South Carolina IDeA Networks of Biomedical Research Excellence
University of South Carolina**

Principal Investigator

Lucia A. Pirisi-Creek, M.D.

*Department of Pathology, Microbiology
and Immunology*

University of South Carolina

School of Medicine,

Building 1, Room B-43

6439 Garners Ferry Road

Columbia, SC 29208

Tel: 803-216-3419

Cell: 803-269-8631 (preferred)

Fax: 803-216-3413

E-mail: lucia.pirisi-creek@uscmcd.sc.edu

Web: <http://www.scinbre.org>

Program Coordinator

T. Scott Little, Ph.D.

*Director, South Carolina EPSCoR/IDeA State
Office*

University of South Carolina

Osborne Administration, Suite 202

915 Bull Street

Columbia, SC 29208

Tel: 803-777-6202

E-mail: slittle@mailbox.sc.edu

Program Manager

Kiona Thomas, MSW, HS-BCP

SC INBRE Office

*University of South Carolina School of
Medicine*

PMI, Building 1, Room B35

Columbia, SC 29208

Phone: 803-216-3469

Fax: 803-216-3413

E-mail: kiona.thomas@uscmcd.sc.edu

Partner Institutions

Comprehensive Research Universities

Clemson University

Medical University of South Carolina

University of South Carolina

Primarily Undergraduate Institutions

Clafflin University

College of Charleston

Francis Marion University

Furman University

South Carolina State University

University of South Carolina – Beaufort

Winthrop University

Program Goals

- To engage the participating institutions into a research network that includes both CRU and PUI faculty members, to build a system that will further strengthen undergraduate research and research training in two major areas of scientific emphasis: translational regenerative medicine and biochemistry/molecular biology
- To build a “pipeline to research careers” that actively encourages and supports minority

students and students from underserved areas in the state to pursue a college education and engage in biomedical research

Research Projects

- *Bioengineering/regenerative medicine*
 - Evaluation of hypoxia and anoikis in encapsulated pancreatic islet tissue
 - Nano- and microfluidics technology for early detection of colorectal cancers
 - Cardiac cells biomechanics
 - Mechanisms of atherosclerotic plaque rupture and stabilization
 - CCN 1/ and CCN 2 regulate hyaluronan-CD44 induced cell survival signaling for cardiac cushion development
 - Functional nanoparticles for CNS diseases
 - Mechanisms of LPA receptor signaling in retinal axon guidance

- *Biochemistry/molecular biology*
 - A comparative genomics approach to the generation of immunoglobulin diversity
 - Dynamics of competition for DNA binding between small molecules and proteins
 - Control of TP53 transcription by CEBP-beta and RPBjk
 - Biaryl synthesis via palladium-catalyzed reactions of arenediazonium salts
 - Structure and function studies of human sphingosine kinases 1 and 2
 - Gene expression related to apoptosis in the adult fish brain in response to injury
 - Role of the brain endocannabinoid system as a modulator or mediator for most drugs of abuse
 - Comparative study of the neural and morphological structures involved in detecting and processing wind stimuli in insects
 - Metal ions interacting in the active site of the hammerhead ribozyme
 - Functional analysis of sds1, an enzyme capable of degrading sds
 - Effect of chloroquine on response to ceramide in prostate cancer cells over-expressing acid ceramidase
 - A novel technique to monitor swelling in mitochondria isolated from mouse tissues
 - Methods development of polar and non-polar metabolite extractions from serum samples for application in an NMR-based metabolomics study of human papillomavirus (HPV)
 - Developing analytical tools to study nervous systems in non-mammalian systems
 - Role of posttranslational modifications of proteins in the progression of Parkinson's Disease
 - Effects of anthropogenic chemicals, harmful algal blooms and noise pollution on the sensory and neurobiology of marine wildlife
 - Thermodynamic investigations of biological driving forces: Cu⁺ binding and allostery
 - Mechanisms of epidermal cell replacement in *Aeolosoma headleyi*
 - Development of a fast and accurate invariant based quartet puzzling algorithm of phylogenetic reconstruction

