

2010 Annual Report

Arkansas Children's Hospital
Research Institute

Arkansas State University

University of Arkansas
Division of Agriculture

University of Arkansas
Fayetteville

University of Arkansas
for Medical Sciences

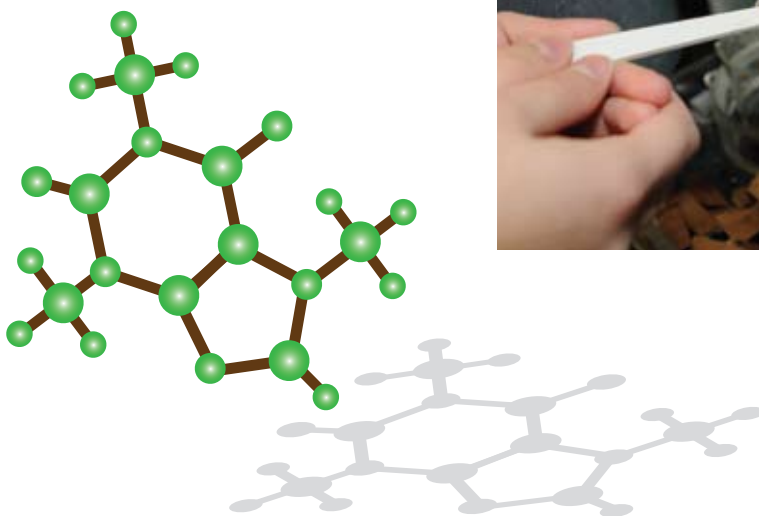


Arkansas Biosciences Institute, the agricultural and biomedical research program of the Arkansas Tobacco Settlement Proceeds Act of 2000, is a partnership of scientists from:

- Arkansas Children's Hospital Research Institute
- Arkansas State University
- University of Arkansas – Division of Agriculture
- University of Arkansas, Fayetteville
- University of Arkansas for Medical Sciences

As outlined in the Act, the purpose of the Arkansas Biosciences Institute is to conduct:

- Agricultural research with medical implications;
- Bioengineering research that expands genetic knowledge and creates new potential applications in the agricultural-medical fields;
- Tobacco-related research that identifies and applies behavioral, diagnostic, and therapeutic knowledge to address the high level of tobacco-related illnesses in Arkansas;
- Nutritional and other research that is aimed at preventing and treating cancer, congenital and hereditary conditions, or other related conditions; and
- Other areas of developing research that are related or complementary to primary ABI-supported programs.



LETTER FROM THE DIRECTOR, Dr. Robert E. McGehee, Jr.

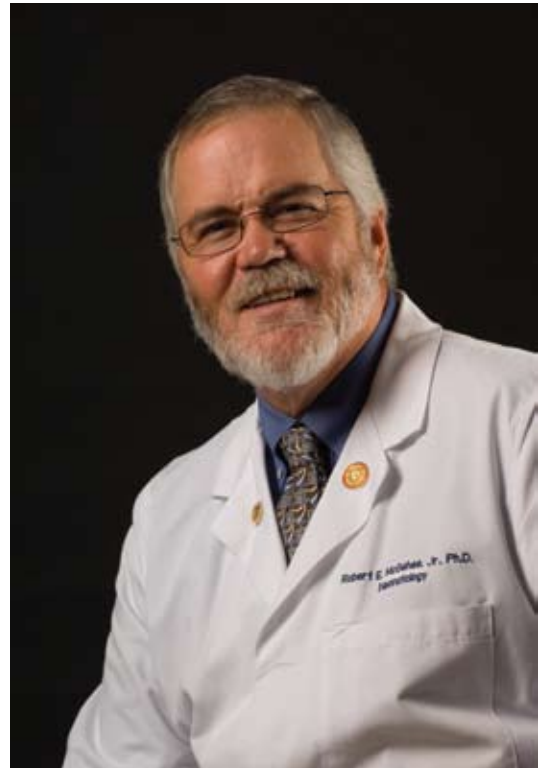
Conducting big science in today's environment is a daunting task. It is expensive, it is competitive, it requires some of the brightest minds on the planet and, to borrow biochemical terminology, it requires a high degree of cooperativity at every level. Cooperativity is a term used to describe how a change in one protein within a complex is transmitted to other proteins in the complex to affect a biological function. Only when each component has changed does the full effect take place. The Tobacco Settlement Proceeds Act of 2000 and the Arkansas Biosciences Institute represent a remarkable example of cooperativity, with components of the complex being the governor, the legislature, the citizens of Arkansas, the commission, the board of directors, the member institutions, the investigators, and the research personnel in each laboratory or program. Combined, all these components have come together to make a significant impact on agricultural and biomedical research in the state of Arkansas, and in so doing have worked not only in improving the health of Arkansans, but also in recruiting many outstanding scientists and in developing a new biotechnology industry in the state. Since its inception in 2001-2002, ABI resources have helped bring in over 300 million new dollars of extramurally funded research into the state. These successes are due to an amazing level of cooperativity by everyone involved and, as such, we should all be proud of and equally share in these accomplishments.

Thank you for taking the time to review our Arkansas Biosciences Institute 2010 Annual Report that summarizes many of the accomplishments that have helped make this another excellent year. This year, ABI-supported scientists received \$49.9 million in related extramural funding from federal agencies and foundations such as the National Institutes of Health, the National Science Foundation, the US Department of Agriculture, and the American Cancer Society, representing a return of \$3.71 in outside funding to Arkansas for every ABI dollar in FY2010. Also, in this year's report you have the opportunity to learn about ten of our ABI scientists along with the students, postdoctoral fellows and research technologists who comprise their teams and some of the work they are currently pursuing.

With your continued support and cooperativity, we can continue to expand the state's research capabilities and make Arkansas a destination for conducting agricultural and biomedical science. On behalf of the ABI scientists and the member institutions, I want to thank you for your continued support and encouragement.



Robert E. McGehee, Jr., Ph.D.
Director, Arkansas Biosciences Institute



The Arkansas Biosciences Institute supports agricultural and biomedical research at its five member institutions and emphasizes collaborative research that brings together investigators from other disciplines and institutions. ABI support is leveraged to attract additional related extramural funding to Arkansas, thereby increasing the state's agricultural and biomedical research base.

ARKANSAS BIOSCIENCES INSTITUTE-SUPPORTED INVESTIGATORS AND EXTRAMURAL FUNDING

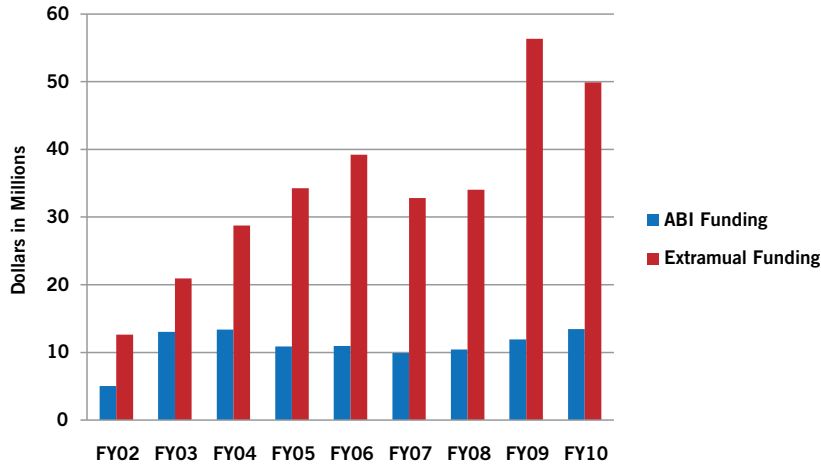


Figure 1: ABI and Related Extramural Funding for Arkansas

Scientists supported by the Arkansas Biosciences Institute utilize funding to conduct research experiments, purchase laboratory equipment, and/or to support personnel such as laboratory technicians, generally with an overall goal to generate preliminary data that will strengthen extramural grant applications. It is expected that ABI funding will be leveraged to attract extramural grant support.

In FY2010, related extramural funding totaled \$49.9 million, bringing ABI's total related extramural funding since inception to more than \$308 million. The extramural leverage factor for FY2010 was \$3.71 for every ABI dollar. Figure 1 below shows the trend in ABI and related extramural funding since FY2002.

Arkansas Biosciences Institute investigators leverage their support through a variety of federal agencies and foundations such as the National Institutes of Health, the Centers for Disease Control and Prevention, the US Department of Agriculture, and the National Science Foundation. Figure 2 shows related extramural funding by source for FY2010.

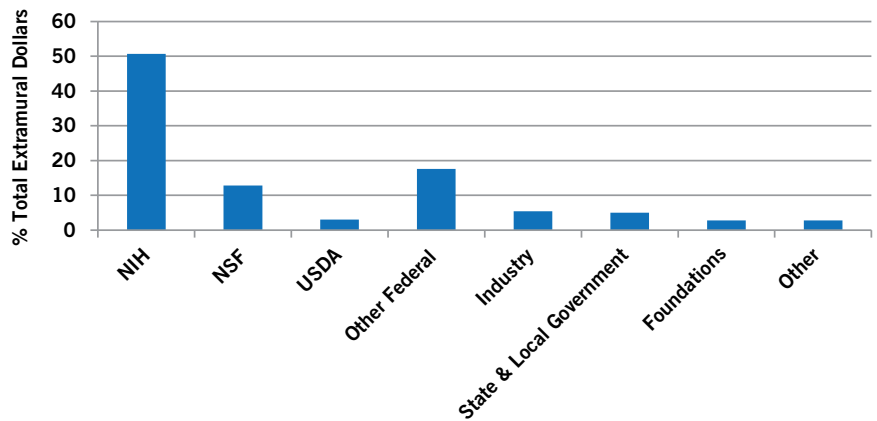
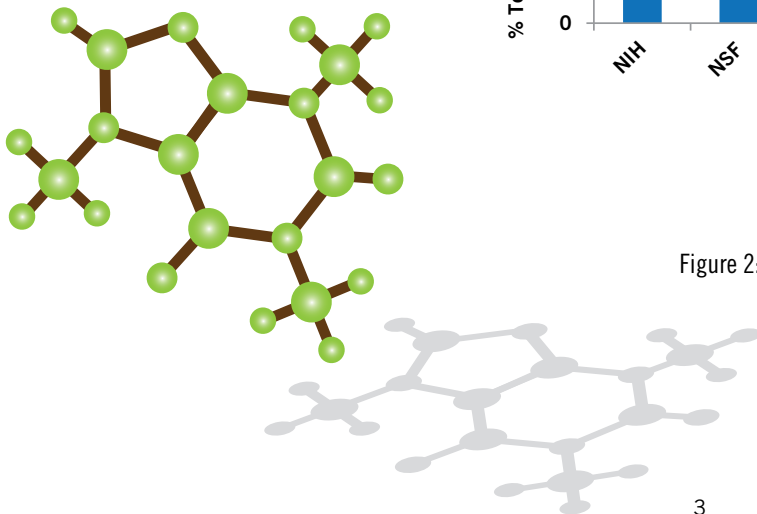


Figure 2: ABI Related Extramural Funding by Source, FY2010



ABI RESEARCH PUBLICATIONS

In addition to extramural funding, another measure of successful research programs is publications. It is critical for investigators and research programs to publish and disseminate their results in scientific journals, where their work is reviewed and assessed by anonymous peers with noted expertise in the areas of submission. Listed individually in the appendix, for FY2010 ABI investigators published over 400 manuscripts and book chapters in national and international journals. Since FY03, ABI investigators have published over 2,300 original manuscripts, books, and book chapters (Figure 3).

