Nebraska Tobacco Settlement Biomedical Research Development Fund

Fiscal Year
2012 – 2013

Progress Report

University of Nebraska Medical Center
Creighton University
University of Nebraska – Lincoln
Boys Town National Research Hospital

Nebraska Tobacco Settlement Biomedical Research Development Fund

Fiscal Year
2012 – 2013

Table of Contents

Nebraska Tobacco Settlement Biomedical Research Development Fund

Section I

Fund Allocation to Each Institution

University of Nebraska Medical Center
Creighton University
University of Nebraska – Lincoln
Boys Town National Research Hospital

University of Nebraska Medical Center
Nebraska Tobacco Settlement Biomedical Research Development Fund
FY 2012-2013 Allocation

Strategic Faculty Recruitment and Retention	**Allocation**
College of Dentistry	95,613
Fahd Alsalleeh, PhD; Ali Nawshad, PhD; Aimin Peng, PhD	
College of Medicine	
Anesthesiology	34,300
Ben Boedeker, MD, PhD, DVM, MBA	
Biochemistry/Molecular Biology	420,005
Surinder Batra, PhD	
Cellular/Integrative Physiology	93,745
Lie Gao, MD, PhD; Steven Sansom, PhD; Matthew Zimmerman, PhD	
Emergency Medicine	55,618
Yulong Li, MD, PhD	
Genetics, Cell Biology & Anatomy	295,001
Vimla Band, PhD*; Runqing Lu, PhD	
Internal Medicine	443,752
Stephen Bonasera, MD, PhD; Jennifer Larsen, MD*; Brian Lowes, MD, PhD; Stephen Rennard, MD	
Pathology/Microbiology	819,442
Kenneth Bayles, PhD; Steven Hinrichs, MD; Javeed Iqbal, PhD; Tammy Kielian, PhD*; Zhixin Zhang, PhD	
Pharmacology/Experimental Neuroscience	553,740
Shilpa Buch, PhD*; Howard Fox, MD, PhD; Howard Gendelman, MD	
Radiology	90,835
Michael Boska, PhD	
School of Allied Health Professions	151,809
Corrine Hanson, PhD*; Jack Turman, PhD	
Surgery	803,750
B Timothy Baxter, MD; Randeep Jawa, MD; Alexey Kamenskiy, PhD; Jason MacTaggart, MD; David Mercer, MD; Michael Moulton, MD; Dmitry Oleynikov, MD; Iraklis Pipinos, MD; Nora Sarvetnick, PhD*	
College of Nursing	95,005
Barbara Swore-Fletcher, PhD*; Juliann Sebastian, PhD*	
College of Pharmacy	3,116
Jered Garrison, PhD	
College of Public Health	117,677
Pinaki Panigrahi, MD; Risto Rautiainen, PhD; Amr Soliman, PhD	
Eppley Institute	1,003,847
Hamid Band, MD, PhD; Michael Brattain, PhD; Jixin Dong, PhD; Michael (Tony) Hollingsworth, PhD; Mayumi Naramura, MD*; Amarnath Natarajan, PhD; Rene Opavsky, PhD; Angie Rizzino, PhD; Ming-Ying Tsai, PhD	
Munroe Meyer Institute	222,436
Anna Dunaevsky-Hutt, PhD*; Shelley Smith, PhD*	
Subtotal	**$ 5,299,691**
Research Program & Infrastructure Development	
Comparative Medicine Operations: Dixon	370,000
Comparative Medicine Animal Care Cost Support	250,000
Biosciences Research Training Program (BRTP)	59,735
IRB & SPAdmin- ITS Svc Level Agreements	191,386
Library - Scopus	25,000
IRB/IACUC Accreditation Consultant	32,410
Research Core Lab Support	79,734
UNMC Institutional Official Support	100,000
Elsevier SciVal Contract	36,500
Subtotal	**$ 1,144,765**
Research in Health Disparities	
Virginia-Nebraska Alliance	131,864
Center for Reducing Health Disparities	518,542
Great Plains Tribal Chairman's Health Board	5,000
Pediatrics Recruitment Stephen Obaro	40,083
Subtotal	**$ 695,489**
Joint UNMC-UNL Research Programs	
Magnetic Resonance Elastography of Traumatic Brain Injury (Kelso)	13,182
Subtotal	**$ 13,182**
Total FY 2012-2013 Allocation	**$ 7,153,127**

Creighton University
Nebraska Tobacco Settlement Biomedical Research Development Fund
FY 2012-2013 Allocation

Strategic Faculty Recruitment and Retention		**Allocation**
School of Medicine		
Biomedical Sciences		100,000
Kenneth Kramer, PhD		
Biomedical Sciences		100,000
Deniz Yilmazer-Hanke, PhD		
Pharmacology		100,000
Kristina Simeone, PhD		
Pharmacology		8,270
Janee Gelineau-van Waes, PhD		
Osteoporosis Research Center		144,644
Laura Armas, MD		
	Subtotal	**$ 452,914**
Research Program & Infrastructure Development		
Mechanisms Underlying Insulin Resistance in Morbidly Obese and Diabetic Patients		50,000
Effects of Creatine Supplementation on Immune System Function		50,000
Assessment of Glutamate Delta-1 Receptor in Autistic Phenotype		75,000
Novel Approach to Hair Cell Regeneration for Hearing Restoration		75,000
Novel Pathway for Bone Adaptation to Exercise		75,000
Spatiotemporal Specific Gene Manipulation in the Mouse Inner Ear to Regenerate Lost Auditory HCS		75,000
School of Medicine Research Faculty Bridge Support		550,000
Internet2/Mobile Video Conferencing Equipment		59,598
Grant Writer Consultation Services		11,000
New Initiative Application Reviewer Services		11,000
Associate Vice President Post Doc Support		48,391
Research Compliance Regulatory Support		58,174
Technical Editing Core Support		32,718
Biostatististical Core Support		104,800
	Subtotal	**$ 1,275,681**
Minority Health Research Grants		
Center for Promoting Health and Health Equality		125,000
	Subtotal	**$ 125,000**
	Total FY 2012-2013 Allocation	**$ 1,853,595**

Univerity of Nebraska-Lincoln

Nebraska Tobacco Settlement Biomedical Research Development Fund
FY 2012-2013 Allocations

Strategic Faculty Recruitment and Retention	**Allocation**
Hasan Otu, Ph.D., Electrical Engineering	149,000
Juan Cui, Ph.D., Computer Science and Engineering	120,440
McQuillan, Julia, Ph.D., Sociology	65,616
Dennis Molfese, Ph.D., Psychology	46,280
Subtotal	**$ 381,336**
Research Program and Infrastructure Development	
Center for Brain, Biology and Behavior, Dennis Molfese, Ph.D.	840,512
Acquisition of 700 MHz UHF NMR Equipment, James Takacs, Ph.D.	681,080
Nutrigenomics, Janos Zempleni, Ph.D.	170,000
Piloting NIH T32 Training Grant on Molecular Mechanisms of Disease, Melanie Simpson, Ph.D.	150,000
Acquisition of IVC cages for Manter Hall, Kelly Heath, D.V.M.	146,000
Molecular Sensors and Complex Disease, Paul Black, Ph.D.	100,000
Continued Team Building and Seed Grant Activities, David DiLillo, Ph.D.	100,000
Big Ten/CIC/Ivy League TBI Research Collaboration, Dennis Molfese, Ph.D.	100,000
Faculty Development in Biomedical Sciences	92,211
Detection of Breast Tumor Tissue Margins Using Surface-Enhanced Raman Spectroscopic Nanosensing Technologies, Yongfeng Lu, Ph.D.	37,500
Non-viral Transfection of the parasite Toxoplasma gondii, Tadeusz Wysocki, Ph.D.	25,000
Biomechanical and Gradient Factors that Promote Growth Plate Architecture in Alginale Hydrogel 3-D Matrices, Angela Pannier, Ph.D.	25,000
Biomaterials and Cartilage Tissue Engineering, Anu Subramanian, Ph.D.	23,500
Meso-Scale Science and Engineering, Ravi Saraf, Ph.D.	22,500
Nebraska Center for Virology, Charles Wood, Ph.D.	20,000
Cognitive Ability, Spatial and Episodic Memory, Al Kamil, Ph.D., Alan Bond, Ph.D., Jeff Stevens, Ph.D.	17,569
Identifying the Factors Contributing to Cerebral Injury in Pediatric Congenital Heart Disease and the Methods for Prevention, Greg Bashford, Ph.D.	9,981
Acquisition of equipment for life sciences research in the Life Sciences, Kelly Heath, D.V.M.	40,000
Subtotal	**$ 2,600,853**
Minority Health Research Grants	
Kirk Dombrowski, Ph.D.	108,763
Minority Health Disparities Initiative, Rick Bevins, Ph.D.	106,404
Enhancing UNL Capacity for Telehealth with Minority Populations in Nebraska, Debra Hope, Ph.D. & Timothy Nelson, Ph.D.	9,299
Subtotal	**$ 224,466**
Total FY 2012-2013 Allocation	**$ 3,206,655**