Resources

- USC DNA microarray facility
- USC School of Medicine instrumentation resource facility (IRF)
- MUSC proteogenomics facility

- Stem cell core laboratory – MUSC
- Histotechnology facilities – Clemson
- Surface analysis facilities – Clemson
- Mechanical testing facility – Clemson
- Waters LC-ESI-MS with fluorescence and UV-Vis detection – Furman
- BD biosciences FacSORT flow cytometer – Furman
- Life Science Biology and Biomedical Research Center – Winthrop
- Sims Chemistry and Biochemistry Research Center – Winthrop

Index Terms

regenerative medicine, bioengineering, biomaterials, cardiovascular disease, tissue engineering, stem cell biology, angiogenesis, extracellular matrix, metalloproteins, biochemistry, molecular biology, neuroscience, cancer therapy, virus-host interactions, proteomics and genomics, bioinformatics

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South Dakota

P20GM103443

**South Dakota Biomedical Research Infrastructure Network
University of South Dakota, Vermillion**

Principal Investigator

Barbara E. Goodman, Ph.D.

Professor of Physiology

Division of Basic Biomedical Sciences

Sanford School of Medicine

University of South Dakota

Lee Medicine, Room 224

414 East Clark Street

Vermillion, SD 57069

Tel: 605-677-5158

Fax: 605-677-6381

E-mail: barb.goodman@usd.edu

Web: <https://sites.google.com/a/usd.edu/brin/>

Program Coordinator

Cynthia M. Anderson, Ph.D.

Department of Biology

Black Hills State University

1200 University Street, Unit 9067

Spearfish, SD 577799

Tel: 605-642-6854

Fax: 605-642-6762

E-mail: cynthiaanderson@bhsu.edu

Partner Institutions

Augustana College, Sioux Falls

Black Hills State University, Spearfish

Dakota Wesleyan University, Mitchell

Mount Marty College, Yankton

University of Sioux Falls, Sioux Falls

University of South Dakota Sanford School of Medicine, Vermillion

Outreach Institutions

Sinte Gleske University, Mission

Sisseton-Wahpeton College, Agency Village

Oglala Lakota College, Kyle

Program Goals

- Continue to develop a strong collaborative network within South Dakota to enhance basic biomedical research capabilities
- Foster interdisciplinary research in the control of cell growth, with special emphasis on proteomics and genomics
- Enhance research capacity and critical mass of investigators through mentorship of junior investigators at the lead institution
- Maintain professionally staffed core facilities in proteomics and genomics for use by investigators throughout the state
- Provide increased opportunities for graduate training in the core disciplines
- Provide research support and mentoring for junior investigators and faculty from partner institutions
- Provide training and research opportunities for students at predominantly undergraduate institutions

- Introduce undergraduate students to graduate programs and career opportunities in biomedical sciences and bioinformatics
- Foster interest in further education and careers in science and research for students at Tribal Colleges through enhancement of their science education programs and provision of research opportunities