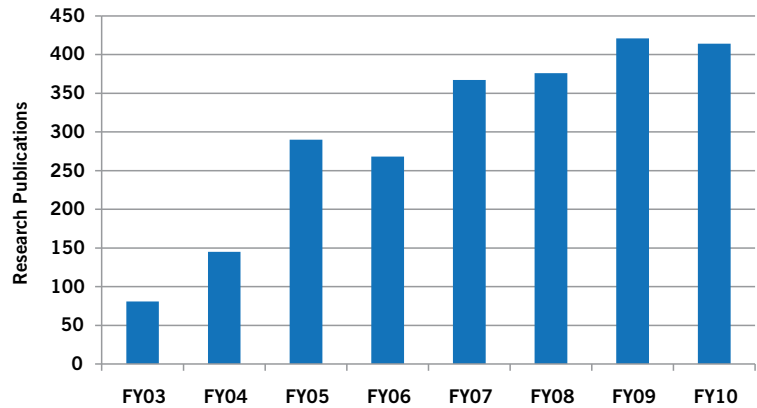


Figure 3: ABI-Supported Research Publications

ARKANSAS BIOSCIENCES INSTITUTE AND ECONOMIC DEVELOPMENT FOR ARKANSAS: RECRUITMENT AND JOBS

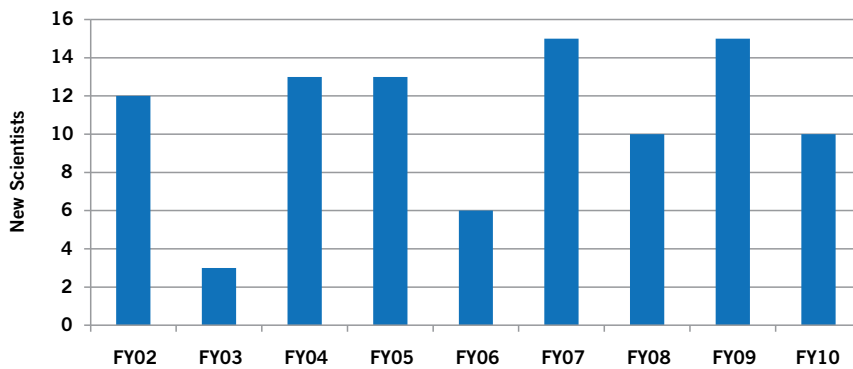


Figure 4: Research Scientists Recruited to Arkansas

Because of concerted efforts by state and community leaders and our citizens, Arkansas is rapidly becoming a destination state in being able to recruit and retain highly skilled research scientists. Arkansas Biosciences Institute member institutions utilize funding to help recruit experienced research investigators to Arkansas, and since 2001-2002 more than 95 scientists have made their home in Arkansas, thanks to support from ABI (Figure 4). These scientists add to Arkansas's growing research infrastructure, bringing highly specialized skills in biomedical and agricultural research.

Arkansas Biosciences Institute funding and related extramural funding provide high-tech, knowledge based jobs for Arkansans. Full-time employment for research support personnel, such as laboratory or animal care technicians, is supported by ABI-related extramural funding from outside agencies and foundations. For FY2010, ABI-related extramural funding provided 271 full-time (equivalent) jobs (Figure 5).

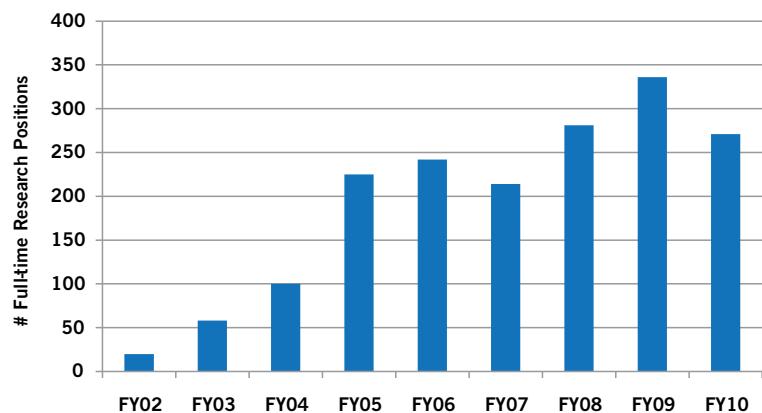


Figure 5: Employment Supported by ABI-related Extramural Funding

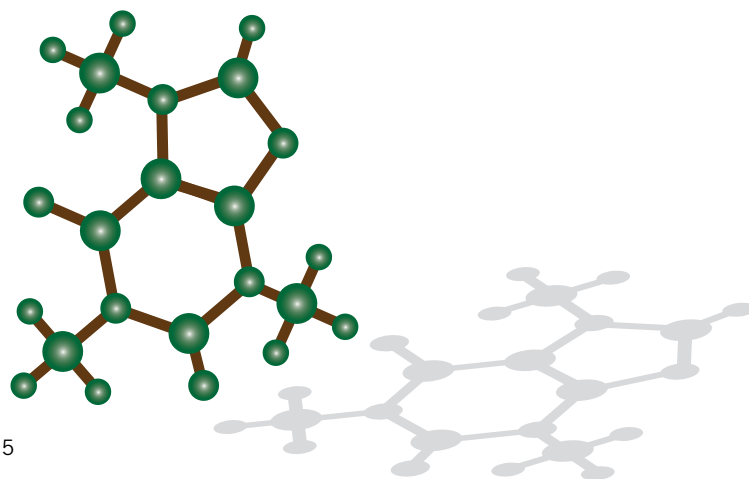
Below is brief summary on ten of our ABI-supported investigators from across all five member institutions. They range from newly recruited junior faculty to well established investigators who have taken ABI resources and leveraged them successfully into extramural funding. The extramural support generated by ABI investigators is peer reviewed by the best-in-the-field experts across the country. These extramural dollars are budgeted annually by the particular agency, and are going to be awarded to some investigator, in some state. Because of ABI-support, we have been able to attract many of these dollars to Arkansas, many of which without ABI support would have gone to other states. This remarkable level of cooperativity referred to earlier is helping make ABI a tremendous investment. Here is just a sampling of some of the investigators responsible for this success. (Award amounts listed below represent annual costs on four to five year grants.)

PLANT BASED PRODUCTION OF ENZYMES FOR BIOFUELS

Everyone is familiar with ethanol as an alternative fuel that is derived predominantly from starch found in grain corn, a component representing only a small fraction of the total plant. Less familiar is cellulosic ethanol, ethanol produced from cellulose, the major component of all plant cell walls, that when appropriately harnessed allow virtually the entire plant to be used for ethanol production. While the technology to produce cellulosic ethanol has been around for some time, it is entirely too expensive to produce as an alternative fuel because the enzymes used to break down cellulose are very expensive and needed in large quantity. Dr. Elizabeth Hood and her team of collaborators, postdoctoral fellows, and students at Arkansas State University are taking this challenge head on by developing transgenic corn plants that will serve as biofactories to produce large amounts of these enzymes within their seeds and at very low cost. The next time you eat a fruit or vegetable, just imagine how much of the plant used to produce it was not used. Through Dr. Hood's work, farmers in Arkansas and worldwide may one day have the opportunity to use these waste materials, such as stalks, leaves, and branches, in the production of ethanol while simultaneously reducing our dependency on fossil-based fuels. Dr. Hood received her initial extramural funding from the Wal-Mart Foundation in 2008 and has ongoing funding support from the US Department of Energy.



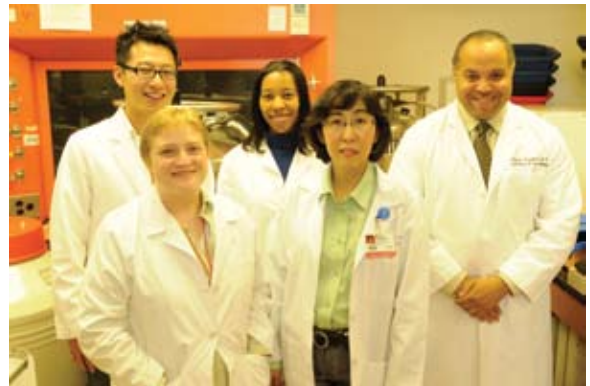
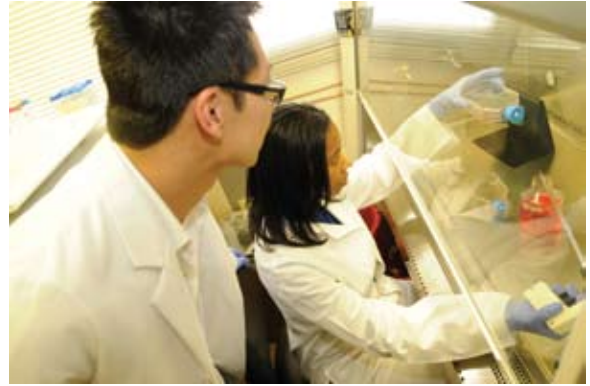
- Ethanol from Agriculture for Arkansas and America
- US Department of Energy; \$500,000



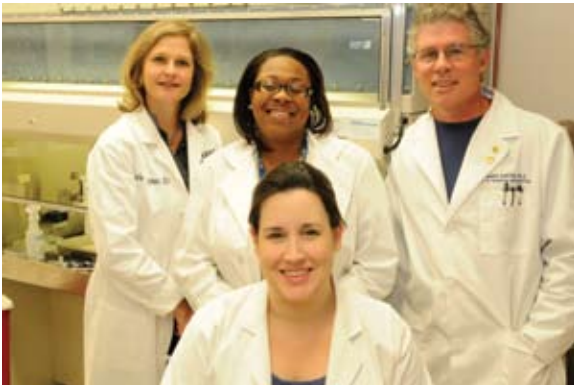
CANCER VACCINE FOR WOMEN

Cervical cancer is the second most common cancer among women worldwide, and often develops from exposure to human papillomavirus (HPV). Scientists at the University of Arkansas for Medical Sciences, led by Dr. Mayumi Nakagawa, are developing a new therapeutic vaccine to fight HPV-induced cervical cancer. While there is a vaccine for women who have not been exposed to HPV, there is not a vaccine for those already infected and who may already have precancerous lesions. Dr. Nakagawa, along with her collaborator Dr. William Greenfield, and their team of technical associates and graduate students have recently received funding from the National Institutes of Health to initiate Phase I clinical trials of the therapeutic vaccine, enrolling women with high-grade precancerous lesions for this critical first step toward FDA approval and commercial development.

- Understanding and Enhancing T-cell Responses to High Risk Human Papillomaviruses
- National Institutes of Health; \$774,808



FOOD ALLERGY RESEARCH IN CHILDREN



Food allergies are potentially life-threatening, affecting approximately 4 percent of Americans, and can be especially scary for parents with food-allergic infants and children. Here in Arkansas, we have one of the nation's top allergy physician scientists, Dr. Stacie M. Jones a Professor of Pediatrics who conducts her research at the Arkansas Children's Hospital Research Institute. As both a practicing pediatric allergy physician and food allergy scientist, Dr. Jones is able to stay poised on the cutting edge of translational science in moving novel effective treatment strategies into patient care. Dr. Jones and her team are also part of the NIH-funded Consortium of Food Allergy Research, a five-member consortium dedicated to research and develop new treatments for food allergic children and adults.

