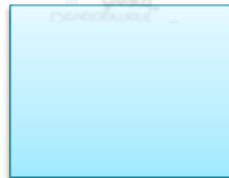
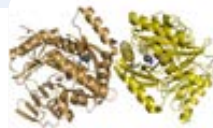
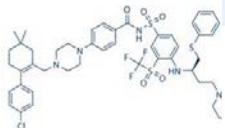




IDeA Networks of Biomedical Research Excellence (INBRE)

INBRE Directory



2016

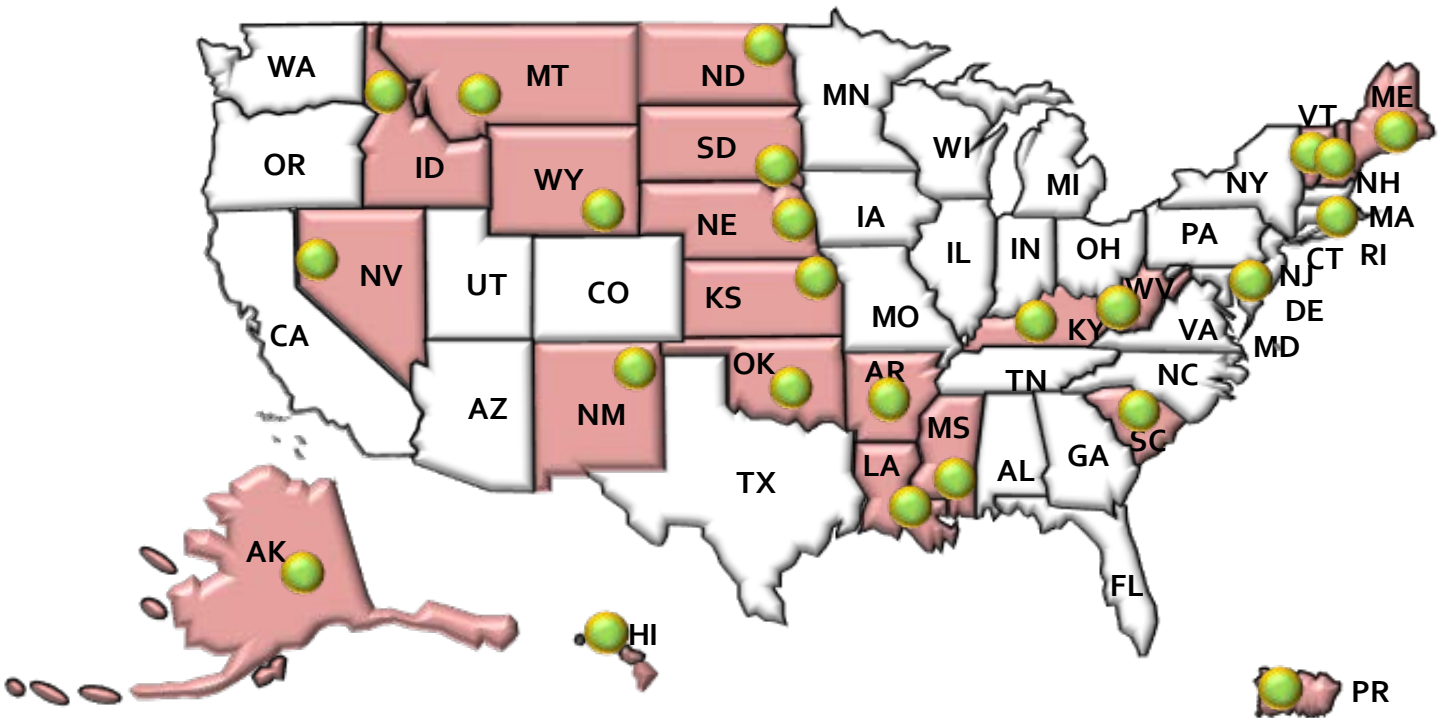
Institutional Development Award (IDeA) Program

Center for Research Capacity Building
National Institute of General Medical Sciences
National Institutes of Health

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Location of INBRE Lead Institutions



IDeA Networks of Biomedical Research Excellence (INBRE) provides an opportunity to augment and strengthen the statewide biomedical research capacity. The goals of the program are to: 1) establish multi-disciplinary research network to strengthen biomedical research expertise and infrastructure; 2) build and increase the research base and capacity by providing support to faculty, postdoctoral fellows and graduate students at the participating institutions; 3) provide research opportunities for students from primarily undergraduate institutions, community colleges, and Tribal Colleges and Universities (TCUs), and serve as a "pipeline" for these students to continue in health research careers within IDeA states; 4) enhance science and technology knowledge of the state's workforce. Green circles (●) are the locations of the INBRE lead institutions. Click to follow link.

<http://www.nigms.nih.gov/research/crcb/IDeA/Pages/INBRE.aspx>

Alaska
P2oGM103395
Environmental Agents and Disease
University of Alaska, Fairbanks (UAF)

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Partner Institutions

University of Alaska Anchorage (UAA)

University of Alaska Southeast (UAS)

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Outreach Institutions

-extended campuses and learning centers in the UA Statewide Network

UAA

Kodiak College

Kenai Peninsula College

Kachemak Bay Campus

Prince William C.C.

Matanuska Susitna Campus

Chugiak-Eagle River Campus

UAF

Interior-Aleutians Campus

Chukchi Campus

Northwest Campus

Kuskokwim Campus

Bristol Bay Campus

College of Rural and Community Development

Community and Technical College

UAS

Juneau Campus

Sitka Campus

Ketchikan Campus

Program Goals

- Expand the multi-disciplinary research and teaching network to support biomedical research expertise, infrastructure, and translational capacity.
- Support faculty, postdoctoral fellows, and graduate students through competitive pilot grants aimed at building our capacity for extramural funding and the development of the basic to translational research endeavors.
- Provide undergraduate research opportunities and support the pipeline leading toward biomedical and health careers.
- Enhance science and technology knowledge to build the state's workforce.
- Enhance biomedical research in the western IDeA states with inter-state pilot grants, student research experiences, scientific meetings and workshops, and a regional resource exchange to maximize the effectiveness of individual INBRE programs through collaboration.
- Enlarge and sustain an inter-campus network for one health of humans, other animals, and the environment.
- 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 recently recruited faculty members.
- Feature bioinformatics as an integral part of the program.