BRIN-sponsored Research Projects

- Metagenome analysis of water and biofilms in Homestake DUSEL
- Neurological correlates of skilled object manipulation
- Bacterial biodiversity within biofilms formed at DUSEL
- Software incorporating mathematical models for science
- American Indian medicinal plants as antibiotics
- Novel ionophoric macromolecules and potential fungicides
- Interspecies bacterial interactions
- Synthesis of cationic poly thiophenes toward therapeutic agents
- Investigation of immune cell interactions with cancer
- Bacterial infection drives sex ratio the influence of Wolbachia on population
- Defining novel virulence factors associated with Staphylococcus aureus
- Evaluating the effects of exogenous perturbation of platelet lipid composition
- Plant genome research project
- Chemical biology of non-natural isothiocyanates against cancer
- Lipidomic techniques of evaluation of toxic effects on lung cells
- Differential migration of nuclei during embryogenesis in large and small egg
- Chemical sensor based on dopamine molecular imprinted polymers
- Testing the effects of ATG7 on cardiomyocyte hypertrophy
- The ubiquitin-proteasome system's role in cancer pathogenesis
- Biophysics of possible quantum effects in neural synapse
- Effect of various agents on exercise tolerance
- Molecular ecology of range limits in plants
- Examination of changes in aerobic and anaerobic denitrification performed by PSE
- Multilocus comparative phylogeography of N.A. woodland birds
- Landscape genetics approach to inferring the age and origins of the Black Hills
- Rational drug design for giardiasis
- Anti-inflammatory effects of parasympathetic drugs on endometrial cells
- Bacterial pathogenesis of Streptococcus pyogenes
- Role of latent membrane protein 1 during Epstein-Barr virus replication
- Neuroethological effects of noise: does anthropogenic vibration influence
- Epigenetic regulation of water-related genes in tomato
- Spider and beetle diversity in a high quality remnant prairie and a reseeded CRP
- Venom variation in the prairie rattlesnake, Crotalus viridis
- Characterization of Saccharomyces cerevisiae ERS1-delta cells
- Using HPLC/MS in thiaminase assay

Resources

- DNA sequencing and genotyping core facility
- Genomics core facility

- Proteomics core facility
- Bioinformatics core facility

Index Terms

cell growth, proteomics, genomics, bioinformatics, cell signaling, bacteria, environmental biology, Staphylococcus, antibiotic resistance, infectious diseases, gynecology, Streptococcus, toxic shock syndrome, rheumatic heart disease, autoimmune disorders, blood pressure regulation, pregnancy, women's health, reproductive hormones, minority education, cardiovascular disease, biofilms, omega-3 fatty acids, diabetes mellitus, dental plaque, drug development, malaria, Epstein-Barr virus, lipidomics, exercise tolerance, endometriosis

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Vermont

P20GM103449

Vermont Genetics Network

University of Vermont, Burlington

Principal Investigator

Judith Van Houten, Ph.D.

University Distinguished Professor

University of Vermont

120A Marsh Life Science Building

Burlington, VT 05405-0086

Tel: 802-656-0452

Fax: 802-656-2914

E-mail: Judith.Vanhouten@uvm.edu

Web: <http://vgn.uvm.edu>

Partner Institutions

Castleton State College, Castleton

Green Mountain College, Poultney

Johnson State College, Johnson

Lyndon State College, Lyndonville

Middlebury College, Middlebury

Norwich University, Northfield

Saint Michael's College, Colchester

Outreach Institutions

Bennington College, Bennington

Burlington College, Burlington

Castleton State College, Castleton

Champlain College, Burlington

Community College of Vermont, Statewide

Green Mountain College, Poultney

Johnson State College, Johnson

Landmark College, Putney

Lyndon State College, Lyndonville

Marlboro College, Marlboro

Middlebury College, Middlebury

Norwich University, Northfield

Saint Michael's College, Colchester

Southern Vermont College, Bennington

Sterling College, Craftsbury Common

University of Vermont, Burlington

Vermont Technical College, Randolph Center

Program Goals

- Expand the network to include more BPI's and develop cultures of research at these new and current BPI's

- Expand education outreach to more colleges, including the Community College of Vermont (CCV)
- Focus research capacity building for the state and region on proteomics and provide state-of-the-art microarray services
- Expand our regional and national efforts to share research resources
- Assess the progress of VGN through a set of evaluation tools

Research Projects

- *Chemistry*
 - The effect of dietary quercetin on aerobic performance under hypoxic conditions
 - New isotopic labels for enhanced detection and quantification of metabolites
 - Indirect photochemical decay of BPA in sunlit surface waters
 - Human physiology and neurophysiology
 - Development regulation of Kv1.3 channels in neurons of the avian hypothalamus
 - Control of airway mechanical function during exercise in asthma
 - Stress induced physiological reactivity among daily and light female smokers
 - Development of a novel model system for the study of neurological disorders
- *Molecular Biology/Genomics*
 - Large-scale transcript analysis for allele-specific environmental regulation
 - Microbial analysis of aquatic communities within the Vermont Asbestos Group Mine
 - Functional investigation of novel phosphotyrosines in the Src family kinase Fyn
 - The KZ algorithm for statistical analysis of long time course microarray data
- *Psychology*
 - Do children's expectancies determine teacher-student relationship quality?
 - Motivational deficits induced by nicotine withdrawal
 - Adapting the ECI for pediatric health interview: identifying why the ECI works
 - The emergence of social referencing in non-ambulatory infants
 - Effects of testosterone on spatial working memory and adult neurogenesis