Boys Town National Research Hospital

Nebraska Tobacco Settlement Biomedical Research Development Fund

FY 2012-2013 Allocation

		Allocation
Strategic Faculty Recruitment and Retention		
Sophie Ambrose, PhD, Lied Learning and Technology Center		15,944
Dawna Lewis, PhD, Hearing Research		57,627
Kayla Pope, MD, JD, Neurobehavioral Disorders		103,440
Monita Chatterjee, Ph.D, Lied Learning and Technology Center		134,281
Kristen Janky, PhD, Audiology and Vestibular Services		52,808
Barbara Morley, PhD, Hearing Research		99,538
Nicholas Smith, PhD, Lied Learning and Technology Center		72,423
Richard Tempero, MD, PhD, Otolaryngology		9,345
Edward Walsh, PhD, Hearing Research		86,071
Yesha Lundberg, PhD, Usher Syndrome Center		138,538
Marissa Zallocchi, PhD, Usher Syndrome Center		93,805
	Subtotal	**$ 863,820**
Research Program and Infrastructure Development		
Animal Care Facility Core, JoAnn McGee, PhD		16,000
Electron Microscopy Core, Walt Jesteadt, PhD		3,024
Usher Syndrome Center Core Support, Dominic Cosgrove, PhD		107,819
Core Center for Communication Disorders Supplement, Walt Jesteadt, PhD		107,341
New Projects Fund, Michael Gorga, PhD		5,000
Recruitment Fund, Walt Jesteadt, PhD		5,000
Postdoctoral Training, Walt Jesteadt, PhD		20,400
	Subtotal	**$ 264,584**
Minority Health Research Grants		
Minority Recruitment, Michael Gorga, PhD		17,000
Spanish-English Bilinguals, Kanae Nishi, PhD		58,863
Effects of Lead Exposure, R. McCreery, Ph.D.		10,000
	Subtotal	**$ 85,863**
	Total FY 2012-2013 Allocation	**$ 1,214,267**

Nebraska Tobacco Settlement Biomedical Research Development Fund

Section II

Project Progress Descriptions

University of Nebraska Medical Center
Creighton University
University of Nebraska – Lincoln
Boys Town National Research Hospital

UNIVERSITY OF NEBRASKA MEDICAL CENTER

Nebraska Tobacco Settlement Biomedical Research Development Fund (NTSBRDF)

Year 12: July 1, 2012 - June 30, 2013

Progress Report

EXECUTIVE SUMMARY

UNMC invests NTSBRDF dollars in three areas:

- Recruitment and retention of excellent scientists
- Research infrastructure and program development
- Research focused on improving health or reducing health disparities.

During 2012-13, UNMC received $7,153,127 in Nebraska Tobacco Settlement Funds. It was invested as follows:

- $5,299,691 in strategic recruitment and retention of researchers of merit, including $1,431,507 for the recruitment or retention of women or under-represented minorities.
- $1,144,765 in infrastructure development
- $13,182 in joint research programs;
- $695,489 in research projects directed at health care disparities or fostering partnerships with under-represented minority groups.

Overall, 9.7% of the total 2012-2013 award was focused on the recruitment of under-represented minorities or research focused on health disparities.

Since the activation of the NTSBRDF program at the beginning of fiscal year 2001-02, we have recruited and/or retained top-notch scientists that have fueled much of our research funding growth.

Last year UNMC research funding totaled $94.3M, an increase of 6% in total research awards from the previous year. This occurred despite flat or reduced budgets for most funding agencies and greater competition for those dollars. Overall, UNMC's total extramural support for research has increased 132% during the twelve years of NTSBRDF. The growth of research funding from outside the state, in turn, has a direct and positive impact on the economy of the State of Nebraska by creating new jobs, both directly by new faculty hires and staff recruitment and indirectly through purchases made with grant monies.

Since 2001, when NTSBRDF support began, UNMC has invested approximately $47.0M in the strategic recruitment or retention of 165 researchers, which, in turn, have attracted a total of over $644M in extramural research support after receiving NTSBRDF funding. As a result, this program has resulted in a return on investment of approximately 14 to 1.

STRATEGIC FACULTY RECRUITMENT AND RETENTION

In 2012-2013, UNMC invested the majority of its NTSBRDF, $5,299,691 (74%), in strategic recruitment and retention. These NTSBRDF dollars were well-invested as the researchers who received them have a combined total extramurally funded research portfolio valued at $168M. These investigators were predominantly funded from National Institutes of Health (NIH), including National Cancer Institute (NCI), National Heart, Lung, Blood Institute (NHLBI), National Institute on Aging (NIA), National Institute of Allergy & Infectious Diseases (NIAID), National Institute of Child Health & Human Development (NICHD), National Institute on Drug Abuse (NIDA), National Institute of Dental & Craniofacial Research (NIDCR), National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK), National Institute of General Medical Sciences (NIGMS), National Institute of Mental Health (NIMH), and National Institute of Neurological Disorders and Stroke (NINDS)]. Other federal funding sources included Department of Health and Human Services (DHHS) [Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH), General Services Administration (GSA)]; National Aeronautics and Space Administration (NASA); Veterans Affairs (VA) and the United States Army.

Newly Awarded Investigators (First Time NTSBRDF support during 2012-2013)

Investigator: Javeed Iqbal, Ph.D.
Position Title & Department: Assistant Professor, COM, Pathology/Microbiology
Expertise: Lymphoma, Gene Expression Profiling, Characterization of Molecular Signatures in Malignacies
External Funding:
Current Funding Total: $705,000
Funding Sources: Lymphoma Research Foundation, Leukemia & Lymphoma Society

Investigator: Michael J. Moulton, M.D.
Position Title & Department: Professor, COM, Surgery - Cardiovascular & Thoracic
Expertise: Mitral Valve Repair, Aortic Surgery, Heart Transplantation, Surgical Treatment of Heart Failure
External Funding:
Current Funding Total: $625,533
Funding Sources: AbbVie, Inc.

Investigator: Amr S. Soliman, Ph.D.
Position Title & Department: Professor, COPH, Epidemiology
Expertise: Cancer Epidemiology, Underserved and Minority Population Cancer Epidemiology, Migration Studies
External Funding:
Current Funding Total: $1,372,529
Funding Sources: DHHS/NIH/NCI, University of Michigan

Mentored Faculty Programs for Under-Represented Minority and Other Junior Investigators

Investigator: Fahd Alsalleeh, Ph.D.
Position Title & Department: Assistant Professor, COD, Surgical Specialties
Expertise: Immunomodulation and Response of the Host Defenses during Fungal Infection

Investigator: Jixin Dong, Ph.D.
Position Title & Department: Assistant Professor, Eppley Institute
Expertise: Cancer Cell Growth

Investigator: Corrine K. Hanson, Ph.D., RD, LMNT
Position Title & Department: Assistant Professor, SAHP, Medical Nutrition Education
Expertise: Infant Nutrition, Growth Disorders

Investigator: Randeep S. Jawa, M.D.
Position Title & Department: Assistant Professor, COM, Surgery - General
Expertise: Advanced Trauma Life Support, Rural Trauma Training, Critical Care Research

Investigator: Alexey Kamenskiy, Ph.D.
Position Title & Department: Assistant Professor, COM, Surgery - General
Expertise: Material Science, Protein Misfolding and Protein Interactions, Therapeutic and Early Diagnostic Materials Development

Investigator: Mayumi Naramura, M.D.
Position Title & Department: Assistant Professor, Eppley Institute
Expertise: Biochemical Pathways Controlling Cancer Stem Cells

Investigator: Barbara A. Swore Fletcher, Ph.D.
Position Title & Department: Assistant Professor, CON, Adult Health & Illness
Expertise: Symptom Management in Cancer Care, Caregiver Support

Investigator: Ming-Ying Tsai, Ph.D.
Position Title & Department: Assistant Professor, Eppley Institute
Expertise: Cellular Mechanisms in Cancer Development and Treatment

Investments in Critical Infrastructure Faculty or Strategic Pilot Grants to Incentivize New Research Collaborations

Investigator: Michael Boska, Ph.D.
Position Title & Department: Vice Chairman, Radiology Research, Professor, COM, Radiology, & Director Bioimaging Core Facility
Expertise: Magnetic Resonance Imaging (MRI) & Spectroscopy (MRS) Methods
Strategic Focus: Bioimaging Core