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Research Projects

- Novel human RNA binding proteins target innate immunity to influenza
- Public health-related viral infectious diseases in Alaska
- Copper status and dietary sugars: roles in inflammation, dyslipidemia and NAFLD
- Role of structural flexibility in epitope selection by HLA-DR
- Ecological to molecular comparative cardiac physiology
- Coevolution and virulence of host-symbiont associations
- Molecular basis of muscular atrophy, osteoporosis prevention in hibernating mammals
- Targeted drug delivery to reprogram immunosuppressive cells in breast tumors
- Phytoremediation for cleanup of diesel-contaminated soils in rural Alaska
- Virus populations harbored by bats in Alaska
- Chronic inflammation and high incidence of gastric cancer in Alaska Natives
- Functional significance of altered HCN channel expression in the turtle pacemaker

Resources

- DNA Core Laboratory (with MiSeq for NGS applications)
- Vivarium
- Biological Research and Diagnostics (BiRD) Facility
- Electrophysiology
- Cell culture
- Flow cytometers
- Central animal facilities
- Scanning and transmission electron microscope facilities
- Public Health Laboratory
- Applied Science and Engineering Technology (ASET) Laboratory

Index Terms

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

Arkansas

P20GM103429

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Lead Institutions

University of Arkansas for Medical Sciences

University of Arkansas

University of Arkansas at Little Rock

Partner Institutions

Arkansas State University

Hendrix College

John Brown University

Ouachita Baptist University

University of Arkansas at Pine Bluff

University of Central Arkansas

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Outreach Institutions

Arkansas Tech University
Central Baptist College
Harding University
Henderson State University
Lyon College
Philander Smith College
Southern Arkansas University
University of Arkansas at Fort Smith
University of Arkansas at Monticello
University of the Ozarks

Program Goals

- Expand and strengthen the biomedical research infrastructure of lead, partner, and affiliate institutions through a multidisciplinary network.
- Increase the Arkansas biomedical research base by providing research support to select faculty at partner and affiliate institutions and augmenting their efforts to obtain independent extramural funding.
- Provide undergraduate research opportunities, thereby serving as a “pipeline” that encourages students to choose health research careers.
- Sponsor specialized outreach activities for faculty and students not currently receiving research support from the Arkansas INBRE, thereby preparing other investigators for future INBRE support.
- Enhance the science and 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

- The effect of high-LET radiation on genomic instability under microgravity
- The role of protein kinase c substrates during *Coxiella burnetii* infection
- Virtual arthroscopic tear diagnosis & evaluation platform for rotator cuff surgery
- Cannabinoids: targeted therapy for Ewing's sarcoma
- A two-way street: retinoid regulation of immune cell adhesion and proliferation
- Molecular basis for enantioselective cytochrome p450 reactions
- Proteomic and transcriptomic analysis of DNA repair in bdelloid rotifers
- Scorpion sodium beta toxin structural, genomic, and electrophysiological studies
- Roles of cap1 and its phosphor-regulation in pancreatic cancer

Pilot Projects

- Pathogenic autoantibody response in systemic lupus erythematosus disease flares
- Context-dependent dihedral angle sampling with protein folding simulations

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Resources

- UAMS Proteomics Facility
- UAF Proteomics 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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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 BioScience Association
Inspiring Women in Science & Technology (IWST)

Program Goals

- Foster a statewide Network to create a strong, sustainable biomedical research capability in Delaware
- Develop independent and inter-dependent researchers and institutions that thrive within the Network
- Institutionalize DE-INBRE initiatives by transitioning programs into the partner institutions
- Enhance the biomedical science and technology knowledge of the state's workforce

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Research Projects

- **Cancer**
 - ❖ Metformin as adjuvant therapy to prevent relapse in pediatric acute myeloid leukemia
 - ❖ Evaluating the effects of nanoparticles on the packing and organization of lipid domains
 - ❖ Adaptive bessel light-sheet fluorescence microscope (AB-LSM) for live-cell imaging
 - ❖ Improving realism of software breast phantoms
 - ❖ Molecular mechanisms to distinguish aggressive tumors
 - ❖ Modular arrays of vascularized multi-cellular micro-tissue constructs for high-throughput drug screening
- **Cardiovascular Health**
 - ❖ Vascular effects of dietary potassium in humans
 - ❖ Data driven mathematical modeling of the hypoplastic left heart syndrome circulation
 - ❖ Characterization of bone marrow microvascular ossification in rodent and human long bones
 - ❖ Diet quality, inflammation, and cognition: an analysis of the HANDLS study
 - ❖ Reproductive aging and vascular function
- **Neurosciences:**
 - ❖ Neuronal and Glial expression of TDP-43 in Alzheimer's Disease

Resources

- Bioinformatics/Biostatistics
- Bioimaging and microscopy
- Biomolecular
- Cell Science
- Center for Outcomes Research
- Drug discovery lab/High-throughput screening
- DNA sequencing and Genotyping
- DSU OSCAR Imaging Facility
- Flow cytometry
- Gene Editing
- Genomics
- Histology and pathology
- Magnetism
- Medical imaging
- Microarrays
- Nuclear magnetic resonance imaging

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- Primer/oligo synthesis
- Proteomics and mass spectrometry
- Shared lab equipment
- Statistics
- Value Institute
- X-ray diffraction
- **STRiDE** – Supporting Translational Research in Delaware

Index Terms

biomedical translation, bioinformatics, computational biology, biotechnology, cancer, colorectal cancer, breast cancer, public health, underrepresented 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, electron microscopy, light microscopy, atomic force microscopy, confocal microscopy, computer resources, Sanger sequencing, Next-Gen sequencing, real-time PCR, digital PCR

Hawaii Statewide Research & Education Partnership (HiSREP) University of Hawai'i, Manoa

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Partner Institutions

Chaminade University, Honolulu

Hawaii Pacific University, Kaneohe

University of Hawai'i at Hilo, College of Pharmacy, Hilo

Outreach Institutions

Kapi'olani Community College, Honolulu

Leeward Community College, Pearl City

UH Maui College, Kahului

Windward Community College, Kaneohe

Hawai'i Community College, Hilo

Kauai Community College, Lihue

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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 previous cycles of INBRE
- Develop multi-disciplinary research projects that explore basic biological processes, drug discovery and aspects of natural product discovery and activities
- Establish teams consisting of local senior investigators, mentors and junior investigators at the partner institutions, as well as expanded opportunities for undergraduate and community college 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 workforce development

Research Projects

- The adipocyte-macrophage interaction: contribution to breast cancer development
- The hybrid approach for nicotinic acetylcholine receptor (nAChR) ligands
- Role of c-myc in the tumor promoting actions of oxidized lipids in the colon
- MYCN-induced calcium signaling promotes the malignant progression of neuroblastoma
- Formation of dynamic membrane structures in activating mast cells
- Characterization of Arc-regulated neuronal trafficking of AMPA receptors
- Remodeling the fetal membranes: a new way to examine mechanisms of rupture
- Synthesis of waixenicin A pharmacophore

Resources

- Bioinformatics/Biostatistics/Molecular Modeling Core
- Imaging facilities (fluorescence microscopy; confocal microscopy; electron microscopy; immunoblot imaging)
- Molecular Biology facilities (DNA sequencing)
- Vivarium at the John A. Burns School of Medicine
- Tissue culture facilities
- Genomic research facilities (microarrays; RNAseq)
- Proteomics facility
- Animal MRI research facilities

Index Terms

cell biology, neurobiology, immunology, reproductive biology, organic chemistry, cell signaling, imaging, molecular biology, genomics, proteomics, natural products, cancer, and aging

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P2oGM103408
Idaho INBRE Program
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Boise State University, Boise

Boise Veterans Research and Education Foundation, 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

College of Western Idaho, Nampa

Lewis-Clark State College, Lewiston

North Idaho College, Coeur d'Alene

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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

- Development of novel antibiotics targeted to interrupt bacterial signaling
- Effect of NSAIDs on streptococcal myonecrosis
- Co-evolutionary approach to discover medicinal properties of sagebrush flavonoids
- Environmental toxicology and health implications of nanoparticles

