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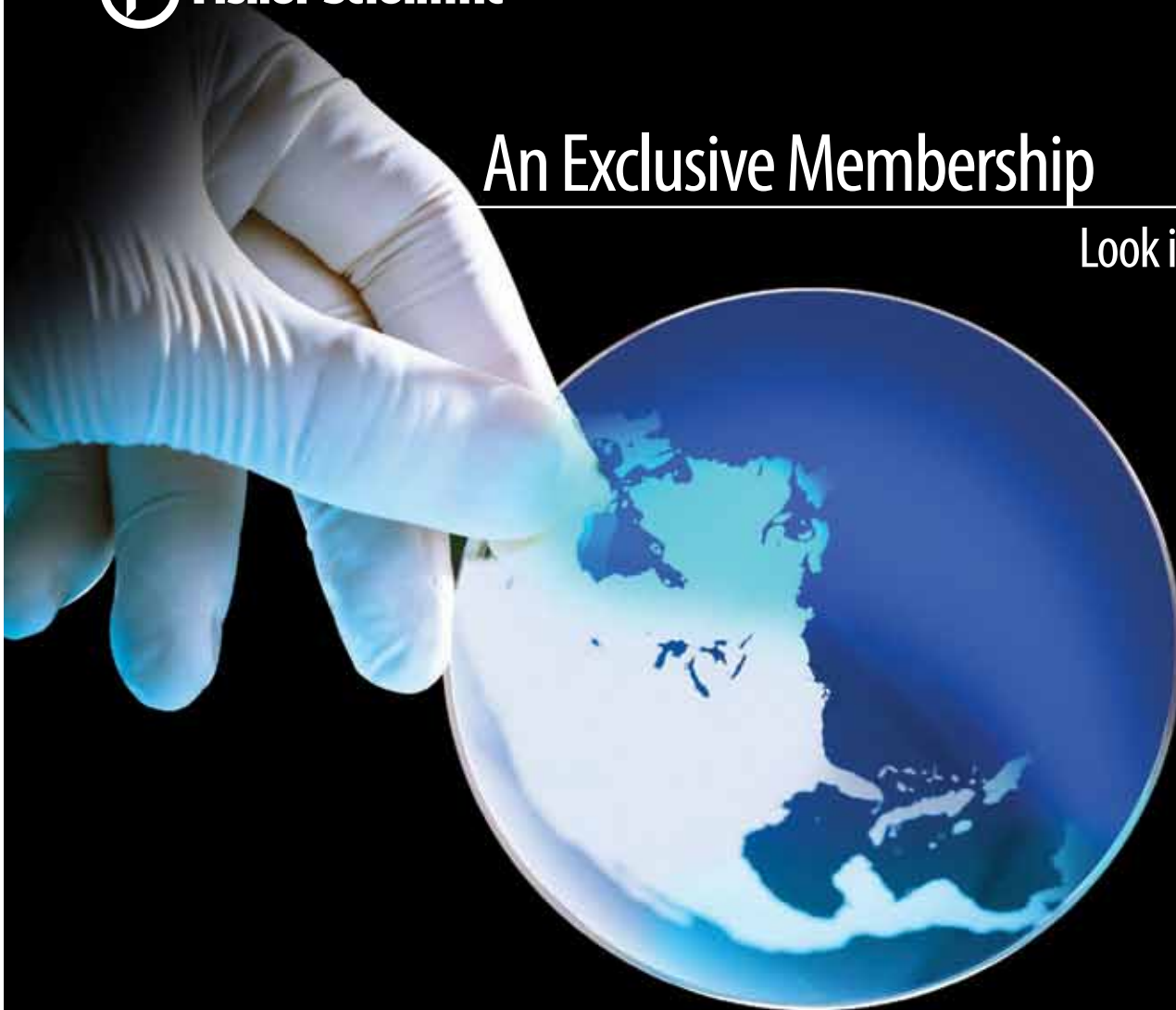
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The University of Colorado is advancing biomedicine.

The Anschutz Medical Campus and Fitzsimons Life Science District in Aurora will be one of the largest academic biomedical developments in the U.S. when completed, including three affiliated hospitals.

In Boulder, the new Jennie Smoly Caruthers Biotechnology Building will house more than 600 faculty, staff and students from nine CU-Boulder departments, helping create genuinely groundbreaking biotechnology research via the CU Biofrontiers Institute: a collaboration among CU-Boulder, the CU Anschutz Medical Campus and the University of Colorado Colorado Springs.

CU is recruiting world-class interdisciplinary faculty for these and other initiatives, like the new Colorado Center for Health and Wellness and Department of Bioengineering at the Anschutz Medical Campus, and ongoing bioscience and technology efforts on the Boulder campus.

Opportunities to advance Colorado’s biotech industry through CU’s flourishing research enterprise are plentiful:

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- sponsored research – CU’s four campuses receive ~\$500M of bio-related sponsored research annually
- longer-term research collaborations through the Anschutz Medical Campus’ Office of Corporate Alliances and the CU Biofrontiers Institute
- technology licensing and new business creation through CU’s Technology Transfer Office

CU has a track record of alliances with companies that enhance healthcare outcomes – CU research has led to four new approved drugs and numerous new diagnostic tests and medical devices, and CU is nationally prominent for new company creation, including biotech firms like Myogen (purchased by Gilead), GlobelImmune, ARCA biopharma, OPX Biotechnologies, SomaLogic, Taligen (purchased by Alexion) and 70 others since 1994.

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Biofrontiers Institute

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BioScience

Colorado



Welcome to the Colorado BioScience Association's eighth edition of *BioScience Colorado*, the state's only in depth guide and directory to the bioscience industry.

This publication is an integral part of the Association's mission to support the Colorado bioscience community through advocacy, resources, and advancement of opportunities for collaboration. With a total audience of over 15,000, including on-line impressions, this publication is one of the industry's greatest voices locally, nationally, and internationally.

This issue of *BioScience Colorado* highlights centers of excellence within the state. As we developed this issue, we asked "what makes a center of excellence?" The research our writers and experts have compiled for this issue illustrates that there are several components—infrastructure, expertise, industry connections, and patient outcomes. Each article focuses on a center and examines the elements that make it truly excellent.

We are proud to say there is a level of *elevated thinking* in Colorado bioscience. We have some of the top research institutions in the country and over 600 bioscience companies led by the best in the industry—creating the vision and drive to succeed. That's why so many great ideas that impact the globe start and grow here.

As a whole Colorado is an excellent place for bioscience—spread the word!

Holli Riebel

President and CEO
Colorado BioScience Association

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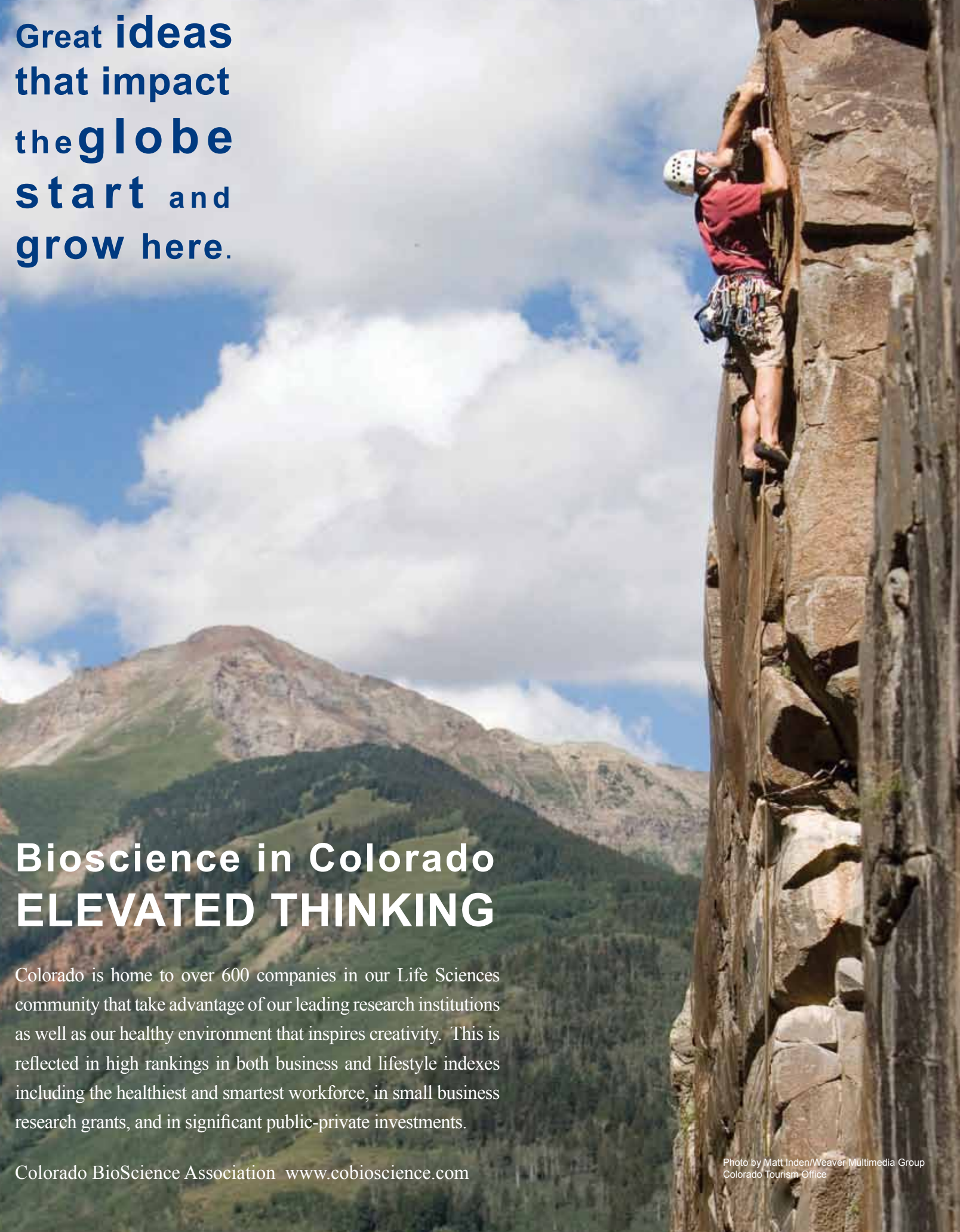
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COMING TOGETHER TO IMPROVE CANCER TREATMENT

BY ANDREA PAWLICZEK



Anschutz Medical Campus, Aurora, Colorado

As scientific research into cancer has progressed, there has been increasing awareness of its complexity and the differences among different cancers, even those in the same organ. According to Patrick Mahaffy, CEO of Clovis Oncology, a company based in Boulder, Colorado, “We now think about cancer on the genetic and cellular level rather than by organ type.” This way of thinking means that for two people with the same type of cancer—for example colorectal cancer—the appropriate course of treatment might be very different based on the specific mutations or characteristics of their individual tumors.

This new understanding offers hope

that cancer treatment could be improved by identifying—through diagnostic testing—the most appropriate treatment for each patient. But it also presents a daunting task. First, differences in individual tumors must be identified. Then, both the therapies and diagnostics must be discovered, developed, and tested. This is not something one researcher, company, or hospital could hope to achieve alone. Despite the challenges, the University of Colorado Cancer Center (CU Cancer Center) has a bold vision for 2025—for Colorado to have the lowest cancer mortality rates in the country and be able to serve as a model for other states.

The CU Cancer Center is the only

recognized National Cancer Institute comprehensive cancer center in the state of Colorado and contributes to the improvement in cancer care across all phases—from discovery and development, to delivery.

SURPASSING THE NATIONAL AVERAGES

Providing top quality care to patients is at the heart of the center’s mission; in 2010 alone the CU Cancer Center saw more than 19,000 new patients. In addition, the Center is able to achieve outcomes that substantially surpass national averages in many cases. For example, the five-year survival rate for stage IV breast cancer is about 40% at the Center versus about 20% nationally. The CU

Cancer Center also focuses on total patient care rather than just treatment—a broader focus that includes prevention and survivorship. Mark Kochevar, Center associate director for administration and finance, comments, “As more patients survive longer, it is essential to provide continued support and care even after intensive therapy may be over.”

The CU Cancer Center is a resource even for those who might not be able to travel regularly to the metro Denver area. Kochevar notes that “Colorado is a large and

geographically challenging state, making outreach extremely important.” Recently, the University of Colorado Hospital and the Poudre Valley Health System, located in northern Colorado, joined forces to form University of Colorado Health. The Cancer Center also has formal collaboration with six hospitals across the state, from Glenwood Springs to Colorado Springs, to help ensure that community oncologists are informed about the most recent research, have expert counsel available, and can offer patients access to clinical trials.

LEVERAGING RESOURCES, FROM DISCOVERY TO DEVELOPMENT

CU Cancer Center’s mission goes far beyond providing the best care currently available. The more than 440 doctors and scientists of the cancer center are actively engaged in research to discover new targets and treatments. They have garnered an average of \$522,687 in research funding per capita, totaling over \$148 million. Although the largest concentration of doctors and scientists is on the Anschutz Medical Campus in Aurora, researchers are spread across the state including on the campuses of CU Boulder, Colorado State University in Fort Collins, and National Jewish Health in Denver. They are all supported by the CU Cancer Center’s 13 shared resources—including biostatistics, genomics, tissue biobanking, and flow cytometry. This provides scientists with equipment, expertise, and facilities that are vital to research, but which would be too expensive to maintain in a single laboratory.

Even after a valuable discovery has been made, there is still a long road to having a marketed drug or diagnostic tool. Bioscience companies such as Clovis Oncology often lead this development stage. “There is an excess of discovery compared to the current capacity for development,” notes Clovis CEO Mahaffy. “Moreover, the skill set to develop a drug is in many ways different than that needed for drug discovery.” Clovis helps bridge this gap by pushing promising drugs through the development process. Centers such as the CU Cancer Center still play an extremely important supporting role at this stage by serving as sites for clinical trials. In fact, 27% of new patients at the Center participate in clinical trials, and it will serve as one of the clinical trial sites for an important phase I/II lung cancer trial of Clovis’ CO-1686, an oral epidermal growth factor receptor (EGFR) inhibitor.

Gone are the days when anyone talks about a single cure for cancer. Rather, the complexity and heterogeneity of cancer require multiple types of work to improve outcomes. This work ranges from basic scientific research, to drug and diagnostic development, to patient care. To make advances in a task so complex takes the efforts of physicians, researchers, companies—and centers like the University of Colorado Cancer Center where key resources can come together.

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CANCER, CANINES AND THE QUEST FOR A CURE IN COLORADO

BY ANDREA PAWLICZEK

Stepping into the waiting room at the Colorado State University (CSU) Veterinary Teaching Hospital campus, it might seem much like the reception area in any medical office. Patients' families wait—some looking nervous while others pass the time reading or playing with smart phones. Doctors in white coats and nurses in scrubs stride through purposefully, sometimes stopping to update families. Then, a patient returning from chemotherapy comes trotting out on a leash, wagging its tail, anxious to be reunited with its owner. This is a different kind of medical facility.

The CSU Animal Cancer Center (ACC) at the CSU Veterinary Teaching Hospital treats dogs and cats suffering from cancer—one of the most common and devastating diseases affecting adult pets today. World-renowned in the field, the Animal Cancer Center sees 1,500 new patients a year, 25% of whom travel here, with their human companions, from outside of Colorado. The center is also a training ground for eight to 10 residents and fellows studying veterinary oncology, and provides over 3,000 phone consultations to veterinarians and pet



Golden retriever Jasper was treated at the CSU Animal Cancer Center.

owners per year. Companion animals receive the best possible care, along with support for their owners.

Veterinary oncologists here use many of the same tools as those treating humans to combat the cancers that afflict their patients—surgery to remove localized tumors, radiation to shrink tumors, and chemotherapy in

attempts to control systemic disease. On the chemotherapy front, veterinary oncologists are faced with a relative paucity of data compared to that in human patients. Only two drugs and one vaccine are approved to treat cancer in animals. Much of current treatment involves repurposing human drugs, usually the relatively less expensive generic medications.

NEW TREATMENTS FOR PEOPLE—AND THEIR BEST FRIENDS

In this challenge, there also lie several opportunities. Many pets with cancer may be eligible for well-managed clinical investigations of new therapeutic agents or devices. At any given time, the ACC is conducting 10 to 15 clinical trials for therapies that bioscience companies hope will eventually be used in humans.

Dr. Rodney Page, ACC director, explains that the center's dual missions are "providing top quality care to companion animals as well as helping to advance new therapies being developed for people." These missions go hand in hand; 'human' therapeutic companies conducting trials provide financial support to the center, making it possible for pet owners with financial constraints to get treatment for their best friends.

Moreover, the National Cancer Institute has recognized that dogs are an excellent model for many human cancers due to genetic similarities, similar cancer types, and similar responses to treatment. Clinical trials in dogs can enable the evaluation not only of the efficacy of a particular drug, but also provide important information on optimal dosing and scheduling, safety, and the correlation with biomarkers and imaging. Page would like to see research collaborations expand further to the point where they become financially self-sustaining

One company looking to capitalize on animal-human synergy is VetDC, based in Fort Collins. VetDC was established as a spin-off



CSU Animal Cancer Center, Fort Collins, Colorado

of CSU Ventures, an organization designed to commercialize promising research coming out of CSU. Dr. Terry Oppenorth and others at the university recognized an untapped opportunity to approach human health companies that were conducting research at CSU to obtain licenses to implement similar programs for veterinary use. "In discussions with many of these companies, very few have the bandwidth, resources, or strategic focus to adequately develop their programs for veterinary applications," says Dr. Oppenorth. "That's where VetDC comes in."

Steven Roy, a veteran of the pharmaceutical industry, was brought in to serve as CEO, and help establish and advance VetDC's product pipeline.


In one example, a clinical trial conducted at the Animal Care Center gave VetDC a unique opportunity. Dr. Douglas Thamm, a medical oncologist at the center, was working on a trial for a promising new anti-cancer compound being studied in pet dogs with lymphoma. Although the drug showed strong efficacy in reducing the sizes of tumors in many of the treated dogs, Gilead (the company developing the drug) chose

not to pursue further human development. Dr. Thamm brought the opportunity to the attention of VetDC and eventually the company was able to negotiate a license for the use of the drug, VDC-1101, in animal cancer.

Licensing a molecule already under development gave Gilead a "huge head start" versus developing a drug from scratch notes Roy. VDC-1101 already had a complete package of animal data, and was aggressively seeking funding to pursue FDA approval. The company is now looking to in-license other drugs since many human-focused biopharmaceutical companies have programs they are not actively pursuing that could be of tremendous benefit to animals. Roy believes VetDC is in an ideal position to bring in other opportunities that may arise. "The location near and collaboration with the Animal Cancer Center is a significant competitive advantage, since veterinarians and researchers at CSU are at the leading edge of companion animal research," he says.

Talking to any pet owner, the value of this innovative center becomes apparent. Chris Vincent, whose golden retriever, Jasper,

was treated for a rapidly growing form of cancer called hemangiosarcoma, praises the treatment that his pet received. "The most important thing to me was the great care everyone [at the ACC] provided to Jasper. Each doctor and nurse was superb, which gave me confidence that he was receiving the best treatment available. Ultimately, this gave me additional high-quality months with my dog." Vincent goes on to say "I also appreciate the fact that Jasper might help [veterinarians and researchers] learn something that advances medical understanding, which could allow others more time with their loved ones—human or canine."

In time, the research currently underway at the CSU Animal Cancer Center and companies like VetDC may lead to even more treatment options and more success stories. Although currently available treatments are limited, the center and its staff of highly trained veterinarians have much to offer pet owners and bioscience alike. "I want more people to know we're here," says Page. "Both to treat animals and support partnerships in drug development." 



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COLORADO COMBATS THE SPREAD OF INFECTIOUS DISEASE WORLDWIDE

CDC DIVISION BASED IN FORT COLLINS TEAMS WITH BIOSCIENCE FIRMS TO DEVELOP BETTER VACCINES

BY ANDREA PAWLICZEK



Aedes aegypti mosquito. Photographer James Gathany, Centers for Disease Control

Vector borne diseases —dengue fever, Lyme disease, the plague—are not top of mind concerns for most people in United States. Despite this relative lack of concern, these illnesses represent a real—and in some instances increasing—risk to people in this country.

Some aspects of modern life have actually increased the risks of vector borne diseases. International travel and commerce increase the possibility that infected vectors from other parts of the

world will be introduced. The encroachment of the suburbs into wooded areas increases potential contact with certain vectors such as ticks. The Center for Disease Control and Prevention’s Division of Vector-Borne Disease (DVBD) is charged with mitigating and managing these risks.

The DVBD addresses diseases primarily carried by three different vectors: ticks, mosquitoes, and fleas. Based in Fort Collins, Colorado, with additional offices in San Juan, Puerto Rico, and Atlanta, the agency’s

overarching goal is to protect the nation from bacterial and viral infections spread by these vectors. Toward this end, the DVBD engages in a variety of activities—from the development of preventative strategies and technologies, to disease management, to confirming and tracking outbreaks when they do occur. According to Emily Zielinski-Gutierrez, a behavioral scientist there, “A large part of our work is in collaboration with state and local health departments and international governments and organizations.”

A NEW VACCINE FOR DENGUE FEVER

Due to the nature of its work, the DVBD has many opportunities to collaborate and interact with biotechnology companies. One such instance occurred in the development of a dengue fever vaccine, exclusively licensed by Inviragen, a company formed to develop vaccines and also based in Fort Collins. The symptoms of dengue fever, a disease spread by infected mosquitoes, mirror that of a bad flu—high fever, fatigue, bone and body aches. In most cases, those afflicted are able to recover, however a percentage of cases develop into the more severe dengue hemorrhagic fever (DHF), which can be fatal. Most cases occur in tropical regions (dengue is currently endemic in Puerto Rico), but the disease can occur in some subtropical regions. In 2009 and 2010, nearly 100 cases of dengue were

reported in Key West, Florida.

Inviragen became aware of DVBD research into a new dengue vaccine through contacts at Colorado State University. According to Dan Stinchcomb, Inviragen's CEO, the vaccine was an attractive licensing opportunity for several reasons. The DVBD researchers had started with a weakened version of the DEN-2 virus, demonstrated to be safe in previous phase I trials in humans. They then replaced key structural genes with those of the other types of dengue (DEN-1, DEN-3, and DEN-4) because, to be effective, a dengue vaccine must confer immunity to all four types of the virus. "[The researchers] had done genetic mapping that gave us confidence that replacing the structural genes would not impact the safety of the original attenuated virus," Stinchcomb says.

Since executing an exclusive license with the CDC, Inviragen has continued to develop the vaccine, now called DENVax.

MANY OTHER COMPANIES THROUGHOUT COLORADO ARE ALSO WORKING TO IMPROVE THE DIAGNOSIS AND TREATMENT OF VARIOUS INFECTIONS.

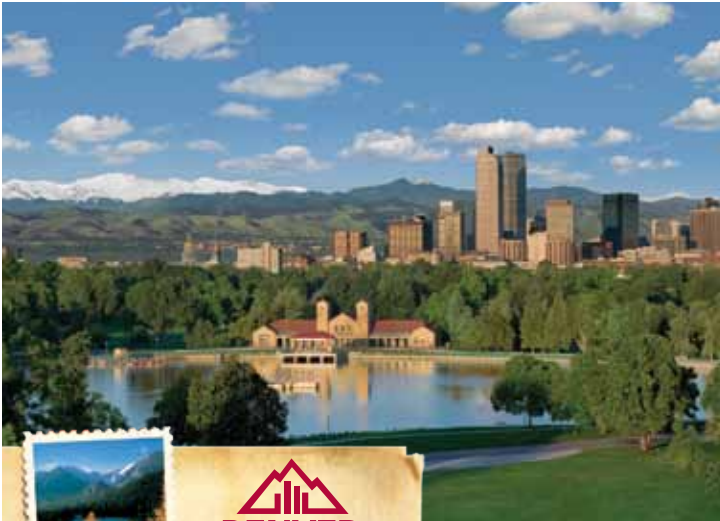
Microphage (Longmont) – Developed the FDA-approved KeyPath test that can identify the contagious staph bacteria MRSA within five hours

PeptiVir (Aurora) – Developing a synthetic peptide-based vaccine platform with lead product PVI-1000 that has the potential to be a universal flu vaccine

InDevR (Boulder) – Collaborating with GE with DARPA funding to develop a device that could rapidly identify flu and other infectious diseases at the point of care

The company recently completed a phase I trial in which DENVax was shown to be safe and well tolerated. Moreover, the vaccine induced neutralizing antibodies to all four types of dengue in study participants, a

strong signal of efficacy. Inviragen has already begun enrolling patients in a phase II trial where the vaccine will be tested in patients on three continents across a wider age range and including people



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previously exposed to dengue. “We’ve had opportunities for continued collaboration with DVBD scientists on two fronts,” Stinchcomb notes. “They are characterizing the viruses in the vaccines to ensure they are safe. Additionally, they are researching opportunities to improve the vaccine for a potential second generation product.”

TRACKING AND PREVENTING LYME DISEASE

Another important program at the DVBD is focused on Lyme disease, the most common vector-borne disease in the United States with about 30,000 cases reported in 2010. The DVBD has multiple programs to track and prevent Lyme disease. A core aspect of these programs is to prevent contact with infected ticks in yards where people spend much of their outdoor time.