Investigator: Steven H. Hinrichs, M.D.
Position Title & Department: Chairperson & Professor, COM, Pathology/Microbiology
Expertise: Infectious Disease, Biopreparedness, Development of Diagnostic Assays
Strategic Focus: Department of Defense research programs

Investments in Critical Infrastructure Faculty or Strategic Pilot Grants to Incentivize New Research Collaborations - continued

Investigator: Jennifer L. Larsen, M.D.
Position Title & Department: Vice Chancellor for Research, Professor, COM, Internal Medicine - Diabetes, Endocrinology & Metabolism
Expertise: Diabetes, Clinical and Translational Research
Strategic Focus: Clinical/Translational Research Center

Investigator: Brian Lowes, M.D., Ph.D.
Position Title & Department: Professor, COM, Internal Medicine - Cardiology
Expertise: Molecular Mechanisms of Cardiac Remodeling.
Strategic Focus: Translational cardiology

Investigator: Runqing Lu, Ph.D.
Position Title & Department: Associate Professor, COM, Genetics, Cell Biology and Anatomy
Expertise: Immune Cell Development, B-Cell Leukemia
Strategic Focus: Hematologic malignancy

Investigator: Jason N. MacTaggart, M.D.
Position Title & Department: Assistant Professor, COM, Surgery - General
Expertise: Endovascular Repair and Pathophysiology of Aortic Aneurysm and Dissection
Strategic Focus: Bioengineering solutions to cardiovascular problems

Investigator: David W. Mercer, M.D.
Position Title & Department: Chairperson & Professor, COM, Surgery
Expertise: Role of Gut in Pathogenesis of Multiple Organ Failure
Strategic Focus: Surgical specialty recruitment

Investigator: Angie A. Rizzino, Ph.D.
Position Title & Department: Professor, Eppley Institute
Expertise: Genetic Regulation in Cancer
Strategic Focus: Regenerative medicine

Investigator: Juliann Sebastian, Ph.D.
Position Title & Department: Dean & Professor, CON, Academic Adminstrative
Expertise: Care Delivery Systems, Underserved Population Care, Nurse-Managed Centers for Health Care Delivery
Strategic Focus: Nursing faculty recruitment

Funded Investigators (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Hamid Band, M.D., Ph.D.
Position Title & Department: Professor, Eppley Institute
Expertise: Cellular Signaling in Cancer, Breast Cancer
External Funding:
Current Funding Total: $5,395,938
Funding Sources: US Army, DHHS/NIH/NCI, NE DHHS/LB506

Funded Investigators – continued (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Vimla Band, Ph.D.
Position Title & Department: Chairperson & Professor, COM, Genetics, Cell Biology and Anatomy
Expertise: Cancer, Diagnostic/Prognostic Markers for Breast Cancer
External Funding:
Current Funding Total: $2,075,823
Funding Sources: US Army, DHHS/NIH/NCI

Investigator: Surinder Batra, Ph.D.
Position Title & Department: Chairperson & Professor, COM, Biochemistry and Molecular Biology
Expertise: Pancreatic Cancer, Development of Diagnostic/Prognostic Markers for Cancer
External Funding:
Current Funding Total: $7,927,571
Funding Sources: DHHS/NIH/NCI, NWI-VAMC

Investigator: Bernard Timothy Baxter, M.D.
Position Title & Department: Professor, COM, Surgery - General
Expertise: Aortic Aneurysms, Causes and Treatments for Aneurysms; Surgical Interventions
External Funding:
Current Funding Total: $6,467,185
Funding Sources: DHHS/NIH/NHLBI, University of Maryland

Investigator: Kenneth Bayles, Ph.D.
Position Title & Department: Associate Vice Chancellor for Basic Science Research, & Professor, COM, Pathology/Microbiology
Expertise: Antibiotic Development, Biofilm Physiology
External Funding:
Current Funding Total: $13,010,152
Funding Sources: DHHS/NIH/NIAID, National Strategic Research Institute, Emergent BioSolutions

Investigator: Ben H. Boedeker, M.D., Ph.D., DVM, MBA
Position Title & Department: Professor, COM, Anesthesiology
Expertise: Airway Management, Telemedicine, Equipment Design
External Funding:
Current Funding Total: $6,583,256
Funding Sources: US Army, National Strategic Research Institute, General Services Administration

Investigator: Stephen J Bonasera, M.D., Ph.D.
Position Title & Department: Assistant Professor, COM, Internal Medicine - Geriatrics
Expertise: Neurobiology of Aging
External Funding:
Current Funding Total: $3,114,912
Funding Sources: DHHS/NIH/NIA, Alzheimer's Association

Funded Investigators – continued (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Michael Brattain, Ph.D.
Position Title & Department: Professor & Associate Director, Eppley Institute
Expertise: Colon Cancer, Molecular Targeting in Cancer
External Funding:
Current Funding Total: $4,326,448
Funding Sources: DHHS/NIH/NCI

Investigator: Shilpa Buch, Ph.D.
Position Title & Department: Professor, COM, Pharmacology & Experimental Neurosciences
Expertise: Infectious Diseases of the Brain and their Treatment
External Funding:
Current Funding Total: $9,580,584
Funding Sources: DHHS/NIH/NIDA/NIMH/NIAID, Johns Hopkins University

Investigator: Anna Dunaevsky-Hutt, Ph.D.
Position Title & Department: Associate Professor, MMI, Developmental Neuroscience
Expertise: Human Neurodevelopmental Disorders, Learning Induced Brain Changes
External Funding:
Current Funding Total: $2,254,797
Funding Sources: DHHS/NIH/NICHD, US Army, University of Nebraska - Lincoln

Investigator: Howard Fox, M.D., Ph.D.
Position Title & Department: Senior Associate Dean for Research & Professor, COM, Pharmacology & Experimental Neurosciences
Expertise: Infectious and Neurodegenerative Diseases and Substance Abuse
External Funding:
Current Funding Total: $16,941,964
Funding Sources: DHHS/NIH/NIMH/NIDA, University of Missouri - Kansas City

Investigator: Lie Gao, M.D., Ph.D.
Position Title & Department: Assistant Professor, COM, Cellular & Integrative Physiology
Expertise: Neurological Influences on Chronic Heart Failure (CHF)
External Funding:
Current Funding Total: $1,819,059
Funding Sources: DHHS/NIH/NHLBI

Investigator: Jered Garrison, Ph.D.
Position Title & Department: Assistant Professor, COP, Pharmaceutical Science
Expertise: Drug Development, Nanomedicine and Molecular Targeting
External Funding:
Current Funding Total: $732,062
Funding Sources: DHHS/NIH/NCI

Funded Investigators – continued (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Howard E. Gendelman, M.D.
Position Title & Department: Chairman & Professor, COM, Pharmacology & Experimental Neuroscience
Expertise: Neurodegenerative Disease, Infectious Disease, Neuroimmunology, & Nanomedicine
External Funding:
Current Funding Total: $23,787,731
Funding Sources: DHHS/NIH/NINDS/NIDA, University of Rochester, University of Nebraska - Lincoln, Neotope Biosciences Limited, ViiV Healthcare Limited, University of Hawaii

Investigator: Michael A. (Tony) Hollingsworth, Ph.D.
Position Title & Department: Professor, Eppley Institute
Expertise: Pancreatic Cancer
External Funding:
Current Funding Total: $9,788,998
Funding Sources: DHHS/NIH/NCI, Arizona State University, University of Texas Health Science Center at San Antonio, Quest Pharma Tech, Inc

Investigator: Tammy Kielian, Ph.D.
Position Title & Department: Professor, COM, Pathology/Microbiology
Expertise: Bacterial Infections of the Central Nervous System
External Funding:
Current Funding Total: $1,545,055
Funding Sources: DHHS/NIH/NINDS, Kings College London, Rare Disease Therapeutics, Inc

Investigator: Yulong Li, M.D., Ph.D.
Position Title & Department: Associate Professor, COM, Emergency Medicine
Expertise: Nervous System Function in Heart Failure and Diabetes
External Funding:
Current Funding Total: $1,459,934
Funding Sources: DHHS/NIH/NHLBI

Investigator: Amarnath Natarajan, Ph.D.
Position Title & Department: Associate Professor, Eppley Institute
Expertise: Compound Formulation, Cancer Targeted Therapeutics
External Funding:
Current Funding Total: $1,226,829
Funding Sources: DHHS/NIH/NCI

Investigator: Ali Nawshad, Ph.D.
Position Title & Department: Associate Professor, COD, Oral Biology
Expertise: Cleft Palate, Craniofacial Development
External Funding:
Current Funding Total: $1,883,196
Funding Sources: DHHS/NIH/NIDCR, University of Michigan