Pilot Projects

- Computational Imaging in Retinal Circuit Development

Resources

- Computational Resources Core
- Genomics Resources Core
- Optical Imaging Core (microscopy, cell separation)
- Vivarium
- 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, non-steroidal anti-inflammatory drugs, microbe-specific nucleosidase, bioavailability, co-evolution, infectious disease, antibiotics, exotoxin, Staphylococcus, Group A Streptococcus, *E. coli*, quorum sensing, sagebrush flavonoids, neuronal development, retina, computational imaging

Kansas

P20GM103418

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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

- Brain connectivity study with integrated microfluidic systems
- Alterations of autophagy in CLN5 deficient neuronal ceroid lipofuscinosis
- Cellular pathologies arising from metabolic trade-offs

Resources

- Automated NMR Data Analysis Software
- Thermocycler
- Stereomicroscope and Isoflurane Vaporizer
- Bioinformatics Core
- Communications Core

Index Terms

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

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Research Intensive Partner

University of Kentucky, Lexington

Regional Partner Institutions

Eastern Kentucky University, Richmond

Morehead State University, Morehead

Northern Kentucky University, Highland Heights

Western Kentucky University, Bowling Green

Murray State University, Murray

Outreach Institutions

Bellarmine University, Louisville

Berea College, Berea

Bluegrass Community and Technical College, Lexington

Hazard Community and Technical College, Hazard

Kentucky State University, Frankfort

Lindsey Wilson College, Columbia

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Somerset Community College, Somerset
Transylvania University, Lexington
University of Pikeville and School of Osteopathic Medicine, Pikeville
West Kentucky Community and Technical College, Paducah

Program Goals

- Support the development of infrastructure and resources for biomedical and health related research
- Develop sustainable critical mass of competitive research programs at all state-supported institutions
- Enhance the pipeline for undergraduate students from KY universities and colleges to graduate and professional degree programs in biomedical research and health-related professions

Research Projects

- Next-generation sequencing analysis of transposon regulation in germline
- Mechanisms of soy glyceollin action in the brain
- Pulsed chronopotentiometric sensors for biomedical and environmental applications
- Design, synthesis and biological evaluation of novel aromatase inhibitors
- Hormonal and vascular regulation of inflammation from sleep loss
- The effects of energy drinks on cardiovascular measures and sport performance
- Metabolic inflexibility with obesity: Does DNA methylation play a role
- Pathogen-specific DNA detection utilizing DNA-binding proteins
- Synthesis and antifungal activity of novel cyclopeptides
- The Role of LY6C high monocytes in ovulation
- Finding novel platinum (II) complex anti-cancer drugs with reduced ototoxicity
- Genetic modifiers in cancer: checkpoint-dependency and nutrient metabolisms genes

Pilot Next Generation Sequencing Projects

- Transcriptomics of the avian immune response using RNA-seq.
- Quantifying gene expression changes in *Xenopus laevis* spinal cord following crush injury.
- Whole genome CRISPR/Cas9 screen to identify genes required for survival of lung cancer cells on 3 dimensional ECM treated with cisplatin.
- Metabolic inflexibility with obesity: Investigating molecular mechanisms that influence the metabolic health of women.
- Comparative gene expression associated with inflammation and endoplasmic reticulum stress in diabetic kidney.
- Role of *tudor* gene in small piRNA biogenesis in *Drosophila* brain.
- Quantify differentially abundant RNA transcripts in mouse kidney tissue with chronic alcohol consumption.
- Determine transcriptome response to endoplasmic reticulum stress in rat oligodendrocyte precursor cells.

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Resources

- Genomics Core Facility
- Bioinformatics Research and Service Core
- Applied Statistics Laboratory

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

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Partner Institutions

Grambling State University

Louisiana State University, Shreveport

Louisiana Tech University

Southeastern Louisiana 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

Summer Research Institutions

Baton Rouge Community College

Centenary College of Louisiana

Dillard's University

Loyola University of New Orleans

Louisiana College

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Louisiana State University, Alexandria
Louisiana State University-Eunice
McNeese State University
Nicholls State University
Northwestern State University
Our Lady of Holy Cross College
Our Lady of the Lake College
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 PUI campuses through the support of mentored research and enhanced communication.
- Increase undergraduate student interest in biomedical research careers throughout Louisiana by providing summer and academic year research opportunities to all PUI 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***
 - ❖ Large-scale atomistic simulation for novel self-assembled drug delivery vehicles
 - ❖ Design and synthesis of novel polyphenol cancer therapeutics
- ***Molecular mechanisms of disease***
 - ❖ Characterizing inhibitors of the mutagenic retrotransposon LINE1 endonuclease
 - ❖ Spore outer structures: contribution to germination heterogeneity
 - ❖ Mechanistic analysis of Kif5A mutations that cause hereditary spastic paraplegia
 - ❖ The role of mediator in maintaining and differentiating human mesenchymal stem cells
 - ❖ Role of heme oxygenase in the renal control of hypertension
 - ❖ Understanding the role of proteostasis in non-alcoholic fatty liver disease
 - ❖ An investigation of the role of SOCS36E in energy homeostasis and obesity in *Drosophila*
- ***Therapeutics and preventive medicine***
 - ❖ Inhibition of HSV-1-associated ocular neovascularization by antiangiogenic agents
 - ❖ DPP4 inhibitors in combating the effects of homocysteine and cholesterol
 - ❖ Development of casein kinase 1 inhibitors as therapeutics of Alzheimer's disease
 - ❖ A predictive modeling framework for studying disparity in colorectal screening

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- ❖ Neurolymphatic biomarker analysis in multiple sclerosis
- ❖ Cytotoxicity of tocotrienol nanoemulsions loaded with paclitaxel/gemcitabine PUFA conjugates against pancreatic cancer cells

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, computational biology

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Comparative Functional Genomics INBRE in Maine Mount Desert Island Biological Laboratory, Salisbury Cove

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Partner Institutions

Bates College, Lewiston

Bowdoin College, Brunswick

Colby College, Waterville

College of the Atlantic, Bar Harbor

The Jackson Laboratory, Bar Harbor

The University of Maine, Orono

University of Maine Honors College, Orono

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

- Strengthening the lead and partner institutions' biomedical research infrastructure through a multi-disciplinary research network with a thematic scientific focus in comparative functional genomics

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- 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 by significantly expanding state, regional and national collaborations with other IDeA, NIGMS, and NIH-supported programs

Research Projects

- Effect of expression of human mutant CHMP2B, an ESCRT-III component involved in frontotemporal dementia, on circadian rhythms in *Drosophila*
- Genome-scale analysis of neuronal heterogeneity
- Deciphering *Helicobacter pylori*'s glycode: uncovering & harnessing drug targets
- Investigating the nanoscale organization of chromatin by super-resolution STED microscopy
- Exploration of two different compensatory strategies for recovery from injury in the cricket CNS
- Functional genomic dissection of viral and cellular factors that regulate JC polyomavirus infection
- Using halophilic *Archaea* as model systems to explore responses to environmental stressors
- Role of nuclear factor, erythroid 2 (Nfe2) in the oxidative stress response during development

