

# Colorado

Office of Economic  
Development and  
International  
Trade

## BIOSCIENCE DISCOVERY EVALUATION GRANT PROGRAM AN EFFECTIVE ECONOMIC DEVELOPMENT, JOB AND COMPANY CREATION PROGRAM



**T**he Bioscience Discovery Evaluation Grant Program (BDEGP) was created in 2006 by the Colorado General Assembly to grow the bioscience industry in the state. The goal was to stimulate jobs and create new bioscience companies based on promising discoveries made at the state's major research institutions.

The \$56 million program is appropriated through the Governor's Office of Economic Development and International Trade (OEDIT). Since the first grants were made in mid-to-late 2007, the program has provided 116 grants to researchers at Colorado research institutions; 41 grants to help early stage companies further these technologies; and has formed four new bioscience commercialization organizations to identify, manage and support technologies and to bring together necessary expertise to advance novel Colorado biotechnologies to commercialization. A total of \$19 million of the \$56 million program has been granted through April 2011. Each grant is awarded following a rigorous review by scientists, bioscience executives, financiers, and OEDIT.

Within this funding year (FY 2010-2011) 41 grants have been awarded as of April 2011, in three program areas:

- 30 - Proof of Concept (POC) grants to research institutions to accelerate the development of new bioscience discoveries that may lead to the creation of new Colorado companies.
- 8 - Early Stage Company Grants (ESC) to Colorado companies that have licensed a bioscience technology from a Colorado research institution.
- 3 - Commercialization Infrastructure grants to develop essential resources for Colorado scientists and bioscience companies.

## 2010 -2011 PROOF-OF-CONCEPT GRANTS

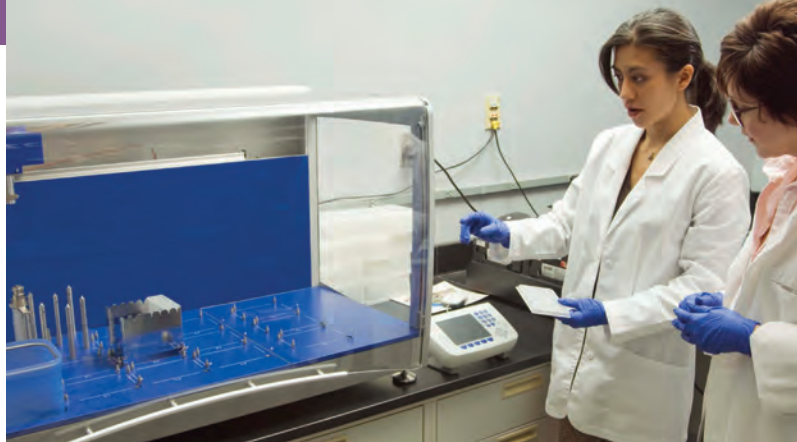
### COLORADO SCHOOL OF MINES

**INVESTIGATOR:** David Marr Ph.D.

**TITLE:** Cell Isolation Using DVD Optics

**RESEARCH:** The research has two goals in using DVD optics: 1) Optimization of microfluidic geometries and flows for cell isolation, and how to integrate these settings to sort cells; 2) Incorporation of detection of cell location using integrated quadrant photodiode.

**IMPACT:** Because of rising health-care costs, there is a significant need for inexpensive diagnostics and methods for drug screening in the context of personalized medicine – techniques that allow for rapid and point-of-care testing of potential therapeutics. Available DVD optical pickups are technologically sophisticated yet incredibly inexpensive due to their mass production and ubiquity in consumer electronics. The objective is to determine their practical utility for commercial biomedical device application.



**INVESTIGATOR:** David W.H. Riches, Ph.D.

**TITLE:** Therapeutic Small Molecule Inhibitors to Treat Pulmonary Fibrosis

**RESEARCH:** Idiopathic pulmonary fibrosis (IPF) is a fatal lung disease that severely limits the ability of patients to breathe. Two thirds of IPF patients die within 3 years of diagnosis accounting for approximately 45,000 American deaths every year. Unlike breast cancer, from which a similar number of American women die each year, there is no effective pharmacologic or biologic therapy for IPF.