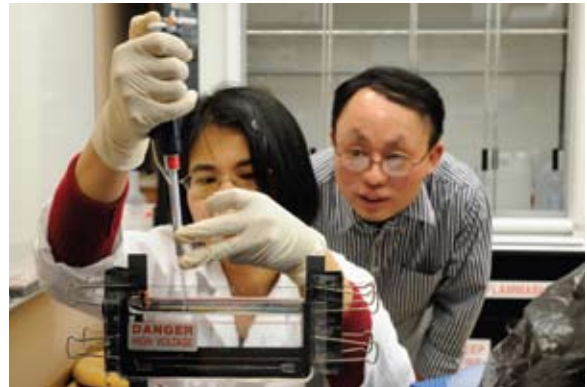
- Immunology of Peanut Allergy and Its Treatment
- National Institutes of Health; \$410,927



CANCER RESEARCH AT THE UNIVERSITY OF ARKANSAS

Dr. Yuchun Du, with the University of Arkansas's Department of Biological Sciences, studies very specific proteins that are associated with the development of human cancer and neurodegenerative diseases, including Alzheimer's and Parkinson's disease. One of these proteins, designated Bax, undergoes a structural change that triggers a new dysfunctional role associated with cell death. Understanding the mechanisms associated with these changes in Bax will provide valuable information for designing new strategies in therapeutic interventions to treat these diseases. In a different but related project, Dr. Du's team of investigators is also working on the question of why pancreatic cancer is so resistant to therapies that are effective on other types of cancers. Both of Dr. Du's cancer research projects receive support from the National Institutes of Health.

- Proteomic and Biochemical Studies of Bax Regulatory Proteins in Apoptosis
- National Institutes of Health; \$189,054



THE FIGHT AGAINST CHILDHOOD OBESITY

Dr. Rudy Nayga, University of Arkansas professor and holder of the Tyson Endowed Chair in Food Policy Economics, is providing valuable research on the causes of childhood obesity, a major public health issue in the US. Poor dietary outcomes are linked not just to health but to poor academic performance as well. Dr. Nayga's research on children's dietary behavior looks at variables such as the amount of television viewing time, parental time spent with children, fast-food restaurant consumption, and even schools' proximity to fast-food restaurants. Early studies have indicated some interesting results such as the amount of time a father spends with a child positively impacts the child's size, weight, and BMI. Dr. Nayga's work has also demonstrated that a school's proximity to a fast-food restaurant positively correlates with obesity rates. Dr. Nayga is currently establishing research collaborations with nutrition scientists at Arkansas Children's Hospital Research Institute.

- Nutrition, Health, and Changing Consumer Preferences
- Research Council of Norway; \$735,000



ANTI-CANCER EFFECTS OF ARKANSAS GROWN RICE

Not just anyone can look at rice bran, a rice milling by-product, and see a cancer fighting peptide, but that is exactly what University Professor Dr. Navam Hettiarachchy sees. Dr. Hettiarachchy, in the University of Arkansas's Department of Food Sciences, is well known for finding the benefits in plant co- or by-products. Her research includes developing an edible film from soybeans to protect fresh foods from bacteria. She and her team are now expanding their focus to begin isolating novel peptides from rice bran, a by-product generated when milling brown rice into white rice. They have already demonstrated that one of these peptides is a potent inhibitor of cancer cell growth in multiple organs, including colon, lung, liver, and breast. These peptides offer a lot of promise as a new therapeutic alternative to expensive, synthetic drugs.

- Novel Technologies to Decontaminate and Extend the Shelf Life of Produce
- US Department of Agriculture; \$178,157



FROM THE LABORATORY TO THE MILITARY



Dr. Roger Buchanan and his research team at Arkansas State University have developed a technology for collecting, concentrating, and detecting volatile compounds - useful in detecting compounds associated with drug manufacturing, yet lifesaving when applied to detecting in-field explosives for the military. ASU's Standoff Hazardous Agent Detection and Evaluation System, known as SHADES, is a priority for the US Department of Defense which is providing funding support of \$5.4 million annually for continued research. SHADES is focused on the design and development of near real-time detection of explosives and other hazardous chemicals. Dr. Buchanan's research focuses on developing an integrated device that is automated and easily operated by a user with little or no technical knowledge of the hardware and software components, making it as user-friendly and portable as possible and allowing it to be almost unlimited in its potential for detecting and identifying explosive materials in US ports, airports, cargo, warehouses, and military checkpoints.

- Standoff Hazardous Agent Detection and Evaluation System
- US Department of Defense; \$5,400,000



MOLECULAR INTERACTIONS CRITICAL FOR THE FUNCTION(S) OF THE ACIDIC FIBROBLAST GROWTH FACTOR

Normal human growth and development is associated with a remarkably complex set of cellular pathways or switches that are turned on and off at very specific times throughout life. One of the ways that cancers develop is by “locking” one or more of these switches in the “on” position, thus allowing tumors to develop. Dr. Suresh Kumar, an Associate Professor of Chemistry of the University of Arkansas, is investigating one of these pathways, the Fibroblast Growth Factor (FGF) signaling pathway. Specifically, he and his collaborators are using ultra high resolution imaging technology, available in the UA Center for Protein Structure and Function, to study the structure of the proteins associated with the FGF pathway. Understanding the structure of these proteins and the functional nature of their interactions will provide invaluable clues for the rational design of therapeutic interventions against a variety of FGF-mediated cancers.

- Structural Characterization of the Fibroblast Growth Factor Signaling Complex
- National Institutes of Health; \$100,000



SMOKING AND THE CENTER FOR ADDICTION RESEARCH

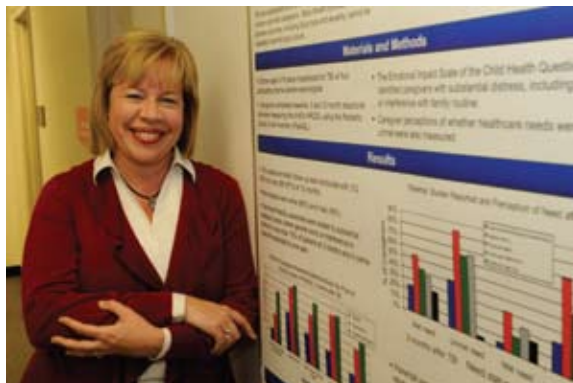


The serious health risks of smoking are well known and well understood by both smokers and non-smokers. Yet, why do 46 million Americans make the decision – several (or many) times a day – to smoke? The Center for Addiction Research (CAR), headed by Dr. Warren Bickel at the University of Arkansas for Medical Sciences, is investigating this decision making process in smokers in order to identify why known health risks are overlooked or why smokers discount future health to engage in activities (smoking) known to be harmful. Early findings are demonstrating many of the decision making processes associated with smoking are consistent with those used for many other drugs of abuse. Understanding these processes will allow the development of targeted behavioral modification approaches to addictive behavior.

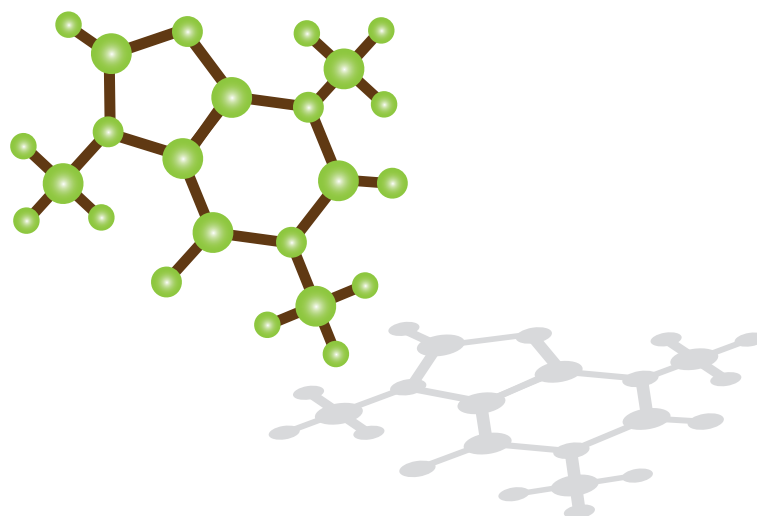
- Soft Commitment as a Mechanism to Prevent Preference Reversals in Smokers
- National Institutes of Health; \$200,000

INJURY PREVENTION RESEARCH IN CHILDREN

As a general pediatrician at Arkansas Children's Hospital, Dr. Mary Aitken has seen more than her share of traumatic brain injury in children. In her role as a physician scientist specializing in injury prevention at the Arkansas Children's Hospital Research Institute, Dr. Aitken is able to help prevent injuries before they happen. A particular focus for her research is in the prevention of motor vehicle and all-terrain vehicle injuries in rural children and teens, with an emphasis on getting the message of safety and injury prevention out to communities throughout our state. Dr. Aitken's research also includes ways to improve teen driving, child passenger safety, and home safety. Dr. Aitken has extensive funding support for her research from agencies such as the Arkansas Department of Transportation, the Centers for Disease Control and Prevention, and the National Highway Traffic Safety Administration.



- Improving Teen Driving Through Parental Responsibility
- National Highway Traffic Safety Administration; \$241,905



APPENDICES

The annual report appendices list all ABI projects, publications, and patents for 2009-2010 in the following pages.

Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
AR CHILDREN'S HOSPITAL RESEARCH INSTITUTE									
1. Effects of Polymorphisms within Folate Metabolism Enzymes on Risk of Limb Reduction Defects; Genes, Micronutrients and Homeobox Related Malformations	C. Hobbs			\$814,852 \$1,032,748 \$856,406 \$40,025	2.06 6.70 4.32	NIH/NICHD CDC NIH/NICHD NSF	4,5	UAMS	SFC Fluidics
2. Screening Disinfection By-products for their Ability to Promote Autoimmunity	K. Gilbert	\$127,582	1.35	\$404,304 \$177,509	0.50 2.00	TCE Settlement NIH	5,1	UAF, UAMS, ASU	
3. Community Intervention and Case Management Strategies Targeted at High-risk Asthmatic Children; Regulating Airway Contractility and Response to Therapeutic Agents Using Viral Vector Delivery; Role of Environmental Allergens and Conditions in Pediatric with Asthma; Role of Dendritic Cells in Immunoregulation in Atopic Disease	S. Jones A. Scurlock T. Perry J. Woods	\$124,697	0.01	\$87,925 \$136,589 \$410,927 \$12,822 \$4,457 \$19,000 \$11,239 \$5,254 \$95,633 \$8,712 \$43,159	0.85 0.62 4.31	NIH NIH/NIAD NIH/NIAD NIH NIH/NIAD Genocea Dyax Dyax Natl Peanut Frdn Duke RWJ	5,3	UAMS	Mount Sinai
4. The Physiology of IGFBP Degrading Proteinases in Bone	J. Fowlkes	\$124,864	1.00	\$121,988	1.26	NIH/NIDDK	5		Duke
5. Program Expansion within the Center for Birth Defects Research and Prevention	J. James	\$123,090	0.90	\$378,798 \$159,007 \$179,242 \$139,801 \$3,901 \$500,036	2.70 1.40 1.60 1.40 1.00	NIH DHHS/MCHB DOD Cure Autism Now NIH Private Frdn.	4,5	UAMS	
6. CARE Health Services Research Core Program	J. Robbins	\$68,737	0.30	\$13,932		U of Maryland	5	UAMS	U of Maryland
7. Mechanisms of Postnatal Development of Carotid Body Oxygen Sensing	J. Carroll			\$131,841 \$378,661 \$76,587	0.87 1.08 0.15	NHLBI NIH Cystic Fibrosis	5	UAMS	Yale
8. Immune Response to Chlamydial Genital and Ocular Infections	R. Rank			\$69,742 \$204,746 \$190,510	0.30 1.10 1.15	NIH NIH NIH	1	UAMS	U of Maryland
9. Molecular mechanisms of Chlamydia-induced type 1 interferon response	U. Nagarajan			\$316,244	2.90	NIH	1	UAMS	
10. Family Support and Educational Reintegration for Children with Special Health Care Needs	M. Aitken			\$125,169 \$200,549 \$20,298	0.94 2.49 0.26	CDC HRSA NIH	5	UAMS	Baylor