Pilot Projects

- DNA Barcoding to Identify medical cannabis chemotype
- RNA-binding proteins and hyphal mRNA transport in the pathogenic fungus *Candida albicans*
- Measurement of cannabis/terpenoid profiles of medicinal cannabis chemotypes
- Investigation of effects of heavy metal contamination on the DNA of *Alitta virens* (*Annelida*, *Polychaeta*)
- The evolution of the chitinase A gene in bacteria associated with epizootic shell disease in the American lobster
- Host-phage interactions and the discovery of biological novelty

Resources

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

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Index Terms

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

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Mississippi

P20GM103476

Mississippi INBRE

The University of Southern Mississippi, Hattiesburg

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Partner Institutions

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Coahoma Community College, Clarksdale

Copiah-Lincoln Community College, Natchez

Delta State University, Cleveland

Hinds Community College, Raymond

Itawamba Community College, Fulton

Jackson State University, Jackson

Millsaps College, Jackson

Mississippi College, Clinton

Mississippi Gulf Coast Community College, Perkinston

Mississippi State University, Starkville

Mississippi University for Women, Columbus

My Brother's Keeper, Ridgeland

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Rust College, Holly Springs
Tougaloo College, Jackson
University of Mississippi Medical Center, Jackson

Outreach Institutions

Alcorn State University, Lorman
Belhaven University, Jackson
Coahoma Community College, Clarksdale
Copiah-Lincoln Community College, Wesson
Delta State University, Stoneville
East Central Community College, Decatur
East Mississippi Community College, Scooba
Hinds Community College, Jackson
Holmes Community College, Goodman
Itawamba Community College, Fulton
Jackson State University, Jackson
Jones County Junior College, Ellisville
Millsaps College, Jackson
Mississippi College, Clinton
Mississippi Gulf Coast Community College, Perkinston
Mississippi University for Women, Columbus
Mississippi Valley State University, Itta Bena
Northeast Mississippi Community College, Booneville
Northwest Mississippi Community College, Senatobia
Pearl River Community College, Poplarville
Rust College, Holly Springs
Southwest Mississippi Community College, Summit
Tougaloo College, Jackson
William Carey University, Hattiesburg

Program Goals

- Develop biomedical research foci throughout the state with emphasis on undergraduate institutions
- Enhance core research facilities in high-throughput genomics, proteomics, 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 promising faculty researchers at the partner undergraduate institutions

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- 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

- From sialome shifts to sialome switches and sialome phases: a new paradigm in tick biology
- Sulfhydryl metabolism and yeast-mold dimorphism in the pathogenic fungus *Histoplasma capsulatum*
- Biofilm dissemination in *Staphylococcus aureus*
- Determination of molecular mechanisms involving amyloid aggregation in neurodegenerative diseases
- The development of high affinity nucleic acid ligands to target the DNA-binding cytokine HMGB1
- Role of miR-1017 in modulating neurodegeneration
- Mirtron structure/function
- Dynamics of block Ionomer delivered siRNAs
- Annotation of miRNAs in twelve fly species
- piRNA abundance in spider mites
- Unusual RNAi biology in dust mites
- Conducting polymer-based sensor for miRNA expression
- Biosynthesis of phenazine metabolites in *Burkholderia* spp.
- Immune responses to West Nile virus infection
- Nanoparticle-based SERS assay for Dengue virus detection in blood

Pilot Projects

- The role of *Trichomonas vaginalis* in trichomoniasis
- Cancer cell theranostics using multimodal gold nanomaterials
- Inhibition of hormone therapy resistant breast & prostate cancers
- Investigating the regulation of the M46 gene in *Histoplasma capsulatum*
- The induction and maintenance of membrane curvature during cell fusion
- Investigation of drug release capabilities of novel oxidized alginate nanofibers
- Protein modifications and interactions regulating CFTR stability
- Functional analysis of a phenotypic variation pathway in *Xenorhabdus nematophila*
- The photochemistry of bifunctional N-substituted heteroaromatic salts
- The role of cathepsin B, a during early zebrafish embryonic development
- Role of BCAR3 in tumorigenesis
- The role of the msa operon in biofilm formation of *Staphylococcus epidermidis*
- Natural and synthetic flavonoids against oxidative stress
- Multifunctional magnetic Au-graphene SERS plat-form for sensitive detection and isolation of breast cancer circulating tumor cell
- The evaluation of natural products as anticancer therapies in pediatric cancers

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Resources

- Imaging facility
- Genomics facility
- Proteomics facility
- Bioinformatics core

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 Network of Biomedical Research Excellence Montana State University, Bozeman

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Partner Institutions

Aaniih 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

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Program Goals

- Strengthen Montana's biomedical and bioinformatics infrastructure through continued development of shared facilities, research collaborations, focused working groups, and training opportunities.
- Develop a continuous pipeline for Montana Native and non-Native students to careers in health research and increase the scientific and technological knowledge of the state's workforce.
- Mentor and develop health disparities investigators in the social and behavioral sciences and partner them with infectious disease and environmental health investigators to sustain and grow an interdisciplinary biomedical research network.
- Develop and support sustainable research initiatives by MT INBRE III network investigators that will mitigate health disparities in Montana's rural and Native American communities.

Research Projects

- Initiating partnerships and projects on food and nutrition with tribal and health disparate communities in Montana
- Improving chronic illness management with the Crow Nation: The Visions of Wellness Project
- Building community health care from the ground up in the Montana Latino community
- Transgender mental health in rural Montana
- Expanding the role of family in culturally appropriate childhood obesity prevention strategies
- Collecting narratives of hope through group-based indigenous arts experiences
- Indoor exposure and dietary determinants of DNA methylation in asthmatic children
- Managing obesity via telehealth: expanding services to rural and American Indian Montanans
- The energy-water-health nexus: assessing the environmental impacts and public health implications of oil and gas production in Richland County, Montana
- Human exposure assessment down-wind of an active open-pit copper and molybdenum mine in the continental USA
- Billings suicide prevention project
- Correlation between stress level and disease susceptibility among individuals from the Blackfeet community
- Promoting resilience in participants enrolled at Stone Child College using a culturally relevant curriculum titled *Biskanewin Ishkode: "fire that is beginning to stand"*
- West Nile virus surveillance in Montana

Education and Outreach Projects

- The Montana Native Undergraduate Transition Program
- Undergraduate research projects and public health internships at Montana Tech
- American Indigenous Research Association
- Research Laboratory at Blackfeet Community College
- INBRE public health/biomedical research internships at Montana State University-Billings

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- Montana INBRE public health internships at MSU-Bozeman
- Montana State University-Bozeman undergraduate research program grant writing boot camp
- Native American doctoral fellowship at MSU-Bozeman
- Education of Crow middle school youth about impacts of substance abuse

Pilot Planning Projects

- Building research capacity and community awareness on the vaginal microbiome's importance to reproductive health among American Indians in Montana
- Project feasibility and preparation interventions for adolescent stress: a planning project

Resources

- Statistical Consulting and Research Services
- Bioinformatics Core Facility
- Proteomics/Mass Spec Core Facility
- NMR Core Facility
- Microscopy Core Facility
- Imaging & Chemical Analysis Laboratory (ICAL)
- UM Remote-Access Electron Microscopy Core Facility
- HELPS (Human Ecology Learning and Problem Solving) Lab