**IMPACT:** The goal of this project is to discover small molecule inhibitors (therapeutics) that block the interaction between Fas and PTPN13. The identification of such molecules could pave the way for an innovative therapeutic approach to the treatment of IPF. In addition, the same small molecule inhibitors could represent a new treatment for pancreatic and colon cancer where resistance to Fas-induced apoptosis also contributes to disease progression. Given the dismal responses of patients with IPF, colon and pancreatic cancers to current therapies, the approach might offer a new avenue for treatment in the long term.

### NATIONAL JEWISH HEALTH

**INVESTIGATOR:** Richard Meehan, M.D.

**TITLE:** Joint Aspirate Facilitator Device

**RESEARCH:** Osteoarthritis (OA) is the most common cause of disability in the elderly and 1/3 of individuals > 65 years of age have OA of the knee which is the most common joint needing joint aspiration (for diagnosis) or injection.

**IMPACT:** This project should develop a novel, relatively inexpensive, reusable or disposable device which can improve patient comfort in a medically important but underutilized procedure, joint aspirations and injections.

**INVESTIGATOR:** Jerry Nick, M.D.

**TITLE:** A Novel Compound For Pseudomonas Biofilm Disruption

**RESEARCH:** This project will allow for synthesis of candidate molecules, using well-described drug-development modifications of a current product, with the goal of identifying unique molecules with superior stability and bioavailability. These candidates will then be tested in our model system of neutrophil-enhanced biofilm development on biofilm plates and contact lenses in vitro, followed by in vivo testing of treatment of PA infections in a murine model of thermal injury.

**IMPACT:** The proposed product will serve as an adjuvant to available antibiotics, to prevent or disrupt the PA biofilm in early stages of development, and improve efficacy of conventional treatment. If successful, this will be the first product of its kind in this potentially very large medical market.

**INVESTIGATOR:** Gongyi Zhang, Ph.D., and John Cambier, Ph.D.,

**TITLE:** BCMA-Fc Chimeras as Therapeutics for Autoimmunity

**RESEARCH:** B cells play a critical role in a broad spectrum of human autoimmune diseases. These include not only those diseases that are mediated by autoantigen-reactive antibodies such as Systemic Lupus Erythematosus, Idiopathic Thrombocytopenia and Multiple Sclerosis, but also autoimmune diseases that have a prominent T cell effector component such as Type 1 Diabetes and Rheumatoid Arthritis.

**IMPACT:** The current best therapy for these diseases is Rituxan, an antibody that targets B cells for destruction by phagocytic cells found in the liver. While Rituxan holds great promise, it spares certain B lineage cells, and therefore is not effective in all situations. For example, clinical trials using Rituxan for SLE failed, probably because the offending B cell population was not efficiently eliminated. Finally, the mode of action of Rituxan places patients at risk of a variety of infectious diseases. Specifically, Rituxan causes long-term depletion (sometimes 1-2 years) of B cells needed to fight infection. Clearly there is great need for effective alternative B-cell targeted therapies.

**INVESTIGATOR:** Philippa Marrack, Ph.D. and Anatoly Rubtsov, Ph.D.

**TITLE:** Generation of Bispecific Antibodies for Targeting Autoimmune-Associated B Cells (ABCs)

**RESEARCH:** Current autoimmune disease treatments have been mainly directed to preserve the body organs. These treatments can preserve organ function and reduce pain, but they fail to stop or cure the disease. Modern therapies for autoimmune diseases have very profound effects on the whole immune system and tend to affect large populations of cells that are important for maintaining protection of the host from pathogens. Investigators propose to generate a new type of antibody that will specifically deplete a small population of autoimmune-associated B cells (ABCs) recently identified by the likely source of autoantibodies in autoimmune mice.

**IMPACT:** The plan is to design antibodies that will target a specific population of cells that has been demonstrated to play a key role in the production of autoantibodies. If the designed antibodies indeed cause the depletion of ABCs, the product could become a powerful new drug in the treatment of a variety of autoimmune diseases.