Resources

- Microarray facility
- Proteomics facility
- Bioinformatics core
- Next gen sequencer
- FACS facility
- Imaging facility (COBRE)
- Molecular biology facility (COBRE)
- Vermont Cancer Center
- Structural biology – x-ray crystallography
- High performance computing center
- Center for Clinical and Translational Science (CCTS)
- Animal facility, College of Medicine, UVM
- UVM Internet2

Index Terms

genetics, microarray, proteomics, outreach, diversity, biological sequence analysis, bioinformatics

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West Virginia

P20GM103434

**West Virginia IDEa Networks of Biomedical Research Excellence
Marshall University School of Medicine, Huntington**

Principal Investigator

Gary O. Rankin, Ph.D.

Professor and Chair

Department of Pharmacology,

Physiology and Toxicology

Joan C. Edwards School of Medicine

One John Marshall Drive

Huntington, WV 25755

Tel: 304-696-7319

Fax: 304-696-7391

E-mail: rankin@marshall.edu

Web: <http://www.wv-inbre.net>

Program Coordinator

James M. Sheil, Ph.D.

Associate Professor and Vice Chairman

Department of Microbiology, Immunology,

and Cell Biology

West Virginia University

School of Medicine

West Virginia University Health

Sciences Center

P.O. Box 9177; Health Sciences North

Morgantown, WV 26506-9177

Tel: 304-293-7416

Fax: 304-293-7823

E-mail: jsheil@hsc.wvu.edu

Partner Institutions

Alderson-Broaddus College, Philippi

Bethany College, Bethany

Bluefield State College, Bluefield

Concord University, Athens

Davis and Elkins College, Elkins

Fairmont State University, Fairmont

Glenville State College, Glenville

Shepherd College, Shepherdstown

University of Charleston, Charleston

West Liberty State College, West Liberty

West Virginia State University, Institute

West Virginia University, Morgantown

West Virginia Wesleyan College, Buckhannon

Wheeling Jesuit University, Wheeling

Program Goals

- Develop and enhance the multi-disciplinary statewide research network biomedical research base and capacity that was created during Phase I of the WV-INBRE program by providing research support to faculty, postdoctoral fellows and graduate students at the participating institutions
- Provide research opportunities for undergraduate students and serve as a pipeline for undergraduate students into health research careers
- Work with partner institutions to enhance research activities for undergraduate students
- Enhance science and technology knowledge of the state's workforce

- Strengthen and develop stronger relationships between WV-INBRE and other NIGMS biomedical research programs (e.g. COBRE) to enhance biomedical research opportunities for West Virginia's students and participating undergraduate faculty

Research Projects

- Effect of stress on ascending chlamydia genital infection in a mouse model
- Sex steroid hormones and epigenetics in meningiomas
- PI3K, AKT and cMyc pathways in chaetoglobosin-inhibiting tumorigenesis
- The mechanisms of erythrocyte invasion by Francisella tularensis
- Modeling and stability analysis of mixed immuno-chemotherapy of tumors by impulsive Cntrl
- Formulation and evaluation of nasal mucoadhesive D-cycloserine gels for brain delivery
- Expression and functional studies of Burkholderia cenocepacia LlpE
- Can AFAP110 serve as a prognostic indicator for prostate cancer
- Changes in cell surface ADAMs in apoptotic LN18 cells
- The molecular actions of atorvastatin on progression of the atheromatous plaque
- Plant cell culture system for isolation of antibacterial compounds from mangrove
- Characterization of shape determining genes in B. burgdorferi
- Resveratrol modulates cisplatin oxidative stress
- Epicardial fat biomarkers in patients with coronary artery disease in Appalachia