Index Terms

epidemiology, pathogenesis, infectious diseases, environmental health, West Nile virus, biodefense, antibiotics, minority education, suicide prevention, water quality, bioinformatics, biostatistics, health disparities, CBPR, indigenous research

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Nebraska Research Network in Functional Genomics University of Nebraska Medical Center

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Creighton University Medical Center, Omaha

Doane University, Crete

Nebraska Wesleyan University, Lincoln

University of Nebraska, Kearney

University of Nebraska, Lincoln

University of Nebraska, Omaha

Outreach Institutions:

Chadron State College, Chadron

Wayne State College, Wayne

College of Saint Mary, Omaha

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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

Pilot Projects

- Metabolic imaging of disease progression in skin cancer by FLIM
- Antimicrobial properties of click-derived triazole compounds, triazolium salts and trizolyl metal complexes
- Dynamics of Buggy Creek virus infection: Investigations with *in vitro* and *in vivo* models
- Examination of spermine riboswitch structure and function for the development of antibiological agents
- Development of lab-on-a-chip devices for biological and environmental applications
- Mechanisms of prion protein-plasma membrane interactions: A multi-scale molecular modeling approach
- CURB: Center for Undergraduate Research on Biofilms
- Examination of plasticity in energetics, enzyme activities, mitochondrial gene expression with changes in locomotor performance
- Investigation of anti-oxidation effect of H₂S in PC12 neuronal cells by using cell permeable fluorescence sensors
- Origin and evolution of novel rRNA introns in fungi
- Characterizing individual nickel-binding sites within the Escherichia coli metallochaperone SlyD
- Development of microfluidic devices to extract and concentrate extremely long DNA molecules for genome analysis
- Septin-mediated pathways in filamentation and cell wall integrity in *C. albicans*
- Evaluation of novel anti-toxoplasma therapeutics
- Human skeletal muscle responses to temperature; Implications in health and disease
- Virulence determinants in the Coxsackievirus B3 genome

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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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IDeA Network of Biomedical Research Excellence University of Nevada School of Medicine

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Partner Institutions

University of Nevada, Las Vegas

University of Nevada, Reno

Nevada State College

Outreach Institutions

College of Southern Nevada

Great Basin College

Sierra Nevada College, Incline Village

Truckee Meadows Community College

Western Nevada College, Carson City

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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

- Breast cancer survival disparities in Nevada
- Determining the molecular mechanism of the SCF ubiquitin ligase
- Juvenile justice adverse childhood experiences study

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

P20GM103506

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

Geisel School of Medicine at Dartmouth

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Lead Institutions

Geisel School of Medicine at Dartmouth
University of New Hampshire, Durham

Partner Institutions

Colby Sawyer College, New London
Community College System of New Hampshire
Franklin Pierce University, Rindge
Keene State College, Keene
New England College, Henniker
Plymouth State University, Plymouth
St. Anselm College, Manchester

Program Goals

- Enhance scientific, scholarly, and administrative interactions within the NH-INBRE network
- Enhance the biomedical research infrastructure at NH-INBRE institutions
- Enhance the research opportunities for students and faculty at NH-INBRE institutions
- Enhance the science and research culture at NH-INBRE institutions
- Enhance the bioinformatics and genomics infrastructure, training and research activities at NH-INBRE institutions
- Facilitate student transition to New Hampshire's workforce

Research Projects

- **Microbial Pathogenesis**
 - ❖ The effects of clinically relevant SNPs on Virulence capabilities of *V.cholerae*
 - ❖ Neurobiology and Behavior
 - ❖ Neural mechanisms of circadian rhythms and interactions between clocks

Pilot Projects

- **Microbial Pathogenesis**
 - ❖ C-di-GMP mediated biofilm formation in *Pseudomonas fluorescens*
 - ❖ Regulation of the Cek1 MAP kinase cascade and morphogenesis in *Candida albicans*
- **Molecular and Cellular Biology**
 - ❖ Cell survival through a dicentric chromosome phase
 - ❖ Targeted treatment of cancer and neurological disorders
 - ❖ Advancement of a novel fatty acid synthase inhibitor
- **Neurobiology and Behavior**
 - ❖ Molecular and cellular mechanisms of circadian and circatidal rhythms
- **Human Health**
 - ❖ Behavioral and cortical effects of computerized language training for autism
 - ❖ An efficacy and feasibility study of a hope-centered intervention for adolescents
 - ❖ Enhancing follow-up mechanisms for women at risk for postpartum depression

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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
- ❖ Dartmouth SYNERGY

- ***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

P2oGM103451

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

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Lead Institution

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Partner Institutions (New Mexico)

Eastern New Mexico University, Portales

National Center for Genome Resources

New Mexico Institute of Mining & Technology, Socorro

New Mexico Highlands University, Las Vegas

National Center for Genome Resources, Santa Fe

Pueblo of Zuni, Zuni

San Juan College, Farmington

University of New Mexico, Albuquerque

Western New Mexico University, Silver City

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Program Goals

- To provide student-focused experiences in biomedical and biobehavioral research. Student research experiences are available through Developmental Research Projects.
- To provide a collaborative sequencing and bioinformatics core (SBC) that supports hypothesis and discovery-driven research in the thematic areas of NM-INBRE.
- To build and enhance the biomedical research base through faculty development and a strong portfolio of scientific research projects in thematic focus areas.
- To support multi-disciplinary collaborative and community-based research, and cooperate synergistically with NIGMS IDeA and other related programs at the STATE, regional and national level.

Research Projects

- ***Structure and Function of Biomolecules***
 - ❖ Optimization of binding affinity and specificity of SH3-domain binding peptides
 - ❖ Anti-oxidant properties of modified arginine residues
 - ❖ Natural product exploration in tarantula hawk wasp venom using LC-MS/MS
 - ❖ Design for ultrasound theranostic agents carrying podophyllotoxin-like compounds
 - ❖ Lipids regulate oxygen bioavailability: simulations of membranes and fat droplets
 - ❖ Genetic analysis of cajal bodies and their role in RNP biogenesis in *Arabidopsis*
 - ❖ Examining CPEB expression and function in the *Manduca sexta* nervous system
 - ❖ Regulation of CLL progression and B cell development by membrane scaffolds
 - ❖ Integrated approach to discover and engineer type II polyketide natural products
 - ❖ Identification of antibiotics in honey and nectar from Russian knapweed
 - ❖ DNA ligase IV modulates the response to select chemotherapeutics
 - ❖ Natural product-inspired beta-lactone proteasome inhibitors as anticancer agents
 - ❖ Developing novel small molecule-based microRNA regulators
- ***Cell and Organism***
 - ❖ Mechanisms of GPR30-dependent IGF1R expression in breast cancer cells
 - ❖ V-ATPase-dependent regulation of estrogen receptor in breast cells
 - ❖ Ethnic and age effects of vascular responses in women with metabolic syndrome
 - ❖ Can hormesis reduce free radical damage and improve healthspan and lifespan?
- ***Pathogens***
 - ❖ Post-transcriptional regulation of virulence genes in *Escherichia coli* O157:H7
 - ❖ Deciphering immunogenomic responses to a fungal pathogen in toad populations
 - ❖ Molecular and microbiome analysis of gallbladder cancer in New Mexico populations
 - ❖ Novel diagnostic tools for malaria and Chagas disease
- ***Population/Community/Health***
 - ❖ Linking land health and public health on the Navajo Nation
 - ❖ Zuni Health Initiative: chronic disease care to reduce health disparity
 - ❖ Toxicological impacts of “mineral aging” on human health in the presence of PPCPS

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- ***Bioinformatics/Sequencing/Genomics, Clinical Translational***
 - ❖ Statistical Analysis of Gene Sets

Resources

- National Center for Genome Resources (NCGR) applies bioinformatics, software engineering and next-generation sequencing to solve the -omic challenges of the 21st century through collaborative research and services. The SBC uses the following technologies to accelerate IDEa research in *Sequencing: Illumina, PacBio; and Nanopore MinION*. NCGR also provides new simple bioinformatics tool for biologists which are focused on the most popular Next Gen Sequencing experiments in RNA-Seq, DNA-Seq, and ChIPseq. They provide custom support for assemblies, gene fusion, copy number variation, and metagenomics.