Funded Investigators – continued (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Dmitry Oleynikov, M.D.
Position Title & Department: Professor, COM, Surgery - General
Expertise: Robotic Surgery, Minimally Invasive Surgery, Computer Assisted Surgery
External Funding:
Current Funding Total: $2,940,285
Funding Sources: NASA, Foundation for Surgical Fellowships (FSF), University of Nebraska - Lincoln, Covidien, LifeCell Corporation

Investigator: Rene Opavsky, Ph.D.
Position Title & Department: Assistant Professor, Eppley Institute
Expertise: Epigenetics, Lymphoma Causes, DNA Methylation
External Funding:
Current Funding Total: $40,000
Funding Sources: NE DHHS/LB506

Investigator: Pinaki Panigrahi, M.D.
Position Title & Department: Director, Center for Global Health & Development, & Professor, COPH, Epidemiology
Expertise: Pathogenesis of Infectious & Inflammatory Diseases of the Gastrointestinal Tract
External Funding:
Current Funding Total: $1,919,453
Funding Sources: DHHS/NIH/NICHD, London School of Hygiene and Tropical Medicine (LSHTM), Child Health Research Foundation, Nestec Ltd

Investigator: Aimin Peng, Ph.D.
Position Title & Department: Assistant Professor, COD, Oral Biology
Expertise: Cell Cycle Regulation, DNA Damage Response in Cancer
External Funding:
Current Funding Total: $1,577,346
Funding Sources: DHHS/NIH/NCI

Investigator: Iraklis Pipinos, M.D.
Position Title & Department: Professor, COM, Surgery - General
Expertise: Regenerative Medicine, Peripheral Arterial Disease, Repair of Skeletal Muscle Tissue in the Extremities
External Funding:
Current Funding Total: $5,228,764
Funding Sources: DHHS/NIH/NIA

Investigator: Risto Rautiainen, Ph.D.
Position Title & Department: Associate Professor, COPH, Environmental, Agricultural & Occupational Health Science
Expertise: Agricultural & Occupational Health and Safety
External Funding:
Current Funding Total: $5,471,322
Funding Sources: DHHS/CDC/NIOSH

Funded Investigators – continued (Received Continuing NTSBRDF support during 2012-2013)

Investigator: Stephen Rennard, M.D.
Position Title & Department: Professor, COM, Internal Medicine - Pulmonary
Expertise: Chronic Obstructive Pulmonary Disease, Smoking Cessation, Lung Injury and Repair
External Funding:
Current Funding Total: $8,236,573
Funding Sources: DHHS/NIH/NHLBI, NE DHHS/LB506, University of North Carolina @ Chapel Hill, University of Michigan, Otsuka Maryland Research Institute, Inc, GlaxoSmithKline, Pfizer, Inc, Boehringer Ingelheim Pharmaceuticals, Inc, Pearl Therapeutics, Inc

Investigator: Steven C. Sansom, Ph.D.
Position Title & Department: Professor, COM, Cellular & Integrative Physiology
Expertise: Diabetes and Hypertension
External Funding:
Current Funding Total: $2,884,284
Funding Sources: DHHS/NIH/NIDDK

Investigator: Nora Sarvetnick, Ph.D.
Position Title & Department: Director, Nebraska Regenerative Medicine Project, & Professor, COM, Surgery
Expertise: Regenerative Medicine, Regulation of the Immune Response, Immunological Implications of Diabetes, Immunology of Autoimmune Diseases
External Funding:
Current Funding Total: $2,947,169
Funding Sources: DHHS/NIH/NIAID, Benaroya Research Institute at Virginia Mason

Investigator: Shelley D. Smith, Ph.D.
Position Title & Department: Professor, Munroe Meyer Institute
Expertise: Molecular Genetics of Language and Learning Disorders
External Funding:
Current Funding Total: $11,088,669
Funding Sources: DHHS/NIH/NIGMS, University of Colorado at Boulder, University of Kansas

Investigator: Zhixin Zhang, Ph.D.
Position Title & Department: Associate Professor, COM, Pathology/Microbiology
Expertise: Immune System Development, Antibodies
External Funding:
Current Funding Total: $1,819,439
Funding Sources: DHHS/NIH/NIAID

Investigator: Matthew C. Zimmerman, Ph.D.
Position Title & Department: Associate Professor, COM, Cellular & Integrative Physiology
Expertise: Hypertension, Neuronal-derived Reactive Oxygen Species (ROS)
External Funding:
Current Funding Total: $2,124,289
Funding Sources: DHHS/NIH/NHLBI, University of Nebraska - Lincoln

RESEARCH PROGRAM AND INFRASTRUCTURE DEVELOPMENT

A total of $1,144,765 (16%) was invested in research program and infrastructure development in 2012-2013. The general areas included animal facilities support, research core laboratories, grant management, and educational/training & compliance programs for NIH-funded scientists. Infrastructure is often critical to attract and retain nationally recognized scientists. These investments in infrastructure support investigators with research awards of over $94.3M annually.

An example of some of the infrastructure supported includes the Comparative Medicine department, which was awarded $620,000 or 54% of the infrastructure total, for upgrades to animal facility equipment and support for animal services. One of the most important research developments is the ability to develop new genetic strains of mice that can provide models for human disease, or to study the role of genes in risk for diseases, such as cancer, autism, learning disabilities, and other heritable disorders. The NIH funded Molecular Biology of Neurosensory Systems program relies heavily on such genetic mouse models and has also benefited from this NTBSBRDF support.

NTSBRDF support has also supported new software development and implementation to facilitate access of our scientists to management, informatics, educational, and other software applications to increase research efficiency and decrease the risk of non-compliance.

MINORITY HEALTH AND HEALTH DISPARITIES RESEARCH

In 2012-13, UNMC invested $695,489 in health disparities by supporting UNMC's Center for Reducing Health Disparities (CRHD), and supporting collaborations with the Great Plains Tribal Chairman's Health Board (GPTCHB) and the Virginia-Nebraska Alliance.

The mission of the CRHD is to promote health equity and social justice in health and health care by leading collaborative efforts to generate and disseminate evidence-based, policy-relevant solutions. The vision of the CRHD is to become a nationally recognized Center of Excellence for promoting health equity through quality research, education, and community engagement. One of the priorities identified in the vision statement and strategic plan is to improve research capacity and performance in the areas of cancer-related health disparities, obesity and diabetes, rural health, and maternal and child health in an effort to become more competitive in initiating and sustaining sponsored programs in these areas. Five major research projects were supported in part through NTSBRDF in the focus areas ("Latinas, Tabaco, y Cancer"; "Racism, Coping Strategies, and Birth Outcomes among African American Women"; "The Impact of Perceived Discrimination on Health Status and Health Outcomes in North Omaha"; "Racial and Ethnic Disparities in Health care Utilization in Douglas County, Nebraska"; and "Family Background Associated with the Incidence of Acanthosis Nigricans among Mexican-American children in South Texas") An investment of $518,542 was made in the Center for Reducing Health Disparities.

The Great Plains Tribal Chairman's Health Board (GPTCHB) provides the Indian people of the Aberdeen Area with a formal representative board as a means of communicating and participation with the Aberdeen Area Indian Health Service and other health agencies and organizations on health matters. In 2003 the Northern Plains Tribal Epidemiology Center (NPTEC) was founded as a program of GPTCHB to assist in improving the health of the 18 Aberdeen Area tribal nations and communities. $5,000 was used to support travel for GPTCHB personnel to come to Omaha to develop research collaborations and inform faculty on their health disparities and research priorities.

The Virginia-Nebraska Alliance (The Alliance) is a unique partnership between unlikely partners to address the national need to diversify the healthcare and biomedical research workforce. The Alliance was formed in September 2004 between two of Virginia's Historically Black Colleges/ Universities (HBCUs)—J. Sargeant Reynolds Community College and Virginia Commonwealth University (VCU)—and UNMC. In 2006 the University of Richmond (U of R), the University of Virginia (UVA), and Eastern Virginia Medical School (EVMS) joined so the Alliance now includes five HBCUs. The Alliance focuses on four areas: 1) student exchanges to identify and encourage undergraduate students interested in health professions or health research graduate education to pursue their goal and consider attending programs at UNMC; 2) faculty exchanges; 3) faculty research collaborations; and 4) institutional collaborations to pursue new funding opportunities. Participating students conduct research with mentors for two summers. Faculty exchanges include collaborative research, seminars and presentations. Virginia HBCUs attract a majority of underrepresented minority students and provide a pipeline to graduate training programs as they are largely focused on undergraduate education. UNMC, in turn, views the relationship as an opportunity to attract more diverse students into its health professions and graduate education programs. Students become members of actively funded UNMC research teams for 10 weeks each summer during which they develop technical laboratory skills, expand their scientific knowledge base, analyze data, document results, participate in team meetings, attend research weekly seminars, and then present their work at the end of summer research poster session with all the other summer undergraduate students. They learn about career paths, interviewing skills, balancing the stresses of graduate training and personal life, and visit with successful role models. The program is evaluated annually. The six underrepresented minority undergraduate students that participated this year were all attending Nebraska undergraduate institutions. A total of $131,864 was invested in this program.