**INVESTIGATOR:** Remy Kachadourian, Ph.D. and Brian J. Day, Ph.D.

**TITLE:** Combining Pro-Oxidant Effects to Kill Cancer Cells; A Mouse Model Study

**RESEARCH:** The strategic objective of this project is to demonstrate in an animal model the efficacy of a new approach to sensitize cancer cells to alkylating agents. This new approach is based on inducing glutathione (GSH) efflux through multi-drug resistant proteins (MRPs) that are activated by some flavonoids. Investigators plan to demonstrate in an animal model (mice), the benefits of combining a GSH depleting agent with an alkylating agent.

**IMPACT:** The development of new and more efficient inducers of GSH depletion may significantly impact cancer treatment by allowing the use of smaller treatment doses, resulting in better patient tolerance and compliance. Therefore, this project can potentially lead to the commercialization of a library of compounds that would be used in individualized medicine against cancer.

## COLORADO STATE UNIVERSITY

**INVESTIGATOR:** Charles S. Henry, Ph.D. and Lawrence Goodridge, Ph.D.

**TITLE:** Microfluidic Paper-Based Analytical Device for Detection of Pathogenic Bacteria

**RESEARCH:** The goal of this project is to develop a sensor for the detection of foodborne pathogens using selective biological assays to be used in the food industry.

**IMPACT:** Diseases resulting from foodborne pathogens affect millions of people every year and represent a major health problem in developed and developing countries. Most foodborne illness can be prevented with proper sterilization. Current monitoring methods are too slow, expensive, prone to interference, or too cumbersome for widespread implementation. The project outcome will result in a new technology that overcomes these problems and addresses an area of significant need in the food industry.

**INVESTIGATOR:** Susan P. James, Ph.D. and Lakshmi Prasad Dasi, Ph.D.

**TITLE:** Developing the Cardiovascular Applications of BioPoly™

**RESEARCH:** The goal of this project is to develop BioPoly™ materials for use in cardiovascular blood-contacting applications. BioPoly materials which are largely made of synthetic plastic have the mechanical properties of plastic – they are strong, flexible and durable. A small percentage of natural hyaluronan (HA) is also incorporated into the materials and gives them water-loving, tissue-like surface properties. These materials are easy to manufacture into a variety of shapes.

**IMPACT:** Cardiovascular BioPoly will meet critical needs in two large human health markets: 1) small-caliber vascular grafts that can be used in the over 1.4 million arterial bypass surgeries performed each year in the U.S.; and 2) leaflets for polymeric heart valves in the roughly 400,000 heart valve replacement surgeries performed each year.

**INVESTIGATOR:** Susan P. James, Ph.D. and David A. Prawl, M.S., Ph.D. Candidate

**TITLE:** Penetrating Osteointegrative Coatings for Titanium Lattice Implants

**RESEARCH:** Use electrospaying to deposit consistent, biocompatible coatings on titanium surfaces which will enhance integration of orthopedic implants into existing bone.

**IMPACT:** The proposed research would significantly enhance the clinical outcome of patients in the joint replacement and bone cancer reconstructive implant markets by improving natural bone growth, more deeply into the structure of these implants.





**INVESTIGATOR:** E. Christopher Orton, Ph.D.

**TITLE:** Catheter-Delivered Artificial Heart Valve Device

**RESEARCH:** The goal of this project is to provide proof of concept of a novel catheter-delivered mitral valve replacement device. The device is designed to be delivered into the beating heart, thereby eliminating the need for open heart surgery or a heart lung machine (i.e. cardiopulmonary bypass). Thus, the device can be delivered less invasively and in a much shorter period of time compared to traditional open heart surgery, and thereby would be safer in older and seriously ill patients.