Index Terms

antibiotics, antimicrobial, bacteria, Batrachochytrium dendrobatidis, behavioral health, biobehavioral, bioinformatics, biomarkers, biostatistics, biotechnology, brain health, breast cancer, Cajal body, cardiovascular disease, Chagas disease, chemotherapy, community health, crassulacean acid metabolism, cytochromes, cytoplasmic polyadenylation binding protein, diabetes, DNA repair, drug discovery, drug resistance, G-protein-coupled estrogen receptor, gene sets, genetic dependencies, genomics, health disparity, hormesis, hypertension, imaging immunity, immunology, infectious disease, inflammation, ischemia, kidney disease, leukemia, lipid membrane, malaria, memory, metabolic syndrome, mineral aging, microRNA regulators, mountain west research consortium, Navajo Nation, neurogenetics, next-generation sequencing, obesity, oxidative damage, pathogens, peptide, photosensitizing agents, PPCP, Proteasome inhibitors, RNA interference, signaling pathways, specific analysis sequencing platform instrument, *Staphylococcus aureus*, student research training, ultrasound, V-ATPase pumps, Vacuolar-ATPase, vasodilation, Zuni Pueblo

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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

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Partner Institutions

Cankdeska Cikana Community College
Dickinson State University
Fort Berthold Community College
Mayville State University
Minot State University
North Dakota State University
Sitting Bull College
Turtle Mountain Community College
United Tribes Technical College
Valley City State University

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 four predominantly undergraduate institutions (PUIs) and five Tribal Colleges (TCUs).
- Increase the number of students from PUIs and TCUs who choose to pursue advanced training in the biomedical sciences
- Empower all stakeholders in North Dakota to participate fully in the Nation's research and training portfolio

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- Enhance bioinformatics core facilities to provide computational resources and increase state-wide access to electronic resources for biomedical research
- Enhance existing and newly formed core facilities at the research universities to make them sustainable and effective training and service centers for the scientific network

Research Projects

- Molecular insights into the mechanisms of atmospheric nucleation
- Environmental health: coal fly ash phytoremediation and plants biofortification
- Determining the potential impact of road traffic and dust on environmental health
- The role of c-Met in acidic extracellular pH-induced cell motility and invasion
- The etiology of exuberant tissue in equine.
- Trophic level bioaccumulation of cadmium in the Red River Valley of North Dakota.
- Epigenomic and transcription control in bean.
- Examination of the secondary effects of magnesium on ALDH2 substrates, inhibitors
- Ghrelin interaction with genetic risk factors of methamphetamine addiction
- The role of allosteric disulfide bonds in cellular infection and metal insertion
- Metagenomics of North American tick species
- Caffeine: a model drug for studying environmental factors in addiction
- The effect of epigenetic manipulation on differentiation therapy in AML.
- Novel formamide ligands, their antifungal activity and methods of their synthesis
- Non-auxin hormonal control of leaf expansion in *Arabidopsis*.
- Environmental and geographical constraints on plant evolution.
- Mechanisms of gene expression in an *in vitro* model of metal-induced cellular change
- Genetic polymorphisms, gene expression and pre-eclampsia.
- Mercury in fish from the Sakakawea Reservoir.
- InFuse: Integrating fundamentals using student experiences

Pilot Projects

- Bridging the evidence gap between migraine and breast cancer risk
- The US Geography of chronic lymphocytic leukemia incidence and radon exposure
- Serum calcium and magnesium in lobular breast cancer: a case-controlled study
- Effectiveness of total worker health programs on reducing workplace injuries

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Resources

- Informatic resources core facility
- Behavioral core facility
- Flow Cytometry core facility
- Environmental analysis core facility
- Mentoring core

Index Terms

heavy metals, environment, biomarkers, cadmium, arsenic, zinc, remediation, eclampsia, kidney, proximal tubule, plants, ticks, fly ash, enzymes, beans, nutrition, cancer, renal disease, undergraduate research

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

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Partner Institutions

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

Outreach Institutions

Comanche Nation College, Lawton
Langston University, Langston
Oklahoma City Community College, Oklahoma City
Redlands Community College, El Reno
Southeastern Oklahoma State University, Durant
Southwestern Oklahoma State University, Weatherford
Tulsa Community College, Tulsa
University of Tulsa, Tulsa

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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
- Lead institutions and partner undergraduate institutions to develop independent research programs
- Encourage and mentor participating research investigators to develop new grant applications to leverage INBRE funding
- 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

Research Projects

- Effect of nanoscale surface treatment on the biomechanical performances of titanium
- Identification of an anti-apoptotic mutation causing T cell cancer predisposition
- Identification of virulence factors in *E. coli* strains causing neonatal sepsis
- The role of lateral septal neural circuitry in anxiety and depression-related behavior
- Memory T cell-mediated protection against malaria
- Ard1 control of cell survival and cancer progression in *Drosophila*
- Low cost clot-dissolving protein from transgenic plants for stroke treatment
- Personalized pressure ulcer prevention for spinal cord-injured wheelchair users

Pilot Projects

- Investigating the role of UPR activator IRE1 in IL-4 expression
- Quantifying the structural dependence of flagellar biomechanics and motility
- Understanding the function of Mcm10 and polymerase epsilon interaction in yeast
- Antibiofilm effect of cinnamon oil nanoemulsions on *S. aureus*, MRSA and VRSA

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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, genomics, bacteria, nutrition, brain, minority education

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

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Partner Institutions

Research Institutions

University of Puerto Rico - Medical Sciences Campus (Lead)

University of Puerto Rico - Rio Piedras Campus

Primarily Undergraduate Institutions

University of Puerto Rico - Mayaguez Campus

University of Puerto Rico - Humacao Campus

University of Puerto Rico - Cayey Campus

Inter American University - San Juan Campus

Inter American University - Bayamon Campus

Universidad del Este, Bayamon Campus

Universidad del Turabo, Caguas Campus

Universidad Metropolitana, San Juan Campus

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Outreach Institutions

Universidad Central del Caribe, Bayamón, PR
Ponce Health Sciences University, Ponce, PR
Pontifical Catholic University of Puerto Rico, Ponce, PR
University of Puerto Rico - Ponce Campus
University of Puerto Rico - Aguadilla Campus
Inter American University - San German Campus
Carlos Albizu University, San Juan, PR

Program Goals

- Strengthen the PR-INBRE network lead and partner institutions' biomedical expertise and research infrastructure.
- Contribute to the development of research faculty, postdoctoral Fellows, graduate and undergraduate students of underrepresented groups in research.
- Enhance the science and technology competency of the biomedical workforce.