The DVBD is also working on a unique vaccine for Lyme disease in collaboration with Ventria Biosciences of Fort Collins. The goal of this program is to vaccinate white-footed mice against *Borrelia burgdorferi*, the bacteria that causes Lyme disease, so the mice are unable to transmit the bacteria to ticks that could later infect humans (vaccinated mice could also kill bacteria in ticks already infected). To vaccinate mice, researchers propose placing the vaccine in bait that the mice would eat. The collaboration is currently funded by a phase II SBIR grant, awarded after successful progress on the project with a phase I grant.

The vaccine under development began with the same molecule as a Lyme disease vaccine for humans that used to be on the market but is no longer available. Through this public/private sector collaboration, DVBD scientists are doing laboratory testing to show that the vaccine is effective in conferring immunity to mice, and working to modify the vaccine so that it is effective when administered orally.

In turn, Ventria is working to optimize production of the vaccine using its ExpressTec protein expression platform, in which recombinant proteins are grown in rice. According to DVBD Chief of Microbiology and Pathogenesis Activity Barbara Johnson, Ventria has proved an ideal partner for several reasons beyond its geographic proximity. “Making the vaccine

in rice alleviates any safety concerns that might come with a bacterial platform. It’s also potentially very cost-effective. While many homeowners are concerned about Lyme disease, price sensitivity hovers around \$100 per season, making economical production important.”

Researching better vaccines is just a

fraction of the activity going on inside the DVBD to both manage today’s diseases and prepare for potential future threats—internally and in collaboration with other government agencies and companies. In other words, this agency spends every day thinking about vector-borne diseases so most of us will never have to.





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CHILDREN'S HOSPITAL COLORADO AND SOMALOGIC WORK TO SOLVE RARE PEDIATRIC LUNG DISEASES

BY JEANNE MCADARA-BERKOWITZ, PHD

As the director of the Children's Breathing Institute and Interstitial Lung Disease Program at Children's Hospital Colorado, Robin Deterding, MD, has taken on a daunting challenge: she wants to figure out how, at a molecular level, to recognize, treat, and predict outcomes for a group of related but distinct pediatric lung diseases. Some are so rare they don't even have their own names. Individually, these "rare diffuse lung diseases" may show up in only a handful of patients, but taken together they affect a significant number of children, although the exact prevalence of these diseases is not known.

The problems with managing rare diffuse lung diseases are multifold. Some arise out of genetic deficiencies in production of lung surfactants; others are immune disorders in which the body inappropriately attacks its own lung tissue; and the causes of yet others are still unknown. The symptoms often manifest from birth, meaning that tiny newborns or young children must undergo an uncomfortable, invasive, costly workup that may or may not yield useful insight into their disease. In infants, bronchoalveolar lavage—washing and collection of fluid from the lungs—yields at best a few milliliters of fluid for testing. Lung biopsy is common. And invasive procedures may need to be done throughout a child's life in order to monitor disease progression and response to treatment. Without a clear understanding of disease etiology, treatment choices are based more on art and past experience than on solid scientific evidence.

Deterding aims to change that, with the help of a pilot-stage collaboration with SomaLogic, a Boulder, Colorado,



Children's Breathing Institute and Interstitial Lung Disease Program at Children's Hospital Colorado, Robin Deterding, MD, with patient.

company. Through an unusually flexible and collaborative partnership, Deterding and her team are using SomaLogic's technology and expertise to analyze bronchoalveolar lavage samples from pediatric patients at Children's Hospital Colorado. Ultimately, the goal is to identify patterns of protein expression that differ between healthy and diseased lungs for use in clinical management.

At the core of SomaLogic's technology

is the Slow Off-rate Modified Aptamer, or SOMAmer™—a synthetic protein-capture reagent that can be engineered, in modular fashion, to bind with high sensitivity and specificity to a particular protein of interest. Built from modified nucleic acids instead of amino acids, SOMAmers essentially represent a human-engineered improvement over nature's protein-capture reagent, the antibody.



Children's Hospital Colorado, Aurora Colorado

SomaLogic has developed more than 1,000 distinct SOMAmers to date, each of which binds a different protein target critical to normal and disease biology. The SOMAmers are used together in the SOMAscan™ assay, to conduct highly multiplexed protein detection and measurement.

COLLABORATION SPEEDS UNDERSTANDING

From Deterding's perspective, access to SomaLogic's technology and scientists is enabling a profound acceleration in the pace of her research to understand rare lung diseases.

"At birth we have maybe a teaspoon of lavage fluid to work with," she says. "SomaLogic can detect 1,000 different proteins in a drop of that fluid, and tell us how their expression levels are different from one patient to another. That's going to make a huge difference in the not-too-distant future."

The benefits of the collaboration are not, of course, just on the part of Deterding's research program. If, in the future, her team's collaboration with SomaLogic is successful in using SOMAscan to develop reliable diagnostic signatures for pediatric lung diseases, the biggest beneficiaries will be patients.

"If we had these tools, we could spare kids the repeated, invasive workup. SomaLogic's technology could potentially replace all of that and help us get to treatment faster," says Deterding.

SomaLogic also stands to benefit from

the research directions set by Deterding and other research clinicians at Children's Hospital Colorado.

"We're learning that, when we work with bright, passionate, dedicated clinicians like Robin, and we give them and their teams access to our resources without a lot of predefined questions, they end up discovering all kinds of things none of us ever expected," says Stephen Williams, MD, PhD, SomaLogic's chief medical officer. "These researchers know best what they need out of a technology and can recognize quickly when something surprising and exciting is happening. The end result can be a much more direct path from discovery to development to validation than any diagnostics company might have designed on its own."

The SOMAscan research program at Children's Hospital Colorado isn't limited to rare diffuse lung disease; Deterding is working with another team of investigators—including Edith Zemanick MD, Kirk Harris, PhD, and Brandie Wagner, PhD—to analyze blood and lung fluid samples from cystic fibrosis (CF) patients, again hoping to tease out differences in protein expression that could predict which patients will respond best to different treatments.

"CF is a single disease, but each individual kid is still different," says Deterding. "We know that with different CF treatments, there are responders and nonresponders, but right now we have no way of knowing who's who until we've tried it empirically. If we can work with SomaLogic to develop a rapid diagnostic

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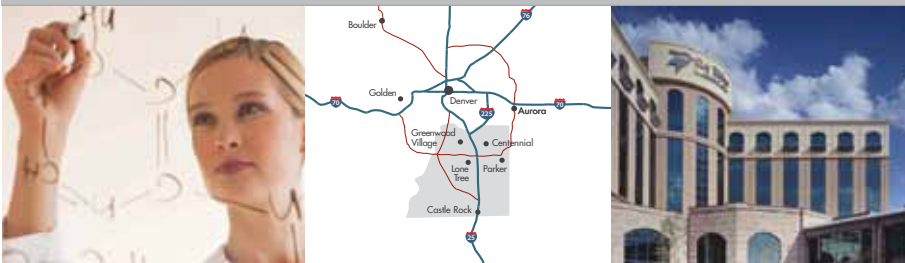
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signature from blood, we can skip the treatments that aren't going to work, and get patients on effective ones right away."

Children's Hospital Colorado provided the ideal environment for this research. It is a leading referral center for rare pediatric lung disease, the largest CF center in the country, and also has strong multidisciplinary programs in clinical care and translational research for cystic fibrosis, asthma, and lung diseases of prematurity. In addition to active patients, Children's houses an extensive, state-of-the-art clinical research laboratory with samples from Colorado and all over the world.

"When you think about Children's Hospital Colorado's research focus, talent, and resources, it was a natural fit for this work," says Williams.

TECHNICAL KNOW-HOW MEETS CLINICAL RESEARCH

Deterding and her team are already meeting with some early successes. She says they have identified the potential involvement of proteins not previously associated with lung disease. That could provide interesting clues no one had considered previously. While the research represents an exciting potential real-world application of proteomics (large-scale study of proteins), in the end, its success will hinge on the clinical utility of the findings.

"It's not enough to look at the expression patterns and say 'isn't that interesting,'" says Deterding. "The key will be to get this to the clinic, and that's why the collaboration is so important. They have the technological know-how, and we have the clinical research capabilities."

For SomaLogic's part, they see this collaboration as a model for future programs, in a variety of therapeutic areas, including neurodegenerative and gastrointestinal diseases—and not only the common ones.

"We think this approach holds the key for anyone with rare or mechanistically complex diseases," says Williams.

Meanwhile, back in the clinic, Deterding's excitement about the collaboration's potential is unmistakable.

"It's so frustrating how limited our knowledge about these diseases is right now," she says. "But I just know that, in five years, we will look back and be absolutely amazed at how far we've come."

NATIONAL JEWISH HEALTH TEAMS WITH INDUSTRY TO TREAT ASTHMA AND OTHER INFLAMMATORY DISEASES

BY JEANNE MCADARA-BERKOWITZ, PHD

Despite the availability of a wide range of treatments, recent epidemiological studies have shown that greater than 50% of patients taking multiple asthma medications still have poorly controlled disease. Patients with uncontrolled asthma face higher risks of exacerbations, hospitalizations, ER visits, and rescue interventions, not to mention serious long-term health consequences. Thus, the search for new and better asthma medicines continues.

“Asthma is a disease with significant heterogeneity,” says Rohit Katial, MD. “Some patients do very well with currently available inhaled medications, but others continue to have significant symptoms even with high-dose oral corticosteroids. Clinical trials studying new therapeutics provide some hope for the future for such patients.”

Katial is the director of the Allergy & Immunology-Adult Program, and the director

of the Weinberg Clinical Research Unit, at National Jewish Health (NJH) in Denver, Colorado. His clinical practice includes several thousand patients with asthma, allergy, sinus disease, allergic eczema, and primary immune deficiencies. Katial’s involvement in a number of asthma-related research programs, including inflammation,

biomarkers, aspirin intolerance, and drug development, led him to a recent collaboration with Boulder, Colorado-based N30 Pharmaceuticals, aimed at finding new medicines for asthma.

N30 Pharma is taking a novel approach

Rohit Katial, MD, National Jewish Health

National Jewish Health campus in Denver, Colorado.



to this problem. Their product development program is centered on modulating the nitric oxide (NO) signaling pathway—specifically, they are developing therapeutic candidates that inhibit the enzyme S-nitrosoglutathione reductase (GSNOR), in turn increasing the body's circulating pool of the molecules S-nitrosoglutathione. S-nitrosoglutathione is a physiological precursor for the signaling molecule, NO, and changes in its concentration produce downstream effects on numerous aspects of physiology, including cellular receptor function, inflammation, vascular and airway smooth-muscle tone, and breathing control.

Given the properties of N30 Pharma's GSNOR inhibitor (GSNORi) compounds, the company's clinical program is initially aimed at the treatment of acute inflammatory lung conditions, such as asthma and COPD. The company's lead candidate, N6022, is among the most potent in its portfolio of GSNORi.

A STEROID-FREE ALTERNATIVE

"Our compounds provide a potential new therapeutic class for inflammatory respiratory disease," says Janice Troha, N30 Pharma's vice president of clinical development and regulatory affairs. "In animal models they exhibit potent bronchodilatory and anti-inflammatory properties. We also have evidence that N6022's effects would likely be additive to beta agonist treatments, and provide an alternative to the steroid anti-inflammatory pathway in asthma patients."

As exciting as these predictions are, there is a long road between early evidence and clinical outcomes. Having successfully brought the compound through phase I, N30 Pharma turned to Katial and National Jewish Health for help with the next step in N6022's journey, a phase IIa clinical trial.

Founded in 1899, NJH is known worldwide for treatment of patients with respiratory, cardiac, immune, and related disorders, and for groundbreaking medical research.

"Throughout its history, National Jewish has continuously been on the cutting edge of treatment and research to advance the science of respiratory disease," says Katial. "In this case, we have the deep clinical research experience and patient population of difficult-to-treat asthma patients that makes us an ideal partner for N30 Pharma's research."

For Katial, working with a small, local company on such an early-stage therapeutic has been a refreshing and invigorating experience. Says Katial, "the relationship with N30 Pharma provided an opportunity for an unusual amount of face-to-face interaction and direct collaboration. We were able to provide input on the best approaches to study design and appropriate endpoints—something we don't often get to do when working within the bureaucracy of the large pharmaceutical companies."

Because N6022 is a completely new drug, with a novel mechanism of action, a cautious approach to clinical trial design was warranted. With valuable input from

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Katial and the other trial investigators, N30 Pharma opted to test the intravenous (IV) formulation of N6022, and designed the study as a phase IIa, double-blind, randomized, placebo-controlled, two-period crossover study to evaluate the bronchoprotective effects of a single dose of

N6022 in adult patients with mild asthma.

“The strategy we arrived at was to use the IV formulation as a ‘pathfinder’ drug, since it gave us the opportunity of a rapid path into the clinic,” says Troha. “We and the NJH investigators felt that this was important for an entirely new class of drugs that had not been tested in patients before.”

Data collection was completed late in 2011 and analysis is under way. While NJH investigators and N30 Pharma couldn’t reveal any specific results at the time of this writing, they did note an interesting pattern of response, with sustained effects for more than 24 hours after a single IV injection, consistent with previous preclinical results.

THE NEXT STEPS

Development will depend on the outcome of this study, but Katial and N30 Pharma are currently working together on plans for stratifying patient selection and identifying responders in asthma and COPD. Should the final results of the analysis and additional

trials prove favorable, N30 Pharma hopes to develop N6022 for inhaled delivery and other, related compounds for oral administration.

“In the end, our goal is to help people with asthma live their lives in ways similar to those without,” says Katial. “They should be able to enjoy work, personal activities, and other endeavors without limitations from their underlying disease. That’s why this work is so important.”

For its part, N30 Pharma recognizes great value in the time, input, and effort Katial and NJH have invested in this collaboration. Troha says they see this early study as just the beginning of an ongoing collaboration that will undoubtedly yield long-term gains.

“When you are developing compounds in clinical research, building long-term relationships with thought leaders who can provide critical research and clinical insight, as well as knowledge about how each system works operationally, is one of the keys to success.”



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FITZSIMONS REDEVELOPMENT AUTHORITY BIOSCIENCE BUSINESS INCUBATOR FUELING ECONOMIC GROWTH AND A COLLABORATIVE, THRIVING COMMUNITY

BY CASEY DEMCHAK

The Fitzsimons Redevelopment Authority (FRA) had a bold vision when it opened its bioscience incubator in July of 2000. The goal was to provide office and lab space within the FRA's 60,000 square-foot Bioscience Park Center that would foster a collaborative environment among startup bioscience companies.



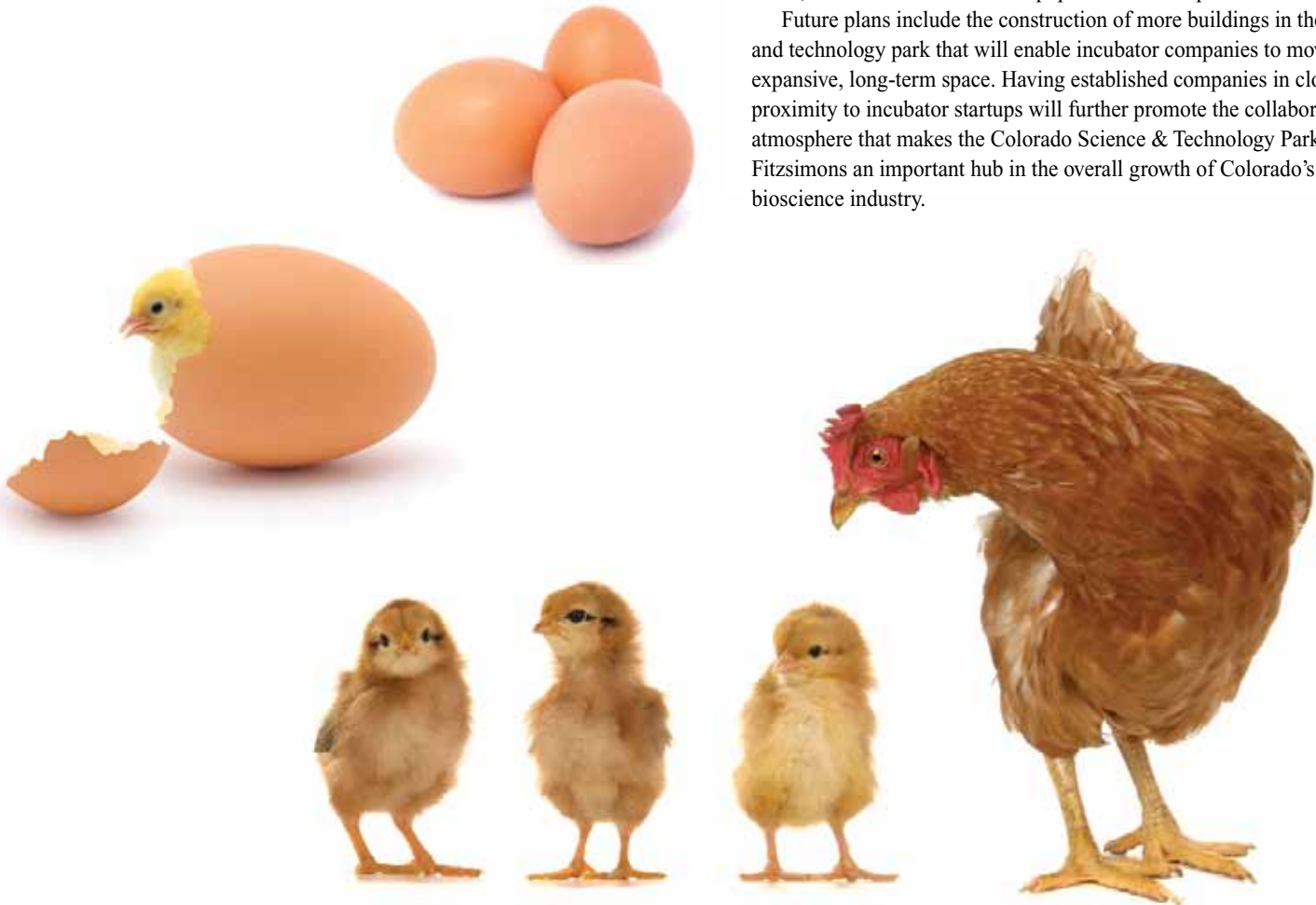
With access to University of Colorado core labs, business development assistance, shared scientific equipment, conference rooms, and other essential services, the hope was that early-stage companies would become successful organizations that create jobs and help drive the growth of Colorado's bioscience industry.

Nearly 12 years after its inception, the authority's vision has become a reality—and the prospect of even greater growth looks bright. Some of the prominent Colorado companies that began in the incubator include Myogen, Accera, GlobelImmune, and ValveXchange.

Today, the incubator is home for 35 companies in different stages of development. Several of them show great promise. Just some of the companies industry leaders have their eyes on are Beacon Biotechnology, Mitomics, Sharklet Technologies, and Oberon FMR.

While FRA's vision remains the same, the authority has made some notable upgrades over the years to its incubator services. A second building, Bioscience East, was added in 2005, allowing maturing companies to move to larger space. A 37,000 square-foot accelerator building attached to the Bioscience Park Center will open in July, 2012. Business development services have been enhanced, access to CU core labs has become even easier, and additional scientific equipment has been purchased.

Future plans include the construction of more buildings in the science and technology park that will enable incubator companies to move into expansive, long-term space. Having established companies in close proximity to incubator startups will further promote the collaborative atmosphere that makes the Colorado Science & Technology Park at Fitzsimons an important hub in the overall growth of Colorado's bustling bioscience industry.



SUCCESSFUL GRADUATE COMPANIES

Company	Entered	Graduation
Myogen	1998	2000
Accera	2002	2004
GlobeImmune	2002	2005
Evolutionary Genomics	2003	2007
VitroDiagnostics	2002	2007
Taligen Therapeutics	2004	2011
ValveXchange	2008	2011
ARCA Biopharma	2004	2010

INCUBATOR STATISTICS

- 35 current companies (academic & commercial) located in Fitzsimons Redevelopment Authority buildings
- 59 total current and past companies that occupied FRA buildings (academic & commercial entities) since 1998
- 52 total current and past Incubator clients
- 9 successful graduates (still active or acquired)
- 578 jobs created*
- \$659 million Funds raised by incubator clients (does not include acquisition amounts)

* (Companies with available data)

CURRENTLY INCUBATING

AktiVax	Life BioScience, Inc.
Avidity, LLC	Light Labs
Barofold, Inc	Lohocla Research Corp
Beacon Biotechnology	MBC Pharma, Inc.
BioAMPs International LLC	Mitomics Inc
Biodesix	Mosaic Biosciences, Inc.
BodySync, Inc.	NanoTrans Technologies Inc.
CID4	Oberon FMR
Clarimedix	OncoTherix
ClinImmune	PhosphoSolutions, LLC
Crestone	PolyNEW, Inc.
CU Dermatopathology	Qgenta
Consultants	Shape Ophthalmics LLC
ELISA Tech	Sharklet Technologies
EndoShape, Inc.	Taiga Biotechnologies, Inc.
Fluonic Inc.	Telsano
FluTrends International, LLC	Touch of Life Technologies
iCanDxRx, LLC	UCD-Technology Transfer
iC42 Bioanalytics/CU Dept of	Office
Anesthesiology	Work, Education and Lifelong
ICV Rx	Learning Simulation
IHC Tech	(WELLS) Center
Isogenis, Inc.	XNTERA Corporation

For more information visit www.FitzScience.com or contact Vicki Jenings at vjenings@colobio.com

Rendering of the Bioscience Park Center with expansion.



UNIVERSITY OF COLORADO HOSPITAL ACADEMIC ENTREPRENEURSHIP MEETS CARDIOVASCULAR INNOVATION

BY CASEY DEMCHAK

There is an important business dynamic growing stronger every day in Colorado that plays a vital role in cardiovascular treatment innovation. It centers on the interweaving of academic research and entrepreneurial passion that leads to the formation of companies changing the face of medical device and drug development.

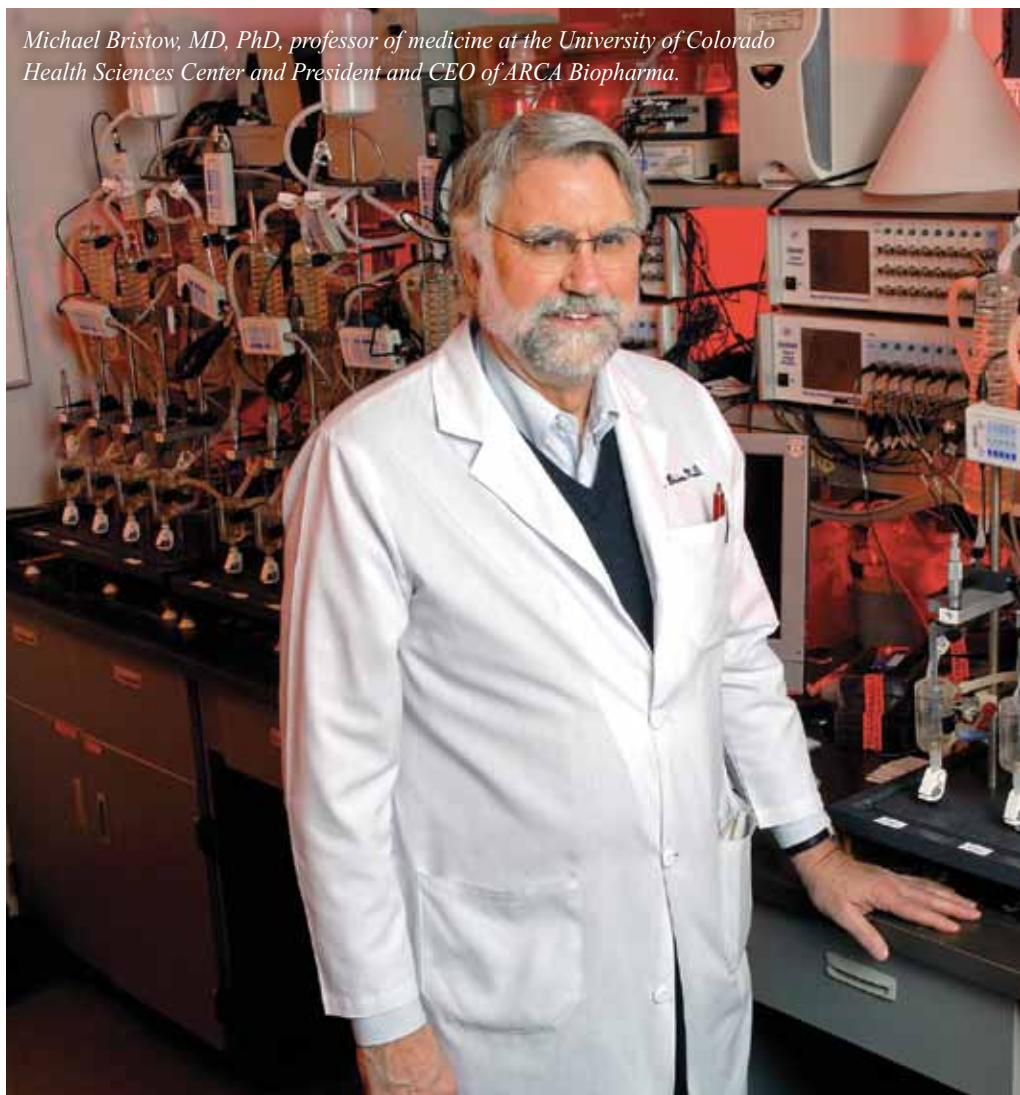
The relationship between University of Colorado Hospital (UCH) and ARCA Biopharma exemplifies this vibrant interplay. Michael Bristow, MD, PhD, is professor of medicine at the University of Colorado Health Sciences Center and president and CEO of ARCA Biopharma, which he co-founded in 2004. ARCA's mission is to develop cardiovascular drugs that uniquely act through important genetic variants in drug targets, a process known as pharmacogenetic targeting.