11. Biomarkers of Acetaminophen Toxicity	L. James D. Roberts	\$241,905 \$83,206	2.55 1.40	NHTSA ASHTD		
		\$252,590 \$192,105 \$10,920 \$550,441 \$96,069 \$2,965 \$27,685 \$65,382 \$5,020 \$9,506 \$1,881 \$3,637	1.34 1.73 1.30	NIH NIH NIH/NIDDK NIH NIH Bayer Merck ATD Case Western J&J GlaxoSmithK KAI	5	UAMS U of Pittsburgh Case Western ATD Case Western
12. Dynamic and Static Lung Volume in Infants	M. Morris	\$50,000			5	
13. Regulation of Steroid Hormone-Responsive Tissues in Development and Disease	R. Simmen	\$53,019 \$102,451	0.25 1.30	DOD NIH/NICHD	5	UAMS
14. Community Based Projects Concerning the Prevention of Obesity	J. Weber	\$90,000 \$45,014 \$229,660 \$457	3.40 6.00	USDA USDA USDA AR Comm. Fndn	4,5	
15. Metabolic Research	N. Deutz	\$318,827 \$36,281 \$27,065	1.34	NIH Sophia Unilever	4,5	UAMS
16. Validity and Power for Detecting Heterogeneous Effects with Quantitative Traits	T. Nick	\$23,797	0.20	Dept of Ed	5	UAMS TIRR Memorial Hermann
17. Pediatric Hypertension	K. McNiece	\$19,843 \$15,896 \$19,595		Novartis Parexel Takeda	5	
18. Ethanol and Osteoblastogenesis: Roles of IL-1 and TNF	C. Lumpkin	\$131,028	1.95	NIH/NIAAA	4,5	UAMS
19. Genome-wide Association Study of Congenital Heart Defects	M. Cleves	\$125,000	0.39		4,5	UAMS
20. Center for Investigation of Congenital Aberrancies in Vascular Development	G. Richter	\$121,729	0.96		5	UAMS
Totals for ACHRI		\$915,699	4.91			\$10,028,858 65.57

* ABI Research Areas: 1-Agricultural/Medical Research; 2-Bioengineering Research; 3-Tobacco-Related Research; 4-Nutritional Research; 5-Other Related Research

Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
ARKANSAS STATE UNIVERSITY									
1. Outreach Program	M. Dolan	\$5,000					1,2,3,4,5		
2. Plant Transgenics for Vaccines, Adjuvants and Therapeutics	C. Cramer M. Dolan	\$97,876	0.25				1,3		
3. ABI Incubator Planning Project (ABI/Delta Ctr Ptnshp)	A. McVey C. Cramer	\$136,063					5		
4. ABI-Commercial Innovation Center: Tech Business Incubator	A. McVey C. Cramer			\$494,000		SBA	5		
5. MRI-R2: Acquisition of Equipment for Investigating Biodynamic Interactions	C. Cramer R. Buchanan M. Srivatsan S. Yu M. Dolan			\$1,070,851		NSF	5		
6. Arkansas ASSET Initiative (Bioproduction)	C. Cramer			\$146,427 \$90,197	0.70 0.36	NSF EPSCoR ASTA	1,2,4 1,2,4		
7. Bioproduction Access Grid	C. Cramer			\$15,000		ASTA	1,4		
8. P3 Faculty/Student Exchange Program Grant	C. Cramer			\$18,000		ASTA	1,2,4		
9. ASSET Initiative Site Visit	C. Cramer			\$1,400		ASTA	5		
10. Efficient Algorithms for Protein Structure Prediction and Applications in RTB Binding Occupancy Determination	C. Cramer X. Huang			\$56,287	1.32	ASTA	1,2		
11. Bioproduction Start Up	J. Xu			\$50,000		ASTA	1,2,3		
12. Computational and Biological Co-Design-Cracking UGT Structure-Function Relationships	X. Huang			\$121,250	1.75	NIH-INBRE	5		
13. Center for Efficient and Sustainable Use of Resources (CESUR)	M. Dockter			\$1,400,000	3.00	ASTA	5		
14. ASSET Initiative Site Visit	M. Dockter			\$1,000		ASTA	5		
15. Determination of Factors Affecting High-Level Protein Accumulation in Transgenic Maize Seed	E. Hood X. Huang			\$93,000	1.00	ASTA	1		
16. Enabling Crop Deregulation with Software: A Prototype	E. Hood R. Segall			\$30,649	0.34	ASTA	1		UALR

17. Ethanol from Agriculture for AR and US	E. Hood	\$500,000	7.30	DOE	1	Applied Bio-technology Institute, Texas A&M University
18. Intersection of Ascorbate Regulation, Jasmonate-Signaling, and Defenses against Herbivory in Plants	A. Lorence	\$28,368	1.25	ASTA	1,2	
19. Role of Ascorbate (Subward)	A. Lorence	\$7,185	0.13	UAMS	1,2	UAMS
20. Mechanisms Leading to Enhanced Tolerance to Oxidative Stress and Increased Lifespan in Arabidopsis	A. Lorence	\$111,049	1.67	NIH INBRE	1,2	UAMS
21. Advanced Life Support in Space Exploration	A. Lorence	\$7,000	0.25	ASGC (NASA RID Award)	1,2,4	
22. Role of Ascorbate in Mitigating ER and Cellular Stress Associated with Transient and Stable Plant-Based Protein Production	A. Lorence M. Dolan	\$30,683	1.25	ASTA	1,2	UAF
23. Role of Oxylipins in Plant Defenses against Aphids	V. Nair	\$48,974	0.55	ASTA	5	UAF
24. Regulation, Production and Purification of Bioactive Stilbenoids from Hairy Root Cultures of Peanut	F. Medina-Bolivar M. Dolan	\$20,396	0.50	ASTA	1,2,4	UAF
25. Regulation of Specialized ("Secondary") Metabolism in Tomato by Genetic Manipulation of the Phosphoinositide Pathway	F. Medina-Bolivar	\$18,369	0.25	ASTA	1,4	UAF UALR
26. Establishment of Root Culture for "Botanical Insulin" Production	G. Sivakumar F. Medina-Bolivar	\$8,550	0.13	ASTA	1	
27. Enhancing Abiotic Stress Tolerance and Production of Antioxidants in Plants for Advanced Life Support in Space Exploration	F. Medina-Bolivar	\$7,000	0.25	ASGC	1,2,4	UALR
28. Molecular Technology in Food Microbiology	S. Ahn	\$18,878	0.50		5	
29. Cardiovascular Response to Plant-Based Anti-inflammatory Agents	A. Grippo	\$35,105	0.50	ASTA	1,3	UAF
30. Creating STEM Teachers for Arkansas' Future	A. Grippo	\$115,541	0.25	NSF	5	
31. GK12: Environmental Sciences and Molecular Biosciences in the Natural State: Land Use, Land Cover, and Biodiversity in the Mississippi Embayment	A. Grippo	\$450,110	8.36	NSF	1	

* ABI Research Areas: 1-Agricultural/Medical Research; 2-Bioengineering Research; 3-Tobacco-Related Research; 4-Nutritional Research; 5-Other Related Research

APPENDIX 1

ABI-SUPPORTED RESEARCH FOR 2009-2010

Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
32. Assessing the Benefits of Genetically Modified Crops: Using Small Mammal Models	T. Risch			\$5,800 \$9,500		Speloelo Bat Conservation International	5 5		
33. Investigating the Immune Cells	S. Yu	\$55,191	0.50				1,5		
34. INBRE: Regulation of Adhesion Molecule Expression on Vascular Smooth Muscle Cells	S. Yu			\$31,105	0.23	NIH INBRE	1,5		
35. Standoff Hazardous Agent Detection and Evaluation System	R. Buchanan			\$5,400,000	3.00	DOD	5		Radiance Technologies
36. Nanotechnology: No Child Left Behind: Improving Teacher Quality: P-16 Education Partnerships	R. Buchanan			\$80,142		ADHE	5		
37. URM: Cross Disciplinary Research at the Interface of Biotechnology and the Environment	R. Buchanan			\$195,396		NSF	5		
38. Arkansas Alliance for Minority Participation (AR LSAMP)	E. Benjamin			\$79,634 \$9,747	1.13 0.15	NSF ASTA	2 2		UAPB UAPB
39. Synthesis and Testing of Novel Vorinostat Derivatives for Increased Bioavailability to Cancer Cells	E. Benjamin			\$114,392	2.25	NIH INBRE			
40. Sampling of Shorebirds that are Potential Carriers of H5N1 Avian Influenza in Arkansas	J. Bednarz			\$5,000 \$20,000 \$25,000 \$3,800	0.13 0.50 0.50 0.13	USFWS USFWS USFWS AGFC	5 5 5 5		
41. Assessment of Vegetative Regulatory Network Performance at Drainage Scales	J. Farris			\$37,000 \$5,955	0.25	City of Jonesboro USDA	5 5		
42. EPSCoR WINS Center for Wireless, Nano, Bio, Neuro Sensors	M. Srivatsan			\$279,065	3.00	NSF	3	UAF, UAMS	UALR, NCTR
43. Rice Lipoxigenase	G. Phillips	\$35,000	1.50				2	UA-Div of Ag	ARS-Rice Center, Stuttgart, AR
44. Mapping Structural and Functional Changes in Esterase Treated Pectin and Characterizing Enzyme Mode of Action	B. Savary P. Vasu			\$50,209	0.50	USDA-NRI	5		USDA-ARS
45. Coevolution of Plant-Insect Interactions	T. Marsico	\$30,000		\$10,000 \$5,000	0.12 0.08	AR Natural Heritage Comm University of Memphis	1,5		

46. Tracing the History of Oceanic Connections	E. Gilbert	\$3,343				5	
47. Biotech Supplies	R. Johnson	\$10,000					
48. New Faculty Startup	J. Zhou	\$30,692				5	
49. Animal Care Core	ABI Faculty	\$26,779	0.50			1,3,5	
50. Summer Student and Intern Research Support	ABI Faculty	\$62,131	2.94			1,2,3,4,5	
51. Administrative Salaries	ABI	\$565,114	6.30			5	
52. Research and Faculty Salaries	ABI	\$1,223,638	18.00			5	
53. Occupancy and Custodial	ABI	\$467,971	3.00			5	
54. General Supplies, Service Contracts, and Equipment	ABI	\$1,116,134				5	
Totals for Arkansas State University		\$3,883,809	33.49	\$11,343,136	43.08		

UNIVERSITY OF ARKANSAS, DIVISION OF AGRICULTURE

1. Validation of an Animal Model for Human Pulmonary Arterial Hypertension	N. Anthony	\$82,038	0.72	\$12,500		1,4	USDA NIFA UAF
2. Discovery and Characterization of Molecular Mechanisms Underlying Mycotoxigenesis	B. Bluhm	\$65,665	0.30	\$23,934 \$89,972 \$105,500 \$164,012	0.31 0.98 0.50 1.50	1,2,4,5 1 1 1,2,4	ASTA United Soybean Board AR Corn and Sorghum Board NSF UAF Purdue, Texas A&M, Coker College
3. Investigation of Aging Mechanisms and Mitochondrial Biogenesis in Muscle and Liver Cells	W. Bottje	\$99,696	0.34			1,4	UAF
4. Hemicellulose Depolymerization Research	D. Carrier	\$101,024 \$87,090 \$35,000			0.94 0.32	1,2 1,2 1,2	NSF NSF/ASTA DOT UAF ASU
5. Natural Compounds from Blueberries as an Alternative to Antibiotics to Reduce Antibiotic Resistant Tuberculosis in High Risk Populations in Arkansas	P. Crandall	\$190,844 \$25,000 \$26,000	1.00		1.09 0.25	1,2,3,4 1,2 1,2	USDA NIFA CA Dried Plum Board National Cattlemen's Beef Assoc UAMS USDA ARS
6. The Role of Antioxidant Rich Berries in the Prevention of Smoking-induced Bone Loss in Postmenopausal Women	L. Devarreddy	\$44,000 \$122,147	1.12		0.50 0.43	1,3,4 1,3,4	USDA NIFA NSF/ASTA UAF ASU