CREIGHTON UNIVERSITY

Nebraska Tobacco Settlement Biomedical Research Development Fund (NTSBRDF)

Year 12: July 1, 2012 - June 30, 2013

Progress Report

EXECUTIVE SUMMARY

The Creighton University investment of the Nebraska Tobacco Settlement Biomedical Research Development Fund dollars is concentrated in three areas:

- Strategic Faculty Recruitment and Retention
- Research Program and Infrastructure Development
- Minority Health Research Grants

With the support of the NTSBRDF, Creighton University continues to address some of the world's most complex and perplexing health care challenges. Research investigators play a fundamental role in enhancing the quality of life for individuals and in expanding the research community in Nebraska and the region. The primary purpose and use of the NTSBRDF program at Creighton University is to increase funding from federal health agencies and institutes. In 2012-2013, the collective efforts of the research investigators at Creighton University produced significant results. Creighton University received approximately $30 million in extramural funding. Investigators were awarded federal grants from the Department of Defense, National Institutes of Health, National Science Foundation, Health Resources and Services Administration, and Agency for Healthcare Research and Quality, as well as many other non-federal grants from corporations and foundations. The university and its investigators look forward to continuing to use NTSBRDF funds as a springboard to benefit the citizens of Nebraska and to add to research and health care knowledge everywhere.

STRATEGIC FACULTY RECRUITMENT AND RETENTION

Creighton University's goals include the recruitment of talented investigators and the enhancement of its research resources, research mentoring, and research faculty development. In 2012-13, Creighton University invested $452,914 of the NTSBRDF funds to support new faculty in the departments of Biomedical Sciences, Pharmacology and the Osteoporosis Research Center in the School of Medicine. These investigators, Kristina Simeone, Kenneth Kramer, Deniz Yilmazer-Hanke, Janee Gelineau-van Waes and Laura Armas, used NTSBRDF funds to assist with start-up and the enhancement of their research endeavors.

Funded Investigators

Investigator: Kenneth Kramer, Ph.D.
Position Title & Department: Assistant Professor, School of Medicine, Dept. of Biomedical Sciences
Expertise: Zebrafish model system focused on understanding how changes to the glycosaminoglycans control development
External Funding:
Current Year Funding Total: $220,989
Funding Sources: DHHS/NIH/NIGMS, NSF

Investigator: Deniz Yilmazer-Hanke, Ph.D.
Position Title & Department: Associate Professor, School of Medicine, Dept. of Biomedical Sciences
Expertise: Molecular and structural changes, gene expression and signal transduction mechanisms leading to neural plasticity and neurodegeneration in limbic brain regions
External Funding:
Current Year Funding Total: $92,250
Funding Sources: DHHS/NIH/NIGMS, Health Future Foundation

Investigator: Kristina Simeone, Ph.D.
Position Title & Department: Assistant Professor, School of Medicine, Dept. of Pharmacology
Expertise: Neural mechanisms underlying epilepsy with the overarching goal of providing insights into the development of novel treatments for this neurologic disease
External Funding:
Current Year Funding Total: $271,901
Funding Sources: DHHS/NIH/NINDS

Investigator: Janee Gelineau-van Waes, Ph.D.
Position Title & Department: Associate Professor, School of Medicine, Dept. of Pharmacology
Expertise: Investigation of nutritional, genetic, and environmental factors that impact embryonic development
External Funding:
Current Year Funding Total: $0

Investigator: Laura Armas, M.D.
Position Title & Department: Associate Professor, School of Medicine, Osteoporosis Research Center
Expertise: Use of novel technologies to investigate bone health in diabetes mellitus
External Funding:
Current Year Funding Total: $382,232
Funding Sources: DHHS/NIH/NIAMS, Hormel Foods Corporation, DSM Nutritional Products AG, Dialysis Clinic, Inc.

RESEARCH PROGRAM AND INFRASTRUCTURE DEVELOPMENT

A total of $1,275,681 was invested in research program and infrastructure development in 2012-2013, in a wide variety of topics, including Mechanisms Underlying Insulin Resistance in Morbidly Obese and Diabetic; Patients Effects of Creatine Supplementation on Immune System Function; Assessment of Glutamate Delta-1 Receptor in Autistic Phenotype; Novel Approach to Hair Cell Regeneration for Hearing Restoration; Novel Pathway for Bone Adaptation to Exercise and Spatiotemporal Specific Gene Manipulation in the Mouse Inner Ear to Regenerate Lost Auditory HCS. Moreover, the Research Program and Infrastructure Development portion of the NTSBRDF supported biomedical research by providing bridge funding for research faculty and employing a Biostatistician and Technical Writer/Editor to aid investigators in the development of competitive applications.

Funded Investigators

Investigator: Kalyana Nandipati, M.D.
Position Title & Department: Assistant Professor, School of Medicine, Dept. of Surgery
Project Title: Mechanisms Underlying Insulin Resistance in Morbidly Obese and Diabetic Patients
External Funding:
Current Year Funding Total: $0

Investigator: Kristen Drescher, Ph.D.
Position Title & Department: Professor, School of Medicine, Dept. of Medical Microbiology and Immunology
Project Title: Effects of Creatine Supplementation on Immune System Function
External Funding:
Current Year Funding Total: $0

Investigator: Shashank Dravid, Ph.D.
Position Title & Department: Assistant Professor, School of Medicine, Dept. of Pharmacology
Project Title: Assessment of Glutamate Delta-1 Receptor in Autistic Phenotype
External Funding:
Current Year Funding Total: $139,520
Funding Sources: DHHS/NIH/NIHM, NSF, Health Future Foundation, George F. Haddix President's Faculty Research Fund

Investigator: Garrett Soukup, Ph.D.
Position Title & Department: Professor, School of Medicine, Dept. of Biomedical Sciences
Project Title: Novel Approach to Hair Cell Regeneration for Hearing Restoration
External Funding:
Current Year Funding Total: $338,681
Funding Sources: DHHS/NIH/NIDCD

Funded Investigators - continued

Investigator: Diane Cullen, PhD
Position Title & Department: Professor, School of Medicine, Dept. of Biomedical Sciences
Project Title: Novel Pathway for Bone Adaptation to Exercise
External Funding:
Current Year Funding Total: $0

Investigator: Sonia Rocha-Sanchez, Ph.D.
Position Title & Department: Associate Professor, School of Dentistry, Dept. of Oral Biology
Project Title: Spatiotemporal Specific Gene Manipulation in the Mouse Inner Ear to Regenerate Lost Auditory HCS
External Funding:
Current Year Funding Total: $0

Investigator: Thomas Murray, Ph.D.
Position Title & Department: Associate Vice President for Health Science Research
Project Title: Associate Vice President Postdoctoral Support
External Funding:
Current Year Funding Total: $837,027
Funding Sources: DHHS/NIH/NINDS, DHHS/NIH/NIDA, NE-DHHS

MINORITY HEALTH RESEARCH GRANTS

Creighton's core values include the inalienable worth of each individual and appreciation of ethnic and cultural diversity coupled with service to others. As such, the NTSBRDF supports Creighton University's commitment to improving the health of racial and ethnic minorities. In 2012-13, a total of $125,000 was used to support the Creighton Community through clinical and educational services primarily to the African-American community in Omaha.

Funded Investigators

Investigator: Sade Kosoko-Lasaki, M.D.
Position Title & Department: Associate Vice President – Health Science Multicultural and Community Affairs
Expertise: Center for Promoting Health and Health Equality (CPHHE)
External Funding:
Current Year Funding Total: $0

UNIVERSITY OF NEBRASKA-LINCOLN

Nebraska Tobacco Settlement Biomedical Research Development Fund (NTSBRDF)

Year 12: July 1, 2012 - June 30, 2013

Progress Report

EXECUTIVE SUMMARY

The twelve years of NTSBRDF funding have enabled the University of Nebraska-Lincoln to strategically invest funds to achieve tangible results and to build significant biomedical research capacity that have well served the State of Nebraska and the nation. UNL's goals for the NTSBRDF program are to increase our biomedical research capacity and external funding, which in turn will enable us to contribute to the improved health of Nebraskans and stimulate economic development and employment opportunities in the state.