ARCA is currently developing Gencaro,™ a drug intended to help prevent atrial fibrillation and treat chronic heart failure. All of the discoveries related to Gencaro,™ and other compounds in the ACRA pipeline, originated in Dr. Bristow's lab at UCH or in the laboratory of a close scientific and NIH grant collaborator,

Dr. Stephen Liggett of the University of Maryland. This mix of academic discovery leading to the creation of a growing enterprise also resulted in the formation of Myogen Inc., which Dr. Bristow co-founded with Leslie Leinwand of CU Boulder. There, he served as chief science and medical officer and director until the company was acquired by Gilead Sciences in 2006.

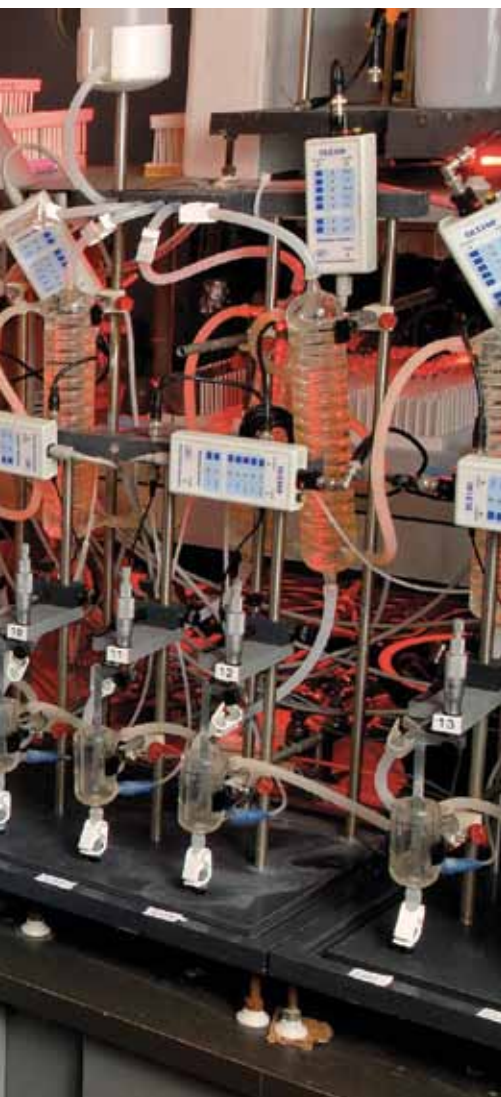
The creation of ARCA Biopharma is a great example of how discovery science at UCH can result in the birth of a Colorado biotech company. "Following the usual discovery trajectory, when we have a target or compound within the pharmacogenetic universe we think is protectable from an intellectual property standpoint, we disclose it and submit a patent," says Dr. Bristow.

Michael Bristow, MD, PhD, professor of medicine at the University of Colorado Health Sciences Center and President and CEO of ARCA Biopharma.



“We then license the patent from UCH to ARCA through the university tech transfer office. From this point, the R&D and commercial development of the compound is in the hands of the company, and the role played by UCH ends. However, they still retain royalties from product sales and maintain an equity stake in the company.”

This academic-entrepreneur model benefits UCH through product sale royalties which create additional revenue streams that lead to new research and discovery. Companies that form from discovery at UCH gain because they don't have to build freestanding laboratories or other facilities for work that can be more easily contracted through UCH. In addition, the state of Colorado reaps economic rewards through greater job creation and the expansion of our bioscience community.



ACADEMIC ENTREPRENEURS

One aspect of the academic-entrepreneur model that makes UCH a regional center of excellence is its willingness to allow academic physicians to remain professors while also wearing the hat of CEO in a company they founded. What makes this work are well-defined standards that assure ethical lines are not crossed and conflicts of interest between UCH and companies like ARCA are avoided.

Not every university hospital around the country allows for physicians who have dual missions. However, Peter Buttrick, MD, head of the Division of Cardiology at UCH, believes the academic-entrepreneur model can be very advantageous.

“UCH has a very enlightened tech transfer office and excellent relations with the state of Colorado,” reports Dr. Buttrick. “We are always eager to develop sponsored research agreements with companies formed through discovery at UCH because it can lead to economic and quality of life advancements that benefit our citizens, the university and the growth of our statewide bioscience sector.”

While support of academic entrepreneurs is one hallmark of UCH's contribution to the bioscience community, their advancements in cardiovascular care are also central to its recognition as center of excellence in Colorado.

UCH is the only hospital in the region to perform heart transplants, and one of two Colorado hospitals—along with Medical Center of The Rockies—chosen to perform transcatheter aortic-valve implantation using the SAPIEN heart valve from Edwards Life Science.

SUPERIOR CARDIOVASCULAR CARE THAT DRIVES INNOVATION

Transcatheter procedures that eliminate the need for open-heart surgery represent a shifting approach to treating structural heart disease. Much of the technology and innovation guiding this shift is being driven by emphasis on superior cardiovascular care.

One such innovation is new approaches to treating an irregular heartbeat. Today, it's possible to electronically map and ablate disordered circuitry within the heart to cure patients who have certain types of electrical instability—the most common form being



Peter Buttrick, MD, Head of the Division of Cardiology at UCH.

atrial fibrillation.

Although a lot of hospitals perform such ablations, Dr. Buttrick believes UCH is at the cutting edge of this technology. “We can perform ablation procedures better than most because of advanced technology that enables us to approach electrical arrhythmias very effectively.” Dr. Buttrick goes on to say, “Five years ago success rates for atrial fibrillation ablation was in the 50% to 60% range, but today we can report success rates of about 85%.”

Advancements in the placement of left ventricular assist devices (LVAD) are another cornerstone of UCH's cardiovascular program. Each year life-saving devices are implanted in about 30 patients. During an LVAD procedure, a tube is placed in the left ventricle pumping chamber. Blood is evacuated and run through an LVAD that is external to the heart—and then the blood is pushed back into the aorta.

Five years ago, LVADs were considered a short-term stop-gap for patients with weak hearts who were awaiting transplantation. Now, due in large part to miniaturization and the research being done at UCH, LVADs can be a longer-term solution for patients too old or weak to undergo heart transplant procedures.

Lloyd Deavenport of Erie, Colorado, is one local resident who had his life extended through the implantation of an LVAD. After being told in 2009 that he only had a few hours to a few days to live because of his weakened heart, Mr. Deavenport agreed to have an LVAD implanted.

“It was very traumatic for me and my family to be told I might only have hours to live,” says Loyd. “Following a brief period of indecision, I decided to go through with the procedure. After a few weeks I began feeling better. It did take some time to go through physical therapy and regain my strength and stamina, but now I’m able to play golf a few times a week, enjoy my family and even take a few well-deserved vacations.”

Ultimately, the innovative cardiovascular research and science being done at UCH is about restoring quality of life for people like Loyd Deavenport. Through close associations with academic entrepreneurs and an emphasis on advancing minimally invasive heart procedures, UCH is poised to grow even stronger as a regional center of excellence.

Recently, UCH finalized a joint operating agreement with Poudre Valley Health System that creates a health network industry leaders say will expand healthcare services, and provide unmatched patient care in the Rocky Mountain region. And in the end, that’s what it’s really all about.



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S P R I N T

COLORADO AT THE CENTER OF BIOFUELS RESEARCH

BY ANDREA PAWLICZEK

Biofuels, fuels derived from biomass such as wood or corn, lie at the intersection between the bioscience and clean technology industries. Creating these fuels efficiently takes a deep understanding of biological and chemical processes that can turn the original biomass, algae for example, into a usable product such as biodiesel. The effort is well worth it, however, since biofuels can be produced with less carbon emissions and particulate pollution than traditional fossil fuels.

It's not surprising that Colorado's strengths in both bioscience and clean technology have made it a hub of activity for biofuels. Many of the state's research institutions are pushing the envelope, their sights set on creating the world's next generation of biofuels. Much of this activity is based in Golden, Colorado, home to both the Colorado School of Mines and the National Renewable Energy Laboratories. These institutions are both involved in the National Advanced Biofuels Consortium, a group focused on producing hydrocarbon fuels that are both sustainable and cost-effective, and which received \$33 million in funding from the Department of Energy in 2010. At the School of Mines, for example, Professor Anthony Means is leading the school's part of the project—working on a theoretical analysis of the chemical reactions that occur during the biomass conversion process as well as reactor design.

THE GOAL:

COMMERCIALIY VIABLE BIOFUELS PRODUCTION

Along with these research institutions, several Colorado companies are looking for ways to commercialize innovative methods of biofuel production. Among them is Englewood-based Gevo, which is developing



a bio-based alternative to petroleum-based products. Gevo uses a proprietary fermentation method (Gevo's Integrated Fermentation Technology® or GIFT®) that relies on an innovative biocatalyst and

efficient separation of isobutanol, a naturally occurring alcohol.

Another innovative company is OPX Biotechnologies of Boulder, whose OPX EDGE™ (Efficiency Directed Genome Engineering) technology platform allows for the rapid optimization of the microbes used to create bio-products. This rapid optimization process makes it possible to produce a variety of products at a cost advantage over petroleum-based alternatives.

Many experts expect a key driver in the adoption of biofuels will be cost-comparability relative to petroleum-based alternatives. The innovations taking place in both the research institutions and companies within Colorado could well play important roles in making biofuels commercially viable.



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A CULTURE OF EXCELLENCE AND FIRSTS

THE CHARLES C. GATES CENTER FOR REGENERATIVE MEDICINE AND STEM CELL BIOLOGY BRINGS TOP SCIENTISTS TOGETHER TO DEVELOP NEW THERAPIES

BY ADAM RUBENSTEIN



Charles C. Gates Center for Regenerative
Medicine and Stem Cell Biology
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Since its founding in 2006, the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology (Gates Center) at the University of Colorado has rapidly and efficiently established itself as a premiere national and international research and clinical center of excellence.

Building on an original \$6.5 million gift from the Gates Frontiers Fund, the Gates Center was able to expand its stem cell research program into pediatrics when an additional \$5 million dollar gift was apportioned to the Fitzsimons-based Children’s Hospital in 2007. In just over five years, the Gates Center has already made significant contributions. Led by Founding Director Dennis Roop, PhD, the Center attracted top scientists in the field, built a world-class series of core laboratories dedicated to the study of stem cell biology and launched, with initial support from a donor the Cancer Stem Cell-Directed Clinical Trials Program (CCTP) which is a collaboration between the University of Colorado Cancer Center and the Gates Center. The CCTP is directed by Dr. Antonio Jimeno and is a “First-in-Nation” program focused on identifying and testing drugs that target and destroy cancer stem cells.

“The CCTP is a wonderful example of how a modest gift from a donor can be



Gates Center scientist preparing to feed cultured stem cells

leveraged into additional funds. In 2010, I received a call from Wayne Hutchens, who at that time was CEO of the CU Foundation (He recently retired after serving as CEO for six years). Wayne had just received a check for \$50,000, from

a donor that he had recently visited on a trip to New York, where he informed him about some of the exciting stem cell research being carried out in the Gates Center. I used these funds, plus an additional \$250,000 from Gates Center

funds, to help Dr. Jimeno establish the CCTP in June, 2010. On the basis of preclinical data obtained with these funds, Dr. Jimeno has recently received a \$650,000 grant from the NCI to support a new clinical trial in head and neck cancer, as well as, a gift of \$300,000 from another donor,” said Dr. Roop.

Housed in the state-of-the-art Research Complex I on the Anschutz Medical Campus (AMC), the newest and largest biomedical and clinical campus in the United States, the Gates Center is open to all investigators interested in stem cell research within the greater Rocky Mountain region, including investigators at UC AMC, UC Denver, UC Boulder, National Jewish Health, and Colorado State University. The goal of its program is to understand the biology of stem cells in order to develop new therapies for debilitating diseases.

Investigator research foci at the Gates Center fall under four broad headings:

- Stem Cell Biology – The study of

mechanisms that drive stem cells to grow and differentiate into a spectrum of tissues, organs, bones, and blood.

- Stem Cells and Disease – Understanding the foundation of stem cell biology to identify certain mistakes that can occur as these unique cells differentiate. Such errors may lead to a vast array of diseases, from birth defects to cancers. Targeting where they occur in the developmental process is the second step to designing therapeutic and regenerative approaches.

- Stem Cells and Regenerative Medicine – Building on a foundational understanding of stem cell biology and the identification of diseases linked to damaged or destroyed stem cells. Once damaged or destroyed stem cells have been identified, replacement cells are engineered and induced to differentiate into the very cells that have ceased their correct function.

- Stem Cells and Cancer – This area can be thought of as the opposite of stem

THE BIOFRONTIERS INSTITUTE, UNIVERSITY OF COLORADO



The BioFrontiers Institute is uniquely defined by its excellent researchers and leadership, and by the scientific and geographical ecosystem that empowers their work.

The Institute is housed in the state-of-the-art Jennie Smoly Caruthers Biotechnology Building on CU-Boulder’s East Campus. This new facility will bring together the scientific vision of BioFrontiers and the resources it takes to explore critical areas of unknown biology and translate that knowledge into applications that will advance human health and welfare.

biofrontiers.colorado.edu

GATES CENTER CORE RESEARCH FACILITIES

These facilities provide specialized services to the research community, enabling investigators to outsource experiments that require specialized knowledge and technical abilities not found in most laboratories.

- Flow Cytometry Core – provides a wide range of assays including cell cycle, proliferation, apoptosis, viability, signaling, detection, fluorescent protein analysis, phenotyping, and cell sorting, including stem cells.
- Morphology and Phenotyping (Histology) Core – provides all of the tools and expertise necessary to process and analyze tissue samples.
- iPSC Core – generates custom-designed iPSCs from mouse and human cells, including disease-specific human iPSCs. (iPSCs are adult cells that have been genetically reprogrammed to an embryonic stem cell-like state.)
- Transgenic and Gene Targeting Core – provides engineered mouse models for gene targeting in embryonic stem cells, the generation of knockout and knock-in mice, and the cryo-preservation of mouse lines.



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cell regenerative medicine. When cancer stem cells are present, their proliferation is uncontrollable. Therefore, the mission is to destroy the cancer stem cell so that it is no longer able to regenerate, thereby ceasing and ultimately reversing the growth of tumors.

THE MINDS, RESOURCES AND CULTURE

What makes a scientific research organization a center of excellence? Excellence requires expert human capital—people who are internationally known in their domains—plus the resources to enable those experts to expand knowledge and understanding on daily basis. And, there is another important factor—the presence of a culture that expects breakthroughs that links researchers together.

The Gates Center has all of those ingredients—the finest minds and resources in stem cell biology and a culture

that has already produced a number of notable “firsts.” Gates researchers were the first in the nation to conditionally immortalize blood stem cells and expand them indefinitely. The first to differentiate stem cells into astrocytes and enable these to grow and repair spinal cord injuries in rodents. And the first to develop a mouse-human chimera stem cell model to help accelerate personalized medicine discovery

As mentioned above, perhaps the Center’s most notable accomplishment was being first in the nation to establish a human phase I clinical trial of the investigational drug IPI-926, in combination with the drug Cetuximab, for the treatment of recurrent head and neck cancer. This investigational therapy is uniquely designed to target traditional tumor cells in concert with cancer stem cells. The trial is a joint effort between the Gates Center, the University of Colorado Cancer Center, and Infinity

Pharmaceuticals, developer of IPI-926. Preclinical studies of this combination therapy approach, led by University of Colorado researcher Antonio Jimeno, MD, PhD, yielded striking results. Jimeno is now the trial’s principal investigator, leading enrollment of 18 to 24 Coloradoan’s with relapsed head and neck cancers.

“When I first came to Denver in 2007, I spent a lot of time meeting with potential donors. Often, their comments were something like “It will be 15 to 20 years before what you are proposing will affect the lives of patients.” Now, to those critics I can say, “You were wrong, within five years of establishing the Gates Center, stem cell based research is already changing the way that Dr. Jimeno treats his cancer patients,” said Dr. Roop.

Clearly, the pieces have been put in place by the Gates Center for many more firsts to come in the field of stem cell biology and regenerative medicine.



Where bioscience means business

Aurora is home to the Anschutz Medical Campus and Fitzsimons Life Science District, one of the largest bioscience redevelopment projects in the United States. The 578-acre site is undergoing a \$5.2 billion transformation that will result in more than 18.5 million square-feet of space dedicated to excellence in health care, education and research.

Visit www.auroraedc.com for more information on Colorado incentives, our highly skilled workforce, and other resources that make Aurora the location for your next bioscience venture.



COLORADO CLINICAL & TRANSLATIONAL SCIENCES INSTITUTE: CONNECTING COLORADO COMMUNITIES

CCTSI patient care



BY ADAM RUBENSTEIN



The Clinical and Translational Science Awards (CTSA) program at the National Institutes of Health coordinates clinical and translational science centers at institutions across the United States.

Funded at \$500 million annually, CTSA institutions work to transform local, regional, and national environments by increasing the efficiency and speed of clinical and translational research.

Nationwide, 60 medical research institutions in 30 states are active members of the CTSA Consortium. In 2008, the CTSA supported the founding of the Colorado Clinical & Translational Sciences Institute (CCTSI).

This program, directed by Ronald J. Sokol, MD, distinguished professor of medicine, is housed at the University of Colorado Denver and relies upon the participation of numerous affiliate CCTSI members throughout the state of Colorado (see box).



Ronald J. Sokol,
MD, Director
CCTSI

The Colorado institute's mission is focused on biomedical discovery and translating lab-based discoveries into new or improved applications of patient care and community health, as well as reducing health disparities among communities. The CCTSI is charged with the challenging task of coordinating the efforts of a large group of talented scientists, health care providers, and advocates across Colorado—including two research universities (University of Colorado Denver and Boulder), six health care professional schools, five hospitals (Denver Veterans Affairs Medical Center, National Jewish Health, Denver Health, Children's Hospital Colorado and the University of Colorado Hospital), a health care network (Kaiser Permanente Colorado), and over a dozen community health programs.

EMPOWERING A NEW GENERATION OF SCIENTISTS

An overarching objective of the Institute is to enhance, integrate, and transform the training methods of new investigators. By pursuing a novel approach to scientific translational thinking, the CCTSI hopes to empower a new generation of scientists with interdisciplinary and collaborative

CCTSI STATEWIDE PARTICIPATING PARTNERS

- American Academy of Family Physicians National Research Network
- American Indian/Alaska Native (AI/AN) Programs
- Building Investigative Practices for Better Health Outcomes
- Catholic Health
- Children's Hospital Colorado
- Colorado Cardiovascular Outcomes Research
- Colorado Children's Healthcare Access Program
- Colorado Foundation for Public Health and Environment
- Colorado Pharmacy Practice Education & Research Network
- Colorado Research Network
- Denver Health
- Denver Metro Emergency Network
- Denver Veterans Affairs Medical Center
- Kaiser Permanente Colorado
- LUCHAR-Latinos Using Cardio Health Actions to Reduce Risk
- National Jewish Health
- National Surgical Quality Improvement Program
- Nurse Family Partnership
- Population-based Palliative Care Research Network
- Rocky Mountain Altitude Network
- Stapleton 2040
- University of Colorado, Denver and Boulder
- University of Colorado Health System

COLLABFLU. A CLINICAL TRIAL IN ACTION SPONSORED BY THE UNIVERSITY OF COLORADO AND THE CENTER FOR DISEASE CONTROL & PREVENTION

Beginning with the 2009-2010 season, influenza vaccine has been universally recommended for children age six months to 18 years old, placing extra burden on health care providers across the U.S. The focus of this study is to develop new strategies and implement existing evidence-based strategies to enhance influenza immunization in these children. The intervention will involve collaboration from different types of primary care providers, the Colorado Immunization Information System, public health departments, and visiting nursing services. Primary outcome measures in the intervention and control groups include:

- 1) increase in the rate of receipt of ≥ 1 influenza vaccines during the post-intervention year compared to the pre-intervention year among children 6 mo.-18 yr.
- 2) increase in the rate of children 6 mo.-18 yr. who were fully immunized (received all required influenza injections) during the season
- 3) measure outcomes by age group (6 mo.-5 yr., 6-8 yr., 9-12 yr., 13-18 yr.) and types of clinical sites (urban pediatrics, urban family medicine, rural family medicine)

COLORADO IS HOST TO THOUSANDS OF LOCAL, NATIONAL, AND INTERNATIONAL TRIALS. RECRUITING AND ONGOING TRIALS CURRENTLY INCLUDE:

Focus	No. of Trials
Asthma	17
Cancer	174
Diabetes	38
Heart Disease & Stroke	23
Mental Illness	30

FROM BENCH TO BEDSIDE: TRANSLATIONAL RESEARCH AND MEDICINE

Translational research is the process of applying discoveries in the laboratory, and in preclinical studies, to the development of trials and studies in humans. It also includes research aimed at enhancing the adoption of best practices in the community.

skills that foster a team approach to investigation.

Its success is measured in several ways:

- Accelerating the translation of laboratory discoveries to clinical use, and bringing these clinical advances into communities
- Applying new technologies to the delivery of personalized medicine
- Delivering next generation training to future researchers
- Advancing child and maternal health

SHARING DISCOVERIES, SEEKING INPUT

The Institute places particular emphasis on connecting disparate communities through the dynamic Partnership of Academicians and Communities for Translation—a partnership that facilitates exchanges between communities and academic programs. This communication channel allows scientists to share discoveries with communities while asking communities in turn to inform scientists what medical and public health needs should be addressed.

Integration of community, be it the academic, the clinical, or the four million residents of Colorado, is of paramount importance to the CCTSI. The Institute's unique approach to fostering collaboration is apparent in the thoughtful design of its key programs:

- *Biostats, Epidemiology and Research Design* – Analytical services required by clinical trials, training and mentorship for students and investigators
- *Translational Informatics* – Tools to help researchers find data, storage and

analysis of data

- *Novel Clinical and Translational Methods Development and Translational Technologies*– Identification of clinical and translational research questions that require development of a novel methodology, analysis and application of resources
- *Evaluation and Tracking* – Quality control and assurance to keep the Institute focused on its missions
- *Clinical and Translation Research Centers*– Centrally administered and coordinated infrastructure of participating hospitals and campuses
- *Building Human Capacity for Clinical and Translational Research* – Educational and skills training to promote cross-collaborations, and enhance Colorado’s workforce and national leadership in clinical-translational research
- *Community Engagement* – Integration of existing community and academic partnerships into a collaborative, broad-based enterprise that enhances public trust and reduces health disparities
- *Child and Maternal Health Research* – Clinical and translational research in children of all ages, pregnant woman, and the mother-child dyad to improve child health and prevent diseases
- *Regulatory Support and Knowledge* – Member support to navigate regulatory requirements and training in the responsible conduct of research
- *Pilot and Collaborative Translational and Clinical Studies Program* – One-year pilot grants to encourage cross-disciplinary and collaborative research in clinical and translational science

“The CCTSI, through its broad base of over 2,500 interdisciplinary scientists, technologies and communities working together, is transforming the process of translating new discoveries into better patient care and community health for the state of Colorado,” says Ronald J. Sokol, MD, CCTSI director.

Together, Colorado and the Colorado Clinical & Translational Sciences Institute are pushing the envelope of translational medicine, leveraging its capabilities and communities to become an engine of innovation benefiting not only our state, but also our nation and our world.



The Colorado Small Business Development Center Network is dedicated to helping small businesses throughout Colorado achieve their goals by providing free confidential consulting and various training programs.

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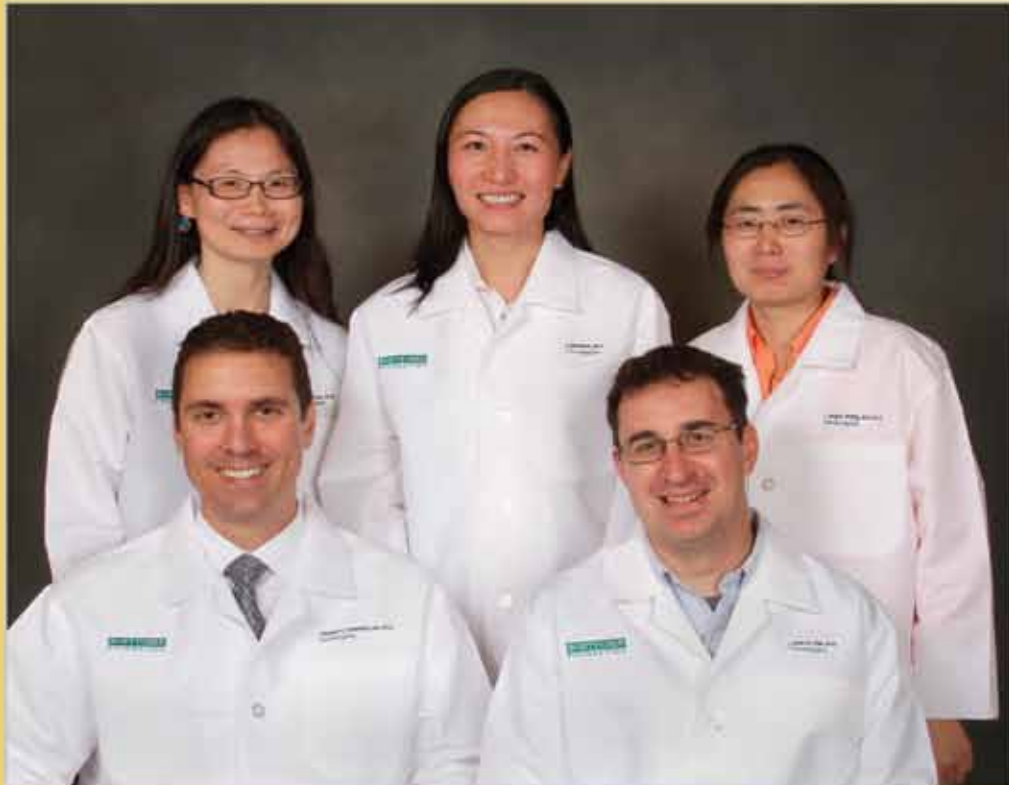
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BOETTCHER INVESTIGATORS

Class of 2011



(pictured left to right—back row)

Tingting Yao, Ph.D., Assistant Professor of Biochemistry and Molecular Biology, Colorado State University. Investigating ubiquitin-dependent signaling.