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Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
7. Development of Novel Strategies to Decrease Sexually Transmitted Diseases: Reduction of Bacterial Pathogens from Semen	D. Donoghue	\$96,665	1.36	\$509,695	1.48	USDA NIFA	1		Univ of Nebraska, USDA ARS, Univ of Connecticut
8. Environmental Triggers of Autoimmune Vitiligo Expression in Susceptible Smyth Line Chickens	G. Erf	\$104,792	0.85	\$108,437 \$2,650 \$44,669	0.50 0.21	NIH Silo Advisory Council Cobb-Vantress	1.4 1.4 1.4	ASU	USDA ARS
9. Rice Bran Phenolics as Potential Antioxidants to Ameliorate Oxidative Stress and Inflammation in Atherosclerosis	N. Hettiarachchy	\$45,000	0.49	\$16,000	0.26	DOE	1,4,5	UAF	
10. Value Added Gastrointestinal Environment Resistant Bioactivepeptides Against Diabetics, Obesity and Alzheimer's Disease from Rice Bran	N. Hettiarachchy	\$92,180	0.88	\$178,157	0.50	USDA NIFA	1,5	UAMS	
11. Improved Stabilization and Anti-obesity Properties of Blueberry and Aronia Anthocyanins by Microencapsulation	L. Howard	\$166,306	2.04	\$51,000		USDA NIFA	1	ACH	
12. Multi-color and Multi-Functional Gold Nano-Agents for Multiplex Cancer Detection and Therapy	J. Kim	\$141,277	1.71				1,2	UAMS	
13. Host-Virus Interactions of Infectious Laryngotracheitis Virus in Chickens	B. Kong	\$68,362	0.53				1,2,4	UAF	
14. Isolation of RNA Aptamers Inhibiting Salmonella Virulence	Y. Kwon	\$70,795	0.75	\$44,912	0.08	USDA NIFA	1,2,4		
15. Anti-Colon Cancer Effect of Soy Saponin Fractions in Soybean	S. Lee	\$92,663	1.20	\$36,000	0.10	USDA NIFA	1,4		
16. Aptamer SPR Biosensor for Rapid Detection of Avian Influenza Virus	Y. Li	\$132,781	1.02	\$75,000	0.74	NSF/STTR	1,2		
17. Identifying Specific Molecular Anti-cancer Compounds Originating from Fermentation of Dairy and Soy milk by Probiotic Bacteria that Target Mechanisms of Cell Growth and Survival	J. Lingbeck	\$50,000	0.39	\$30,000	0.50	USDA NIFA	1,3,4,5	UAMS	
18. Socio-Economic Status, School Lunch Participation and Childhood Obesity	R. Nayga	\$130,081	0.85	\$735,000	7.35	Research Council of Norway	4	UAMS	Norwegian Univ of Life Sciences
19. Isolation of CLA Rich Triacylglyceride Fractions and Fatty Acids from High CLA Soy Oil for Nutrition Studies	A. Proctor A. Proctor	\$103,226	1.36	\$6,500 \$62,500	0.73	Oil-Dri Corp Soybean Promotion Board	1,4 1,4	UAMS	

20. A Novel Gene Suppression System for Agricultural and Medical Applications	V. Srivastava	\$161,450	2.63	\$24,014	0.52	NSF	1,4
21. Anti-Diabetes Efficacy of a Novel Rice Product in Humans	Y. Wang	\$88,125	0.72	\$47,000	0.31	Various Industry	1
22. DNA Resource Ctr/General Support	All PIs	\$97,413	1.00				
Totals for UA, Division of Agriculture		\$2,072,532	21.26	\$2,998,557	20.10		
UNIVERSITY OF ARKANSAS, FAYETTEVILLE							
1. Characterization of A Minimal Ras-GTPase Binding Domain Peptide Derivative a Tuberos Sclerosis-2	P. Adams	\$96,612	1.5	\$140,543 \$108,000	2.0 1.0	NIH NIH	2,3,5
2. Pilot-scale High Throughput Sequencing of the Timber Rattlesnake Genome	S. Beaupre	\$77,990	0.5				5
3. Determination and Circumvention of Biochemical Roadblocks Associated with Production of Biopolymer Conjugates for Cancer Gene Therapy	R. Beitle	\$48,713	0.5	\$32,451	0.5	NSF	2,4,5
4. Developing Quality Control Standards to Evaluate Microarray Results	J. Chimka	\$36,588	0.5				2,4,5
5. Molecular Mechanisms of Bax Activation	Y-C Du			\$213,001 \$427,402 \$72,000 \$118,054	2.5 2.5 1.0 2.0	NIH NIH NIH NIH	2,4,5
6. T- Cell Study in Mice	J. Durdik			\$71,000	1.5	NIH	4, 5
7. Cigarette Smoking and Posttraumatic Stress Disorder	M. Feldner			\$155,894	1.5	Boston VA	1, 3 Boston VA
8. Detection of Neurotransmitters in Mixtures Suitable for In Vivo Analysis	I. Fritsch	\$51,711	0.5				2,5
9. Catalytic Dynamic Resolution of Chiral Reactive Intermediates	B. Gawley	\$56,101	0.5	\$213,000	3.0	NIH	2,4,5
10. Maintenance of FPLC-based Purification Capabilities	R. Henry	\$19,843	0.0	\$160,000	2.5	DOE	2,5
11. Detection of Diabetes Variants using Microchip Electrophoresis	C. Hestekin	\$39,902	0.5				2,4,5

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ABI-SUPPORTED RESEARCH FOR 2009-2010

Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
12. Enzyme-Based Glucose-Air Biofuel Cells for Sensor Applications	J. Hestekin			\$132,000	2.0	College of William & Mary	1, 5		College of William & Mary
13. Hole-Trapping in Quantum Dots: Connection to Fluorescence Blinking and Implications for Biomedical Research	C. Heyes	\$70,000					2,5		
14. A Multitask Computation and Visualization Facility for Protein Structure and Function	J. Hinton	\$74,759					2,5		
15. Role of Suranim on Tumor Metastasis	M. Kavdia			\$316,951	4.0	NIH	1,3	UAMS	
16. Mechanisms of Sympathetic Neurotransmission	H. Kluess			\$55,762	1.0	NIH	4, 5		
17. Bio-Medical Research	R. Koeppel, et al.	\$339,169	3.5	\$656,040 \$52,315	4.5 1.0	NIH NIH	3,5	UAMS	Weill Cornell Medical College
18. High-Performance digital NMR spectrometer	R. Koeppel			\$193,377	2.0	NSF	5		UC-San Diego, Oxford Univ
19. Rational Design of a Novel Peptide Drug Against Pathogenic Fungi	T.K.S. Kumar	\$99,166	1.5	\$42,600 \$427,402 \$291,910	0.5 2.5 0.5	NIH NIH NSF	2,5	UA-Agri, UAMS	Maine Medical
20. Investigation of Anaphylaxis to IgE Specific Galactose-1,3 Galactose in Residents of Arkansas and Surrounding States	J. Lay J. Lay	\$28,400	0.5	\$107,858 \$22,818	1.0 0.5	ASTA NIH	4,5	UA-Agri UAMS	
21. Equipment for large-scale cultivation of anaerobic microorganisms and purification of oxygen-sensitive biomolecules	D. Lessner	\$43,240	0.5				2,4,5		
22. Detecting DNA-binding Sites of Regulation Proteins with a Nanopore Sensor	J. Li			\$86,212	0.5	NIH	1,5		
23. Development of Novel Chitosan-Based Vaccines for the Treatment of Meth Addiction	M. McIntosh	\$98,605	1.0	\$260,000	2.0	NSF	2,4,5	UAMS	
24. Impact of Tobacco Use on the Results of Rotator Cuff Repair	G. Oliver	\$74,620	1.5	\$5,000		Am Coll Sports Med	3		
25. Bio-marks Using Non-cadmium Doped Nanocrystals	X. Peng			\$109,444	1.5	Columbia Univ	1,2,5		Columbia Univ
26. The Role of Histone H2B in Centromere Function and Chromosome Segregation	I. Pinto	\$45,298	0.5	\$144,000	1.5	NSF	2,5		

Project ID	Project Title	Principal Investigator	Start Year	End Year	Funding Agency	Duration (Years)	Total Budget (USD)	Current Budget (USD)	Progress (%)	Impact Score	Notes
27	Improving the Accuracy of Nuclear Magnetic Resonance Based Protein Structure Determination	P. Pulay	2018	2023	NSF	5	\$158,525	\$158,525	100	4.2	NSF Grant: DMR-1801234
28	Emergency Power Generation	D. Rhoads	2019	2024	NSF	5	\$200,000	\$150,000	75	3.8	NSF Grant: EEC-1901567
29	Using FRET to Determine Structural and Kinetic Parameters of Collagen Binding Domains	J. Sakon	2020	2025	UAMS	5	\$58,879	\$58,879	100	3.5	UAMS Grant: 2020-001
30	Mimicking Antibodies: Peptoid-based Affinity Reagents	S. Servoss	2021	2026	NSF	5	\$50,008	\$50,008	100	3.2	NSF Grant: CMMI-2101234
31	Morphology and Phylogeny of Free-Living Relatives of Trichomonad Parasites	J.D. Silberman	2022	2027	NSF	5	\$43,891	\$43,891	100	3.0	NSF Grant: DEB-2201567
32	Analytic-Enabled Integrative Analysis of Microarray Results	J.J. Song	2023	2028	NSF	5	\$63,820	\$0	0	3.5	NSF Grant: IIS-2301234
33	Bio-Medical Research	J. Stenken	2024	2029	NIH	5	\$267,782	\$185,821	70	3.8	NIH Grant: R01NS12345
34	Methods for Characterization of the Oxidation State of Methionine in Proteins	W. Stites	2025	2030	NSF	5	\$69,113	\$69,113	100	3.0	NSF Grant: CHE-2501567
35	Nucleation of Proteins on the Surface of Nano-Functionalized Titanium Oxides for Biomedical Applications	J. Tchakhalian	2026	2031	NSF	5	\$57,560	\$57,560	100	3.2	NSF Grant: DMR-2601234
36	Image and Microarray Analysis for Remediation of Polycyclic Aromatic Hydrocarbon-Contaminated Soils	G. Thoma	2027	2032	Dairy Management	5	\$390,809	\$390,809	100	3.5	Dairy Management Grant: 2027-001
37	Non-(100) Based Nanostructure Superluminescent Diodes for Biomedical Imaging Applications	Z. Wang	2028	2033	NSF	5	\$66,188	\$66,188	100	3.0	NSF Grant: EEC-2801567
38	Studies of the Mechanism of Activation of Ubiquitin Ligase SCF Met3	C. Wilkins	2029	2034	NSF	5	\$45,366	\$45,366	100	3.2	NSF Grant: MCB-2901234
39	Development of ultra-Low Power Smart Biomedical Sensors: an Integrated Software-Hardware Approach	J. Wu	2030	2035	NSF	5	\$52,098	\$52,098	100	3.5	NSF Grant: IIS-3001567
40	Fluorescence Lifetime Microscopy Imaging of Intracellular Blood Glucose	K. Ye	2031	2036	NIH	5	\$308,234	\$38,738	12	3.8	NIH Grant: R01EB01234
41	Selective Inactivation of Virus Using Low-Power Continuous-Wave Lasers	S-Q Yu	2032	2037	NSF	5	\$66,933	\$66,933	100	3.0	NSF Grant: EEC-3201567
42	The Use of Azirines in Iron-catalyzed Formation of Carbon-Nitrogen Bonds	N. Zheng	2033	2038	NSF	5	\$51,131	\$51,131	100	3.2	NSF Grant: CHE-3301234
43	Surface Micro/Nano Texturing for Biomedical Applications	M. Zou	2034	2039	NSF	5	\$54,711	\$54,711	100	3.0	NSF Grant: EEC-3401567
Totals for University of Arkansas, Fayetteville							\$2,025,094	\$1,587,644	78.4	3.5	

Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES									
1. Proteomics and Gene Expression	A. Tackett			\$386,250 \$98,750	2.55	NIH NIH	4,5		Washington University
2. Tobacco and Drug Dependence	C. Stanger	\$59,998	0.55	\$217,500	0.13	NIH			
3. Complement Systems in the Eye	N. Bora			\$56,840 \$73,950	0.40	Baxter Hlthcare NIH	5		
4. Pathophysiology of Thrombosis	J. Ware	\$22,904		\$142,918 \$57,351 \$362,500	0.02 0.50 1.75	Dept. of Army FFANY NIH	3		
5. Center for Neuroscience Research	P. Drew			\$499,999 \$40,000 \$217,500	1.18 1.18 0.23	NIH Nat'l IMS Society NIH	5		
6. Cancer Control and Prevention	P. Emanuel	\$8,411	0.14				4		
7. Tobacco and Drug Dependence	A. Budney			\$32,249 \$547,021 \$390,683	0.10 4.64 3.03	NIH NIH NIH	3		
8. Brain Imaging in Addictions	C. Kilts	\$216,000	4.15	\$35,738 \$316,528	0.07 0.13	NIH NIH	3		
9. Antiviral Immunology	M. Nakagawa			\$7,064 \$233,147 \$774,808	0.02 1.30	NIH ACS NIH	4,5		
10. Small Animal Models in Radiation Therapy	E. Moros			\$45,283 \$496,929 \$61,500	0.45 1.63 0.22	FFANY NIH Office of Naval Research	4		
11. Transonic Nanoprobe System	P. Mayeux	\$19,764		\$302,936	4.16	NIH	5		
12. Strength Model of Self-regulation and Cigarette Smoking	R. Yi			\$290,000	0.46	NIH	3		
13. Membrane Trafficking	B. Storrie			\$1,491,136		NSF	5		
14. Microbiology and Immunology	R. Morrison	\$496,000 \$80,846		\$345,300	2.09	NIH	5		
15. Early Detection of Cisplatin Nephrotoxicity	G. Kaushal			\$252,000		NIH	5		

16. Microbiology and Immunology - Coxiella burnetii Pathogenesis	D. Voth	\$108,000	1.48	NIH	5
17. Total Internal Reflection Fluorescence Microscopy	S. Rhee	\$93,020	1.54		5
18. Microbiology and Immunology - E. coli Cell Division	K. Young	\$50,000		NIH	5
19. Illumina System Core Facility	P. Emanuel	\$106,920	1.00		
20. Enzyme Nanocrystal Conjugates for Single Molecule Studies	K. Raney	\$430,192	2.70	NIH	4,5
21. Role of Zinc in Brain Function	F. Zheng	\$281,160	1.96	NIH	3,5
22. Molecular Epidemiology Core Laboratory	F. Kadlubar	\$244,450	3.30	World Cancer Research Fdn. AR Breast Cancer Res. Program	5
23. Staphylococcal Capsule Virulence and Regulation	C. Lee	\$352,057	3.25	NIH	4,5
24. Brain Mechanisms Governing Attention, Arousal and Awareness	M. Memmemeier	\$166,170	0.87	NIH	3
25. Vesicle Trafficking in Neuroendocrine Cells	G. Baldini	\$338,859	1.35	NIH	5
26. Transgenic Mouse Facility	S. Manolagas	\$75,000	0.75		5
27. Cannabinoids and ALS	P. Prather	\$10,672 \$43,123 \$156,334	0.76 0.83	NIH NIH NIH	5
28. Role of CCAAT Enhancer Binding Protein Delta in Response to Ionizing Radiation	S. Pawar	\$64,853			5
29. Substance Abuse	A. Oliveto	\$300,990	2.28	NIH	3
30. Cesium Irradiator	M. Hauer-Jensen	\$386,000	3.73	Uniformed Services Univ. Subaward	5
31. Support for Scientific Editing	W. Bickel	\$71,250			5
32. DNA Damage in Lung Cells	K. Das	\$181,250	1.16	NIH	5
33. Effect of Psychostimulants on Cardiovascular Neurons	A. Hayar	\$58,748	0.67	NIH	3,5
34. Microbiology and Immunology - E. Coli Cell Division	J. Blevins	\$357,100	0.08	NIH	5

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Project	Principal Investigator(s)	ABI \$ Allocated	ABI FTE Employment	Related Extramural \$	Extramural FTE Employment	Extramural Source	ABI Research Areas*	ABI Partners	Other Partners
35. Effects of Statins on Paraoxonases in Rheumatoid Arthritis	R. Ortman	\$55,575	0.50				5		
36. Role of UDP-glucuronosyltransferases and Protein Kinase C in the Development, Prevention, Treatment of Smoking-related Cancers	A. Radominska			\$261,921	2.01	NIH	3	ASU	
37. DNA Damage Core Facility	A. Basnakian			\$63,990 \$290,000	3.04	NIH NIH	5		
38. Arkansas Cancer Community Network	R. Henry-Tillman	\$75,000	0.70				4		
39. Modular Screening Coupled with Patient-generated Screening to Increase Early Breast Cancer Detection in Arkansas	R. Henry-Tillman			\$153,542 \$478,402	0.32 3.14	NIH NIH	4		
40. Tobacco-induced Carbamylated LDL in Atherosclerosis Development	E. Apostolov			\$70,000	0.81	AHA	3		
41. Tobacco and Drug Dependence	W. Bickel			\$373,204 \$551,121	3.06 3.39	NIH NIH	3		Baylor College of Medicine
42. Lung Cancer Research	T. Bartter	\$66,500	0.24				4		
43. Role of Nove Sec34 Protein Complex in Intracellular Membrane Trafficking	V. Lupashin			\$227,542 \$161,825	2.39 2.24	NIH NSF	3		
44. Genetic Diversity and Cancer Susceptibility	G. Boysen	\$185,500	2.02				3		
45. Evaluation of the Effect of Smoking on Biotin Status in Women	D. Mock	\$64,676	1.29	\$34,815 \$30,986 \$277,929 \$363,805	0.85 0.10 1.46 2.28	Thrasher Fdn. Univ. of Iowa Subaward Univ. of Iowa Subaward NIH	3		ADH
46. Keratinocytes in Cutaneous Immunity	C. Armstrong			\$282,476	2.17	NIH	5		
47. Ascorbate and Osteoporosis	R. Morello	\$31,000					5		
48. Diabetes Outcomes in Older Adults	T. Borders			\$72,500	0.29	NIH	5		
49. Photothermal Therapy and Nicotine	V. Zharov			\$286,607 \$302,940 \$156,134 \$161,685	1.40 1.19 0.58 1.26	NIH NIH NIH NSF	3,4		UALR
50. Mental Health Care and Returning Veterans	J. Hunt	\$100,000	0.69				5		

ABI-SUPPORTED PUBLICATIONS, GRANTS, PATENTS, & CLINICAL TRIALS FOR 2010

Publications, Including Journal Articles, Book Chapters, Books; ABI-supported Investigators in bold.

A. JOURNAL ARTICLES

- Abbott JA, **Medina-Bolivar F**, Martin EM, Engelberth AS, Villagarcia H, Clausen EC, **Carrier DJ**. (2010) Purification of resveratrol, arachidin-1, and arachidin-3 from hairy root cultures of peanut (*Arachis hypogaea*) and determination of their antioxidant activity and cytotoxicity. *Biotechnol Prog*, 26:1344-1351.
- Akubak MA, More, A, Nandy S, **Srivastava V**. (2010) Dosage-dependent gene expression from direct repeat locus in rice developed by site-specific gene integration. *Mol Biotechnol*, 45:15-23.
- Almeida M, Ambrogini E, Han L, **Manolagas SC**, Jilka RL. (2009) Increased lipid oxidation causes oxidative stress, increased peroxisome proliferator-activated receptor-gamma expression, and diminished pro-osteogenic Wnt signaling in the skeleton. *J Biol Chem*, 284:27438-27448.
- Almeida M, Martin-Millan M, Ambrogini E, Bradsher R, Han L, Chen XD, Roberson PK, Weinstein RS, O'Brien CA, Jilka RL, **Manolagas SC**. (2010) Estrogens attenuate oxidative stress and the differentiation and apoptosis of osteoblasts by DNA binding-independent actions of the ERalpha. *J Bone Miner Res*, 25:769-781.
- Ambrogini E, Almeida M, Martin-Millan M, Paik J, DePinho R, Han L, Goellner J, Weinstein R, Jilka R, O'Brien C, **Manolagas SC**. (2010) FoxO-mediated defense against oxidative stress in osteoblasts is indispensable for skeletal homeostasis in mice. *Cell Met*, 11:136-146.
- Anderson EC, Weston MC, **Fritsch I**. (2010) Investigations of redox magnetohydrodynamic fluid flow at microelectrode arrays using microbeads. *Anal Chem*, 82:2643-2651.
- Andrade AC, Baron J, **Manolagas SC**, Shaw NJ, Rappold GA, Donaldson MD, Gault EJ, Säwendahl L. (2010) Hormones and genes of importance in bone physiology and their influence on bone mineralization and growth in Turner syndrome. *Horm Res Paediatr*, 73:161-165.
- Andreyev JN, Wotherspoon A, Denham JW, **Hauer-Jensen M**. (2010) Pelvic Radiation Disease: Defining a new condition in the survivorship era. *Lancet Oncol*, 11:310-312.
- Apostolov EO**, Ray D, Shah SV, **Basnakian AG**. (2009) Scavenger receptors of endothelial cells mediate the uptake and atherogenic effects of carbamylated LDL. *Arterioscler Thromb Vasc Biol*, 10:1622-1630.
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CLINICAL RESEARCH TRIALS

Arnaoutakis K. A pilot study to determine if metabolomic fingerprinting will identify non small cell lung cancer in patients being routinely scheduled for lung cancer management. Ongoing.

Arnaoutakis K. Phase III, randomized, open-label study of the efficacy and safety of PF-02341066 versus standard of care chemotherapy (Pemetrexed or Docetaxel) in patients with advanced Non-small Lung Cancer (NSCLC) harboring a translocation or inversion event involving the Anaplastic Lymphoma Kinase (ALK) gene locus. Ongoing.

Arnaoutakis K. Phase 2, open-label single arm study of the efficacy and safety of PF-02341066 in patients with advanced Non-Small Cell Lung Cancer (NSCLC) harboring a translocation or inversion involving the Anaplastic Lymphoma Kinase (ALK) gene locus. Ongoing.

Arnaoutakis K. Randomized, phase III, double-blind placebo-controlled trial of Sunitinib (NSC #736511, IND #74019) as maintenance therapy in non-progressing patients following an initial four cycles of platinum-based combination chemo-

therapy in advanced, stage IIIB/IV non-small cell lung cancer. Ongoing.

Arnaoutakis K. A phase III randomized trial of adjuvant chemotherapy with or without Bevacizumab for patients with completely resected stage IB (>4cm) - IIIA Non-Small Cell Lung Cancer (NSCLC). Ongoing.

Bickel WK. Improving combined buprenorphine behavioral treatment. Computer delivered treatment for stimulant abuse. Ongoing.

Bickel WK, **Budney A**, Carter L, Landes R, Sheffer C, **Yi R**. The behavioral economics of relapse. Delay discounting as a predictor of relapse among tobacco smokers. Ongoing.

Bickel WK, Redish AD, **Budney A**, Kleiner J, Landes R, **Yi R**. Executive function therapy for stimulant addiction. Assessing normal executive functioning. Ongoing.

Dornhoffer J, **Mennemeier M**. PET-CT to target and validate rTMS as treatment for tinnitus. Ongoing.