UNL has invested the NTSBRDF funds in three main areas:

- **Recruitment and retention of biomedical research faculty**, whose work aligns with our strategic priorities and who either bring significant funding with them, or have a high likelihood of achieving relatively quick success in obtaining funding. This investment in faculty is one of the most effective means of increasing our research capacity and often has the most immediate return.

- **Development of new research projects or infrastructure** leading to NIH and other external funding. These grants are focused on major inter-disciplinary research programs aligned with the research priorities of UNL, NIH and other funding agencies. They also include investments in programs to develop collaborative projects with UNMC.

- Research projects that specifically address issues of importance to the health of Nebraska's **minority populations**.

- In 2012-2013, UNL made 29 awards totaling $3,206,655. These included an allocation of $381,336 for 3 faculty recruitments and 1 faculty retentions; $2,600,853 for 21grants supporting infrastructure and new research projects; and $224,466, or 7 percent of the total, for 3 projects in minority health research.

- As in the previous eleven years of the NTSBRDF program, we are seeing impressive results from these investments in people and research projects. As a group, the new faculty recruits already have brought approximately $900,000 in new external biomedical funding to UNL, with proposals pending for an additional $14.9M in external funding. Related to the aging research infrastructure, NTSBRDF funds have been invested in cutting edge equipment and facilities to enhance our capacity to leverage extramural funding.

STRATEGIC FACULTY RECRUITMENT AND RETENTION

Introduction: Strategic recruitment and retention grants at UNL have two goals: 1) to expand faculty expertise in important areas of biomedical research and 2) to increase the base of NIH and other extramural funding. NTSBRDF funding allowed UNL to meet both of these goals. In 2013, three new faculty members were hired and partially supported by NTSBRDF funding. These new faculty bring expertise in a variety of areas, including: brain imaging, bioinformatics, computational biology, computational immunology, vaccine design, genomics, cancer research, and proteomics. As a group these new recruits already brought approximately $900,000 in new external biomedical funding to UNL with applications pending for an additional $14.9M in external funding. UNL also used NTSBRDF funds to retain faculty with critical expertise in the areas of fertility research and the impact of social inequalities on health outcomes. Investments were also made to further expand the capacity of two major research centers. The Center for Brain, Biology, and Behavior (CB3) and the Nebraska Center for Virology. CB3, which also has received support from the Nebraska Research Initiative, uses state-of-the-art brain imaging technology to further research in areas such as traumatic brain injury. The Center also coordinates research on the long-term effects of concussions across the 13 institutions of the Big 10 Committee on Institutional Cooperation. NTSBRDF funds were invested to recruit faculty in the renowned Nebraska Center for Virology, an externally funded center that includes faculty from UNL, UNMC and Creighton.

Faculty Recruitment

Investigator: Dennis Molfese, Ph.D.
Position Titles & Department: Professor; Dept. of Psychology
Expertise: Brain imaging to study the emerging relationships between brain development, language, and cognitive processes.
External Funding:
Current Funding Total: $907,062
Proposals Currently Pending: $14,868,003
Funding Sources: NIH, NSF, Am. Cancer Society, Dept. of Defense, Brain Science Foundation

Investigator: Hasan Otu, Ph.D.
Position Titles & Department: Professor; Dept. of Electrical Engineering
Expertise: Bioinformatics, proteomics, genomics, computational biology

Investigator: Juan Cui, Ph.D.
Position Title & Department: Assistant Professor; Dept. of Computer Science and Engineering
Expertise: Cancer genomics and bioinformatics, computational immunology, vaccine design, proteomics.

Faculty Retention

Investigator: Julia McQuillan, Ph.D.
Position Titles & Department Chair and Professor; Dept. of Sociology
Expertise: Sociology of health, fertility.
External Funding:
Current Funding Total: $4,752,551
Proposals Currently Pending: $8,816,904
Funding Sources: NIH, NSF, Nebraska Dept. of Health and Human Services, American Sociological Association, Elsevier Foundation

RESEARCH PROGRAM AND INFRASTRUCTURE DEVELOPMENT

Introduction: Grants were provided to support development of novel research programs with the potential to improve human health and to strengthen the research infrastructure at UNL. These investments will enhance the ability of UNL faculty to compete for external biomedical research funding. In 2013, support was provided for the professional development of faculty and to provide seed funding for a diverse set of projects in the biomedical sciences. Investments also were made in equipment needed to conduct the research at several campus facilities. The research projects funded in 2013 cover important areas of health research including developmental changes in brain, language, and cognitive processes across the lifespan, brain injury, pediatric heart disease, infectious diseases, virology, cancer and tissue engineering. NTSBRDF funding supported early basic research in these projects and served as a bridge to help researchers collect important preliminary data necessary for new and renewed NIH funding. Several of these projects include collaborators across institutions in Nebraska, evidence of the success of our efforts to promote more collaboration between the institutions.

Infrastructure development funding was provided for equipment acquisition and partial support of key personnel for the Center for Brain, Biology and Behavior (CB3), which conducts cutting-edge brain and behavioral research associated with head injuries.

Research Program Development

Project Title: Faculty Development in Biomedical Sciences
Amount of Funding: $92,211
Description of Goals and Accomplishments: A nationally known grant writing consultant provides workshops to UNL faculty to enhance competitiveness for federal funding.

Project Title: Big 10-CIC-Ivy League TBI Research Collaboration
Principal Investigator: Dennis Molfese, Ph.D.
Amount of Funding: $100,000
Description of Goals and Accomplishments: Dr. Dennis Molfese is leading a Consortium of 13 University Research & Sport Programs that includes the Big 10 Committee on Institutional Cooperation institutions and eight Ivy League Schools. The goal is to develop a shared data base for imaging and behavioral data, test procedures and programs, and to increase external funding for research related to the CB3's goals.

Project Title: Nebraska Center for Virology Support
Principal Investigator: Charles Wood, Ph.D.
Amount of Funding: $20,000
Description of Goals and Accomplishments: Funds were provided as a stipend for serving as the Director of the Nebraska Center for Virology.

Project Title: Prevention of Cerebral Injury in Pediatric Congenital Heart Disease Patients
Principal Investigator: Greg Bashford, Ph.D.
Amount of Funding: $9,981
Description of Goals and Accomplishments: Seed funding was provided to develop a collaboration and for team building activities involving researchers from multiple institutions, with the long-term goal to pursue large and/or center-type funding from NIH. The research collaboration focuses on designing methods and tools to prevent cerebral injuries that can occur when children with congenital heart disease undergo reparative heart surgery.

Project Title: Non-Viral Transfection of the Parasite Toxoplasma Gondii
Principal Investigator: Tadeusz Wysocki, Ph.D.
Amount of Funding: $25,000
Description of Goals and Accomplishments: Seed funding was provided to this collaborative team to support research on ways to minimize the health effects this parasite (which is carried by livestock) can have on humans. Specifically, the project tests a gene delivery approach designed to incapacitate the parasite.

Project Title: Molecular Sensors and Complex Disease
Principal Investigator: Paul Black, Ph.D.
Amount of Funding: $100,000
Description of Goals and Accomplishments: Funding was provided to facilitate team-building activities involving faculty from several departments and career stages, who share an interest in the study, prevention, and treatment of metabolic diseases, including but not limited to obesity, fatty liver disease, diabetes, heart disease and stroke, as well as several cancers and inflammatory diseases.

Project Title: Continued Team Building and Seed Grant Activities
Principal Investigator: David DiLillo, Ph.D.
Amount of Funding: $100,000
Description of Goals and Accomplishments: Funding was provided to facilitate team-building activities involving faculty collaborating on projects collectively known as the Substance Abuse and Violence Initiative/SAVI. Funding included support for faculty development and junior faculty mentoring, as well as pilot data collection to strengthen subsequent external funding applications.

Project Title: Biomechanical and Gradient Factors that Promote Growth Plate Architecture in Alginale Hydrogel 3-D Matrices
Principal Investigator: Angela Pannier, Ph.D.
Amount of Funding: $25,000
Description of Goals and Accomplishments: Funding was provided as part of a multi-campus bioengineering initiative between UNMC and UNL to support basic research designed to identify the chemical and mechanical signals associated with successful tissue engineering. The long-term goal is to identify mechanisms that regulate the growth of cartilage that has the property of native tissue, and to facilitate the growth of such tissue for use in transplantation and rehabilitative medicine.