Zhe Chen, Ph.D., Assistant Research Professor of MCD Biology, University of Colorado at Boulder. Investigating axon guidance during neural development.

Jing H. Wang, M.D., Ph.D., Assistant Professor of Immunology, University of Colorado—Anschutz Medical Campus. Investigating antibody production and genomic instability in B lymphocytes.

(pictured left to right—front row)

Robert C. Doebele, M.D., Ph.D., Assistant Professor of Medical Oncology, University of Colorado—Anschutz Medical Campus. Investigating resistance mechanisms in oncogene-driven lung cancer.

John D. (Nick) Fisk, Ph.D., Assistant Professor of Chemical and Biological Engineering, Colorado State University. Investigating bacteriophage biomedical devices and engineering.

WEBB-WARING BIOMEDICAL RESEARCH PROGRAM



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FOUNDATION

The Webb-Waring Institute was founded in 1924 by Dr. Gerald B. Webb and later directed by Dr. James J. Waring. For over 80 years, the organization contributed to the advancement of biomedical research by engaging in basic and clinical research and training research scientists. In 2008, the Webb-Waring Institute became a part of the University of Colorado and is now known as the Webb-Waring Center. The Boettcher Foundation was entrusted with the stewardship of the Webb-Waring Foundation's assets. Through an innovative agreement between the Boettcher Foundation, the Webb-Waring Foundation and the University of Colorado, a new funding area was established at the Boettcher Foundation that supports the work of early-career investigators in the biomedical sciences in Colorado.

Class of 2012

Harald Junge, Ph.D., University of Colorado at Boulder

Matthew Kennedy, Ph.D., University of Colorado—Anschutz Medical Campus

Chad Pearson, Ph.D., University of Colorado—Anschutz Medical Campus



MEDICAL CENTER OF THE ROCKIES

COMMITTED TO EXCEPTIONAL ACHIEVEMENT IN CARDIOVASCULAR CARE

BY CASEY DEMCHAK

Based in northern Colorado, the Poudre Valley Health System is a regional network of hospitals and clinics that provide evidence-based health care and wellness services to people in Colorado, Nebraska, and Wyoming. An important component in this network is Medical Center of the Rockies (MCR), a 136-bed regional center in Loveland, Colorado.

MCR offers some of the region's most advanced cardiac care, including a highly innovative robotic-assisted surgery program. As opposed to being a standard hospital that



MEDICAL CENTER
OF THE ROCKIES
Foundation
RESEARCH AND EDUCATION

conducts some clinical trials, this health system research facility is dedicated to being a nationally recognized cardiovascular clinical trial site. Since being founded in 2007, MCR has continually placed great

emphasis on creating highly efficient systems that result in better quality of care.

"During MCR's inception, we decided we wanted to be heavily involved in scientific research and groundbreaking cardiovascular clinical trials," says Dr. Gary Luckasen, who has been a driving force in MCR's heart program since day one. "By being so involved in innovative cardiovascular trials, our Front Range community has access to world-class care without having to leave the region. And, we provide a platform from which local companies can do research that becomes the foundation of important new technologies."



Dr. Gary J. Luckasen, Medical Director of Research,
Medical Center of the Rockies Foundation

We are
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The Medical Center of the Rockies Foundation research team has over 20 years of clinical research experience specializing in Phase I-IV clinical trials work.

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- _____ trauma
- _____ neurology
- _____ infectious disease

www.mcrresearch.org

MEDICAL CENTER OF THE ROCKIES
RESEARCH AND EDUCATION *Foundation*

FROM NORTHERN COLORADO TO THE WORLD

Thirty clinical trials are currently being conducted at the Medical Center of the Rockies. Two of them are very noteworthy given the positive impact they could have on cardiovascular care for people throughout the world.

One is a prospective, multicenter, single-blind, randomized controlled trial comparing the Moxy drug-coated PTA catheter against standard balloon angioplasty for the treatment of femoropopliteal arteries in the leg. This is the first use of drug-coated balloons in a large trial population. A positive outcome in this study could lead to advancements in cardiovascular care that would decrease the need to use stents in heart arteries.

A second important study is the Dal-OUTCOMES trial, a long-term, multicenter, international cardiovascular outcome study. It is evaluating the efficacy of a drug from Roche called Dalcetrapib, which is an oral cholesterol ester transfer

protein modulator. Dalcetrapib is intended to raise HDL, or “good cholesterol.” Currently, there are no other drugs proven to achieve this outcome, so positive findings in this study could significantly improve heart disease treatment.


One Colorado resident participating in the second study is Deb Lucero. After suffering the shock of a heart attack, Deb greatly appreciates the opportunity to be involved in the Dal-OUTCOMES trial.

“There is a definite health benefit to me being in the study because I receive extra checkups with my cardiologist that I otherwise would not have,” reports Deb. “Plus, research is an important part of developing new drugs. So I feel that not only could I benefit, but I could also be helping other people with heart disease as well.”

In addition to maintaining long-term relationships with clinical trial patients, a close connection with the Colorado

BioScience Association enables MCR to build partnerships with numerous organizations—all in an effort to help Colorado companies develop products that will help the state stay at the forefront of medical technology innovation.

MCR also maintains strong connections with Colorado State University. This alliance has become fertile ground for several potential innovations. The medical center is assisting the university with basic science on several projects that it hopes will lead to even more participation in successful animal and human studies.

As a leading science and research institution, the Medical Center of the Rockies has proven to be a true partner for the Colorado bioscience industry. A close allegiance with the local community, along with the goal of being a nationally renowned clinical trial center, are just two reasons why this medical center is widely recognized as a Colorado center of excellence. 



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BIOSCIENCE DISCOVERY EVALUATION GRANT PROGRAM

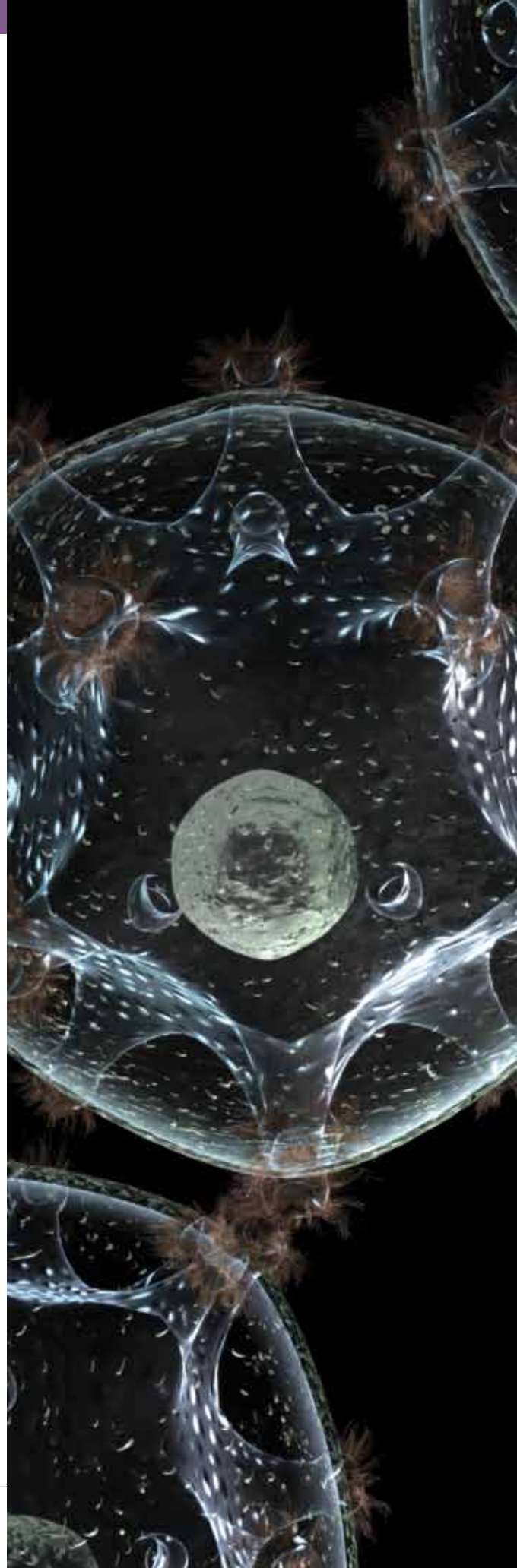
Colorado

Office of Economic
Development and
International
Trade

The Bioscience Discovery Evaluation Grant Program (BDEGP) was created in 2006 by the Colorado General Assembly to grow the bioscience industry in the state. The BDEGP provides gap funding to advance promising research from Colorado's outstanding research institutions into the marketplace. The bioscience industry in Colorado is strengthened by such efforts, resulting in long-term job creation and company formation.

The BDEGP has been praised for its effectiveness in leveraging a limited state investment to move promising commercial technologies to market and supporting the biotechnology industry in Colorado. Since the first grants were made in mid-to-late 2007 through calendar year 2011 the program has awarded 130 grants to researchers at Colorado research institutions to bring their cutting-edge technologies closer to market. Forty-four grants have helped companies further these technologies as they complete studies, secure intellectual property, and develop their approach to bring their products to market. In addition, the program has supported four new bioscience technology organizations, under the commercialization infrastructure program, that identify and manage technologies, and support collaboration to bring necessary expertise together to advance novel Colorado biotechnologies to commercialization.

The State leverages this investment in the industry by requiring a one-to-one match for both Proof of Concept and Early-Stage Company grants. The economic benefit is realized near-term in the strengthening of our research institutions, the jobs required to fulfill the grant work, and the products and services purchased to complete grant work. Longer-run payouts come in the form of additional capital investment into the technologies and companies, the creation of new companies, and growing businesses adding high quality jobs. Approximately \$22.1 million from the BDEGP Cash Fund has been granted and will garner at least an equal amount in matching funds (excluding Commercialization Infrastructure grants). Of 184 grants made or approved under the program by the end of 2011, 96 have completed work while the others are in process. To date, the program successes include the creation of 34 new Colorado companies and the direct creation of 302 jobs. Additionally, these funds have helped the technologies acquire an additional \$95 million in grants and investments to further commercialize these bioscience technologies.



PROOF-OF-CONCEPT GRANTS 2011 -2012



COLORADO SCHOOL OF MINES

INVESTIGATOR: Reed Ayers, Ph.D.

TITLE: Tri-Calcium Phosphate Manufacturing for Biomedical Applications

RESEARCH: Multiphasic calcium Phosphate (MCaP) materials obtained through the solid-state reaction of combustion synthesis can be specifically formulated to mimic critical inorganic features of the bone, and may provide a novel method to enhance bone tissue healing. The success of the commercialization of this technology depends mainly on demonstrating successful manufacturing scale-up to hundreds of grams of the material while preserving critical mechanical and chemical characteristics. Combustion synthesis technique has a high commercial potential as it can be applied to other materials, allowing expansion to other markets including non-medical. The researcher is pursuing McaP as the material of choice as it is the fastest material to bring to market because it does not require FDA approval.

IMPACT: Biomaterials products had a market size of \$25.5 billion in 2008, and the biomaterial device market size was \$115.4 billion in the same year, and is expected to reach \$252.7 billion in 2014. Bone allograft is a sub-segment of the Orthobiologic biomaterials market (\$2.9 billion with the 7% growth rate). In 2009, its market size was about \$0.75 billion. Future growth in the market is expected to depend on fabrication technology improvements and development of new products at competitive prices. Improved patient benefits form the most important factor stimulating market growth for biomaterials. The other market drivers are increase in aging population, rising awareness, shorter product approval time, and larger application area. However, the lack of tissue availability and proper reimbursement facilities are restraining the growth of the biomaterials market. MCaP is intended primarily for the biomedical use with the focus on drug development and implant device manufacturing. The goal is to provide high quality medical grade MCaP to the customers and to become a primary supplier for MCaP for biomedical applications.

INVESTIGATOR: Hongjun Liang, Ph.D.

TITLE: Development of Retrieable and Reusable Coagulation Agents for Highly Efficient Microalgae Harvesting and Cost-Effective Biofuel Production

RESEARCH: The specific objective of this proposal is to identify the rational correlations between inter-algal pair interactions and coagulation-agents with well-defined structures, and to develop a family of super coagulation agents for highly efficient microalgae dewatering at a negligible cost. It aims to clear the bottleneck limiting commercialization of microalgae-derived biofuels, and to foster successful growth of this industry by collaborative partnerships with algaculture companies. The central hypothesis is that nanoparticle-pinned polymer brushes are far more effective in dewatering microalgae than conventional flocculants; and solid-state nanoparticles allow low-cost operations to be designed to collect algal biomass and retrieve the coagulation agents for multiple cycles of microalgae dewatering.

IMPACT: It is anticipated that the proposed work will yield the following expected outcomes to transform microalgae dewatering: 1) low operational cost (the re-usable coagulation agents will minimize materials cost while the dewatering process will require low maintenance, consume little energy, and is continuously operable); 2) high efficiency (the de-watering process is quick and has an efficiency of almost 100% compared to currently known coagulation methods that typically harvest microalgae at efficiencies ranging from 20-90%); 3) facile scale-up potential (the coagulation agents will impose no contamination to the growth medium for continuous, post-dewatering microalgae farming, and no interference to downstream processes for biofuel conversion).

INVESTIGATOR: Matt Liberatore, Ph.D.

TITLE: Dewatering Algae Cells Using Polymers to Scale Up Bio-fuel Production

RESEARCH: The goal of the project is to identify polymers and delivery mechanisms to induce flocculation of algae in an optimized and cost efficient manner. A flocculation mechanism using polyelectrolytes has developed intellectual property. The flocculating polymer may have a secondary benefit that the cells are more easily lysed to remove intercellular products (e.g., lipids). The project will focus on the optimization of flocculation with polymers and complex, analytical measurements of the flocculation. The use of rheology in combination with light scattering will help identify polymer chemistries and concentration regimes that result in flocculation of algae cells at a minimal cost.

IMPACT: The technology allows for the scale-up for biofuel production from algae. This technology could also be expanded to solids separation and processing, a significant component of wastewater treatment.



INVESTIGATOR: Keith Neeves, Ph.D.

TITLE: Microfluidic flow assays for evaluating anticoagulant and antiplatelet drugs

RESEARCH: Part of the long-term goal of this research is to develop technology for evaluating, monitoring, and dosing therapeutics for the treatment of bleeding and thrombotic disorders. Steps have been taken towards that goal with an in vitro vascular injury model called the microfluidic flow assay (MFA). The MFA consists of a series of microfluidic channels with characteristic sizes of $\sim 100 \mu\text{m}$, which run perpendicular to micropatterned prothrombotic molecules that trigger clotting, such as collagen and tissue factor. This technology captures the dynamics of clot formation under flow, which is currently absent in conventional clotting assays. Within a single assay we can flow blood over the range of physiologic shear stresses in different channels and monitor the growth and stability of the each clot in real-time with various microscopy methods. To date, we have shown that the MFA can be used as a diagnostic tool to detect dysfunctions on platelet function and coagulation. The objective of this study is to extend the application of the MFA towards the evaluation of new anticoagulation and antiplatelet agents.

IMPACT: The market for the technology developed in this project will target the cardiovascular disease diagnostic market, specifically point-of-care (POC) diagnostics. From 2003 to 2008 there was an 8% increase (CAGR) in U.S. POC market from \$1.68 billion to \$2.28 billion. Coagulation and cardiac markers represent approximately 15% of this market, and over the same period had double-digit growth (13% CAGR). The coagulation monitoring market was estimated at \$445 million in 2006. There are several drivers that suggest further market growth in POC, including a government focus on reducing hospital length of stay, economic focus on enabling more effective and efficient care, advances in lab-on-chip technology, and an increased use of information technology to deliver and manage diagnostic results. Furthermore, the development of new anticoagulant and antiplatelet drugs is expected to increase the need for affordable and accurate predictors of therapeutic efficiency. The explosion of a new class of oral anticoagulants that target factor Xa and thrombin is expected widen the use of anticoagulants, which will require concomitant measures of their efficacy.

INVESTIGATOR: Kent Voorhees, Ph.D.

TITLE: Rapid Detection of Listeria Using Bacteriophage Amplification and Enhanced Lateral Flow Immunoassays

RESEARCH: The project looks to develop a handheld bacterial detection device, which takes advantage of species-specific phage amplification (PA) and surface enhanced Raman spectroscopy (SERS) to maximize sensitivity and allow for a quantifiable readout while employing inexpensive lateral flow immunoassay (LFI) sample concentration for rapid, onsite screening of ready-to-eat foods and processing equipment for *L. monocytogenes*. The primary goals of the proposed research are 1) to characterize, and utilize the *L. monocytogenes*-specific phage A511 and antibodies produced against that phage to develop a cost-effective, rapid, and accurate diagnostic detection device and 2) to demonstrate the utility of that detection device for rapid, user-friendly screening of ready-to-eat meats and cheeses, produce, and food processing equipment with an expected total sampling and analysis time in the 5 to 7 hour timeframe.

IMPACT: Rapid diagnostic detection of food-borne Listeria at the farm and/or processing level is vital for the prevention of Listeria-related illness and mortality. Conventional testing has historically relied upon the use of inefficient off-site government or corporate analysis laboratories using expensive, time-intensive methods that have made high-volume testing impractical. As a result, the demand for a shift to more feasible onsite testing using much cheaper detection methods has risen sharply. Several attempts have been made to meet this demand. However, even the most rapid of currently available products requires a minimum of 24 hours at a significant cost. The next best option requires a minimum of 48 hours also at a significant cost. While considered the current state of the art, these products still fall short of tractable, inexpensive on-site testing capabilities. In contrast, the proposed PA, SERS-based LFI device will make Listeria testing possible in as little as 5 to 7 hours at an estimated cost of \$50 per kit, requiring the use of a \$3,500 Raman spectrometer, far below the costs for the other current tests.

INVESTIGATOR: Anne Avery, Ph.D.

TITLE: Development of a Diagnostic Assay for Canine Hemangiosarcoma

RESEARCH: The goal of this project is to create a blood-based diagnostic test for a common canine tumor that is otherwise expensive to diagnose. The project is also intended to demonstrate the feasibility of this approach for developing a broad array of non-invasive cancer diagnostics in human and veterinary patients.

IMPACT: Cancer diagnosis can be invasive and expensive, often, for visceral organs, including biopsy and anesthesia. Less invasive blood tests reduce costs and morbidity associated with obtaining a diagnosis. Blood-based diagnostics for tumors of canine patients will have particular utility, since the prohibitive cost and invasiveness of the procedures often preclude their usage. Successful implementation of blood-based tests will save money, discomfort, and, potentially, lead to better patient outcomes.

INVESTIGATOR: Fausto Bellezzo, DVM, DACVS and Dean Hendrickson, DVM, MS, DACVS

TITLE: High Fidelity Abdominal Surgical Simulator

RESEARCH: The goal of this project is to create an abdominal cavity model that represents with accuracy the anatomical details of surgical relevance for use as a medical education tool. Vascular and organ structures will be included, which mimic the shape, texture, color, and location of real structures, as well as blood color, viscosity, flow, mechanics, and pressure.

IMPACT: Existing surgical training tools for medical and veterinary students are limited to rudimentary models, including orange peels, carpet pads, or live animals, which are not anatomically correct with respect to the human body, while still being very expensive. Other simulators use video based training, but lack the hands on approach of this new model. This new technology will address an unmet need in medical schools, hospitals, and simulation centers, as well as in military medical training.

INVESTIGATOR: John D. Fisk, Ph.D.

TITLE: Biosensor Platform Development via Protein Assembly Engineering and Device Integration

RESEARCH: The goal of this project is to develop sensors for the detection of active tuberculosis infections using phage-based biological reagents in paper microfluidic devices. To achieve this goal, effort will be focused on developing and establishing the properties of phage-based sensor components in different physical sensor platforms.

IMPACT: Approximately 1/3 of the world's population is infected with tuberculosis, and 15 million people develop active disease annually—the majority in the developing world. The existing paradigm for the detection of tuberculosis relies on tests that are slow, expensive, and require laboratory resources not typically found in resource-poor areas. As a result, faster, cheaper, point-of-care diagnostics of active tuberculosis infections are needed.

INVESTIGATOR: David A. Prawl, Ph.D. and Susan P. James, Ph.D.

TITLE: Enhanced Osseointegration of PEEK Implants

RESEARCH: The goal of this project is to validate a novel approach for enhanced osseointegration of poly ether ketone (PEEK) fusion devices.

IMPACT: The proposed research would significantly enhance surgical outcomes for patients who undergo spinal fusion for conditions such as tumor, spinal fracture, degenerative disc disease, scoliosis, and other deformities--an estimated 330,000 people annually in the US alone.

INVESTIGATOR: Melissa M. Reynolds, Ph.D.

TITLE: Quantitative Assessment of Bio-Bandaids - Innovative Materials to Treat Wounds

RESEARCH: The goal of this project is to evaluate a class of new biodegradable polymers - bio-bandaids - for their ability to treat infection and promote wound healing. A data set will be collected to support the application of these new materials to overcome the lingering problems associated with wound healing.

IMPACT: Currently, there are no treatments that can address all of the problems caused by traumatic injury, such as bleeding, infection, and soreness, and some treatment options can cause significant side effects to put patients at more risk. Bio-bandaids are expected to address these issues, providing a superior treatment option to those currently available.



INVESTIGATOR: Larry Roesner, Ph.D., P.E.

TITLE: Determine the Biological Efficacy of Graywater Reuse

RESEARCH: The objective of this project is to demonstrate that a simple, low energy input, graywater reuse system comprising storage with disinfection will produce a water supply for toilet flushing that poses no public health risk.

IMPACT: Utilizing graywater in toilet flushing will reduce the demand for fresh water resources and reduce wastewater flows. This wastewater reuse system will serve as an alternative to current systems, which are large, costly, and require large energy inputs. Since wastewater treatment currently accounts for 36% of the City of Fort Collins energy expenditure, the gains from adopting such a system locally would be substantial.

INVESTIGATOR: Herbert Schweizer, Ph.D.

TITLE: Production of Genetically Engineered Materials

RESEARCH: The goal of this project is to facilitate the distribution of genetically engineered materials, such as broad-host-range plasmids and bacteria, to the scientific community and to facilitate their continued development. This includes producing stocks of commonly requested materials, developing an electronic database to track distribution, and evaluating the use of the non-antibiotic glyphosate resistance marker in drug resistant bacteria such as *Acinetobacter baumannii*.

IMPACT: There is a significant unmet medical need to introduce new antibacterial agents to combat resistance to current drugs. Genetically engineered strains of bacteria are a very important and highly used tool in the discovery process; however many of these tools have not previously been commercially available. This project will help to facilitate these discovery efforts, potentially speeding the commercialization of new antibacterial agents.

INVESTIGATOR: Richard A. Slayden, Ph.D.

TITLE: Identification of Potentiating Agents that Enhance Treatments Caused by *Pseudomonas Aeruginosa*

RESEARCH: The goal of this project is to identify lead compounds that impact drug resistance in *Pseudomonas aeruginosa* via drug efflux. It is hypothesized that, when co-administered with existing clinically used drugs, these compounds could potentiate drug activity. The identified compounds can then be used in preclinical studies to assess utility in the treatment of disease caused by *Pseudomonas aeruginosa*.

IMPACT: *Pseudomonas aeruginosa* is a pathogen of increasing medical importance, because it is nosocomial and causes significant infections in immunocompromised individuals, including the elderly and chronically ill. Since *Pseudomonas aeruginosa* is naturally resistant to a wide range of chemotherapeutics, these infections can be difficult to treat and manage. Reducing the pathogen's resistance, thereby potentiating existing drugs' efficacy will improve management and treatment options for patients.

INVESTIGATOR: Ronald B. Tjalkens, Ph.D.

TITLE: Development of Neuroprotective Compounds for Treating Parkinson's disease, Phase 2: Safety Evaluation

RESEARCH: The goal of this project is to develop a novel anti-inflammatory, neuroprotective drug to block the progression of Parkinson's disease. The project supports the evaluation of a novel class of synthetic triterpenoid structures that have discreet modifications to optimize anti-inflammatory activity in neural cells.

IMPACT: Parkinson's disease is the second most common neurodegenerative disease in the United States, effecting more than 1.5 million people. Current drugs for Parkinson's treat only the symptoms of the disease, without addressing the condition, itself, or curtailing its progression. Thus, a drug that blocks the progression of Parkinson's would extend and improve the quality of life for those suffering from the disease.