James LP. Safety, tolerability and pharmacokinetics of single dose intravenous Moxifloxacin in pediatric patients. Bayer Pharmaceuticals. 04/10 – Ongoing.

James LP. An open-label, study to evaluate the single-dose pharmacokinetics, safety and tolerability of Doripenem in infants (term and preterm), less than 12 Weeks chronological age. Johnson and Johnson. Ongoing.

Jones S. Edema 4: A randomized, double-blind, placebo-controlled, multi-center study to assess the efficacy and safety of DX-88 (Ecallantide) for the treatment of acute attacks of hereditary angioedema. Dyax Corp. 04/07 – 04/10.

Jones S. DX88/19 open label patient continuation of DX-88 (Ecallantide) for acute hereditary angioedema attacks. Dyax Corp. 04/07 – 04/10.

Kilts C. The clinical and neural response of cocaine addicts to combination treatment with a cognitive enhancer and extinction-based psychotherapy. 06/08 - 05/10.

Mehta JL. Aspirin, ANG II and angiogenesis. Bayer Pharmaceuticals. 10/09 – 09/10.

McNiece KL, Wells T, Ilyas M. An 8-day open-label, multiple-dose, multi-center study to evaluate the safety/tolerability of aliskiren in hypertensive pediatric and adolescent patients 6-17 years of age. Novartis Pharmaceuticals. 11/08 – 12/10.

McNiece KL, Wells T, Ilyas M. A phase III, randomized, open-label, parallel-group, dose ranging

clinical trial to study the efficacy of MK-0954/ losartan potassium in pediatric patients with hypertension. Merck and Co. Ongoing.

Nakagawa M. Phase 1 study to evaluate the immunologic mechanisms underlying wart resolution after intralesional immunotherapy with Candida antigen. Ongoing.

Redwine KM, James L, Ilyas M, Morgan A, Farrar H. A comparative single dose pharmacokinetic and safety study of TAK-491 between infants, children, and adolescents with hypertension and healthy adults. Takeda Research & Development Center, 03/10 – 02/11.

Scurlock AM. T-cell immune responses to chlamydia trachomatis infection. Genocea Biosciences, 08/08 – 07/10.

Zharov VP. Detection of circulating melanoma tumor cells. 10/09 – 10/10.

NEW RESEARCH AWARDS, July 1, 2009, to June 30, 2010

(Including those with start dates after July 1 – annual direct costs only)

Adams PD. Biophysical Studies of Oncogenic Cdc42Hs Constructs. NIH; \$108,000.

Aitken M. Improving Teen Driving through Parental Responsibility. National Highway Traffic Safety Administration; \$600,000.

Anthony N. Application of Genomic SNP Analysis to Differentiate Ascites Susceptible from Resistant Broilers. USDA; \$12,500.

Basnakian AG. Novel Endonuclease-targeted Approaches to Nephroprotection. VA Merit Review; \$260,700.

Basnakian AG. Administrative Supplement to: Premortem Enzymatic DNA Damage in Kidney Injury. NIH; \$64,000.
Basnakian AG. DNA Damage and Toxicology Core: Partnership for Biomedical Research in Arkansas. NIH; \$32,000.

Berleant D, Segall R, Hood EE. Enabling Crop Deregulation with Software: a Prototype. NSF EPSCOR; \$30,649.

Bickel W, Budney A. Translational Training in Addiction (T32). NIH \$262,000.

Blevins JS, Bellamy WT. RpoS-mediated Virulence Regulation in *Borrelia burgdorferi*. NIH; \$357,100.

Bluhm BH. Defining the Molecular Dialogue Underlying Stomatal Infection During Fungal Pathogenesis. NSF; \$164,012.

Blumer J, James LP. Methodological Improvement in Measuring Efficacy Outcome in Antihypertensive Trials in Children. NIH; \$95,675.

Blumer J, Redwine K, James LP. Effect of BMI on Exposure-Response Relationships to Lisinopril in Children. NIH; \$16,754.

Booker JM, Oliver GD. Military Boots: Minimizing Knee Valgus in Drop Landings. ADHE; \$2,000.

Bora N. Complement System and Idiopathic Anterior Uveitis. NIH; \$359,000.

Brooker B, Storrie B. Single Snapshot 3D Holographic Super-Resolution Widefield and 2-Photon Microscope for High Speed Live Cell Imaging. National Institute Standards Tech; \$65,700.

Buchanan R. Standoff Hazardous Agent Detection and Evaluation System. DOD; \$8,500,000

Buchanan R. URM: Cross Disciplinary Research at the Interface of Biotechnology and the Environment. NSF; \$196,576

Carrier J, Pelki M. Can Understory from Managed Pine Forests Be Used As Feedstock in the Biochemical Biorefinery. USDOT; \$35,000.

Cramer CL, Yu S, Srivatsan M, Dolan MC, Buchanan R. Acquisition of Equipment for Investigating Biodynamic Interactions. NSF; \$1,070,851.

Das K. Role of Sod2 in the Regulation of Caspase-1 in the Heart. NIH; \$397,250.

Devareddy L. Efficacy of Fresh and Processed Blackberries in Alleviating the Complications Associated With Obesity. USDA; \$44,000.

Devareddy L, Grippo A. Plant-based Anti-inflammatory Agents May Reduce the Risk of Chronic Inflammatory Diseases. NSF EPSCOR; \$122,147.

Dockter ME. Center for Efficient and Sustainable Use of Resources (CESUR). ASTA; \$1,400,000.

Du Y. Proteomic and Biochemical Studies of Bax Regulatory Proteins in Apoptosis. NIH; \$71,000.

Du Y. Administrative Supplement for Proteomic and Biochemical Studies of Bax Regulatory Proteins in Apoptosis. NIH; \$118,054.

Du Y. Proteomic and Functional Studies of Mitochondrial Proteins Involved in ROS Metabolism in Pancreatic Cancer. NIH; \$72,000.

Durdik J. Cell Biology of T Lymphocyte Aging. NIH; \$50,000.

Emanuel PD. Construction Completion of the Cancer Institute's Shelled Space on Floors 9 and 11. NIH; \$10,458,675.

Erf G, Kuenzel W. An Examination of Neurological and Immunological Abnormalities Associated with Lameness in Broiler Breeders. Cobb-Vantress; \$44,669.

Farris J. Contaminant Removal by Edge of Field Wetlands. USDA ARS; \$30,798.

Feldner MT. PTSD-focused Relationship Enhancement Therapy for Returning Veterans and Their Partners. Boston VA Research Institute; \$80,508.

Feldner MT. PTSD-focused Cognitive Behavioral Therapy for Partner Violent OEF/OIF Veterans. Boston VA Research Institute; \$75,386.

Gawley RE, Adams P, Heyes C, Peng X. Monovalent Nanocrystals for Biomedical Imaging. NIH; \$390,500.

Gilbert KM. Inactivating Autoreactive T Cells by HDAC Inhibitors. Sturgis Charitable Trust; \$24,970.

Gilbert KM, Blossom SJ. Determining How Trichloroethylene Alters CD4+ T Cell Function. NIH; \$997,000.

Henry-Tillman R, Greene P, Mehta P, Kim K. Colorectal Cancer Education and Screening Program. NIH; \$514,798.

Henry-Tillman R, Thomas B. AR-CCN Summer Research Internship Program. NIH; \$223,224.

Hestekin J. An Integrated Research Approach for Sustainable Algal Energy Production and Environmental Remediation: The Chesapeake Algae Project. College of William and Mary; \$132,000.

Hettiarachchy N, Slavik M, Singh S, Ricke S. Novel Nanoscale Delivery of Selected Individual Phenolic Compounds and Combinations for Synergistic Activity to Inhibit *L.m.* EHEC and *Salmonella*. USDA; \$44,912.

Hettiarachchy N, Slavik M, Ricke S. Natural Green Tea and Grape Seed Extracts and Nisin to Reduce Conventional Chemical Antimicrobials to Inhibit the Growth of Pathogens in Ready-to Eat High and Low Fat Chicken and Turkey Hotdogs. USDA; \$44,912.

Hettiarachchy N, Wang Y, Proctor A, Carrier J. Food and Pharmaceutical Co-Products from Bitter Melon Leaves. DOE; \$16,000.

Hobbs CA. Centers for Birth Defects Research and Prevention (CBDRP). CDC; \$1,000,000.

Hobbs CA. Genetic and Metabolic Determinants of Congenital Heart Defect Risk Summer Supplement. NIH: \$14,209.

Hood EE, Huang X. Determination of Factors Affecting High Level Protein Accumulation in Transgenic Maize Seed. NSF EPSCOR; \$93,000.

Howard L. Enhancing Agricultural Profitability and Sustainability through Specialty Crops. USDA; \$25,000.

Howard L. Processing Effects of Berry Polyphenolics. USDA; \$26,000.

Huang X. Computational and Biological Co-design: Cracking UGT Structure-function Relationships. NIH INBRE; \$121,250.

James L, McNiece KL. Methodological Improvement in Measuring Efficacy Outcomes in Antihypertensive Trials in Children. NIH; \$81,425.

James LP, Roberts D. Identification of New Mechanistic Biomarkers of Adverse Responses to Acetaminophen in Children and Adolescents. NIH; \$384,096.

James LP, Roberts DW. Dipstick Assay for the Detection of Acetaminophen Protein Adducts. NIH Equipment Grant; \$89,043.

Kaushal G. Mepriin A Metalloproteinase in Acute Kidney Injury. NIH; \$698,000

Kavdia M. Nitric Oxide-Superoxide Interactions in Endothelial Cell Dysfunction. NIH; \$316,951.

Kilt C, Stanger C. The Neuroeconomics of Behavioral Therapies for Adolescent Substance Abuse. NIH; \$150,000.

Koeppe II RE. UAF Component of: Partnerships for Biomedical Research in Arkansas. NIH; \$287,030.

Kwon YM. Role of Protozoa in Poultry Drinking Water in Transmission of *Campylobacter* Jejuni. NIH; \$44,912.

Lee S, **Devareddy L, Howard L, Lingbeck J, Ricke S.** Efficacy of Fresh and Processed Blackberries in Alleviating the Complications Associated with Obesity. USDA; \$36,000.

Li J. Characterization of Solid State Nanopore 3D Structure by High Resolution TEM. NSF; \$25,000.

Li J. Solid-state Nanopore Identification for Proteins. NIH: \$86,212.

Li J. Exploration of Solid-state Nanopore Reading Labeled Linear DNA Sequence. NIH; \$277,000.

Li Y, Ruan C. Development of Aptamer-ssDNA Intelligent Hydrogel Materials for Magnetoelastic Detection of Avian Influenza Virus. NSF; \$75,000.

Lorence A. Mechanisms Leading to Enhanced Tolerance to Oxidative Stress and Increased Lifespan in Arabidopsis: Role of Mitochondrial, ER, and Chloroplastic Enzymes Involved in Ascorbate Biosynthesis. NIH AR INBRE; \$579,198.

Lorence A, Khodakovskaya M. Enhancing Production of Pharmacologically Active Phytochemicals in Plants for Advanced Life Support in Space Exploration. Arkansas Space Grant Consortium; \$40,000.

Lorence A. Artemisinin Biosynthesis: Role of Reactive Oxygen. NIH-AREA; \$150,000.

McIntosh MC. Applications of Novel Rearrangement Reactions. NSF; \$260,000.

McNiece KL, James L. Effect of BMI on Exposure-Response Relationships to Lisinopril in Children. NIH; \$24,628.

Marsico TD. Crowley's Ridge Plant Identification Project. Arkansas Natural Heritage Commission; \$10,000.

Mayeux PR. Mechanistic Targets for Intervention in Sepsis-induced Renal Injury. NIH; \$67,063.

Miller C, **Buchanan R, Dolan M.** Biotech in A Box. Arkansas Department of Higher Education; \$105,128.