Project Title: Detection of Breast Tumor Tissue Margins Using Surface-Enhanced Raman Spectroscopic Nanosensing Technologies
Principal Investigator: Yongfeng Lu, Ph.D.
Amount of Funding: $37,500
Description of Goals and Accomplishments: Funding for this project is part of a multi-campus bioengineering initiative between UNMC and UNL and used to develop highly sensitive techniques that help improve our ability to define breast tumor margins intra-operatively. The goal is to optimize the surgical and long-term health outcomes for breast cancer patients, including a reduction in mastectomies and repeat surgery, as well as cancer recurrence.

Project Title: Piloting NIH T32 Training Grant on Molecular Mechanisms of Disease
Principal Investigator: Melanie Simpson, Ph.D.
Amount of Funding: $150,000
Description of Goals and Accomplishments: Funding was provided to pilot a new interdisciplinary graduate training program in the field. Funding enabled support for curriculum development, student professionalization and research experiences, and involved a cohort of graduate students and two dozen faculty members with expertise in the areas of biomolecular signaling, metabolic integrity, oxidative stress, and microbiology/virology. The long-term goal is to secure NIH funding for this graduate training program.

Research Program Development

Project Title: Meso-Scale Science and Engineering Laboratory
Principal Investigator: Ravi Saraf, Ph.D.
Amount of Funding: $22,500
Description of Goals and Accomplishments: Funding for this ongoing and highly successful STEM training project in the nanoscience area supported research by PhD students associated with four different projects focusing on the areas of ultrathin films, nanoparticle necklaces, microarray analysis and surface probe microscopy. It is expected that the preliminary data collected will improve the odds of successful external funding. Output from this project already has appeared in *Science* and other prominent scientific publications.

Project Title: Research Program on Cognitive Ability, Spatial and Episodic Memory
Principal Investigator: Alan Kamil, Ph.D./Alan Bond, Ph.D./Jeff Stevens, Ph.D.
Amount of Funding: $17,569
Description of Goals and Accomplishments: Funding was provided for this team in the School of Biological Sciences to continue ongoing research regarding cognitive processes and decision-making and provide data that will strengthen proposals for external funding.

Project Title: Research Program in Nutrigenomics
Principal Investigator: Janos Zempleni, Ph.D.
Amount of Funding: $170,000
Description of Goals and Accomplishments: In coordination with the Agricultural Research Division, the College of Education and Human Sciences, and the PI's department, funding was provided to support a technician and critical supplies for ongoing research in nutrition sciences. This investment is anticipated to improve the odds of successful external funding.

Project Title: Research Program in Biomaterials and Cartilage Tissue Engineering
Principal Investigator: Anu Subramanian, Ph.D.
Amount of Funding: $23,500
Description of Goals and Accomplishments: Funding for this ongoing and successful project in biomaterials and tissue engineering was provided in anticipation of a successfully revised grant application and planned proposal submissions. Findings from this work will have implications for biochemical, mechanical and histological evaluation. Funding was allocated to support new experimental data collection involving graduate students and a post-doc involved in a project on mesenchymal cell expansion and chondrocyte-specific conversion. It is expected that data collected via this project will improve the odds of successful external funding.

Infrastructure Development

Project Title: Center for Brain, Biology and Behavior (CB3)
Principal Investigator: Dennis Molfese, Ph.D.
Amount of Funding: $840,512
Description of Goals and Accomplishments: Funds were provided to support the acquisition of equipment and hiring of key personnel during the opening year of the CB3. Additional funding has been provided by the Athletics Department, private sources and other university funds. Each year more than 1.5 million Americans suffer head injuries. Many of these head injuries are related to athletics, but the majority of these injuries are experienced during car accidents or on the battlefield. Faculty affiliated with the CB3 will conduct cutting-edge biomedical and behavioral research that will lead to development of innovations that enhance the prevention, detection and treatment of severe head injuries and ultimately benefit society. External funding for this research is being pursued from the National Institutes of Health, the Department of Defense and other agencies.

Project Title: Acquisition of IVC Cages for Manter Hall
Principal Investigator: Kelly Heath, D.V.M.
Amount of Funding: $146,000
Description of Goals and Accomplishments: Equipment was purchased to improve research using state-of-the-art equipment regarding rodent research. Purchasing the equipment is considered critical to UNL's pursuit of AAALAC accreditation.

Project Title: Acquisition of Equipment for the Life Sciences
Principal Investigator: Kelly Heath, D.V.M.
Amount of Funding: $40,000
Description of Goals and Accomplishments: Critical equipment was purchased for UNL's state-of-the-art life sciences research facility. Purchasing the equipment is considered critical to UNL's pursuit of AAALAC accreditation.

Project Title: Acquisition of Equipment for Hamilton Hall
Principal Investigator: James Takacs, Ph.D.
Amount of Funding: $681,080
Description of Goals and Accomplishments: Funding was provided to purchase highly sensitive (700MHz) Nuclear Magnetic Resonance (NMR) equipment required for research in metabolomics and proteomics and a NMR console to support ongoing research in organic (molecular) and inorganic systems. Additional funding was provided by the College of Arts and Sciences as well as the PI's department.

MINORITY HEALTH RESEARCH GRANTS

Introduction: Minority health research grants support research focusing on the health needs of racial and ethnic minorities, particularly in the areas of biomarkers and stress in mothers and adolescent children. UNL is supporting a campus-wide initiative that focuses on advancing science, policy, data integration, practice, and training related to research on minority health disparity issues in Nebraska and the nation.

Project Title: Minority Health Disparities Initiative
Principal Investigator: Rick Bevins, Ph.D.
Amount of Funding: $106,404
Description of Goals and Accomplishments: This initiative seeks to break down traditional academic silos and develop an interdisciplinary and translational approach that includes science, policy, practice, and training. In its first year, the primary objective was to identify the network of investigators and practitioners conducting research on critical minority health issues in Nebraska and the nation and strengthen the research infrastructure in key areas. Two key hiring opportunities have been identified (see below), and two well-attended faculty retreats were organized that featured outside speakers from the CDC and other funding agencies. These efforts already have yielded a set of new collaborations (see below) involving researchers from several Nebraska institutions with an interest in minority health issues. The long-term goal is to develop a trans-disciplinary, large-scale center to conduct research on minority health disparities, broadly defined.

Project Title: Minority Health Disparities Initiative
Principal Investigator: Kirk Dombrowski, Ph.D.
Amount of Funding: $108,763
Description of Goals and Accomplishments: Dr. Dombrowski was recruited to UNL with the specific charge to lead the Minority Health Disparities Initiative (MHDI) into its next phase. He is developing several large grant proposals that will capitalize on existing expertise regarding complex ("big") data collection, integration, and analysis that centers on identifying the causes and consequences of existing minority health disparities, and developing interventions designed to mitigate them.

Project Title: Enhancing UNL Capacity for Telehealth with Minority Populations in Nebraska
Principal Investigator: Debra Hope, Ph.D., and Timothy Nelson, Ph.D.
Amount of Funding: $9,299
Description of Goals and Accomplishments: Funding for this project supports a new MHDI-related project designed to create health care access for minority and rural populations through high quality videoconferencing equipment. Funding supports both data collection and the creation of a pilot telehealth site. Emerging, complementary research projects on topics including health promotion, over-provision of mental health services and training for health professionals will capitalize on existing faculty expertise at UNL. The goal is to establish new collaborative networks among researchers and tie them to federal funding opportunities to position UNL as a national leader in this growing field, both in research and outreach to minority populations.

BOYS TOWN NATIONAL RESEARCH HOSPITAL

Nebraska Tobacco Settlement Biomedical Research Development Fund (NTSBRDF)

Year 12: July 1, 2012 – June 30, 2013

Progress Report

EXECUTIVE SUMMARY

During the twelfth year of the NTSBRDF program, the Boys Town National Research Hospital (BTNRH) continued to pursue strategic objectives established during the first year to improve the health of Nebraskans through biomedical research, increase NIH funding and enhance collaboration among Nebraska's major biomedical research institutions.

During Year 12, we continued support of new researchers recruited in earlier years. Because it has been difficult for our new researchers to obtain R01 funding, we submitted a COBRE application to create a Center for Perception and Communication in Children. It was reviewed at the end of Year 12 and received a priority score in the exceptional range. Funding is expected to start in Year 13.

Dr. Sophie Ambrose received R03 funding in Year 12. Dr. Ryan McCreery, a clinical audiologist who recently received a Ph.D. from UNL, was promoted to Director of the Center for Audiology and Vestibular Services and submitted an R01 in Year 12 that was funded in Year 13.

In the area of Minority Health, we continued to support a program on perception of speech in difficult listening environments in Spanish-English bilinguals and a program to monitor the effects of lead exposure on hearing in North Omaha children.