INVESTIGATOR: John C. Cambier, Ph.D.

TITLE: Advancing Human CD79-targeted Therapy Using huMouse Models

RESEARCH: Using mouse models it was discovered that anti-CD79 antibodies are therapeutic in Lupus-like disease and Type 1 Diabetes, and prevent development of Collagen-Induced Arthritis (CIA). Importantly, these antibodies act by a mechanism involving receptor desensitization which is distinct and advantageous over current B cell-targeted drugs, Rituxan® and Benlysta® (which act by B cell depletion). Since anti-mouse CD79 mAbs do not cross-react with human CD79, further development of this technology required the researchers to produce and test a panel of mAbs specific for human CD79. To improve the marketability of this technology and lead mAbs the researchers will demonstrate their therapeutic activity in preclinical models. Mice that express human CD79 will be developed and will enable in vivo studies of the efficacy of anti human CD79 antibodies.

IMPACT: Mice expressing human CD79 will enable researchers to establish the efficacy of antibodies against human CD79. These antibodies have the potential to become new drugs in the treatment of autoimmune diseases like lupus, rheumatoid arthritis, and diabetes.

INVESTIGATOR: Claudia Jakubzick, Ph.D.

TITLE: Apoptotic Cell-like Liposome Nanoparticles for Cell Mediated Immunity

RESEARCH: Cancer is one of the most enduring health problems of the modern era. Recent developments using immunological techniques offer substantial new promise for developing vaccines against immunogenic cancers. Researchers are developing a method for educating the endogenous immune system to recognize and target tumor cells. The approach capitalizes on the specialized functions of certain dendritic cells (DCs) to recognize antigens within apoptotic cells and induce differentiation of naïve T cells into cytotoxic T cells to eliminate tumor cells. While this approach is highly promising, it is believed that the development of DC-based cancer vaccines will be substantially enhanced by exploiting the different functional roles played by specific DC subtypes present in tissues. This proposal focuses on the lung, and outlines experiments designed to take several critical steps towards developing a viable vaccine treatment for immunogenic cancers in humans.

IMPACT: This cancer vaccine constitutes a paradigm shift in cancer immunotherapy. The designed vaccine is non-species specific and if successfully developed, the vaccine designed in this proposal could provide long-lasting or permanent remission of a cancer without requiring radiation, chemotherapy, or other treatments with adverse long-term effects.



INVESTIGATOR: Mari Numata-Nakamura, M.D., Ph.D. and Dennis R. Voelker, Ph.D.

TITLE: Novel Antiviral Lipids for Extended Prophylaxis and Post-Infection Treatment of Respiratory Syncytial Virus Infections

RESEARCH: Respiratory syncytial virus (RSV) is the most common cause of hospitalization for respiratory illness in young children - 90% of children under age 2 are infected by this virus annually. RSV is also currently recognized as an important pathogen in adults, particularly in the elderly, patients with chronic lung disease, and those with impaired immunity. Despite decades of research, no vaccine is clinically approved, or effective for preventing RSV. Researchers have demonstrated that one of the minor components of pulmonary surfactant, palmitoyl-oleoyl-phosphatidylglycerol (POPG) markedly attenuates proinflammatory cytokine production (IL-6, IL-8) induced by RSV, and prevents viral replication in human bronchial epithelium. POPG also significantly attenuates RSV infection in vivo, in mice, by a factor of 2,000 when the lipid is administered at the same time as the virus. Data also show that POPG can be applied as an inhibitor of infection in a short time window of approximately 45 minutes, prior to viral challenge. The aims of this project are direct extensions of the recent findings and are focused on another minor pulmonary surfactant lipid, phosphatidylinositol (PI). These aims are designed to elucidate: 1) the pre-infection efficacy of extended PI treatment as an anti-RSV agent, 2) the post-infection efficacy of PI treatment of RSV infection and 3) the in vivo action of POPG applied after an RSV infection is established.

IMPACT: Successful accomplishment of these aims will provide critical new information about the effectiveness and applicability of PI and POPG as novel preventatives and therapeutics for RSV infection, and treatment for drug-resistant RSV. This proposal will also provide essential insights into development of new POPG and PI-like drugs as anti-viral agents for therapeutic application in humans.

INVESTIGATOR: Preveen Ramamoorthy, Ph.D. and Paul Reynolds, Ph.D.

TITLE: Development and Validation of an Integrated Clinical Diagnostic Test Panel for Primary ImmunoDeficiency Disease (PIDD)

RESEARCH: Blood tests are the most widely used method for diagnosing PIDD. Through blood tests, physicians obtain the total number and type of white blood cells, and the quantity of vital immunological proteins such as cytokines and complement proteins that are produced by the body in response to an infection. Physicians also use other tests to measure the functionality of white blood cells and complement proteins. Although these methods are well validated, they are unable to pinpoint the specific defects in the immune system that are responsible for PIDD. They also cannot identify the underlying genetic cause of PIDD. As a result, patients often receive a correct diagnosis only after accumulating serious infections, diminishing the utility of potentially life-saving therapies such as bone marrow transplantation. The researchers have identified four unmet needs in PIDD diagnosis: (1) a clinical diagnostic algorithm for PIDD diagnosis using integrated diagnostics (immunology, complement and genetic testing), (2) a comprehensive genetic test panel for PIDD diagnosis, (3) clinical decision support to help physicians order PIDD clinical diagnostic tests, interpret the results of these tests and guide treatment and clinical management of patients, and (4) physician education. This project is meant to address these four unmet needs.

Project work aims to develop and validate a comprehensive genetic test panel for PIDD composed of 225 genes. This test will be offered with established immunological and complement tests in conjunction with clinical decision support thereby creating an integrated clinical diagnostic test panel for PIDD.

IMPACT: This project has the potential to lead to the development of a diagnostic test for PIDD. This test would enable doctors worldwide to diagnose patients with PIDD earlier, with greater efficiency and accuracy.



INVESTIGATOR: Robert L. Garcea, M.D.

TITLE: Development of a Next Generation, Multivalent Human Papillomavirus Vaccine

RESEARCH: The goal of the project is to develop a multivalent HPV vaccine by combining recombinant viral capsid subunits (capsomeres) from relevant HPV types. These subunits will be purified after expression in bacteria using a new technology. In parallel, monoclonal antibodies to each HPV type will be characterized for use as in-process quality control reagents for future vaccine manufacture.

IMPACT: Infection with high-risk types of human papillomavirus (HPV) is the initial event in the development of cervical cancer. Worldwide, approximately 300,000 women die annually from this disease the majority of these deaths occur in under resourced regions of the world that have inadequate medical care. This proposal aims to develop a low cost HPV vaccine that can be deployed in these less-developed areas.

UNIVERSITY OF COLORADO BOULDER BIOFRONTIERS INSTITUTE

INVESTIGATOR: Christopher N. Bowman, Ph.D.

TITLE: Thio-Ether Nucleic Acids: Next-Generation Genomic Research and Therapy Tools

RESEARCH: The scope of this project is to develop and implement a new class of oligonucleotide molecules that would have significant advantages over both biological (DNA and RNA) and synthetic (PNA) oligonucleotides for directing nanoassembly, biodetection, and biofunctional applications including implementation in a SELEX-like process for TNA molecules, TNA-FISH, and TNA-based microarray format chips.

IMPACT: The overall concept is that the synergistic combination of thiol-ene-based click chemistry with oligonucleotide synthesis has enabled the formation of an entirely new, highly functional, transformative oligonucleotide material that will be developed here for several specific biological applications.

INVESTIGATOR: Leslie Leinwand, Ph.D.

TITLE: Novel Approach to Reversal of Heart Failure

RESEARCH: The strategic objective of this pre-clinical project is to develop modulation of AQP7 expression and/or activity as a therapeutic tool to promote beneficial cardiac adaptation in the presence of pathological stimuli. The key scientific objective is to define the cardioprotective role of AQP7 via its ability to regulate mammalian heart cell size, function, and gene expression.

IMPACT: Currently available therapies for the treatment of heart failure are largely palliative and there are no drugs capable of promoting beneficial patterns of cardiac growth and gene expression in the face of pathological stimuli. Given this large unmet need, novel strategies for promoting beneficial cardiac adaptation in the face of pathological stimuli will have significant commercial potential.



INVESTIGATOR: Hang (Hubert) Yin, Ph.D.

TITLE: Minimally Invasive Diagnosis of Metastatic Cancers in Body Fluids

RESEARCH: The goal of this project is to create an in vitro cancer metastasis detection system using unnatural cyclopeptides that select for shed lipid vesicles and reveal the occurrence of cancer metastasis.

IMPACT: The ability to detect exosomes of tumor origin from a blood draw or a urine sample without the need for a biopsy or surgically resected tissue has a number of advantages. Frequently, fresh tissue is difficult or impossible to access, and archival tissue samples are often less relevant to the current state of the patient's disease. The ability to monitor biomarkers in real-time presents several opportunities including continuous monitoring of disease progression and recurrence, and monitoring the development of patient resistance over the course of therapy. Our cyclopeptide-based detection technology provides an attractive alternative as minimally invasive probes for the screening of cell-derived exosomes as a general indication of cancer metastasis.

UNIVERSITY OF COLORADO DENVER

INVESTIGATOR: Richard J. Johnson, M.D.

TITLE: A Novel Treatment to Prevent Acute Kidney Injury from RadioContrast

RESEARCH: The goal of this project is to develop a therapeutic for acute kidney injury (AKI) to target the underlying mechanism for contrast-induced nephropathy. The University has intellectual property around a target and candidate therapeutic agent, relating to the inhibition of fructokinase, it is shown to prevent AKI following contrast or cardiovascular surgery.

IMPACT: The problem to be solved is to develop a therapeutic means for preventing acute kidney injury (AKI) from contrast and to markedly reduce the risk for AKI following high risk cardiovascular surgery.

INVESTIGATOR: Malik Kahook, M.D.

TITLE: A Non-Invasive Surgical Device for Treatment of Glaucoma

RESEARCH: The goal of this project is to compare a non-invasive glaucoma treatment device to the efficacy of laser trabeculoplasty (standard of care) in a cohort of patients with open angle glaucoma. This non-invasive treatment beneficially alters the protein expression in the drainage system of the eye through stretching of the trabecular meshwork cells.

IMPACT: Glaucoma is a leading cause of world-wide blindness. Increase intraocular pressure (IOP) has been identified in multiple studies as a leading cause of glaucomatous optic neuropathy. It is believed that the cause of IOP elevation in glaucoma patients is due to dysfunction of the drainage angle of the eyes. The cells that make up the drainage angle are known as trabecular meshwork (TM) cells and their function is regulated by regional proteins, which can lead to both increased or decreased outflow of fluid out of the anterior chamber. The subject is designed to non-invasively alter the protein expression in the drainage system of the eye through stretching of the TM cells.

INVESTIGATOR: Uday B. Kompella, Ph.D.

TITLE: Novel Protein Drug for Wet Age Related Macular Degeneration (AMD)

RESEARCH: A new therapeutic fusion protein (transferrin-tumstatin or Tf-T) that acts through mechanisms other than vascular endothelial growth factor (VEGF) inhibition has been developed. The fusion protein has the ability to localize to the affected choroid tissue and selectively inhibit the growth of new blood vessels. The goal of this project is to perform non-GLP efficacy and safety studies of endotoxin free transferrin-tumstatin (Tf-T) in preclinical models.

IMPACT: Tf-T is expected to improve patient outcomes either alone or in conjunction with anti-VEGF agents. AMD is the most common cause of irreversible vision loss in elderly patients.



INVESTIGATOR: Andrew Thorburn, Ph.D.

TITLE: Validation and Development of a Six1 biomarker test for cancer treatment

RESEARCH: The goal of this project is to create a validated, commercially viable diagnostic test that can be used to identify tumors that over-express Six1. The outcome would help physicians to better prescribe cancer treatment.

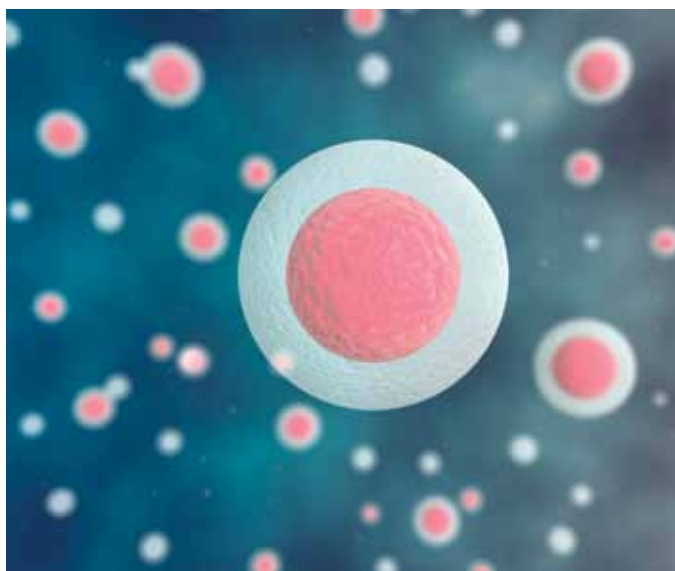
IMPACT: The anticipated response rate predicts ~ 25,000 lung cancer patients each year in the United States who would benefit from treatment. Additionally, it may be viable to develop a routine test that would be performed on patients who are scheduled for treatment with “standard” chemotherapy agents. The focus is on lung and ovarian cancer, which represent the most common and deadly tumor type in both men and women and the most common and deadly gynecological cancer. However because other diseases such as breast cancer also express Six1, the test could be more widely applicable making the potential clinical impact even larger.

INVESTIGATOR: David Wagner, Ph.D.

TITLE: Development of a Drug Substance to Prevent/Reverse Hyperglycemia in Type 1 Diabetes

RESEARCH: The goal of this project is to identify a lead compound and any additional patentable compounds for treatment of type 1 diabetes and other autoimmune diseases.

IMPACT: Diabetes affects over 23.6 million Americans with 5% - 10% of those people having type 1 diabetes (T1D). The yearly rate of new T1D diagnoses in the US is estimated to be approximately 30,000 people and growing. The goal is the prevention and reversal of T1D by controlling pathogenic T cells, which heretofore have proven difficult to target.



INVESTIGATOR: Xiao-Jing Wang, M.D., Ph.D.

TITLE: Novel Use of an Endogenous Human Protein to Treat Oral Mucositis

RESEARCH: The goal of this project is to optimize local Tat-Smad7 protein delivery in animal models to treat severe, painful oral blisters (oral mucositis), leading to Tat-Smad7 commercialization for treatment of severe oral mucositis in patients undergoing chemo/radio-therapy or organ transplant. The researchers have created the Tat-Smad7 recombinant protein that has therapeutic effects on oral mucositis in mice.

IMPACT: Oral mucositis is a chronic oral ulceration. This disease frequently occurs in radiation-treated patients of all cancer types, patients undergoing radiation treatment for organ transplants and patients undergoing routine chemotherapy. Severe oral mucositis is extremely painful and impairs food/liquid intake, hence it is often the most severe complication of cancer therapy. Currently, there is no established therapy to effectively treat severe oral mucositis. There is only one FDA approved drug, given through i.v. injections, for severe oral mucositis in bone-marrow transplant patients, and its use in cancer patients remains to be determined. Hence, this drug is available for a mere 4% of the at-risk population. This research will explore local delivery of a different therapeutic protein to oral mucositis lesions, which provides stronger therapeutic effects with fewer adverse effects compared to the other drug, and can be used to treat all oral mucositis cases.

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 absorbed 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.

EARLY STAGE COMPANY AWARDS 2011-2012

AMIDE BIO, LLC, LOUISVILLE

The company uses an innovative hybrid technology platform that combines recombinant and chemical methods for the efficient production of high-value peptides and proteins. Grant funds will support technology development for insulin variant peptides, demonstrating the technology to attract other partners.

CARBO ANALYTICS, LLC., FORT COLLINS

The company is working on the commercial development of an online sugar monitor with immediate application for more cost effective biofuels production. The monitoring technology was founded at CSU and is being used to bring valuable and timely information, cost-effectively to the transformation of biostocks into fuels.

CRESTONE, INC., BOULDER

The company is developing a novel antibiotic for the treatment of serious Gram-positive bacterial infections including skin infections and pneumonia.

FLASHBACK TECHNOLOGIES, INC., BOULDER

This grant supports the company in developing a robust and accurate, non-invasive resuscitation monitor to improve the clinical outcomes for trauma victims experiencing hemorrhage. At project conclusion, two devices will be ready for clinical trials.

ONKURE, INC., LONGMONT

The company is exploring a highly potent and selective HDAC inhibitor as an anti-tumor drug. Grant funds will help in identifying biomarkers associated with HDAC responsiveness and resistance; and in assessing the candidate in preclinical oncology models.

SHAPE OPHTHALMICS, LLC., AURORA

This company developed out of technologies founded at the University of Colorado. Grant work will move a punctual plug into design freeze stage as the first step toward an FDA 510(k) submission. The punctual plug is a novel and cost-effective clinical treatment for dry-eye syndrome. The company is also developing a drug-eluting component for the punctual plug as a glaucoma treatment.

SOPHONO, INC., BOULDER

This company has a bone conduction hearing technology, and is adapting it for the under-age-5 market using technology licensed from CU that will allow the company to re-design the device effectively. The CU technology will also allow the company to train providers for proper implantation.

SUVICA, INC., BOULDER

Grant funds will support the company in developing their lead candidate for an orphan oncology indication, and in the characterization of a follow-on new chemical entity.



COMMERCIALIZATION INFRASTRUCTURE AWARDS 2011-2012

BIOFRONTIERS INSTITUTE AT UNIVERSITY OF COLORADO BOULDER

This grant supports the Biofrontiers Institute, formerly the Colorado Institute for Drug, Device and Diagnostic Development, in developing a state-of-the-art 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. Grant funds support equipment, resources and personnel costs to develop the core facilities of the institute.

CID4

The Colorado Institute for Drug, Device and Diagnostic Development (CID4) is managing life science discoveries from Colorado research institutions and Colorado start-ups and early-stage businesses with the goal of creating bioscience jobs in Colorado. Grant Funds support operations of the CID4 and the development and management of life-science discoveries adopted as Projects of the CID4. The CID4 currently has 5 Projects, or companies, under its guidance and has fostered those to create 27 jobs (including indirect) and garnered an additional \$1.5 million for these businesses.

COLORADO STATE UNIVERSITY VENTURES - COLORADO CENTER FOR DRUG DISCOVERY

This grant supports the Colorado Center for Drug Discovery (C2D2) as a resource to faculty at Colorado research universities, bringing biology and chemistry faculty together to use chemical libraries, computational resources, bioinformatics, cheminformatics, database support, virtual high throughput screening, and Computer Aided Drug Design to pharmacologically validate drug candidates with patent-protected chemical matter and innovative therapeutics for unmet medical needs. C2D2 has established a grant system and supported 6 inter-institutional projects with funding and resources in 2011. In addition to these, C2D2 is providing medicinal chemistry resources to two other investigators, and is expanding its services on a fee basis.

COLORADO BY THE NUMBERS

UPDATE ON COLORADO'S GROWING BIOSCIENCE INDUSTRY



A HISTORY OF COLORADO-BASED AND RELATED PUBLIC COMPANIES (2007-2011)

1	Accelr8 Technology	AMEX:AXK
2	Agilent Technologies	NYSE:A
3	Allos Therapeutics	NASDAQ:ALTH
4	Alpharma Animal Health King Pharma	NYSE:KG
5	Amgen	NASDAQ:AMGN
7	Array Biopharma	NASDAQ:ARRY
8	AspenBio Pharma	NASDAQ:APPY
9	B2 Health	NASDAQ:BTWO
10	BioNovo	NASDAQ:BNVI
11	Ceragenix Pharmaceuticals	OTC BB:CGXP.OB
12	Cochlear Americas	ASX:COH
13	Conmed	NASDAQ:CNMD
14	Corgenix Medical	NASDAQ:CONX.OB
15	Covidien	NYSE:COV
16	Dharmacon Thermo Fischer Scientific	NYSE:TMO
17	Encision	NASDAQ:ECIA.OB
18	GeneThera	NASDAQ:GTHR.PK
19	Heska	NASDAQ:HSKA
20	Hospira	NYSE:HSP
21	InB:Paxis / Hauser CRO Integrated BioPharma	NASDAQ:INBP
22	Inhibitor Therapeutics	NASDAQ:IHBT
23	Insmed	NASDAQ:INSM
24	Martek Biosciences	NASDAQ:MATK
25	Medtronic	NYSE:MDT
26	Mesa Labs	NASDAQ:MLAB
27	Myogen Gilead	NASDAQ:GILD
28	OrthoNextx	NASDAQ:ANTX.OB
29	OSI Pharmaceuticals	NASDAQ:OSIP
30	Pharmion Acquired by Celgene	NASDAQ:CELG
31	QLT Acquired by Tolmar <small>(PRIVATELY HELD)</small>	NASDAQ:QLTI
32	Replidyne CardioVascular Systems	NASDAQ:RDYN
33	Roche Colorado Acquired by Corden Pharma	VTX:ROG.VX
34	Sandoz	NYSE:NVS
35	Spectranetics	NASDAQ:SPNC
36	The Sorin Group	MTAX:SRN.MI
37	VitroLife	SEK:VITR
38	Xelr8 Holdings	AMEX:BZI
39	Zynex	NASDAQ:ZYXI.OB
40	ARCA <i>biopharma</i>	NASDAQ:ABIO
41	Omnio Biopharma	NASDAQ:OMBP.OB
42	Ampbio Pharmaceuticals	NASDAQ:AMPE
43	Clovis Oncology	NASDAQ:CLVS
44	Gevo	NASDAQ:GEVO

2011

NEW COMPANIES IN COLORADO 2007-2011

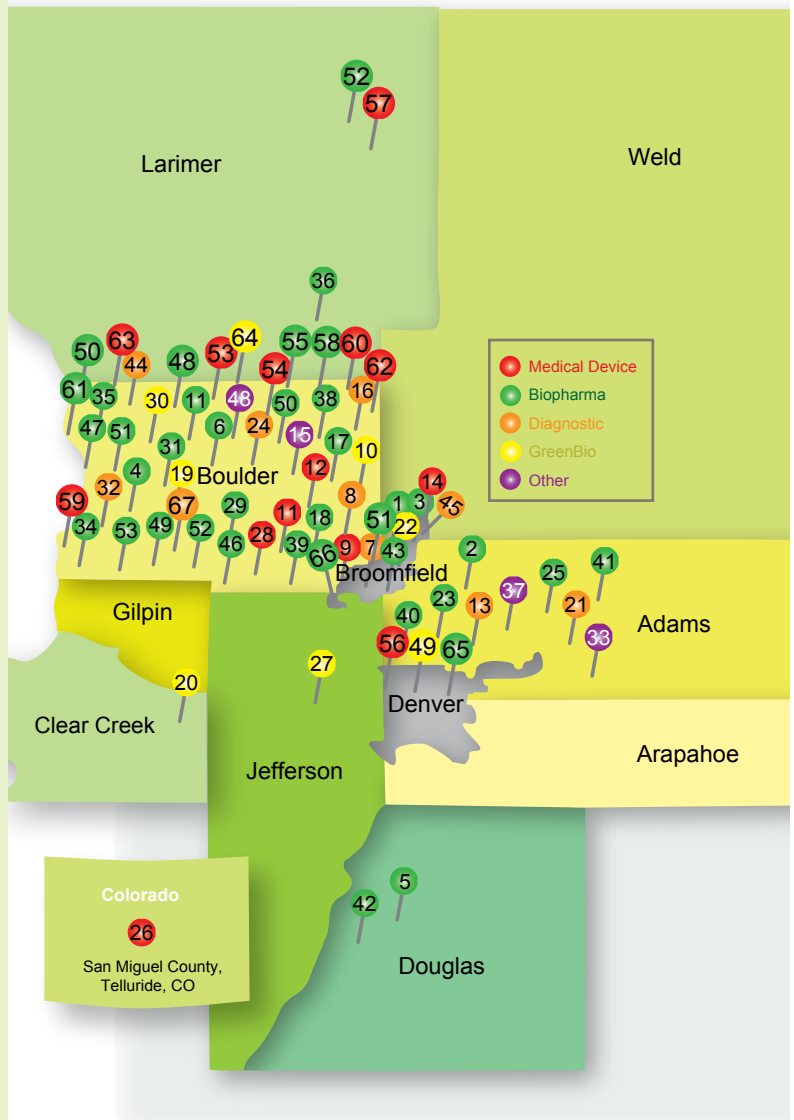
1. 3Q Matrix
2. A2BE Carbon Capture
3. Accuthera
4. Advanced Headache Intervention
5. Advanced Microlabs
6. ApopLogic Pharmaceuticals
7. ArcScan Inc.
8. Beacon Biotechnology
9. BioAMPS International
10. Biodesix
11. BlueSun
12. Caveo Therapeutics
13. Chemizon
14. Clarimedix
15. CycleGen
16. EndoShape
17. Firefly medical
18. Fluonic
19. HepQuant
20. Hiberna
21. Illumasonix
22. KromatidTiD
23. Lanx
24. Locomotion
25. mBio Diagnostics
26. Miragen Pharmaceuticals
27. OPX Biotechnologies
28. Onco Therix
29. Pico-Tesla Magnetic Therapies
30. Precision Biopsy
31. Sierra Neuropharmaceuticals
32. Snoasis Medical
33. Solix Biofeuls
34. Taiga Biotechnologies
35. Tissue Genetics
36. ValveXchange
37. V-Clip Pharmaceuticals
38. Ventrus Biosciences**
39. Vitrumed
40. MycoLogics
41. AmideBio
42. Analytical Research System
43. InDevR
44. Qgenta
45. Allogenes
46. Western States Biopharma
47. Isogenis
48. Tolmar
49. Biotricity Medical**
50. Actium Biosystems, LLC
51. Eveia Medical, Inc
52. Generations Medical Partners LLC
53. ICVRX LLC
54. Leap Frogg, LLC
55. Myocept
56. Ocutronics, LLC
57. Sophono
58. Peptivir
59. Ariel Pharma