**IMPACT:** Approximately 65,000 heart valve repairs or replacements are performed in the United States each year. Currently, valve repair or replacement usually requires traditional open heart surgery (i.e. cardiopulmonary bypass with a heart lung machine). Much of the morbidity associated with heart valve surgery is caused by effects of cardiopulmonary bypass and the heart lung machine. The catheter-delivered mitral valve replacement device would eliminate this problem. Open heart surgery is poorly tolerated in older patients and those with concurrent serious illnesses. This device would potentially allow for many of these excluded patients to receive life-extending heart valve surgery.

**INVESTIGATOR:** Tomislav Rovis, Ph.D.

**TITLE:** Efficient Synthesis of New Resorcinylic Macrolide HSP 90 Anticancer Agents

**RESEARCH:** The aim of this research is to develop a general approach to synthesizing a variety of resorcinylic macrolides using a highly efficient polyketide cassette technology. These compounds are expected to be inhibitors of heat shock protein HSP90, a promising antitumor target. A variety of resorcinylic macrolides will be synthesized and screened for their antiproliferative activity in tumor cells. The most promising candidates will be selected for the next stage of pre-clinical research.

**IMPACT:** This work will specifically target the human anticancer drug market, although it may have veterinary applications as well. Deliverables include the synthesis and selection of promising antitumor compounds based on resorcinylic macrolides, the most successful of which will be ready for the next stage of pre-clinical research.

**INVESTIGATOR:** Kenneth F. Reardon, Ph.D.

**TITLE:** Multichannel Optical Biosensor for Oxygen-Based Detection of Organic Chemicals in Aqueous Media

**RESEARCH:** This project advances the technological state of an optical enzymatic biosensor platform by using biological and engineering approaches to increase the biosensor lifetime, improving the multichannel optoelectronic hardware system used for measuring analytes in mixtures, and developing multichannel calibration and measurement protocols. The multichannel optical biosensor will be used to detect contaminants in water and food.

**IMPACT:** The ability to easily and accurately monitor water and food supplies for contaminants has tremendous health and economic benefits.

**INVESTIGATOR:** Sybil E. Sharvelle, Ph.D.

**TITLE:** Development of a Multi-Stage Anaerobic Digester for Generation of Methane from Manure

**RESEARCH:** The goal of this project is to demonstrate the feasibility of a novel multi-stage anaerobic digester system for converting solid animal waste into biogas, specifically methane. The modular, multi-stage design proposed should have advantages in overcoming scaling issues and will be specifically suited for the arid conditions found in the western United States. Synergistic benefits include reduction of solid animal waste and generation of biogas onsite.

**IMPACT:** Implementation of the reactor onsite will reduce solid animal waste and generate biogas that will partially offset an operation's energy expenses. This technology will be of benefit to many livestock operations, including large Concentrated Animal Feeding Operations (CAFOs) that typically include thousands of animals.

## COLORADO INSTITUTE OF MOLECULAR BIOTECHNOLOGY

**INVESTIGATOR:** Natalie Ahn, Ph.D. & Tin Tin Su, Ph.D.

**TITLE:** Radiation Sensitizers for Cancer

**RESEARCH:** The aim of this grant work is to optimize a small molecule lead compound which synergizes with radiation, in order to develop novel compounds with a high combination index for use in the radiation treatment of cancer.

**IMPACT:** Existing cancer therapies have key limitations, in that targeted therapies are often so specific that they only benefit a small subset of patients with a particular mutation, while chemotherapy and radiation have devastating side effects due to toxicity. Combination therapy using drugs which target different aspects of disease progression is not only more therapeutic, but allows lower doses of each to be used, thereby reducing side effects. Small molecule drugs which increase the efficacy of radiation therapy may allow reduction of radiation doses or overall radiation exposure. Based on results thus far, the small molecule lead compound studied will be effective in combination with irradiation for treating cancer.

**INVESTIGATOR:** Natalie Ahn, Ph.D. & Xuedong Liu, Ph.D.

**TITLE:** A Highly Potent Histone Deacetylase Inhibitor For Cancer Therapeutics

**RESEARCH:** The aim of this grant work is to optimize a small molecule inhibitor of histone deacetylases which shows high potency and selectivity against human xenograft tumors and a panel of cancer cell lines.