During Year 12, BTNRH faculty continued teaching courses in the audiology program at UNL and provided stipend and tuition support for UNL graduate students. We worked closely with UNMC and Creighton on submission of two COBRE applications, one for the third cycle of *The Molecular Biology of Neurosensory Systems* and one for a new *NEBRASKA Clinical and Translational Research Center.*

STRATEGIC FACULTY RECRUITMENT AND RETENTION

Introduction: In 2012-2013, BTNRH invested $863,820 (71%) of its NTSBRDF funds in this category. Most entries in this category represent multiple-year start-up packages for new investigators. As they obtain external support and become fully independent, they drop off the list making way for new people. We also support established laboratories to allow them to maintain active research programs despite short-term lapses in funding. The Current Funding Total reflects the current cycle of all grants where the individual was designated as PI.

Investigator: Sophie Ambrose, Ph.D.
Position Title & Department: Research Associate, Lied Learning and Technology Center
Expertise: Relation between gesture and language development in children with hearing loss.
External Funding:
Current Funding Total: $438,000
Funding Sources: NIH/NIDCD

Investigator: Dawna Lewis, Ph.D.
Position Title & Department: Director, Listening and Learning Laboratory, Center for Hearing Research
Expertise: Pediatric audiology, assessment of children with mild/moderate hearing loss.
External Funding:
Pending

Investigator: Kayla Pope, J.D., M.D.
Position Title & Department: Director, Neurobehavioral Research
Expertise: Pediatric psychiatry, fMRI imaging of children with behavioral disorders.
External Funding:
Pending

Investigator: Monita Chatterjee, Ph.D.
Position Title & Department: Director, Auditory Prostheses and Perception Laboratory, Lied Learning and Technology Center
Expertise: Use of behavioral methods to compare the perception of subjects with cochlear implants to the perception of subjects with normal acoustic hearing.
External Funding:
Current Funding Total: $447,216
Funding Sources: NIH/NIDCD

Investigator: Kristen Janky, Au.D., Ph.D.
Position Title & Department: Coordinator, Vestibular Services, Center for Audiology and Vestibular Services
Expertise: Physiological and behavioral assessment of vestibular function.
External Funding:
Pending

Investigator: Barbara Morley, Ph.D.
Position Title & Department: Director, Auditory Neurochemistry Laboratory, Center for Hearing Research
Expertise: Use of molecular methods to study the development of neurotransmitters in the auditory brainstem nuclei.
External Funding:
Current Funding Total: $140,262
Funding Sources: EPSCoR, NIH Subcontract

Investigator: Nicholas Smith, Ph.D.
Position Title & Department: Director, Perceptual Development Laboratory, Lied Learning and Technology Center
Expertise: Use of behavioral methods including eye tracking to study the perceptual development of infants; acoustic measures of speech communication patterns between care givers and infants.
External Funding:
Current Funding Total: $435,080
Funding Sources: NIH/NIDCD

Investigator: Richard Tempero, M.D., Ph.D.
Position Title & Department: Director, Lymphatic Biology Laboratory, Usher Syndrome Center
Expertise: Roles of lymphangiogenesis in inflammation and cancer; regulation of cellular cues that promote or inhibit formation of new lymphatic vessels.
External Funding:
Current Funding Total: $1,840,790
Funding Sources: NIH/NEI/NCRR

Investigator: Edward Walsh, Ph.D.
Position Title & Department: Director, Developmental Auditory Physiology Laboratory, Center for Hearing Research
Expertise: Physiological measurement of peripheral and central auditory function.
External Funding:
Current Funding Total: $201,555
Funding Sources: EPSCoR/NCRR

Investigator: Marisa Zallocchi, Ph.D.
Position Title & Department: Director, Functional Genetics Laboratory, Usher Syndrome Center
Expertise: Biochemical mechanisms of Usher pathobiology in photoreceptors and cochlear hair-cells; use of zebrafish model to study gene expression and function.
External Funding:
Current Funding Total: $362,562
Funding Sources: NIH/NCRR

RESEARCH PROGRAM AND INFRASTRUCTURE DEVELOPMENT

Introduction: Entries in this category support general program development and investments in essential research infrastructure.

Project Title: Animal Care Facility Core
Principal Investigator: JoAnn McGee, Ph.D.
Amount of Funding: $16,000
Description of Goals and Accomplishments: Core support is necessary to maintain adequate staffing levels and uniform *per deim* charges in the Animal Care Facility in spite of fluctuating levels in the use of the facility.

Project Title: Electron Microscopy Core
Principal Investigator: Walt Jesteadt, Ph.D.
Amount of Funding: $3,024
Description of Goals and Accomplishments: BTNRH relies on electron microscopy core services provided by UNMC, but rates are significantly higher for non-UNMC users than for those at UNMC. This fund covers the difference in costs, giving BTNRH users the equivalent of in-house UNMC rates. This is far less expensive than developing our own core facilities and will be expanded to cover other core services.

Project Title: Usher Syndrome Center Core Support
Principal Investigator: Dominic Cosgrove, Ph.D.
Amount of Funding: $107,819
Description of Goals and Accomplishments: Funds were allocated for supplemental support of programs and core functions in the Center for the Study and Treatment of Usher Syndrome, including the Vestibular Neurogenetics, Cell Signaling and Gene Marker Laboratories and the Genotyping Core.

Project Title: Core Center for Communication Disorders Supplement
Principal Investigator: Michael Gorga, Ph.D.
Amount of Funding: $107,341
Description of Goals and Accomplishments: Funds were allocated to supplement a P30 Core Center funded by NIDCD so that core center functions could be extended to those without current NIH funding. The Core Center provides limited support for researchers at Creighton, UNL and UNMC as well as at BTNRH.

Project Title: New Projects Fund
Principal Investigator: Michael Gorga, Ph.D.
Amount of Funding: $5,000
Description of Goals and Accomplishments: A central fund was continued in Year 12 to provide startup funds for pilot projects proposed by current members of the BTNRH research and clinical staff. This money was used to provide honoraria for research subjects and to cover minimal supply costs.

Project Title: Recruitment Fund
Principal Investigator: Walt Jesteadt, Ph.D.
Amount of Funding: $5,000
Description of Goals and Accomplishments: A recruitment fund allows us to separate the costs of advertising, moving and interviewing candidates from the costs of individual recruitment packages. The initial costs of recruitment occur well in advance of the start date for a position. Moving costs vary and are generally handled separately from start-up funds.

Project Title: Postdoctoral Training
Principal Investigator: Walt Jesteadt, Ph.D.
Amount of Funding: $20,400
Description of Goals and Accomplishments: The longest running NIH grant at BTNRH provides support for a postdoctoral training program. The postdoctoral fellows contribute in many ways to the success of the research program as a whole. The grant does not support the cost of recruiting postdoctoral fellows and provides minimal support for travel to national meetings. It is sometimes necessary to supplement stipends to make competitive offers. We have therefore created a fund to support those costs.

MINORITY HEALTH RESEARCH GRANTS

Introduction. In Year 12 we have continued two projects reported in previous years. The first is key to all of our efforts to expand research in areas related to minority health. The second is a study of the problems associated with learning a second language. We added a pilot project on the effects of lead exposure on hearing in North Omaha children.

Project Title: Minority Recruitment
Investigator: Michael Gorga, Ph.D.
Amount of Funding: $17,000
Description of Goals and Accomplishments: The Minority Recruitment project has continued to be successful in greatly increasing the representation of minority subjects in our NIH-funded research studies. The funds have been used to provide support for translation of consent forms and other documents, interpreters to aid in the consent process, and consultants in the minority communities. The value of this effort was increased by the presence of an NIH-funded Human Subjects Research Core at BTNRH that facilitates recruitment of subjects for all NIH-funded clinical studies. By attaching the

Minority Recruitment effort to the existing core function, we have been able to spread the benefit of a proactive minority recruitment program across many laboratories. Typical minority participation in our research studies is well above the representation of minorities in our community.

Project Title: Spanish-English Bilinguals
Investigator: Kanae Nishi, Ph.D.
Amount of Funding: $58,863
Description of Goals and Accomplishments: The previous phase of the project found that Spanish learners of English (L2) relied heavily on contextual information to process speech presented in noise and that their reliance on context varied widely among individuals even for listeners with similar English proficiency. We have expanded the project to include children as well as adults and to focus on hearing-aid issues. Processing of acoustic cues requires preservation of those cues in the hearing-aid output. This is particularly important for children learning the second language. This project was included in the pending COBRE application and received outstanding reviews.

Project Title: Effects of Lead Exposure
Investigator: Ryan McCreery, Ph.D.
Amount of Funding: $10,000
Description of Goals and Accomplishments: This is a pilot project to conduct hearing and vestibular screening of North Omaha children for effects of lead exposure.