*Company Migrated to Colorado
 **Company Exited from Colorado

INSTITUTIONAL FINANCINGS 2007 TO 2011

COMPANY	ROUND/EVENT	VALUE (\$M)
1 Accera	Series C	\$35.0
2 Allos Therapeutics	Secondary	\$65.2
- Allos Therapeutics	Secondary	\$50.5
3 ARCA biopharma	Series B	18.0
4 Array Biopharma	Debt + Warrants	\$80.0
5 Aspen BioPharma	Secondary	\$18.2
6 BaroFold	Series A	\$12.0
7 Biodesix	Series B	Undisclosed
8 BiOptix	Series B	Undisclosed
9 CeraPedics	Series A	\$12.3
10 Evolutionary Genomics	Series A	\$5.0
11 GlobeImmune	Series C	\$41.2
12 IBalance Medical	Series A	\$13.5
13 Illumasonix	Series A	Undisclosed
14 Lanx	Series A	\$25.0
15 MD-IT	Series B	\$11.0
16 Microphage	Series A	\$11.0
17 Miragen	Series A	\$8.0
18 N30 Pharma	Series A	Undisclosed
19 OPX Biotechnologies	Series A	\$3.6
20 OberonFMR	Series A	\$1.0
21 Precision Biopsy	Series A	Undisclosed
22 Range Fuels	Series B	\$130.0
23 Sierra Neuropharma	Series A	\$21.5
24 SomaLogic	Series D	\$35.0
25 Taligen Therapeutics	Series B	\$65.0
26 TheraTogs	Series A	\$1.1
27 Luca Technologies	Series C	\$76.0
28 Medivance	Series E	\$8.1
29 Clovis Oncology	Series A	\$146.0
30 OPX Biotechnologies	Series B	\$17.5
31 CeraPedics	Series B	\$14.5
32 BiOptix	Series A	\$3.0
33 AmideBio	Seed	Undisclosed
34 GlobeImmune	Series E	\$17.5
35 GlobeImmune	Milestone payment	\$40.0
36 Inviragen	Series A	\$15.0
37 Sharklet	Series A	\$1.5
38 miRagen	Series A2	\$4.0
39 Array Biopharma	Debt + Warrants	\$40.0
40 BioAMPs	Seed	\$0.1
41 Allos Therapeutics	Secondary	\$93.0
42 AspenBio Pharma	Secondary	\$8.7
43 Accera	Series D	\$11.0
44 SomaLogic	Series E	\$15.0
45 Biodesix	Series C	\$7.1
46 GlobeImmune	Series E	\$17.5
47 N30 Pharma	Series B	\$17.5
48 Clovis Oncology	IPO	\$130.00
49 Gevo	IPO	\$123.30
50 Miragen	License Agreement	\$45.00
51 ARCA biopharma	Secondary	\$3.00
52 AmideBio	Seed	\$0.58
53 ValveXchange	Series A	\$3.50
54 St. Renatus	Series A	\$3.50
55 Mosaic Biosciences	Series A	\$1.00
56 Surefire Medical	Series A	\$6.10

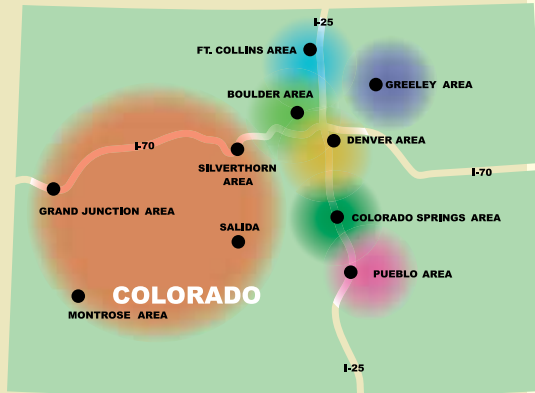


57 Precision Biopsy	Series A	\$2.50
58 PanTheryx	Series A	\$1.00
59 BiOptix	Series B	\$9.00
60 EndoShape	Series B	\$3.50
61 OPX Biotechnologies	Series C	\$36.50
62 Ampio Pharma	Secondary	\$9.50
63 Accera	Series D	\$11.00
64 Biodesix	Series D	\$20.00
Sub-total Capital Raises (disclosed)		\$1,625.08
65 Dharmacon	Acquired	\$80.00
66 Sima	Acquired	\$1,100.00
67 Pharmion	Acquired	\$2,900.00
68 Myogen	Acquired	\$2,500.00
69 RxKinetix	Acquired	\$115.00
70 Insmed	Acquired	\$130.00
71 Taligen Therapeutics	Acquired	\$111.00
72 CaridianBCT	Acquired	\$2,600.00
73 Baxa	Acquired	\$380.00
74 Medivance	Acquired	\$250.00
Sub-total Exits		\$10,166.00
Total Capital Infused to Colorado		\$11,791.08

DIRECTORY

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- 48 Medical Device and Related Companies
- 57 Biotechnology, Pharmaceutical and Related Companies
- 62 Biofuels and Related Companies
- 63 Research & Education Institutions
- 65 Foundations
- 65 Service Providers



MEDICAL DEVICE AND RELATED COMPANIES

2C TECHNOLOGIES

Denver
www.2ctechcorp.com
 Development, validation, and commercialization of "SeeQ" intraocular implant as a next generation in vivo system for stimulating degenerated retinal cells and restoring vision.

ABILITIES UNLIMITED

Colorado Springs, Denver
www.auiop.com
 Provides artificial limbs and custom orthopedic appliances.

ABLE PLANET

Wheat Ridge
www.ableplanet.com
 Developing an extensive line of audio and communications products that are usable by people with all levels of hearing, and provide a means whereby users can listen at lower volumes without compromising full rich sound.

ABLELINK TECHNOLOGIES

Colorado Springs
www.ablelinktech.com
 Addresses the need for well-researched cognitive support technologies for individuals with intellectual disabilities.
 intellectual disabilities

ABOUT PACKAGING ROBOTICS

Thornton
www.aboutpackagingrobotics.com
 Produces robotic package handling systems. The products are engineered to open, fill, transport, seal, code and label a variety of pre-made pouches and bags. Their line of packaging and systems for on demand product identification are currently used in the medical, industrial and food industries.

ACCELLENT

Arvada, Englewood
www.accelcent.com
 Accellent is the best provider of comprehensive supply chain solutions, and we are always striving to be more responsive to our partners. With our Accellent Focus we continue aiming at doing just that.

ACCEL8 TECHNOLOGY CORPORATION

Denver
www.accelr8.com
 Develops medical diagnostic technologies for research and clinical applications. The primary focus is rapid, integrated bacterial analysis system designed to identify, count, and provide complete antibiotic susceptibility data by bacterial species within a few hours of sample injection without prior culturing.

ACCU-TUBE CORPORATION

Englewood
www.accutube.com
 Manufactures standard and custom size stainless steel hypodermic medical tubing.

ACERTARA ACOUSTIC LABORATORIES, LLC

Longmont
www.acertaralabs.com
 Independent ISO/IEC accredited medical ultrasound acoustic measurement and testing laboratory.

ACTALL SECURITY PRODUCTS

Denver
www.actallsp.com
 Engineers, manufactures and markets wireless systems for hospital and pharmaceutical company facilities.

ADVANCED MICROLABS, LLC

Fort Collins
www.advancedmicrolabs.com
 Researches and develops chemical analytical instruments in 'Lab-on-a-chip' format.

ADVANCED RESEARCH INSTRUMENTS CORPORATION

Golden
www.aricorp.com
 Produces preamplifiers for PMT's and electron multipliers, high voltage power supplies, counters and timers, precision rate meters, and image analyzers for scanning electron microscopes.
 preamplifiers

AEROPHASE, INC.

Longmont
www.aerophase.com
 Research and Development of technologies that reduce environmental impact, help economically disadvantaged people, and improve healthcare. Including low cost, environmentally friendly Meter Dose Inhaler and improved Aerosol Therapy for Lung Cancer

AESTHETIC TECHNOLOGIES

Golden
www.parisianpeel.com
 Manufactures and sells Parisian Peel® brand microdermabrasion systems and accessories along with skin care products to medical, and spa professionals.
 Skin Care

AESTIS, INC.

Boulder
www.altitudetraining.com/aux/about/aestis
 Develops a treatment for obesity through controlled hypoxia technology. The two principal components are the air separation unit and proprietary control system.

AGILENT TECHNOLOGIES

Englewood
www.agilent.com
 Provides core electronic and bio-analytical measurement tools to advance life science research.

AKTIVA

Boulder/Aurora
www.aktivax.com
 Developing novel reconstitution, safety syringes for vaccines and biologics.

ALLERGAN, INC.

Denver
www.allergan.com
 Continually conduct research to develop products that enable medical specialists to help people preserve and protect their vision, move freely, best express their inner beauty and lead healthy and active lives.

ALLISON MEDICAL INC

Littleton
www.allisonmedical.com

Develops products to assist specialists in the medical and veterinary industries, and have designed and provided essential syringes, needles and custom items for various industries.

ALLOGENESIS LLC

Denver
www.genbiomed.com

Created purified human platelet mixture from platelets contained in blood (from blood banks) that holds promise to replace current growth media for stem cells. The company's pHPM product promises to offer researchers more affordable animal-free option capable of working across applications.

ALLOSOURCE

Centennial
www.allosource.com

Develops, processes and distributes life-enhancing bone and tissue allografts to the medical community, bone; tissue;

ALLPRO

Broomfield
www.allprodental.com

Produces a large selection of non-latex proph cups, proph angles and other dental products.

ALPHA MOLD WEST

Broomfield
www.alphamoldwest.com

Plastic injection mold-making facility for the medical industry.

ANGIOSLIDE, INC.

Wheat Ridge
www.angioslide.com

Privately held medical device company that developed a unique Embolic Capture Angioplasty solution, PROTEUS™, which provides a combination of PTA balloon and embolic capture.

ANIMAL CARE SYSTEMS, INC.

Centennial
www.animalcaresystems.com

Provides innovative rodent caging systems for the life-science industry.

ANIMARK, INC.

Aurora
www.animark.us

Manufactures and sells ultrasound pregnancy detectors and ovulation predictors for livestock breeding.

APDYNE MEDICAL COMPANY

Denver
www.apdyne.com

Manufactures and distributes the Apdyne Phenol Applicator Kit used to anesthetize the tympanic membrane during in-office myringotomy procedures.

AQUEOUS BIOMEDICAL

Colorado Springs
www.aqueousbio.com

Develops biocompatible materials and geometric designs that can be applied to stents, shunts, artificial organs and drug delivery devices. Their first product, the Oculieve™ shunt, is designed to control over-pressurization inside the eye caused by glaucoma.

ARCSCAN, INC.

Morrison
www.arcscan.com

ArcScan, Inc. has developed break through imaging technology for the eye. Many ophthalmologists feel its patented Artemis 3 (shown above) VHF Ultrasound Arc Scanner will change ophthalmology the way MRI changed radiology.

ARCTURUS STAR PRODUCTS LLP

Cortez
www.arcturusstar.com

Arcturus Star Products is dedicated to pioneering Vibrational Energy Therapy for the wellness and beauty professions. Vibrational energies incorporate subtle low frequencies of light, sound, and electrical waves. Their therapeutic specialty is in the area of lymphatic health.

ASI MEDICAL, INC.

Centennial
asimedical.net

Developer of specialized mobile and integrated dental carts, as well as unique dental instruments for the modern dental office.

ASPIRE BIOTECH, INC.

Colorado Springs
www.aspirebiotech.com

Provides contract services for all phases of product development from concept to launch, and produces its own skin sealant and wound-closure adhesives.

AURI-STIM MEDICAL

Denver
www.net1device.com

Offers an alternative therapy for migraine headaches, hormonal migraine, chronic headaches, premenstrual syndrome (PMS), nicotine and narcotics addictions using the NET-1000 device.

AVANTES

Broomfield
www.avantes.com

Produces, develops and sells spectrometers, light sources, fiber optic multiplexer, fiber optic cables, software, fiber optics, accessories to the medical device industry.

BAL SEAL ENGINEERING, INC.

Colorado Springs
www.balseal.com

Produces seals and canted-coil springs for sealing, holding, latching, and electrical contact in a variety of applications throughout the medical market.

BAXTER HEALTHCARE CORPORATION

Englewood
www.baxter.com

Baxter International, through its subsidiaries, develops, manufactures and markets products that save and sustain the lives of people with hemophilia, immune disorders, infectious diseases, kidney disease, trauma, and other chronic and acute medical conditions.

BEACON BIOTECHNOLOGY

Aurora
www.beaconbiotechnology.com

BP Proteomics, ProLume Ltd, and Black Forest Engineering, LLC have come together to create Beacon Biotechnology to pursue new opportunities that build upon their respective scientific expertise.

BECKMAN COULTER

Fort Collins
www.beckmancoulter.com

Develops and produces instruments for the diagnostic industry. Specializes in the fields of immunocytochemistry, flow cytometry, and microbiology.

BELL DENTAL PRODUCTS, LLC

Englewood
www.belldental.com

Designs, develops, and manufactures precision dental equipment based on electric motor technology.

BIO2 MEDICAL, INC

Golden
www.bio2medical.com

Medical device manufacturer founded to design, develop, and subsequently manufacture a range of medical products in response to clinical needs.

BIOCARE SYSTEMS, INC.

Parker
www.biocaresystems.com

Designs, develops and markets patent-protected, FDA cleared, new health-care devices (LumiWave™) that use deep-tissue light therapy to decrease pain, accelerate healing and improve quality of life.

BIODESIX, INC.

Aurora, Broomfield
www.biodesix.com

Provides clinically reliable methods for the early detection, diagnosis, therapeutic guidance, and monitoring in cancer and degenerative diseases.

BIO-LOGISTICS PRECLINICAL, INC.

Pierce
www.bio-logistics.com

Offers engineering and regulatory support and pre-clinical strategic development to the medical device industry.

BIOPTIX

Boulder
www.biopixinc.com

Offers a new, patented approach to label-free analysis, called Surface Plasmon Enhanced interferometry (SPE).

BIOTRICITY MEDICAL INC.

Aurora
www.biotricitymedical.com

Research and manufacturing company specializing in developing long-term power requirements for implanted devices based on bioelectric generation.

BIOVISION TECHNOLOGIES, INC.

Golden
www.biovisiontech.com

Develops and manufactures micro-visualization solutions that enable endoluminal and minimally invasive medical procedures in both human and veterinary medicine. The imaging technologies and customized micro-endoscope solutions are integrated to reduce incision size and speed healing.

BODYSYNC, INC.

Aurora
www.bodysync.com

Applies evidence-based genetic information to develop personalized products that help individuals achieve their health goals.

BOULDER DIAGNOSTICS

Boulder
www.boulderdiagnostics.com

Boulder Diagnostics is a specialty diagnostics company dedicated to developing diagnostic reagents and test for infectious diseases and other protein targets that can benefit from a reliable, easy to use test for laboratory, physician's office or home use. We focus on underserved markets where the current state of the art is inadequate for effective diagnosis.

BOULDER INNOVATION GROUP, INC.

Boulder
www.boulderinnovators.com

Develops and manufactures image-guided surgical navigation digitizers and industrial 3D capture and modeling equipment.

BROADWEST CORPORATION

Denver
www.broadwest.com

Develops and manufactures ergonomic mammography viewing equipment.

CS MEDICAL WERKS

Grand Junction
www.csmedicalwerks.com

Offers ceramic manufacturing, materials expertise, and custom engineering support to prototype and commercialize designs and patents to orthopedic companies for hip, spinal and dental implants.

CANBERRA INDUSTRIES

Greenwood Village
www.canberra.com

Manufactures and supplies analytical instruments, systems and services for radiation detection and radiation monitoring.

CAR-MAY L.L.C.

Berthoud
www.car-may.com

Unlike basic metering pumps, Car-May's systems provide pumping capability, fluid measurement, and flow control all in one compact module.

CARE ELECTRONICS, INC.

Boulder
www.medicalshoponline.com

Offers a range of electronic monitoring and alarm equipment for the home health and long term care markets.

CAROPA PLASTICS, INC.

Englewood
www.caropa.com

Provides custom injection molds and specializes in the needs of the medical and high technology industries.

CARSAN ENGINEERING, INC.

Golden
www.carsaneng.com

Designs and manufactures products for several of the leading OEMs in the medical, dental, industrial, semiconductor, entertainment, and video projection markets.

CASCADE TEK

Longmont
www.cascadetek.com

Cascade TEK is an accredited medical device testing laboratory located in Longmont CO and Oregon. Specializing in package testing, accelerated aging, photostability, UV, temperature/humidity, vibration, shock testing services.

CEA TECHNOLOGIES, INC.

Colorado Springs
www.ceatechnologies.com

Provides product development and complete product assembly and packaging services to the medical industry.

CERAPEDICS, INC.

Westminster
www.cerapedics.com

Globally supplying the orthopedic and spinal communities with quality products, services and educational opportunities to improve patient outcomes

CERESCAN

Denver
www.cerescanimaging.com

Specialize in state of the art functional brain imaging utilizing a proprietary process including the latest generation high resolution gamma camera, the industry's leading brain image reconstruction software, specially trained board-certified physicians and research-based knowledge to provide unparalleled diagnostic medical reports.

CERTOL INTERNATIONAL, LLC

Commerce City
www.certol.com

Provide patients and healthcare professionals with innovative products and responsible solutions to the complicated infection control challenges of the 21st century.

CLARIMEDIX

Boulder / Aurora
www.clarimedix.com

Leading medical device company targeting vascular dysfunction in Alzheimer's disease with a non-invasive, non-drug therapeutic approach. The product uses an innovative new technology platform to provide significant cognitive benefit without the side effects seen with current treatments. The result is a product that has the potential to revolutionize treatment options for patients and families.

CLEAN ROOM DEVICES, LLC

Westminster
www.deanroomdevices.com

Manufactures products that are engineered specifically for "clean room" environments.

CLIFFORD CONSULTING & RESEARCH, INC.

Colorado Springs
www.ccrflab.com

Clifford Materials Reactivity Testing (CMRT) is a laboratory screening process used to help identify existing sensitivity problems to various chemical groups and families of compounds in an individual patient.

COCHLEAR AMERICAS

Centennial
www.cochlearamericas.com

Designs, manufactures and distributes hearing implants including the Nucleus Freedom and Baha implants.

COLDQUANTA, INC.

Boulder
www.coldquanta.com

Focuses on the development of BEC (Bose-Einstein Condensate) generating devices and systems, allowing them to be accessible to a wide range of research, educational, and industrial institutions. Our products are intended for use in scientific and industrial applications requiring high performance and reliability.

COLIBRI HEART VALVE

Broomfield
www.colibrihv.com

Colibri Heart Valve, LLC is engaged in research and development of novel heart valve technologies. The company has developed proprietary processes of tissue membrane preparation and treatment as well as unique geometries for heart valve design exploiting concepts of strength and durability through material continuity enabled by folded membrane constructs.

COLORADO LASER TECHNOLOGIES, INC.

Colorado Springs
www.coloradolasermarking.com

Provides YAG laser engraving technology, as well as CO2 and YAG laser cutting services.

COLORADO PRECISION PRODUCTS, INC.

Boulder
www.coloradoprecision.com

Provides diamond turned and polished optics/parts. Fabricator of X-ray telescope optical components. Produces and offers air bearing LVDT contact linear measurement systems, .05 microinch resolution.

COMEG U.S.A. ENDOSCOPY, INC.

Denver
www.sopro-comeg.com

A product range producing high quality video imagery that meets the needs of the surgeons in terms of products, budget and services, whatever their specialty.

CONFI-DENTAL PRODUCTS COMPANY

Louisville
www.confidental.com

Manufacture a wide range of dental and healthcare products including composites, cements, creams, lotions & ointments.

CONMED ELECTROSURGERY

Centennial
www.conmed.com

Designs and manufactures RF electrosurgical generators and accessories of the highest quality, safety and value for use in surgical procedures performed in virtually every hospital, surgery center and physicians office.

COORSTEK

Golden
www.coorstek.com

Using our core strengths of custom engineering, materials expertise, operational excellence, and rapid execution, we help our customers develop amazing solutions to their toughest technical challenges. Our experienced engineering and manufacturing experts are ready to help with your next project.

CORGENIX MEDICAL CORPORATION

Broomfield
www.corgenix.com

The Colorado facility is engaged in research, development, manufacture, and marketing of in vitro diagnostic products for use in disease detection and prevention.

COVIDIEN

Boulder
www.covidien.com

Offers an extensive product line, including pulse oximetry and airway and temperature management devices, ventilators, vessel sealing, and electrosurgery equipment.

CROSSTREES MEDICAL, INC.

Boulder
www.crosstreesmedical.com

Privately-held company developing advanced devices and instruments for the treatment of vertebral body compression fractures (VCF) in the spine.

CHART DENVER

Denver
www.chartindustries.com

Chart Denver provides manufacturing services to companies who want to out-source some or all of their manufacturing processes, and to companies that have capacity issues with their current manufacturing resources.

C. R. BARD, INC./ MEDIVANCE

Louisville
www.crbard.com

C. R. Bard, Inc. headquartered in Murray Hill, NJ, is a leading multinational developer, manufacturer and marketer of innovative, life-enhancing medical technologies in the fields of vascular, urology, oncology and surgical specialty products.

CYTOLOGIC INC.

Boulder
www.cytologic.com

Commercialization of an immunotherapy device for treatment of cancer.

DARKHORSE TECHNOLOGIES

Boulder
bparks@colorado.edu

Commercializes a patented technology for affordable, hand-carried, battery operated instruments for on-site genetic detection using Polymerase Chain Reaction (PCR).

DATAWAVE TECHNOLOGIES CORPORATION

Berthoud
www.dwavetech.com

Manufactures a wireless and battery-free device for acquiring and transmitting data from electrodes and other biosensors to a receiver placed meters away for electrophysiology, neurophysiology and physiology related research on both humans and large animals.

dbMEDx

Littleton
www.dbmedx.com

Developing next-generation, automated, wireless 3D ultrasound devices based upon our patent-pending full-view architecture.

DCS SURGICAL

Boulder
www.dfjmercury.com

Early stage company formed to evaluate potential new surgical procedures for the treatment of sinusitis.

DENVER INSTRUMENT COMPANY

Arvada
www.denverinstrumentusa.com

Designs and manufactures analytical balances, electro-chemistry instruments, moisture analyzers, and titration controllers.

DENVER OPTIC COMPANY

Englewood
www.eyeprosthesis.com

Specializes in the fitting and fabrication of two types of ocular prosthesis.

DESERT GLASS WORKS

Colorado Springs
www.dgw.com

Manufactures quartzware for the medical and research industries.

DIAZAMED

Fort Collins
www.diazamed.com

Development of advanced materials and utilize leading technologies to create more biocompatible surfaces.

DIE CUT TECHNOLOGIES

Northglenn
www.diecuttech.com

Offers precision material conversion, skilled assembly and manufacturing efficiencies, including cleanroom facilities.

DIRECTED ENERGY SOLUTIONS

Colorado Springs
www.denergysolutions.com

Develops advanced laser and optical device solutions for medical applications.

DNTLWORKS EQUIPMENT CORPORATION

Centennial
www.dntlworks.com

Manufactures portable, mobile and self-contained dental systems.

dpiX, INC.

Colorado Springs
www.dpix.com

Produces high-resolution amorphous silicon (a-Si) sensor arrays for medical X-ray imaging.

E.I. MEDICAL IMAGING

Loveland
www.eimedical.com

Manufacturer of highly portable and ruggedized ultrasound devices for the veterinary industry.

ELDON JAMES CORPORATION

Loveland
www.eldonjames.com

Designs and manufactures a diverse line of plastic and stainless steel hose fittings with a single-barb design.

ELECTRONIC MATERIALS, INC. (EMI)

Breckenridge
www.emiuv.com

Offers a complete line of EMCAST UV adhesives, epoxies, sealants, encapsulants and coatings. EMI also offers room temperature, thermal and Visible light cure adhesive systems.

ELLAB, INC.

Centennial
www.ellab.com

Manufactures thermal validation solutions for food and pharmaceutical industries.

EMPIRICAL TESTING CORPORATION

Colorado Springs
www.empiricaltesting.com

Provides medical device testing services that add value throughout the product development cycle, with a focus on spinal implant device testing.

ENCISION, INC.

Boulder
www.encision.com

Designs and manufactures innovative surgical devices. Developed AEM® Laparoscopic Instruments to improve electrosurgery and reduce the chance for patient injury in minimally invasive surgery.

ENDOSHAPE, INC.

Boulder / Aurora
www.endoshape.com

Manufactures surgical and medical instruments focusing on shape memory polymer devices for endoluminal application.

ENPLAS CORPORATION

Colorado Springs
www.enplas.com

Enplas is striving to gaze into the future through "OPT-PLANICS": a new concept that fuses the latest optical and electronics technologies on the basis of engineering plastics, the highly functional materials that Enplas has been pursuing since its inception.

es2 TECHNOLOGIES, INC.