**IMPACT:** Ideal drugs for cancer therapy are those which selectively kill tumor cells, but spare normal cells. However, anti-cancer drugs which fulfill these criteria are extremely rare. Histone deacetylase (HDAC) inhibitors have emerged as one of the most promising targets for cancer therapies, given widespread evidence that inhibition of histone deacetylation promotes growth arrest, differentiation, and apoptosis of tumor cells, with minimal effects on normal tissues. The new proprietary compound identified in structure activity relationships (SAR) studies, paragazole, appears to be superior to other known HDAC inhibitors in potency while maintaining selectivity.

**INVESTIGATOR:** Natalie Ahn, Ph.D. & Tarek Sammakia, Ph.D.

**TITLE:** Treatments for Chronic Pain

**RESEARCH:** The aim of this grant work is to develop new chemical entities structurally related to tricyclic antidepressants, which remove antidepressant activity while acting as potent inhibitors of the opioid-mediated TLR4 response. These will provide novel compounds which when used in combination with opioids, eliminate side effects in treating chronic pain.

**IMPACT:** Chronic pain occurs in epidemic proportions worldwide. The most effective therapeutics for the treatment of moderate to severe pain are opioids, all of which are prone to abuse, tolerance, and dependence. Developing chiral tricyclic antidepressants (TCAs) will provide a route to block side effects of opioids towards TLR4, while taking advantage of the blood-brain permeability of TCAs. Resulting therapeutics will lessen the effects of tolerance and dependence associated with opioids.

**INVESTIGATOR:** Christopher Bowman, Ph.D.

**TITLE:** Dual Core Polymer Systems for Biomedical Applications

**RESEARCH:** The Project objective is to develop a dual cure polymer system for orthopedic suture anchors and contact lenses for commercialization.

**IMPACT:** The successful development of a dual cure shape memory polymer as an orthopedic suture anchor would result in a product that is superior in several areas to current market products. The two stage cure allows minimally invasive deployment of the anchor coupled with a high-modulus, high-strength final fixed device.

Parallel development of novel materials and processes for producing custom contact lenses, based on customer's personal wavefront measurements, will result in corrective lenses that perform significantly better than today's lenses. These materials and methods will be applicable to the traditional contact lens wearers, and will also open new markets for patients requiring higher order vision correction not currently possible with existing contact lens technology.

**INVESTIGATOR:** Leslie Leinwand, Ph.D.

**TITLE:** Novel Therapeutics for Pathological Cardiac Hypertrophy

**RESEARCH:** The strategic objective of this grant is to develop specific fatty acid (FA) species as therapeutic tools to promote beneficial cardiac adaptation in the presence of pathological stimuli. Using the fed python as a model of extreme physiological adaptation, the project aims to determine the ability of FAs to regulate mammalian heart cell size, function and gene expression in both in vitro cell culture and in vivo rodent models.

**IMPACT:** There is a need for a better understanding of the intracellular pathways that differentially regulate physiological and pathological hypertrophy. The elucidation of the molecular pathways that control enlargement of the heart remains a central question in cardiovascular research and the identification of key physiological vs. pathological effectors may provide novel therapeutic targets to prevent, reverse, or modify the pathological hypertrophic phenotype. Novel therapeutic targets can lead to new therapies for heart disease.

**INVESTIGATOR:** Hubert Yin, Ph.D.

**TITLE:** Developing Novel Drug Candidates Optimizing Opiate's Clinical Efficacy

**RESEARCH:** The Project objective is to develop agents that can optimize a promising, small molecule TLR4 inhibitor--T5342126--to selectively block opioid-induced TLR4 activation and improve opioid pain relief while minimizing opioid dependence.

**IMPACT:** Because current pharmacotherapeutics have failed both to control pain and to avoid the negative consequences, there is an urgent need to develop the next generation pain management therapies.