Resources

- Genomics core facility with microarray capabilities
- Imaging core facility
- Computational chemistry and modeling laboratory
- Proteomics core facility
- Flow cytometry core facility
- Recombinant DNA core facility
- Image analysis facility
- Animal care facility

Index Terms

cell biology, molecular biology, cardiovascular disease, cancer, proteomics, genomics, imaging, computational chemistry, fat metabolism, genetics, infectious disease, cell signaling

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Wyoming

P20GM103432

**Wyoming IDeA Network of Biomedical Research Excellence
University of Wyoming, Laramie**

Principal Investigator

Jun Ren, M.D., Ph.D., FAHA

*Associate Dean for Research
and Professor of Pharmacology
University of Wyoming College of
Health Sciences*

1000 East University Avenue

Department 3375

Laramie, WY 82071

Tel: 307-766-6131

Fax: 307-766-2953

E-mail: jren@uwyo.edu

Program Coordinator

Robert "Scott" Seville, Ph.D.

*Associate Dean of the Outreach School
and Professor of Zoology and Physiology
University of Wyoming, Casper*

125 College Drive

Casper, WT 82601

Tel: 307-268-2543

Fax: 307-268-2416

E-mail: sseville@uwyo.edu

Associate Program Coordinator

Heywood R. Sawyer, Ph.D.

Research Professor

School of Pharmacy

University of Wyoming College of

Health Sciences

1000 East University Avenue

Laramie, Wyoming 82071

Tel: 307-766-3010

Fax: 307-766-2953

E-mail: hsawyer@uwyo.edu

Web: <http://www.wyominginbre.org>

Partner Institutions

Casper College, Casper

Central Wyoming College, Riverton

Laramie County Community College, Cheyenne

Northwest Community College, Powell

Sheridan College, Sheridan

Western Wyoming Community College, Rock Springs

Outreach Institutions

University of Wyoming, Casper

Program Goals

- Establish a statewide network for biomedical research excellence
- Provide opportunities for undergraduates at the University of Wyoming, and at six of the state's seven community colleges, to participate in hands-on biomedical research

- Enhance the Wyoming INBRE Network by forming partnerships between faculty at UW and community colleges
- Build on existing research strengths in two thematic areas: cardiovascular disease, and obesity and diabetes
- Expand the Wyoming research network across the western IDeA region
- Provide research support to faculty, postdoctoral fellows and graduate students
- Provide research and learning opportunities for undergraduates at the University of Wyoming and the network community colleges to create a pipeline for students to continue in health research careers
- Enhance science and technology knowledge of the state's workforce

Research Projects

- Role of reactive oxygen species (ROS) in anthrax lethal toxin associated cardiac dysfunction
- Targeting endoplasmic reticulum (ER) stress to alleviate insulin resistance
- High throughput screening of β -cell Response to encapsulation
- Developing a weight-management intervention for children and adolescents with serious mental illness
- Role of Ghrelin and PYY in postpartum body weight regulation and presence in human milk
- Colloidal-based SERS detection of AMI-associated microRNAs
- Metabolic syndrome in PCOS: understanding the role of pituitary gonadotropes
- Variability of long-term body weight trajectories among older adults, health and mortality: Implications for public health recommendations

Resources

- Bioinformatics core facility
- Imaging/microscopy core facility – provides microscopy service and training for researchers and students and has available transmission electron microscope (Hitachi-7000 equipped with a 4K by 4k digital camera), laser scanning confocal microscope (Leica TCS-SP2), epi-fluorescence microscope equipped with a low light sensitive digital camera, raman microscope, and tabletop scanning electron microscope
- Center for Rural Health Research and Education (CRHRE) – provides tools, technology, and support services that enable practitioners, administrators, educators, researchers, policy makers, and students to improve the quality of health care and services in rural areas

Index Terms

cardiovascular disease, obesity, diabetes, public health, nutrition, genomics, cell signaling, rural health

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