Englewood
www.es2technologies.com

Product design group that specializes in bringing concepts to life through an inter-disciplinary system engineering, product safety and manufacturing engineering team.

EVERGREEN RESEARCH, INC.

Golden
www.evergreenresearch.com

Offers a complete range of development services from product definition and feasibility studies through detailed design to pilot-run and low-volume production to the medical device industry.

EVEIA MEDICAL

Boulder
www.eveiamedical.com

Development stage company focused on creating a bio-analytical system designed to conduct immunassay tests. Key attributes include; low femtomolar sensitivities, short assay development cycles and results in 10-20 minutes. The product consists of the instruments, software and reagents required for analyte measurement.

EXTREME DIAGNOSTICS

Boulder
www.extremediagnosics.com

Develops noninvasive measurement systems, including optical systems such as custom holographic and interferometric instruments. Specializes in structural health monitoring, nondestructive testing, and materials processing.

FALCON REHABILITATION PRODUCTS

Denver
www.falconrehab.net

Designs and builds high quality, innovative quadruplegic seating systems and accessories (Falcon Rehabilitation Products, LaBac Seating Systems, Gel Ovations).

FIREFLY MEDICAL, INC.

Fort Collins
www.fireflymedicalinc.com

Designs and develops innovative durable medical equipment for clinical healthcare markets.

FISCHER MEDICAL TECHNOLOGIES, INC.

Broomfield
www.fischermti.com

Designs, manufactures, and markets imaging systems for the screening and diagnosis of breast cancer.

FLASHBACK TECHNOLOGIES

Longmont
www.flashbacktechnologies.com

Fast, non-invasive detection of acute blood loss volume and prediction of cardiovascular collapse in emergency situations.

FLUONIC

Boulder
www.fluonic.com

Develops infusion therapy systems with disposable sensors for OEM and proprietary pumping systems.

FUTURA SURGICAL INC.

Wheat Ridge
www.futurasurgical.com

Development, manufacture and sales of orthopedic products

GAMBRO AMERICAS

Lakewood
www.gambro.com

Develops and supplies hemodialysis, peritoneal dialysis and acute dialysis products, therapies and services.

GE ANALYTICAL INSTRUMENTS

Boulder
www.geinstruments.com

Manufactures instruments used to measure total organic carbon (TOC) in water for pharmaceutical applications and medical research.

GENESEE BIOMEDICAL, INC.

Denver
www.geneseebiomedical.com

Manufactures cardiac surgery instruments and devices.

GNATHODONTICS, LTD.

Lakewood
www.gnatho.com

Specializes in functional dentistry, advanced implant work, precision partial dentures, combination cases and metal-free fixed restorations.

GRANT DENTAL TECHNOLOGY CORPORATION

Colorado Springs
www.grantdentaltech.com

Dental implants and surgical/restorative tools.

HACH COMPANY

Loveland
www.hach.com

Manufactures and distributes analytical instruments and reagents used to test the quality of water and other aqueous solutions.

HEI ADVANCED MEDICAL OPERATIONS

Boulder
www.heii.com

Develops and manufactures high performance components, medical software, medical devices, and non-medical products. Produces microcircuits and subsystems for hearing and medical applications.

HIRSH PRECISION PRODUCTS, INC.

Boulder
www.hppi.com

Manufactures precision-machined and assembled components for the medical industry.

ILLUMASONIX LLC

Aurora
www.alliedminds.com/subsidiaries/ilumasonix

In partnership with Allied Minds, we will develop and commercialize a new non-invasive vascular disease detection procedure which will provide near real-time assessment of detailed blood flow patterns within the cardiovascular system.

IMAGISTX, INC.

Highlands Ranch
www.ImgastxProstate.com

Ultrasound system that is potentially able detect and target for biopsy and focal therapy prostate cancer.

INDEVR, INC.

Boulder
www.indevr.net

Develops and manufactures biomedical instruments including molecular diagnostic assays, virus measurement systems and detection technologies for micro-arrays.

INFINITY PHOTO-OPTICAL COMPANY

Boulder
www.infinity-usa.com

Manufactures long-distance and continuously-focusable microscope technology, macro systems, internal-focusing devices and other lenses.

INJECTECH, LLC

Loveland
www.injectech.net

Provides molding, assembly and design of medical components and fittings for OEM device manufacturers. Class 100,000 cleanroom molding and assembly available.

INTEC, INC.

Boulder
www.intec.com

Manufactures precision temperature controllers and microscope hot stage systems for temperature cycling, food sciences, materials characterization, forensics, polymers and liquid crystals and microbiology.

INTERTEK

Boulder
www.intertek.com

Offers testing, inspection and certification of products, commodities and systems for medical devices. Performs FDA 510(k) reviews, electrical safety certification including CE Marking, testing to the MDD and IVDD, risk analysis, EMC and performance testing.

INVITRIA

Fort Collins
www.invitria.com

InVitria develops, manufactures and markets a portfolio of high performance and well defined cell culture products and reagents used in bioprocessing, biopharmaceutical formulation, stem cell & regenerative medicine, life science research and diagnostics.

IPAX, INC.

Englewood
www.ipaxinc.com

Assembles and packs medical products, focusing on bringing new medical products to the marketplace. Specialty is small to medium production runs, also has the capacity and the manpower to take on the larger jobs.

JORGENSEN LABORATORIES, INC.

Loveland
www.jorvet.com

Designs and manufactures instruments which are used in the animal health field including specialty instruments, surgical suture, and veterinary equipment.

KENT SYSTEMS

Loveland
www.kentsystems.com

KENT Systems designs, manufactures, and distributes Plastic Quick Couplings, Tube Fittings, and Media Bags.

KESTREL LABS, INC.

Boulder
www.kestellabs.com

Kestrel Labs combines internal research and development projects with consulting and contract development of innovative, patient monitoring concepts and other medical technologies.

LANX, LLC

Broomfield
www.lanx.com

Specializes in systems and implants for all segments of spinal surgery. Integrating leading technology, intellectual property and state-of-the-art engineering, each product is designed to simplify surgery and improve the quality of care for patients worldwide by providing surgeons with innovative spinal products.

LEAP FROGG, LLC

Grand Junction
970-260-7494

Created The Frogg® Dynamic Compression System which Can Be Used at All Times; No Gaps in Protection; Reduces Accidents; Reduces Nursing Time; Is More Comfortable;

LEEDS PRECISION INSTRUMENTS, INC.

Denver
www.leedsmicro.com

Offers microscopes and custom-engineered products ranging from small modifications on a microscope stand that accommodate specific applications, to large specialized systems, such as an optical comparison bridge for forensic science.

LENOX MACLAREN SURGICAL INSTRUMENTS

Louisville
www.lenoxmadaren.com

Manufactures precision orthopedic and neurological surgical instruments.

LOGISENS CORPORATION

Fort Collins
www.logisens.com

Develops biosensor and software technology, enabling a significant breakthrough in real-time measurement and reduction of stress.

MAGNELAB, INC.

Longmont
www.magnelab.com

Manufactures custom magnetic components (transformers/inductors) for the medical field.

MASSIVELY PARALLEL TECHNOLOGIES, INC.

Boulder
www.massivelyparallel.com

Focuses on the entire communication task at the cluster level, and optimize it mathematically (22 patents granted or pending); Rigorous algorithms allow a system to manage itself and adapt to changing requirements, at any scale; Libraries self-train on a given hardware configuration, so there is no tradeoff between optimality and generality.

MAYER MEDICAL TECHNOLOGIES, INC.

Grand Junction
www.mayermedical.com

Mayer Medical Technologies, Inc. improves health and saves lives by innovating new products, providing seed capital to medical start-ups, and assisting medical professionals in developing their product ideas.

mBio DIAGNOSTICS

Boulder
www.mbiidx.com

Develops a low-cost, high sensitivity, multi-pathogen detection system for diagnostics.

MEDEFFICIENCY, INC.

Wheat Ridge
www.medefficiency.com

Specializes in total contact casting products for off-loading diabetic foot ulcers.

MEDICAL MODELING, INC.

Golden
www.medicalmodeling.com

Produces highly accurate 3-D physical models of human bone structure from imaging such as CT or MRI.

MEDTRONIC NAVIGATION, INC.

Louisville
www.medtronicnavigation.com

At the forefront of surgical navigation solutions, guiding the industry to a higher standard of care for several clinical specialties, including cranial neurosurgery, functional neurosurgery, spinal, ENT, joint replacement and orthopaedic trauma surgeries.

MEINHARD GLASS PRODUCTS

Golden
www.meinhard.com

Continues the evolution in nebulizer design. The principle goal is to produce finer, more narrowly sized-dispersed aerosols while maintaining the high quality, low cost and simplicity of design and operation that characterize the MEINHARD® nebulizer.

MESA LABORATORIES, INC.

Lakewood
www.mesalabs.com

Provides dialysis meters and related supplies to dialysis clinics worldwide.

METAMATRIX, LLC

Boulder
www.zorbent.com

Manufacturers of ZORBENT which absorbent is designed to leave no residue, reducing the risk associated with slippery surfaces and is completely safe to use and represents no health hazard

MICRO IMAGING SOLUTIONS, LLC (MIS)

Englewood
www.micro-imaging.us

Developed an innovative-patented technology that can be utilized in the manufacture of micro-digital CMOS cameras.

MICROLIFE MEDICAL HOME SOLUTIONS, INC.

Golden
www.mimhs.com

Microlife Medical Home Solutions is dedicated to meeting the needs of healthcare providers and their busy medical practices. Our proprietary hand-held medical devices and systemic solutions offer healthcare providers evidence-based and practice-tested methods for accurate assessment, diagnosis, and treatment of cardiovascular and metabolic diseases.

MICROPHAGE, INC.

Longmont
www.microphage.com

Produces high-speed bacteria detection technologies to commercialize in markets including: food safety, water safety, clinical and veterinary diagnostics and detection applications.

MIKRON CORPORATION DENVER

Aurora
www.mikron.com

Supplies transfer machining systems for complex parts, cutting tools with high performance standards, self medication and diagnostic devices.

MIND STUDIOS

Colorado Springs
www.mind-studios.com

A full service product design and research studio housed within the University of Colorado at Colorado Springs. Offers concept generation, advanced prototyping, engineering and consumer research, human factors design and manufacturing solutions.

MUSCLESOUND, LLC

Denver

Developed a process to measure muscle glycogen content real time using non-invasive ultrasound technology.

MITOMICS (USA) INC.

Aurora
www.mitomicsinc.com

Pioneering the development of molecular tests based on the mitochondrial genome in order to improve clinical insight and therapeutic decisions that affect patients worldwide.

nSPIRE HEALTH, INC.

Longmont
www.nspirehealth.com

Develops, manufactures and markets respiratory care products and services focused on cardiopulmonary diagnostics, respiratory core lab services, and disease management solutions.

NEBA HEALTH LLC

Boulder
www.nebahealth.com

Develops neuropsychiatric medical devices, such as Neba™ an experimental, small format EEG-based device being studied under an Investigational Device Exemption from the Food and Drug Administration.

NEURO ASSESSMENT SYSTEMS

Denver
www.neuroassessments.com

Provides an objective brain-based measure of neurocognitive symptoms associated with a wide range of brain health issues including concussion and Alzheimer's disease.

OLYMPUS SOFT IMAGING SOLUTIONS CORPORATION (OSIS)

Lakewood
www.soft-imaging.de

Produces, markets, and sells image acquisition and processing software and hardware for all areas of electron microscopy.

OPTIBRAND LTD., LLC

Fort Collins
www.optibrand.com

Developed optical imaging system for veterinary diagnostics

OPTIENZ SENSORS

Centennial
www.optienzensors.com

OptiEnz has revolutionized measurement capabilities for organic chemical concentration; now providing continuous, real-time, in-place sensor solutions.

OTOLOGICS, LLC

Boulder
www.otologics.com

Develops and commercializes surgically implantable alternatives to conventional "in the ear" hearing aids.

OVAL WINDOW AUDIO

Nederland
www.ovalwindowaudio.com

Produces induction loop assistive listening systems and visual and vibrotactile technologies that help deaf and hard of hearing individuals.

PARÉ SURGICAL, INC.

Centennial
www.paresurgical.com

Develops surgical instruments such as the Quik-Stitch endoscopic suturing system.

PARKER MEDICAL

Highlands Ranch
www.parkermedical.com

Provides airway management products that make intubation safer for the patient and easier for the medical professional.

PARTICLE MEASURING SYSTEMS

Boulder
www.pmeasuring.com

Designs, manufactures, and services precision microcontamination monitoring instrumentation and software used for detecting particles in aerosols, liquids, slurries, gas streams and vacuum processing environments as well as surface molecular contamination monitoring.

PCC/ADVANCED FORMING TECHNOLOGY

Longmont
www.pcc-af.com

Offers thixoforming and metal injection molding for the medical device industry.

PEAK ROBOTICS, INC.

Colorado Springs
www.peakrobotics.com

Manufactures robots, special equipment, and turnkey automated systems for a variety of industries including: biotech, electronics, medical, semiconductor, etc.

PEDDLE MASTER, INC.

Johnstown
www.peddlemaster.com

Designs and manufactures handicapped driving aids. The Peddel Master is totally portable and can be installed and removed in a matter of seconds.

PERNICKA CORPORATION

Fort Collins
www.pernicka.com

Offers analytical testing that meets or exceeds the requirements of MIL-STD 750/883 method 1018 and 45662A for companies in the semiconductor, aerospace, basic & applied research, surface analysis, thin film deposition, laser technology, and medical products industries.

PHARMAJET, INC.

Golden
www.pharmajet.com

Develops a needle-free technology that has a low cost, single use, disposable polypropylene vial or cartridge, suitable for the delivery of common vaccines and standard dose injectable liquid medicines.

PHILLIPS PLASTICS (FARLEY SALES GROUP)

Denver
www.phillipsplastics.com

Phillips Plastics Corporation offers injection molding from design through distribution

PHYSICAL ACTIVITY INNOVATIONS

Fort Collins

Developing unique, footwear-based systems that motivate users to increase their daily physical activity.

PICO-TESLA MAGNETIC THERAPIES, LLC

Littleton
www.pico-tesla.com

Manufactures, markets and supports proprietary medical device technology designed to treat the signs and symptoms of neurological disorders like Parkinson's disease, Alzheimer's, migraines and epilepsy.

PLEXUS CORPORATION

Louisville
www.plexus.com

Provides integrated product development, manufacturing, and sustaining services of medical products.

POLYNEW, INC.

Golden
www.polynewinc.com

Develops Polymer ice and methods of making and using them.

PORTA-LUNG, INC.

Lakewood
www.portalung.com

Provides non-invasive ventilator support for long-term patients who need more portability than the iron lung allows, while maintaining the same level of ventilating efficiency.

PRECISION BIOPSY

Aurora

In partnership with Allied Minds, we are working to develop and commercialize technology for the accurate diagnosis of prostate cancer which uses advanced spectroscopy imaging techniques in combination with tissue biopsy. cancer

PRECISION DIAGNOSTIC INSTRUMENTS

Westminster
www.pdimeters.com

Designs and manufactures professional quality, affordable test equipment.

PRECISION GLASSBLOWING

Centennial
www.precisionglassblowing.com

Provides custom and OEM scientific glass for custom synthesis, pharmaceutical, environmental, petrochemical, research, commercial, government and medical laboratories.

PRECISION PHOTONICS CORPORATION

Boulder
www.precisionphotonics.com

provide price-competitive laser optics and coatings to the telecommunications, defense, aerospace, biomedical, and semiconductor industries.

PREFERRED MEDICAL PRODUCTS, INC.

Englewood
www.preferredmedicalproducts.com

Manufactures stainless steel medical components for hypodermic needles and lancet type products.

PRESCOTT'S2, INC.

Monument
www.surgicalmicroscopes.com

Provides reconditioned operating microscopes and allied accessories that function as intended by the original equipment manufacturer.

PROBETRONIX, LLC

Colorado Springs
www.probetronix.biz

Manufactures oscilloscope probes.

PRODUCTS GROUP INTERNATIONAL, INC.

Lyons
www.productsgroup.com

Researches, develops and engineers ultrasound medical and veterinary equipment.

PROTOMED, INC.

Westminster
www.protomed.net

Creates accurate anatomical models from CT scans by using the latest imaging software and laser driven technology.

PROTOTYPE CASTING, INC.

Denver
www.protcast.com

Manufactures non-ferrous prototype parts for the medical industry, specializes in RPM (Rubber Plaster Mold) casting, sand casting and rapid investment casting.

PTA CORPORATION

Longmont
www.ptacorp.com

Manufactures aluminum and steel molds for projects with lifetime runs of 5,000 to 250,000 pieces for medical applications.

QUEST PRODUCT DEVELOPMENT CORPORATION

Wheat Ridge
www.quest-corp.com

Helps bring to market medical products and analytical systems for small start-ups to research universities and international corporations. grants from NIH, DOD, NASA and NIST.

RADIOLOGICAL IMAGING TECHNOLOGY, INC.

Colorado Springs
www.radiimage.com

Provides clinical and research physicists with a high precision automated QA tool for advanced radiation therapies.

RAND-SCOT, INC.

Fort Collins
www.randscot.com

Designs and manufactures products for persons with disabilities including BBD Cushions and Mattress Overlays, EasyPivot Patient Lifts, and Saratoga Exercise Products.

RAPID PROTOTYPING CORPORATION

Longmont
www.rapidpro.com

Offers engineering and design and other manufacturing services for the medical device industry.

RJD MACHINING

Parker
www.rjdmachining.com

Specializes in precision production runs and some prototype work for OEM's in the medical industry.

ROCKY MOUNTAIN INSTRUMENT COMPANY (RMI)

Lafayette
www.rmico.com

Designs and manufactures optics and coatings (ultra-violet through far infrared) for the medical industry.

ROCKY MOUNTAIN ORTHODONTICS, INC. (RMO)

Denver
www.rmortho.com

Serves all areas of orthodontics including pediatric orthodontic prevention, interceptive pediatric orthodontics, mixed dentition orthodontics, adult orthodontics, reconstructive dentistry orthodontics, TMJ orthodontics, surgical orthodontics and breathing/sleep problem related orthodontics.

SAMSON DESIGN ASSOCIATES, INC.

Boulder
www.samsondesign.com

Provides full service product development ranging from concept to production specifications, with many products for the medical field.

SANDHILL SCIENTIFIC

Highlands Ranch
www.sandhillsci.com

Designs, manufactures and distributes diagnostic products focused on gastroenterology.

SCIENCE CARE

Aurora
www.sciencecare.com

Provide human tissue for medical research and education. We serve as a link between individual donors and medical researchers and educators.

SCIENTECH, INC.

Boulder
www.scientech-inc.com

Manufactures analytical instruments: semi-micro balances, analytical balances, semi-analytical balances, and toploading balances for the medical industry.

SCOTT ORTHOTIC LABS, INC.

Fort Collins
www.scottorthotic.com

Manufactures Orthotic and Prosthetic Components, Pre-fabricated Orthotics, and Custom O&P Devices.

SECURISYN MEDICAL

Highlands Ranch
www.securisyn.com

Dedicated to a continuous process of increasing the safety and effectiveness of our unique life-saving product, which is utilized by skilled medical practitioners to deliver the highest quality emergency and intensive care to their patients.

SEALCON

Centennial
www.sealconusa.com

Manufactures cable management components, including liquid tight strain relief fittings, flexible conduit, M23 circular connectors and related products for the health care industry.

SHAPE OPHTHALMICS LLC

Aurora

Develops state of the art devices and novel treatments for ophthalmic conditions through the application of advanced smart materials.

SHARKLET TECHNOLOGIES, INC.

Aurora
www.sharklet.com

Engineers surface technologies (Sharklet™) that controls the growth of dangerous bacteria.

SHIPPERT MEDICAL TECHNOLOGIES CORPORATION

Centennial
www.shippertmedical.com

Manufactures and distributes medical disposable products and instruments. Serves the ear, nose and throat, plastic surgery, cosmetic surgery, emergency/trauma care, family practice, pediatric, ophthalmology and dermatology fields.

SIENCO, INC.

Arvada
www.sienco.com

Manufactures and distributes Class II medical devices, disposable supplies, reagents and accessories for in-vitro diagnostic use. Also, provides tools for hemostasis monitoring and viscoelastic evaluations.

SNOASIS MEDICAL

Denver
www.snoasismedical.com

Develops dental regenerative products derived from discarded tissues and cells.

SOMALOGIC, INC.

Boulder
www.somalogic.com

Uses aptamer array technology and bioinformatics capabilities to discover disease-specific biomarkers and protein signatures. Develops medical diagnostics based on these signatures.

SONORA MEDICAL SYSTEMS, INC.

Longmont
www.4sonora.com

Provides high quality products and services to the diagnostic ultrasound and MRI markets. ISO 9001 certified and FDA registered.

SONTEC INSTRUMENTS, INC

Centennial
www.sontecinstruments.com

Provides a broad line of instruments as well as custom instrument manufacturing and in-house repair service.

SOPHONO, INC.

Boulder
www.sophono.com

Sophono, Inc. has developed the world's first non-percutaneous, implantable bone anchored hearing device.

SORIN GROUP

Arvada
www.sorin.com

Develops and produces cardiovascular and autologous transfusion therapy products.

SOUND SURGICAL TECHNOLOGIES, LLC

Louisville
www.vaser.com

Offers ultrasonic technologies and related techniques for aesthetic surgery.

SPARTON

Frederick
www.sparton.com

Leading contract manufacturer of low to medium volume, complex products for the medical device, biotech and industrial instrumentation markets.

SPECTRUM LASER & TECHNOLOGIES, INC.

Colorado Springs
www.spectrumlaser.com

Provides contract design and manufacturing services for the medical industry.

SPECTRANETICS CORPORATION

Colorado Springs

www.spectranetics.com

Develops, manufactures, markets and distributes single-use medical devices used in minimally invasive procedures within the cardiovascular system.

ST CARDIO TECHNOLOGIES, LLC

Broomfield

www.stcardio.com

Designs, develops, and manufactures electronic medical devices for use in electrophysiology cardiac cath labs. Our Z6 Cardiac Stimulator is our first product and has FDA 510(k) clearance.

ST. RENATUS, LLC

Fort Collins

www.st-renatus.com

First needle-free, dental anesthetic suitable for use in procedures involving most of the upper teeth. Uses an accurate and sophisticated method to anesthetize the upper teeth without the risk and pain of a needle.

STNDRD INFUSION

Parker

www.stndrdinfusion.com

Early-stage medical device company in the drug infusion market with a standardized pump capable of performing the product requirements currently met by syringe, cassette, and ambulatory pump configurations.

STRIONAIR, INC.

Louisville

www.strionair.com

Manufactures and markets a product that uses disposable media and that can be installed in any air handler or HVAC system.

STROKE RECOVERY SYSTEMS, INC.

Denver

www.strokeaid.com

Develops the AutoMove AM800 that teaches healthy parts of the brain after a stroke to take over lost functionality.

SUMMIT DOPPLER SYSTEMS

Golden

www.summitdoppler.com

Manufactures ultrasound Doppler systems used to detect fetal heartbeat and to monitor peripheral arterial and venous blood flow.

SUNRISE MEDICAL INC

Longmont

www.sunrisemedical.com

Provides home healthcare products including wheelchairs, respiratory, daily living aids, and speech augmentation devices.

SUREFIRE MEDICAL INC.

Boulder

www.surefiremedical.com

The company is developing a novel infusion system for the interventional radiology market.

SURGIREAL PRODUCTS

Fort Collins

www.surgireal.com

Creates and introduces innovative products and methods for surgical training.

SUPREME CABLE TECHNOLOGIES, INC.

Thornton

www.supremecable.com

Manufactures quality custom cable assemblies and wire harnesses.

COLORADO BIOSCIENCE ASSOCIATION MEMBER

SWAN VALLEY MEDICAL, INC.

Aurora

www.swanvalleymedical.com

Developed a line of urology instruments that allow for safer, faster, and more economical treatment of common urological disorders.

SYNERGY HEALTH AMERICAS

Denver

www.synergyhealthpk.com

Offers electron beam sterilization for medical and pharmaceutical devices.

SYNTHEX, INC.

Monument

www.synthes.com

Develops, produces and markets instruments, implants and biomaterials for the surgical fixation, correction and regeneration of the human skeleton and its soft tissues.

TRS, INC.

Boulder

www.oandp.com/products/trs

Develops, manufactures, and markets body-powered prosthetic devices. Designs and builds technology for persons missing hands.

TAPELESS WOUND CARE PRODUCTS, LLC

Englewood

www.tapelesswoundcare.com

Manufactures and distributes a system of patented secondary wound dressing retention devices, offering an alternative to traditional secondary wound dressings, for both human and animals.

TARTAN ORTHOPEDICS, LTD

Northglenn

www.tartanortho.com

Manufactures sacro lumbar belts, dorsal lumbar belts (corsets and moldable inserts), Ottenberg style elbow splint, pelvic traction belts, arm slings, cervical collars, acromioclavicular splints, and ankle supports.

TDA RESEARCH, INC.

Wheat Ridge, Golden

www.tda.com

Provides automated catalyst testing equipment to large chemical companies and national laboratories.

TECH-X CORPORATION

Boulder

www.txcorp.com

Specializes in scientific and engineering software, including visualization and algorithm development.

TENSEGRITY PROSTHETICS, INC.