## UNIVERSITY OF COLORADO

**INVESTIGATOR:** Heide Ford, Ph.D.

**TITLE:** Identify Inhibitors Of The Six1-Eya Interaction for Anti-Breast Cancer Drug Design.

**RESEARCH:** The Project objective is to identify and develop inhibitors targeting the interaction of the Six1 gene and its co-factor Eya for anti-breast cancer drug design.

**IMPACT:** This research is expected to benefit up to 50% of breast cancer patients with primary breast tumors and up to 90% of patients with metastatic tumors. In addition, data from our group and other groups demonstrates that Six1 is over expressed in numerous additional tumor types, including, amongst others, lung, ovarian, hepatocellular, and brain cancers. While initial efforts will be to develop drugs for breast cancer; small molecules that inhibit the Six1 transcriptional complex may also be applied to many other types of cancer.

**INVESTIGATOR:** Emily Gibson, Ph.D.

**TITLE:** In vivo imaging of the eye using multi-photon optics for diagnosis and monitoring of disease.

**RESEARCH:** The Project objective is to construct a prototype device allowing multi-photon microscopy imaging of the trabecular meshwork region of the human eye in vivo. This would allow for early diagnosis and intervention to prevent vision loss from glaucoma.

**IMPACT:** There exists a great and unmet need for technology to accurately diagnose glaucoma and map its progression before optic nerve damage occurs. Such an invention would increase the effectiveness of medical intervention and prevent vision loss for millions.

**INVESTIGATOR:** Todd Grazia, Ph.D.

**TITLE:** Autologous CD117+ Progenitor Cell Therapy in Solid Organ Transplantation and Type 1 Diabetes

**RESEARCH:** The project objective is to study and develop CD117 bone-marrow derived progenitor cells as a novel therapeutic in solid organ transplantation and Type I Diabetes.

**IMPACT:** These cells have high impact potential for the field of tissue and organ transplantation as well as auto-immunity (Type I Diabetes) - as either primary therapy or adjunct therapy to improve tissue/cellular engraftment, decrease acute rejection, and to promote organ transplant tolerance (lack of rejection despite no concomitant immune-suppression).

**INVESTIGATOR:** Robert Hodges, Ph.D. & Kathryn Holmes, Ph.D.

**TITLE:** A Novel Conformation - Stabilized, Synthetic Peptide Vaccine for Respiratory Syncytial Virus

**RESEARCH:** The Project objective is to develop a novel synthetic peptide vaccine to prevent Respiratory Syncytial Virus infection, a common respiratory virus impacting infants, the elderly and others with weak immune systems. This application will provide further proof of concept that the underlying invention can serve as a platform technology effective against viruses with similar mechanisms of viral entry.

**IMPACT:** The Project will develop a novel synthetic peptide vaccine to prevent infection with Respiratory Syncytial Virus (RSV), a common respiratory virus that infects children worldwide by age 2 and causes severe disease or death in infants under 6 months of age who have underlying lung or heart disease as well as elderly patients or adults with weak immune systems.

**INVESTIGATOR:** Malik Kahook, Ph.D.

**TITLE:** Shape Memory Polymer Glaucoma Drainage Device

**RESEARCH:** The project will advance preclinical testing of a novel microsurgical implant (MSI) leveraging Shape Memory Polymer (SMP) technology. The Project will develop a novel device to maintain fluid communication between the anterior chamber of the eye and the outside of the eye to manage and reduce high eye pressure in glaucoma patients.

**IMPACT:** An alternative surgical procedure for glaucoma that is minimally invasive, easily reproducible, and free of serious side effects would be of great benefit to patients.

**INVESTIGATOR:** Tad Koch, Ph.D.

**TITLE:** In Vivo: Preclinical Evaluation of a New Therapeutic for Pancreatic Cancer

**RESEARCH:** Grant work involves preclinical experiments to establish the distribution, metabolism, toxicity, and efficacy of a prodrug, Plasmin Activated Doxazolidine (PAD), for the treatment of pancreatic cancer. PAD may be effective against a wide variety of solid tumors.