Research Projects

- ***Neuroscience***
- ***Molecular medicine/cancer***
 - ❖ Metagenomic and metabolomic approaches to study microbiome dynamics for cervical cancer prevention
- ***Drug discovery and development***
 - ❖ Development of nanoparticles containing docetaxel and nitrochalcone for controlled combination chemotherapy.
 - ❖ New Halophilic hydrolases for the synthesis of chiral pharmaceutical intermediates.
 - ❖ Biocompatible carbon-based nanoparticles for combined neuroimaging and drug therapy.

Pilot Projects

- Drug discovery of novel targeted therapeutics for metastatic breast cancer.
- Development of a bioinformatics platform for patient selection to facilitate future clinical trials in Puerto Rico.
- Ultrasound-induced neuroplasticity.
- Role of RAGE, FABP4 and IL-1 β in breast cancer subtypes using *in vitro* co-culture models.
- Bioinformatics characterization of aggressive prostate cancer biomarkers to build a nano-biosensor for prostate cancer detection.
- Characterization and development of a novel Wee-1 kinase inhibitor as a new anti-breast cancer therapeutic agent.
- The impact of a high fat diet on the gut microbiome and depression.
- Designing an improved tissue-type plasminogen activator.
- Drug discovery of novel anticancer compounds from Puerto Rican medicinal plants.

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- Novel drug development against drug resistance, which occurs during chemotherapy.
- Linking metal-mediated alterations of the ecdysone-dependent signaling pathway to social impairment in *Drosophila melanogaster*.
- Analysis of the function of the MUSA1 ubiquitin E3 Ligase during muscle development in *Xenopus laevis*.
- *In vitro* testing of gold nanodisc assemblies for photothermal ablation tumor therapy

Resources

- High Performance Computing Facility
- Internet2 capability
- Bioinformatics Research Core (BiRC)
- Centralized Research Instrumentation Cores
 - ❖ Genomic Translational Research Unit (Ion Semiconductor Next Generation Sequencers)
 - ❖ Sequencing and Genotyping Core (Illumina MiSeq Next Generation and Sanger Sequencers)
 - ❖ Proteomics Discovery Core (LC-MS/MS)
 - ❖ Metabolomics Core (GC-MS)
 - ❖ Molecular Dynamics Core (Raman, CD)
- Chemical Toxicology Testing facility at UMET (ChemTOX)
 - ❖ Flow Cytometer (six color detection capability)
 - ❖ Automated Cell Counter
 - ❖ Bio-Imaging Microscope (Olympus FSX100)
 - ❖ Freeze dry system
 - ❖ Autoclave
 - ❖ UVP Gel documentation device
- UPR Molecular Sciences Center
 - ❖ NMR (700 MHz)
 - ❖ Mass Spectrometry (MALDI TOF/TOF & ESI MS/MS)
 - ❖ Raman IR Spectroscopy
 - ❖ Circular Dichroism (Jasco 1500)
 - ❖ GC-MS
 - ❖ Confocal microscopy
- Caribbean Primate Research Center
- UPR Comprehensive Cancer Center

Index Terms

Bioinformatics, neuroscience, neurobiology of behavior, drug discovery, drug testing, drug delivery, molecular medicine, genomics, metagenomics, functional genomics, proteomics, biotechnology, cancer, anticancer drugs, drug resistance, carcinogens, environmental pollutants, environmental health, health disparities research, biomedical workforce training, professional development training, student training

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Rhode Island

P2oGM103430

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

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Partner Institutions

Brown University, Providence

Bryant University, Smithfield

Providence College, Providence

Rhode Island College, Providence

Roger Williams University, Bristol

Salve Regina University, Newport

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Outreach Institutions

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 cancer, molecular toxicology, and neuroscience
- 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

- **Cancer**
 - ❖ Synthetic polymers derived from nature: materials for disease treatment via organocatalytic ring-opening polymerization
 - ❖ Tumor penetrating dry powder aerosol nanocomposite particles for the treatment of lung cancer
 - ❖ Development of eudistomin U. derivatives as novel DNA-binding agents
 - ❖ Proteomic and metabolic analysis of IDH mutant gliomas in *Drosophila melanogaster*
 - ❖ Mechanisms of anti-cancer effects of plant secondary metabolites on human gastric epithelial cells
 - ❖ Functional properties of the CiMRF N-terminus
 - ❖ Biomaterials for flexible control over chemotherapeutic delivery profiles
 - ❖ Genetic characterization of programmed cell death in aneuploid yeast cells
 - ❖ Investigation of aberrant sodium channels and mTOR activity in melanoma cells
 - ❖ Regulation of phosphoribosyltransferase type II subfamily: NAMPT, QPRT and NAPRT
 - ❖ Selective toxicity of arylphosphonium salts for cancer cells FACS and ATP assays
 - ❖ Chemical biology of DNA repair, energy metabolism, and cancer
 - **Molecular Toxicology**
 - ❖ Design of potential quorum-sensing inhibitors of bacterial toxin production
 - ❖ Biochemical and ecological approaches for managing amebiasis
 - ❖ Exploring the relationship between structure and function in KmtR
- Antibacterial Ugi-derived terminal alkynes: evaluation of mechanism of action

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- ❖ Understanding prey range and predation efficiency in predatory bacteria
 - ❖ Risks and benefits of consuming Rhode Island coastal marine fishes
 - ❖ The impact of cellular NAD metabolism on antifungal toxicity
 - ❖ Regulation of dsDNA translocation during transcription-coupled DNA repair
 - ❖ The impact of e-cigarette vapor on the pulmonary stress response
 - ❖ DNA-binding transition metal complexes with phosphonium-containing ligands
- **Neuroscience**
 - ❖ The role of notch signaling in alcohol reward memory
 - ❖ A Drosophila model of ALS
 - ❖ Pathological grooming in the GABRG2 KO mouse model of body dysmorphism disorder
 - ❖ Neurobiological indices of stress and adolescent risk behavior
 - ❖ The molecular anatomy of APP-associated axoplasmic organelles
 - ❖ Measuring toddler's understanding of pretense
 - ❖ Understanding effects of N-terminal acetylation on protein aggregation & function
 - ❖ Identification of transcription factor networks that preserve neural stem cells
 - ❖ Development of an animal model for sociality and memory processing
 - ❖ Simultaneous weight intervention to stop smoking
 - ❖ Chaperone tools for neurodegenerative diseases
 - ❖ Assessing the lower bounds of verb comprehension
 - ❖ Visual attention to faces when making rapid judgments of traits

Pilot Projects

- The role of notch signaling in alcohol reward memory
- Studying cortico-muscular coherence: fusing neuroimaging with body motion
- Nervous system wiring by the RoBo3 axon guidance receptor and its ligand NELL2

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, cancer biology, neuroscience, behavioral science, proteomics, genomics, mutagenesis, cell signaling, brain cancer, lung cancer, chemotherapy, Alzheimer's Disease, ALS, heavy metals, e-cigarettes, minority education, undergraduate research