Miller C, **Buchanan R.** Nanotechnology. Arkansas Department of Higher Education; \$64,000

Millett, F Du Y Kumar TKS, Goforth R, Henry R. Administrative Supplement for COBRE: Center for Protein Structure and Function: Exploring Novel Strategies to Prevent and Treat Viral Infection. NIH; \$427,402.

Nakagawa M, Nagarajan UM. Understanding and Enhancing T-Cell Responses to High Risk Human Papillomaviruses. NIH; \$775,000

Nobel LJ, **Aitken M.** Trauma to Developing Brain: Model Refinement and Therapeutic Intervention. NIH (Baylor College of Medicine Subcontract); \$26,276.

Peng X. High Efficiency Nanosystems for Photovoltaics: Moving Beyond the Shockley-Queisser Limit. Columbia University; \$109,444.

Perry TT. Reducing Asthma Disparities Through School-Based Telemedicine for Rural Children. NIH; \$2,157,741.

Proctor A. Analytical Method. Oil-Dri Corporation of America; \$6,500.

Proctor A. New CLA Based Soy Oil Foods and Nutritional Products. Arkansas Soybean Promotion Board; \$62,500.

Pulay P. Ultrafast Monte Carlo Simulation of Molecules with Electronic Embedding, and Novel Basis Sets for Intermolecular Interactions. NSF; \$158,525.

Radin DN, **Cramer CL, Dolan MC, Medrano G.** Plant-based Bioproduction of Chicken IL-12 Adjuvant for Bird Flu Vaccines. USDA; \$119,347.

Radin D, **Xu J.** A Novel Plant Cell Bio-Production Platform for Therapeutic Proteins. NIH-SBIR; \$151,000.

Rank R. Role of the Neurogenic Inflammatory Pathway in the Genital Tract Immune Response. NIH.

Rhee S, Hayar A. Scaffolding of Vascular K+ Channels in Hypertension. NIH; \$250,000.

Ricke S, Crandall P. A Head-to-Head Comparison of the Moisture Retention and Functionality of Dried Plum Fibers Compared to Alkaline Phosphates in Chicken Breast Meat. Dried Plum Board; \$25,000.

Rickertsen K, **Nayga Jr RM, Gustavsen G, Variyam J.** Nutrition, Health, and Changing Consumer Preferences. Research Council of Norway; \$735,000.

Savary B, Bouldin J, Green VS, Humphrey JK, Weathers P, Xu J. MidSouth/Southeast Bioenergy Consortium (1). USDOE Biomass Office; \$656,000.

Schaefer GB. Heartlands Regional Genetics Collaborative. HRSA; \$79,954.

Silberman JD. Genetic and Phylogenetic Diversity of *Entamoeba*. NSF; \$135,000.

Simmen RCM, Simmen FA. Dietary Factors in Colon Cancer Prevention. NIH; \$205,000.

Simmen RCM. Dietary Regulation of the Tumor Suppressor PTEN Network and Tumor Initiating Population in the Mammary Gland: Implications for Breast Cancer Prevention. Department of Defense Breast Cancer Research Program; \$129,600.

Simmen RCM. Dietary Regulation of Mammary Adipocyte Stromal Signaling and Breast Cancer. Fashion Footwear Association of New York; \$21,875.

Smith S, Wu J. REU Site: Summer Research Experiences in Wireless Sensor Networks - Design and Applications. NSF; \$367,734.

Smith S, Wu J, Mantooh A, Di J. Asynchronous and Mixed-signal IC Design and CAD for Next Generation Ultra-low Power Computing and Communication Systems for Medical, Mobile, and Sensor Network. USDOE; \$514,512.

Sohraby K, **Wu J.** Wireless Relay Network for Environmentally Sustainable Communication. AT&T Technology and Environment Awards Program; \$24,795.

Srivatsan M. Use of Stem Cells for Functional Recovery in Spinal Cord Injury: Collaborative Research at Center for Brain Research at Ege University, Turkey. Middle East Studies Grant; \$7,500

Srivatsan M. Stream Computing for Research and Education in Science and Engineering. NSF; \$400,000.

Stanger C, Kilts C, Budney A, Bickel W. The Neuroeconomics of Behavioral Therapies for Adolescent Substance Abuse. NIH; \$217,500.

Storrie B. Transmission Electron Microscope and Sample Preparation Equipment. NSF; \$1,491,136.

Thoma G. Comprehensive Life Cycle Assessment for Fluid Dairy Delivery Systems. Dairy Management, Inc.; \$390,809.

Venkitanarayanan K, **Donoghue DJ,** Donoghue AM, Khan M, Frye J, Darre M. Reducing Salmonella Enteritidis and Campylobacter jejuni in Chickens by Dietary Supplementation of plant-derived Antimicrobial Molecules and Delineating their Effect on Bacterial Gene Expression by DNA Microarray. USDA; \$366,107.

Ware J. Platelets and Spontaneous Metastasis. Fashion Footwear of New York/QVC; \$58,761.

Wang Y. Carbohydrate Research. Various Industries; \$47,000.

Wu J. Cooperative Detection in Decentralized Wireless Information Network. NSF; \$181,710.

Ye K, Jin S. HA Surface Presented Yeast Flu Vaccine and Its Enhancement by CD 154 Codisplay. NIH; \$308,234.

Ye K. Glucose Detection. Bayer Health Care LLC; \$38,738.

Yi R. Soft Commitment as a Mechanism to Prevent Preference Reversals. NIH; \$299,062.

Yi R, Bickel WK, Landes R. Soft Commitment as a Mechanism to Prevent Preference Reversals in Smokers. NIH; \$200,000.

Young KD. Bacterial Cell Wall Synthesis, Shape and Septation. NIH; \$50,000.

Young KD. Composition and Characteristics of Cell Poles as a Measure of Bacterial Growth History. US Army; \$116,996.

Zhou D. Arkansas Research Alliance Scholarship. ARA; \$166,666.

Zou M. CAREER: Nano-engineered Surfaces: Fabrication and Mechanical and Tribological Properties. NSF; \$37,395.

Zou M. Tribological Studies of Nano-textured Surfaces. ADHE; \$2,650.

PATENT ACTIVITY

(Filed or Received July 1, 2009, to June 30, 2010)

Patents Received:

Hermonat P, et al. Genetically altered dendritic cells transduced by adeno-associated virus (AAV), Methods of producing genetically altered dendritic cells and uses thereof. European Patent No. 1,206,563.

Li Y, Varshney M, Ye Z. Separation system and efficient capture of contaminants using magnetic nanoparticles. US Patent No. 7,699,979 B2.

Medina-Bolivar F, Dolan M, Bennett S, Condori J, Hubstenberger J. Production of stilbenes in plant hairy roots. US Patent No. 7,666,677.

Patents Filed:

Allen SD, Calhoun J. UF LED photocatalytic destruction of biothreat agents. US Provisional Patent No. 61/291,609.

Armstrong CA. Alpha-melanocytes stimulating hormone (a-MSH) as topical anti-inflammatory agent for the treatment of allergic contact dermatitis. US Provisional Patent Application Docket No. 110.037PRV.

Cramer CL, Reidy MJ, **Dolan MC.** Methods of delivery of molecules to cells using ricin subunit and compositions relating to same. US Patent No. 60/944193; European Patent Application No. 08770903.6.

Dolan MC, Lorence A, Medrano G. Methods and compositions for enhancing polypeptide production. US Provisional Patent No. 61/254,522.

Hood E, Eversole K, Berleant D, **Segall R,** Mustell R, Vicuna Requesens D. Method and system for data collection and analysis to assist in facilitating regulatory approval of a product. US Provisional Patent No. 61/301,128.

Howard LR, White BL, **Prior RL.** Process of extracting procyanidins by alkaline hydrolysis. US Utility Patent No. 12/794,444.

James L, Roberts D. Acetaminophen-protein adduct assay device and method. US Patent Application No. US-2009-0263839.

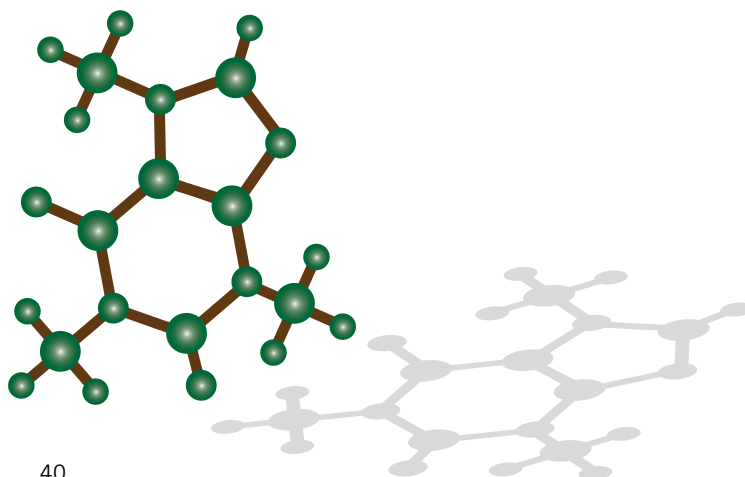
Li Y, Wang R, Jiang T, **Kwon Y,** Zhao J. Avian influenza H5N1 specific aptamers and uses thereof. US Patent No. 61/346,561.

NEW START-UP BUSINESSES

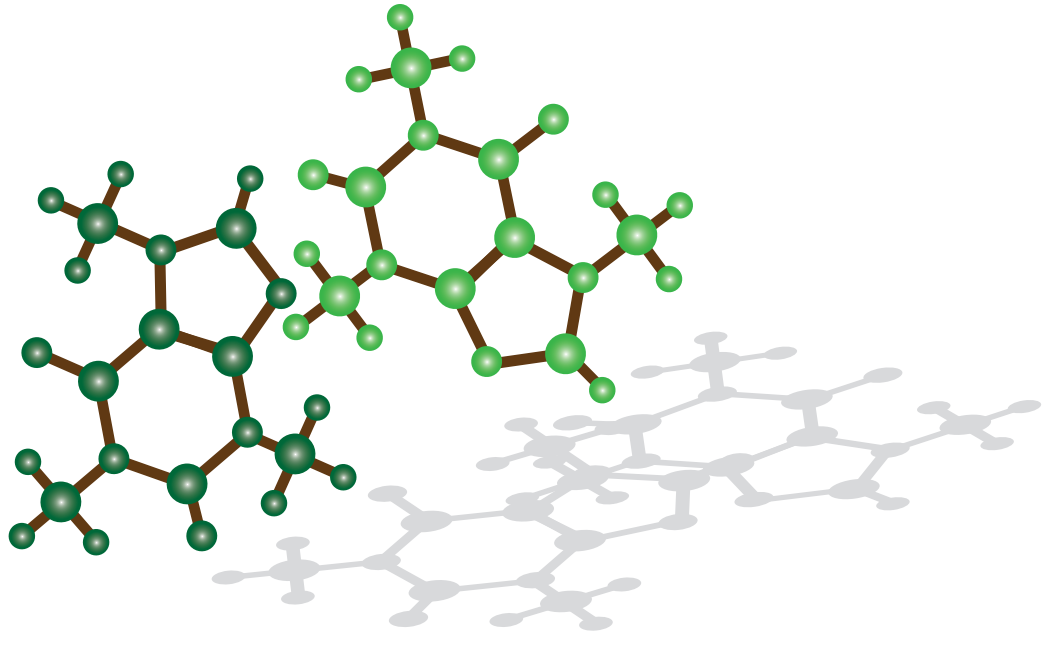
(Started July 1, 2009, to June 30, 2010)

BiologicsMD is developing a new prescription osteoporosis drug called OsteoFlor to treat osteoporosis with a single, annual or semi-annual injection.

Dr. Joshua Sakon, University of Arkansas, Fayetteville



ARKANSAS BIOSCIENCES INSTITUTE



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