**IMPACT:** Investigators envision PAD replacing the cytotoxic components of current therapies for pancreatic cancer and being used in combination with a cell signaling inhibitor such as erlotinib or sorafenib. Success in treating advanced pancreatic cancer will stimulate investigation for the treatment of advanced solid tumors of the breast, prostate, lung, and colon.

**INVESTIGATOR:** Brian Stauffer, Ph.D.

**TITLE:** Selective  $\beta_1$  - Adrenergic Blockade in Children with Heart Failure

**RESEARCH:** This project aims to provide in vivo evidence for a class of therapeutic agents that are beneficial for the treatment of heart failure in children. The purpose of the project is to determine the ability of 3  $\beta_1$  selective adrenergic receptor antagonists and a  $\beta_2$  receptor agonist to prevent cardiac pathology in the animal model of pediatric disease.

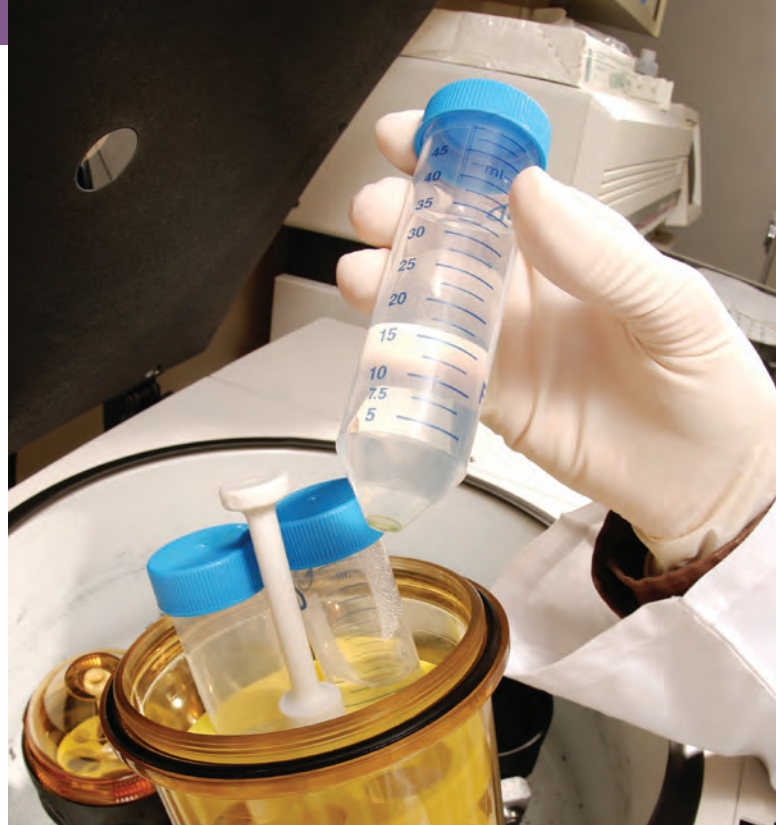
**IMPACT:** The unmet clinical need underlying the proposal is the lack of evidence based medical therapy for children with heart failure. The current project will address this need by providing in vivo evidence of a class of therapeutic agents that are beneficial for the treatment of heart failure in children.

**INVESTIGATOR:** Dan Theodorescu, Ph.D.

**TITLE:** Novel Inhibitors of Ral for the Treatment of Bladder Cancer

**RESEARCH:** The aim of this project is to design, synthesize, and evaluate novel second generation small-molecule inhibitors of Ral (proteins) based on lead compounds found in initial screening assays for the treatment of bladder cancer.

**IMPACT:** Developing a portfolio of Ral inhibitors would expedite the transition of these compounds from preclinical to clinical development where they will be of therapeutic benefit to lung, bladder, and prostate cancer patients.



## UNIVERSITY OF DENVER

**INVESTIGATOR:** Siavash Pourkamali, Ph.D.

**TITLE:** Development of a Nanomechanical Biosensing Platform

**RESEARCH:** The objective of this project is to develop, optimize and demonstrate the basis for a new biosensing platform with fully electronic readout that allows faster and simpler bioanalysis at a much lower cost. The platform will be based on the liquid phase compatible nano-electro-mechanical resonator technology that allows direct real-time measurement of the mass of the adsorbed molecules eliminating the need for fluorescent labeling and optical readout setups.