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South Carolina

P20GM103499

South Carolina IDeA Networks of Biomedical Research

Excellence

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Partner Institutions

Comprehensive Research Universities

Clemson University

Medical University of South Carolina

University of South Carolina

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Network Predominantly Undergraduate Institutions (PUIs)

Clafin University
Coastal Carolina University
College of Charleston
Francis Marion University
Furman University
Converse College Presbyterian College
Presbyterian College
South Carolina State University
University of South Carolina – Aiken
Winthrop University

Outreach PUIs

Anderson University
Benedict College
University of South Carolina Beaufort

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

- Integrating mechanical and chemical signals to enhance in-vitro growth and remodeling of tissue engineering
- Comparing the therapeutic efficacy of perinatal and adult stem cells in osteoarthritis
- high-speed volumetric imaging: method for recording neural activity in 3D
- Defining the role of fibulin-1 in cerebral vascular formation
- BMP-Notch interaction in AV endocardial cushion remodeling and prevalvular fibroblast differentiation
- Genetic analysis of ROS-mediated neurodegeneration
- Mechanism of chromatin decondensation in lymphocytes
- Modeling the mixed-lineage leukemia (MLL1) multi-protein complex in *Saccharomyces cerevisiae*
- A model to study regulation of transcription factor segregation in the ectoderm
- Modeling within and between-hosts dynamics of influenza infection

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- Intracellular delivery of a new anticancer tRNA drug complexed with a cell-penetrating peptide
- Skeletal muscle tissue engineering and regenerative medicine
- The functional significance of human MxB protein in prostate cancer metastasis
- Xerogel-based amperometric biosensing for the detection of a diagnostic marker

Resources

- USC DNA microarray facility
- USC School of Medicine instrumentation resource facility (IRF)
- MUSC proteogenomics facility
- Claflin 700 MHz NMR Facility
- 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

P2oGM103443

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

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Partner Institutions

Augustana, Sioux Falls
Black Hills State University, Spearfish
Dakota Wesleyan University
Mount Marty College
University of Sioux Falls
University of South Dakota Sanford School of Medicine, Vermillion
Yankton University of Sioux Falls, Sioux Falls

Outreach Institutions

Sinte Gleske University, Mission
Sisseton-Wahpeton College, Agency Village
Oglala Lakota College, Kyle

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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

Resources

- DNA sequencing and genotyping core facility
- Genomics core facility
- Proteomics core facility
- Bioinformatics core facility
- Scientific library databases

Index Terms

proteomics, bioinformatics, genomics, DNA sequencing, genotyping, drug discovery, medicinal chemistry, natural products chemistry; physiological (including cellular) and developmental responses to stimuli, environmental health

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Vermont
P2oGM103449
Vermont Genetics Network
University of Vermont, Burlington

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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

Community College of Vermont, Statewide

Landmark College

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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

- **Neuroscience**
 - ❖ Development regulation of Kv1.3 channels in neurons of the avian hypothalamus
 - ❖ Genetic analysis of neurotransmitter release in *C. elegans*
- **Molecular Biology/Genomics**
 - ❖ Microbial community structure of the Vermont asbestos group mine
 - ❖ Thermal decomposition of biomass: molecular pathways for sulfur chemistry
- **Psychology**
 - ❖ Comparative effectiveness of biofeedback vs. exercise for stressed students

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
- Vermont Center on Behavior & Health (COBRE)

Index Terms

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

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

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Partner Institutions

Alderson Broaddus University, 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 University, West Liberty

West Virginia State University, Institute

West Virginia University, Morgantown

West Virginia Wesleyan College, Buckhannon

Wheeling Jesuit University, Wheeling

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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

- Signaling pathway and tumorigenesis inhibition by gallic acid and chaetoglobosin
- *Francisella tularensis* types I and IV secretion systems in erythrocyte invasion
- An integrated approach to study the efficacy of cancer immunotherapy
- Microbial diversity of mouse oral cavity and lung after *Pseudomonas* infection
- Determining regulation of lipid absorption in vertebrate intestine
- Cold stress induced norepinephrine modulation of chlamydia pathogenesis
- Degradation of complement components by MMPs in apoptotic glioblastoma cells
- Protein expression and enzymatic analyses of *Burkholderia cenocepacia* LlpE
- Effect of nicotine on neural tube development
- Effect of alternate media formulations on growth of *Borrelia burgdorferi*
- The mechanism of action of resaruzin, a novel antibiotic

Pilot Projects

- Actions of AHCC in regulation of stress hormones in a mouse model
- Characterization and discovery of novel antibiotics from natural products
- Discovery and synthesis of heterocyclic natural compounds toward cancer research
- AHR signaling pathways in myricetin-inhibited ovarian cancer cells
- Identification of MRSA strains affected by extracts of tyrol knapweed
- Genome-wide profiling of siruin 1-regulated transcriptome in satellite cell regulated muscle repair in obesity and aging
- *Bordetella pertussis* vaccine development
- Identification of transcriptional targets of a novel ADAM-ephrin-Wnt signaling axis in neural crest induction
- The role of high fat diet on intestinal nutrient and electrolyte transporters in a polygenic model of obesity
- ING4, a novel androgen receptor regulator in prostate cancer development and progression

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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, diabetes, obesity, proteomics, genomics, imaging, fat metabolism, genetics, infectious disease, cell signaling, natural products

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Wyoming IDeA Network of Biomedical Research Excellence University of Wyoming at Casper

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Partner Institutions

Casper College, Casper

Central Wyoming College, Riverton

Eastern Wyoming Community College, Torrington

Laramie County Community College, Cheyenne

Northwest Community College, Powell

Sheridan College, Sheridan

Western Wyoming Community College, Rock Springs

Outreach Institutions

University of Wyoming at 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

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- Build on existing research strengths in two thematic areas: cardiometabolic syndrome and technology for chronic disease research and therapeutics.
- 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

- Polycystic ovarian syndrome in American Indian women: an exploratory study
- The effect of obesity induced hyperinsulinemia on lactation
- Molecular mechanisms of luteinizing hormone dysregulation in PCOS.
- Role of RBM20 in the regulation of cardiac gene splicing in heart failure
- CARD9 signaling and childhood obesity-associated cardiac dysfunction
- Optogenetic control of GCS via microRNAs as treatment for liver steatosis
- Circulating tumor cell capture and release from degradable hydrogel surfaces
- Growing resilience phase II: Albany County redesign and Wind River expansions
- TRPV1 activation prevents high fat diet-induced non-alcoholic fatty liver disease (NAFLD) in obesity via SIRT-1
- Structure and function of TSPO, an important drug target

Pilot Projects

- Removable and replaceable glaucoma treatment device pilot study
- Localized immunosuppression for peripheral nerve allografts

Resources

- Bioinformatics Core Facility
- Imaging/Microscopy Core Facility
- Center for Rural Health Research and Education (CRHRE)

Index Terms

cardiometabolic syndrome, chronic disease, obesity, type 2 diabetes, optogenetics, polycystic ovarian syndrome, public health, nutrition, genomics, cell signaling, rural health, glaucoma, therapeutics, allograft

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