**IMPACT:** This technology can potentially lead to much more cost effective and less labor intensive biodetection and medical diagnosis solutions as well as advanced and affordable instruments for molecular biology and biochemical research.

## UNIVERSITY OF NORTHERN COLORADO

**INVESTIGATOR:** Steve Mackessy, Ph.D.

**TITLE:** Toxins To Drugs: An Investigation of Colubrid Snake Venoms for Anticancer Compounds

**RESEARCH:** Identifying and evaluating novel snake venoms with high promise for potentially useful drug compounds on three different and common human cancers.

**IMPACT:** The research has accumulated a high number of venoms from snakes; developed an efficient workflow for processing venoms; purifying components and evaluating effects as well as moving into the next phase of drug discovery and development.



**PhRMA**

Pharmaceutical Research & Manufacturers of America  
Disease is our enemy. Working to save lives is our job.

## EARLY STAGE COMPANY AWARDS 2010-2011

### 2C TECH CORPORATION , LONGMONT

Development of animal models and complete formulation for phase I clinical trials of nanotechnology for the preservation of vision in patients with retinal degenerative diseases.

### BIOAMPS INTERNATIONAL , LLC, AURORA

Development of a peptide drug solution to the problem of bacterial resistance to conventional antibiotics.

### CLARIMEDIX INC., BOULDER

Development of a proprietary medical device technology with the ability to non-invasively trigger and modulate the production of nitric oxide to treat Alzheimer's disease.

### CYTOLOGIC, INC., BOULDER

Commercialization of UNLEASH, CytoLogic's novel immunotherapy aphaeresis column, for cancer treatment.

### MOSAIC BIOSCIENCES, BOULDER

Commercialization of versatile tissue regeneration technology to create a synthetic extracellular matrix that can be used to expedite the natural healing and tissue regeneration process.

### PEPTIVIR, INC., AURORA

Commercialization of a conformationally-constrained, synthetic peptide-based vaccine platform for the prevention of viral diseases.

### PRECISION BIOPSY, AURORA

Prototyping of a proprietary fluorometer that can be utilized in clinical settings for real-time diagnosis of prostate cancer.

### SUVICA, INC., BOULDER

Development of compounds identified in a novel screen and licensed from CU-Boulder. These compounds enhance the efficacy of standard cancer therapies and have the potential for use in the treatment of multiple cancer types.



## COMMERCIALIZATION INFRASTRUCTURE AWARDS 2010-2011

### COLORADO INSTITUTE FOR DRUG , DEVICE AND DIAGNOSTIC DEVELOPMENT (CID4)

The Colorado Institute for Drug, Device and Diagnostic Development funds and provides management expertise to life science discoveries from Colorado research institutions and start-up companies through feasibility, pre IND studies, and initial clinical trials with the goal of creating viable new Colorado bioscience companies supporting quality jobs.

### CSU – COLORADO CENTER FOR DRUG DISCOVERY

The Colorado Center for Drug Discovery (C2D2) fills a gap in drug-discovery at Colorado research universities. The C2D2 provides medicinal chemistry, pharmacokinetics, and consulting resources to create new patent-protected compounds useful for validation of novel drug discovery targets and drug candidates for clinical development by Colorado biopharma companies and others.

### CU – COLORADO INITIATIVE IN MOLECULAR BIOTECHNOLOGY (CIMB)

The CIMB is engaged in the construction of a state-of-the-art 311,000 square foot research and education facility that links the basic sciences, engineering, clinical practice, and industry at the University of Colorado's Boulder campus to support breakthrough developments in areas such as engineering human tissues, RNA enzyme and aptamer based pharmaceuticals, biorefining, and genetics. State grant funds will be applied to the costs of the Integrated Novel Therapeutic Discovery Center, a Sequencing Center, and costs to construct a specialized research support center.