Boulder

www.tensegrityprosthetics.com

Develops a prosthetic foot that mimics the functional biomechanics of the human foot in walking.

TELSANO HEALTH

Aurora

www.telsano.com

Telsano manufactures both the preventive health monitoring devices that gathers and analyzes our personalized data but also provides the innovation to securely display your data and trend charts anywhere anytime.

TERABAT

Longmont

www.terabat.com

Developing a disruptive detection platform based on terawaves technologies that will revolutionize disease diagnosis and patient care.

TERUMOBCT

Lakewood

www.terumobct.com

A global leader in blood component and cellular technologies, is the only company with the unique combination of apheresis collections, manual and automated whole blood processing, and pathogen reduction coupled with leading technologies in therapeutic apheresis and cell processing.

THE HARLOFF COMPANY

Colorado Springs

www.harloff.com

Manufactures and sells a line of crash carts, medication carts and other specialty carts for hospitals, nursing homes, clinics and surgery centers.

THE SYNAPTIC CORPORATION

Aurora

www.synapticusa.com

Develops Synaptic®, a patented pain control technology that works without drugs. Marketed in accordance with FDA regulations for the treatment of acute and chronic pain.

THERATOGS, INC.

Telluride

www.theratogs.com

Produces an orthotic undergarment and strapping system that gives clients with sensorimotor impairment a new modality for improving postural alignment and stability.

TISSUE GENETICS, INC.

Denver

www.tissuegenetics.com

Molecular diagnostics company with unique technology for improving the care of patients with genetic diseases using biomarkers to identify patients with hereditary diseases and to determine the course of care.

TMJ IMPLANTS, INC.

Golden

www.tmj.com

Designs and manufactures all plastic implants for the treatment of temporomandibular joint disorders and injuries.

TOLTEC INTERNATIONAL, INC.

Lakewood

www.toltec.biz

Toltec provides medical device engineering services compliant with US FDA and international regulatory standards. We assist medical device companies with the development and maintenance of medical devices in full compliance with the regulations and standards.

TOUCH OF LIFE TECHNOLOGIES, INC. (TOLTECH)

Aurora

www.toltech.net

Develops procedural simulators in the areas of orthopaedics, gastroenterology, rheumatology, radiology, ophthalmology, and general surgical procedures.

TRANSTRACHEAL SYSTEMS, INC.

Englewood

www.tto2.com

Develops and manufactures innovative respiratory therapy products that advance medical therapy for persons requiring continuous supplemental oxygen, including the SCOOP transtracheal oxygen therapy system.

TRELLEBORG SEALING SOLUTIONS MOUNTAIN

Broomfield

www.trelleborg.com/en

Supplies high-quality products and solutions for industrial sealing and bearing systems. Activities are focused in many business areas including the food and pharmaceutical industries, as well as medical engineering.

ULTRATHERA TECHNOLOGIES, INC.

Colorado Springs

www.ultrathera.com

Life sciences company dedicated to improving human performance by applying advanced technologies to physiological and neurological needs. Maker of AeroStim™ and PointScribe™.

VALUE PLASTICS, INC.

Fort Collins

www.valueplastics.com

Designs and manufactures plastic tubing fittings and connectors.

VALVEXCHANGE, INC.

Greenwood Village

www.valvexchange.com

Develops a bioprosthetic heart valve with a percutaneously-exchangeable leaflet set that provides lifetime service without anti-coagulation therapy.

VISTA LIFESCIENCES

Parker

www.vistalifesciences.com

Innovative Healthcare Technology Solutions for Global Healthcare Challenges

WALKMED INFUSION, LLC

Englewood

www.walkmed.net

Offers solutions for ambulatory infusion therapy and pain management.

WAVI COMPANY

Boulder

www.ewavi.com

The platform is based on the Electroencephalograph (EEG) that integrates with physician diagnostic tools and a research library. Helps with interpretation and treatment of brain ailments and performance including TBI, PTSD, Alzheimer's Age Management and depression.

WESTMED, INC.

Greenwood Village

www.westmedinc.com

Designs, manufacturers and markets medical devices to anesthesia and respiratory professionals.

WESTONE LABORATORIES

Colorado Springs

www.westone.com

Designs and manufactures custom earmolds for hearing healthcare and other applications.

WI LLC – MEDICAL DEVICE PRODUCT DEVELOPMENT

Englewood

www.wiinc.net

Designs and engineers medical devices. Including innovative services such as laser welding, assay design, and air bubble management.

XIMEDIX, INC.

Colorado Springs

www.ximedix.com

Manufactures and sells single patient use medical products for the anesthesia, respiratory care, critical care and emergency medicine applications.

XNTERA

Aurora

Medical Devices will produce initially premium medical syringes for dental market with the strategic product benefits of automatic safety, ease of use, and comfort for the patient. Later on products will be developed to meet the demands in other medical fields such as psychiatric, nuclear and diabetes.

YAMATO CORPORATION

Colorado Springs

www.yamatocorp.com

Manufactures and sells weighing equipment and systems for medical facilities.

ZETEK, INC.

Aurora

www.zetek.net

Manufactures the OvaCue family of ovulation prediction products.

ZYNEX MEDICAL, INC.

Lone Tree

www.zynexmed.com

Offers electrotherapy products, utilizing various methods of non-invasive muscle stimulation and electromyography technology, Interferential Current (IFC) and Transcutaneous Electrical Nerve Stimulation (TENS).

BIOTECHNOLOGY, PHARMA AND RELATED COMPANIES

ACCERA, INC.

Broomfield

www.accelerpharma.com

Commercial-stage healthcare company focused on the discovery and development of pioneering therapeutics to treat serious diseases. Accera has developed Axona, the first proprietary commercialized Alzheimer's disease therapy that address the well recognized physiological hallmark and metabolic defect of hypometabolism, the brain's inability to optimally metabolize glucose.

ADA TECHNOLOGIES, INC.

Littleton

www.adatech.com

Specializes in the creation of high tech companies based upon the development and commercialization of innovative technologies.

ADVANCED REGENERATIVE THERAPIES (ART)

Fort Collins

www.art4dvm.com

Provides a stem cell isolation and expansion service for veterinary medicine.

AGILENT TECHNOLOGIES

Boulder

www.agilent.com

Agilent Nucleic Acid Solutions develops and manufactures therapeutic oligonucleotide in a multi-product, 33,500 square foot facility.

AGRIPRO COKER

Berthoud

www.agriprowheat.com

Develops and delivers superior wheat seed genetics in North America.

AKTIV-DRY

Boulder

www.aktiv-dry.com

Provides dry powder processing solutions for the vaccine, pharmaceutical, and biotechnology industries.

ALBANY MOLECULAR RESEARCH, INC (AMRI)

Denver

www.amriglobal.com

Performs services including drug discovery, pharmaceutical development, and manufacturing of active ingredients and pharmaceutical intermediates for many of the world's leading healthcare companies.

ALLERGAN, INC.

Denver

www.allergan.com

Multi-specialty health care company focused on discovering, developing and commercializing innovative pharmaceuticals, biologics, medical devices and over-the-counter consumer products

ALLOS THERAPEUTICS, INC.

Westminster

www.allos.com

Develops and commercializes small molecule therapeutics for the treatment of cancer.

ALPHARMA, INC.

Longmont

www.alpharma.com

Alpharma's field-proven feed additives and water solubles help prevent or treat common deficiencies and diseases in cattle, swine, and poultry that may negatively affect their health.

AMERICAN ALLIED BIOCHEMICAL, INC.

Aurora

www.aablabs.com

Specializes in the purification and distribution of restriction endonucleases enzymes.

AMGEN, INC.

Boulder/Longmont

www.amgen.com

Discovers, develops, manufactures and markets human therapeutics based on advances in cellular and molecular biology. Amgen's operations in Colorado are dedicated to the mission of assuring patient supply and creating a world-class capability for rapid commercialization, launch and transfer of bulk biopharmaceutical products. In addition to licensed manufacturing of EPOGEN, NPlate, XGEVA, Prolia and clinical therapeutics, Amgen Colorado pursues strategic contract manufacturing opportunities.

AMIDEBIO, LLC

Boulder

www.amidebio.com

Focused on providing peptide and protein research reagents and clinical products for a diverse array of research and commercial targets using proprietary Biopure-Process™ technology.

AMPIO PHARMACEUTICALS, INC.

Denver

ampiopharma.com

Develops innovative proprietary drugs for inflammation, eye disease, kidney disease, CNS disease, metabolic disease and male sexual dysfunction.

ANABOLIC LABORATORIES

Colorado Springs

www.anaboliclabs.com

Focused line of nutritional products, with state-of-the-art pharmaceutical manufacturing facilities in California and Colorado.

ANIMAL HEALTH OPTIONS

Golden

www.animalhealthoptions.com

Animal Health Options has been offering high quality antioxidants and nutritional supplements that meet or exceed industry standards and provide a noticeable benefit to dogs, cats and horses.

APOLOGIC PHARMACEUTICALS, LLC

Aurora

www.apologic.com

Focused on the development and commercialization of Breceptin, a unique oncolytic drug for the treatment of a wide range of solid tumors.

AQUATIC BIOSYSTEMS

Fort Collins

www.aquaticbiosystems.com

Full-service organism culturing facility specializing in the production and distribution of freshwater and marine organisms for aquatic toxicology, biomonitoring and other research activities.

ARCA BIOPHARMA, INC.

Broomfield, Aurora

www.arcabiopharma.com

Specializes in developing and commercializing genetically-targeted therapies for heart failure and other cardiovascular diseases.

ARIEL PHARMACEUTICALS

Broomfield

www.arielpharma.com

Ariel Pharmaceuticals is a clinical-stage specialty pharmaceutical company focused on acute neurology. Lead product, AP-1531, is an EP4 receptor antagonist in Phase II for acute migraine. Tamiastyn is a proprietary IV product in Phase I for hemorrhagic shock. Both products target major unmet medical needs where there is little competition.

ARRAY BIOPHARMA

Boulder, Longmont

www.arraybiopharma.com

Discovers, develops and commercializes targeted small molecule drugs to treat debilitating and life-threatening diseases such as cancer.

ASDX BIOSYSTEMS, INC.

Boulder
www.asdxbio.com

Specializes in the development of immunoassays for environmental agents, foodborne pathogens, infectious diseases and oncology biomarkers using luminescence detection technologies and dedicated luminometer instrument systems.

ASPENBIO PHARMA, INC.

Castle Rock
www.aspenbioinc.com

Primarily focused on advancing towards commercialization, our recently patented blood-based human diagnostic test, ApyScore™ to aid in the diagnosis of human appendicitis and several novel reproduction drugs for use in high value animals.

ASTELLAS PHARMA US, INC.

Denver
www.astellas.us

Researches and develops pharmaceuticals for select therapeutic areas, including Urology, Immunology, Dermatology, Cardiology, and Infectious Diseases.

AUROGEN

Fort Collins
www.aurogen.com

Produces a pharmaceutical treatment for diabetic neuropathy, with a second invention showing that neurotrophic hormones can act across the blood-brain barrier (BBB) to treat various brain disorders.

AVIDITY, LLC

Aurora
www.avidity.com

Licenses the patented biotin-accepting peptides (Avi-Tag) technology which exploits the tight interaction of avidin or streptavidin with biotin for immobilizing, purifying and visualizing proteins.

BAROFOLD, INC.

Aurora / Boulder
www.barofold.com

BaroFold applies its Pressure Enabled Protein Manufacturing (PreEMT™) technology to improve the tolerability, efficacy and safety of a wide variety of protein therapeutics for bio-pharmaceutical companies, research institutions, and government agencies. PreEMT employs high pressure to disaggregate and refold proteins, which may have a significant impact on the quality of these biotherapeutics by improving their activity, homogeneity and safety.

BIORESPONSE, LLC

Boulder
www.bioresponse.com

Researches, develops and commercializes dietary supplements for better absorption and functional foods.

BIOSERVE SPACE TECHNOLOGIES

Boulder
www.colorado.edu/engineering/BioServe

Researches space life science with a wide range of biotechnology applications involving animals, plants and microorganisms. Specializing in conducting microgravity life science research and designing and developing space flight hardware.

BIOSYNTRX INC.

Colorado Springs
www.biosyntrx.com

Develops nutraceuticals to address the micronutrient needs of the dry eye, cataract, macular degeneration, glaucoma and diabetic retinopathy patient.

BOLDER BIOTECHNOLOGY, INC.

Boulder
www.bolderbio.com

Uses advanced protein engineering technologies to create proprietary human protein pharmaceuticals with enhanced therapeutic properties.

COLORADO BIOSCIENCE ASSOCIATION MEMBER

BOULDER SCIENTIFIC COMPANY

Mead
www.bouldersci.com

Provides organometallic compounds to the pharmaceutical, polymer, and specialty chemical industries.

BROTICA

Bellvue
www.interval33.com

Produces Interval33, a termite attractant which works by producing the precise level of CO2 that has been shown to attract termites, all natural and animal safe.

CARGILL RESEARCH

Fort Collins
www.cargill.com

Develops, processes and markets science-based, health promoting ingredients for food and dietary supplement industries worldwide.

CATALENT PHARMA SOLUTIONS, INC.

Boulder
www.catalent.com

Designs, manufactures and distributes specialized medical products for fluid management of pleural effusion and ascites.

CAVEO THERAPEUTICS

Aurora
www.caveotherapeutics.com

Discovers and develops innovative biopharmaceuticals to treat and cure hematologic conditions. Provides two research reagents, highly specific monoclonal antibodies to the Mer receptor tyrosine kinase

CBL (CHEMICAL AND BIOPHARMACEUTICAL LABORATORIES)

Boulder
www.cblbiopharma.com

Offering peptide starting materials, peptide intermediates, and industrial and commercial-scale manufacturing of proprietary and generic GMP and non-GMP peptides.

CEDARBURG HAUSER

Denver
www.cedarburghauser.com

Full service API manufacturer of GMP materials that include small molecule APIs, adjuvants, conjugates and toll manufacturing substances.

CELL>POINT

Centennial
www.cellpointweb.com

Develops novel radiopharmaceutical imaging agents, radiotherapeutic agents and local regional radio/chemotherapeutic drug delivery systems for the diagnosis, treatment and post therapy assessment of cancer, cardiovascular disease, infectious disease and metabolic diseases.

CEVAN INTERNATIONAL, INC.

Longmont
www.cevan.com

Delivers vitamins, minerals and botanical extracts as well as specialty nutraceutical formulations and antioxidants.

CHATA BIOSYSTEMS

Fort Collins
www.chatasolutions.com

Manufactures blended reagents, HPLC mobile phases, standards, buffers and dissolution media.

CHD BIOSCIENCE, INC.

Fort Collins
www.chdbioscience.com

Developing a biocide which is a derivative of a natural molecule, is environmentally friendly ("green") and which has shown to be extremely efficacious against a broad range of pathogens including the difficult to kill MRSA and c-difficile microbes that are the source of secondary infections in hospitals and other healthcare facilities.

CHEMIZON INC.

Longmont
www.chemizon.com

Focused on the discovery and development of targeted therapies to treat patients afflicted with cancer, inflammatory and metabolic diseases.

CLINIMMUNE LABS

Aurora
www.clinimmune.com

Provides genetic testing for transplant patients in addition to stem cell processing and umbilical cord blood banking.

CLOVIS ONCOLOGY, INC.

Boulder
www.clovisoncology.com

Focused on acquiring, developing and commercializing innovative anti-cancer agents in the US, Europe and additional international markets.

COLORADO BIOLABS, INC.

Frederick
www.proferrin.com

Colorado Biolabs, Inc., the manufacturer of Proferrin® ES and Proferrin® Forte, was founded in 1997 with a plan to develop and market Proferrin – an oral iron supplement made from heme iron polypeptide (HIP). Our proprietary process results in an oral iron product that provides an optimal amount of HIP in a single tablet.

COLORADO GENETICS, INC.

Loveland
www.coloradogenetics.com

Provides livestock embryo-transfer research, artificial insemination, embryo collection, freezing and transfer, and international import and export services.

COLORADO HISTO-PREP (CH-P)

Fort Collins
www.histoprep.com

Produces high quality slides, clinical chemistry and hematology data and fully integrated and detailed seamless pathology reports.

COLORADO SERUM COMPANY

Denver
www.colorado-serum.com

Supplies veterinary biologic vaccines, instruments, laboratory reagents and serums for the veterinary industry.

CORDEN PHARMA

Boulder
www.cordenpharmacolorado.com

Corden Pharma Colorado is the small to large-scale resource for peptides manufacturing.

CRESTONE, INC.

Boulder
www.crestonepharma.com

Drug discovery and development company focused on developing novel treatments for serious bacterial infections. The company currently has two advanced pre-clinical programs that address areas of significant and growing unmet medical need, both with novel mechanism of action agents.

CYTOSKELETON, INC.

Denver
www.cytoskeleton.com

Offers kits for drug screening, signal transduction and cytoskeletal research specializing in the production of purified proteins and easy-to-use kits to study biochemical and cellular processes.

DAVITA CLINICAL RESEARCH (DCR)

Denver
www.davitaclinicalresearch.com

Offers a complete array of early-phase study capabilities through its two state-of-the-art research facilities.

EFFICAS, INC.

Boulder
www.efficas.com

Develops bioactive products that offer natural relief from asthma and allergies in both humans and animals.

ELISA TECH

Aurora
www.elisatech.com

Provides immunoassays for the measurement of cytokines, growth factors, and lipid inflammatory mediators such as prostaglandins and leukotrienes

EVOLUTIONARY GENOMICS (EG)

Lafayette
www.evolgen.com

Identifies genes with a high likelihood of commercial value for downstream validation through their proprietary Adapted Traits platform.

FLAGSHIP BIOSCIENCES

Westminster
www.flagshipbio.com

Oncology drug development and tissue analytics and pathology services.

FLUTRENDS INTERNATIONAL, LLC

Denver/Aurora
www.flutrends.com

Biotechnology company that plans to develop and commercialize products for the prevention of influenza.

GEL ANALYTICS, LLC

Golden
www.gel.com

Offers expertise in the field of mass spectrometry and provides chemistry, radiochemistry, radiobioassay and bioanalytical analysis.

GENE CHECK, INC.

Greeley
www.genecheck.com

Gene Check is a diagnostic laboratory specializing in veterinary genetics. In addition, Gene Check maintains a dynamic biotech research program, including rare DNA sequence and SNP detection.

GENENTECH

Denver
www.gene.com

Using human genetic information to discover, develop, manufacture and commercialize medicines to treat patients with serious or life-threatening medical conditions.

GENESIS LABORATORIES, INC.

Wellington
www.genesislabs.com

Provides services to clients in the agrochemical and pharmaceutical industries, rodenticide research and development, as well as invasive species, zoonotic disease, and conservation research.

GENETHERA, INC.

Westminster
www.genethera.net

Develops and markets the latest molecular technologies to eradicate "cross over" diseases such as Johne's Disease, Mad Cow Disease, Chronic Wasting Disease, and E.coli. Develops assay tests and vaccines to eradicate the threat to humans of diseases transmitted up the food chain by cattle, elk and deer.

GENETIC TECHNOLOGIES LIMITED

Fort Collins
www.gtglabs.com

Uses the latest technology to identify changes in DNA to either confirm a diagnosis of a specific disorder of which a person displays signs or symptoms, or to identify individuals at risk of developing a disease before any symptoms appear.

GONEX INC.

Fort Collins
www.cedusinc.com

Dedicated to the research, development and commercialization of hormonal based health care strategies for both the human and companion animal markets including technology for sterilizing companion animals with a single injection.

GLAXOSMITHKLINE

Denver
www.gsk.com

Produces medicines that treat six major disease areas – asthma, virus control, infections, mental health, diabetes and digestive conditions as well as vaccines and new treatments for cancer.

GLIACOR THERAPEUTICS LLC

Fort Collins
Characterize the efficacy and safety of a novel series of antiinflammatory compounds to test their suitability as a new treatment for blocking the progression of Parkinson's.

GLOBEIMMUNE, INC.

Louisville
www.globeimmune.com

Discovers, develops and manufactures potent, targeted molecular immunotherapies called Tarmogens, targeted antigens that distinguish diseased cells from normal cells, for the treatment of cancer and infectious diseases.

GREAT LAKES PHARMACEUTICALS

Denver
www.glypharma.com

Development leading to commercialization of innovative, effective product for prevention of catheter related microbial infections in clinical and in outpatient settings

GREFFEX, INC./ ISOGENIS, INC.

Aurora
www.greffex.com

Develops and produces new therapeutics for immune suppression in humans to prevent transplant rejection, improve gene therapy and develop novel approaches to the treatment of autoimmune diseases.

HAUSER LABORATORIES, DIVISION OF MICROBAC

Boulder
www.hauserlabs.com

Provides research, development, and testing to the pharmaceutical, natural products, dietary supplement, and medical device industries.

HEMOGENIX

Colorado Springs
www.hemogenix.com

Private contract research service and assay development laboratory specializing in developing predictive in vitro assay platforms for primary human and animal target cells and stem cell hemotoxicity testing.

HEPQUANT, LLC

Aurora
www.hepquant.com

Designed test parameters using continuous variables that may be correlated to clinical features or may be followed over time to measure disease progression. HepQuant-E is non-invasive, uses stable (not radioactive) isotopes, and relies on natural, well-defined hepatic functions to measure the portal circulation.

HESKA CORPORATION

Loveland
www.heska.com

Develops advanced diagnostics and specialty products for veterinary practices that focus on companion animals.

HIBERNA CORPORATION

Boulder
www.hibernapharma.com

Pursuing the potential clinical application of hibernation in order to slow metabolism thereby extending survival limits in traumas that reduce oxygen to certain cells, e.g. in the heart and brain.

HOSPIRA, INC.

Boulder
www.hospira.com

Supplies injectable generic and specialty pharmaceuticals. The Colorado site specializes in the supply of active pharmaceutical ingredients for both internal and external markets.

iCANDRX

Aurora
Developing small molecules that stimulate the number and function of white blood cells.

ICVRX

Aurora
www.icvr.com

Drug reformulations and delivery systems targeting disorders of the central nervous system.

IHCTECH, LLC

Aurora
www.ihctech.net

Offers custom histopathology services, antibodies, probes and biosensors tested in tissue. Specializes in immunohistochemistry and in situ hybridization.

IMUTEK LABORATORIES, INC.

Fort Collins
www.imutek.com

Develops and markets bovine colostrums for the nutrition and health products industry. The first manufacturer to receive an indication for colostrum for the passive transfer of antibodies (immunoglobulins) in dry powder form.

INSTITUTE FOR THERAPEUTIC BIOLOGY

Denver
www.therapeuticbiology.org

Research organization studying the Role of T-Cell maturation in Immunology.

INVIRAGEN, INC.

Fort Collins
www.inviragen.com

Focused on developing life-saving vaccines to protect against emerging infectious diseases worldwide. Inviragen's lead product is a vaccine to protect against dengue fever.

IPDX BIOSCIENCES, INC.

Boulder
www.ipdxbio.com

Develops and markets multiplexed immunoassay and proteomic test systems and applications for the decentralized and point-of-care personalized diagnostic market. Clinical applications will focus on autoimmune, metabolic, oncology and neurodegenerative disorders.

JOHNSON & JOHNSON

Denver

www.jnj.com

Manufactures a broad selection of health care products, as well as a provider of related services, for the consumer, pharmaceutical, and medical devices and diagnostics markets.

KEEN INGREDIENTS, INC.

Louisville

www.keeningredients.com

Develops process to de-bitter and stabilize quinoa naturally. Supplying the natural and gluten free industries with high quality Quinoa ingredients.

KEETON INDUSTRIES, INC.

Wellington

www.keetonaqua.com

Researches and develops biological water treatment, aeration, ozone aeration, solids removal, biofiltration and other new technologies.

KIMBALL GENETICS, INC.

Denver

www.kimballgenetics.com

Genetic testing laboratory specializing in DNA analysis for common genetic disorders that are preventable or can be treated.

KROMATID, INC.

Fort Collins

www.kromatid.com

Develops a method and kit using chromatid paints to improve detection of chromosomal inversions. The improvement is important to medical applications such as cancer and birth defects.

LABS, INC.

Denver

www.labs-inc.org

Provides laboratory testing services focused on donor eligibility determination and final product safety; infectious disease, microbiology, histocompatibility and environmental monitoring.

LEGACY BIODESIGN, LLC

Johnstown

www.LegacyBioDesign.com

Conducts peptide and protein formulation and assay development work for biopharma companies. The company also specializes in drug delivery and process development of biotechnology-based products.

LIFE BIOSCIENCE INC.

Longmont / Aurora

www.lifebioscience.com

Developed a patent pending glass-ceramic material that is photo-structurable. We fabricate 3D glass and ceramic micro-arrays for protein, DNA, glycan, peptides and carbohydrates. We also produce and sell printed microarrays. Our other products revolve around cell based assay and multiplexed micro sphere platforms utilizing our glass-ceramic material.

LIFETIME PHARMACEUTICALS

Aurora

Developing several classes of small molecules that stimulate production and function of WBCs.

LIGHT LABS

Aurora

www.lightlabsusa.com

Light Labs distributes, PCR tubes, TPP tissue culture, pipette tips, microcentrifuge tubes, barrier tips, latex gloves, PCR supplies, and much more.

LOHOCLA RESEARCH CORPORATION

Aurora

www.lohocla.com

Develops diagnostics and therapeutics focused on pain, psychiatric and addictive disorders such as alcoholism, depression, smoking cessation and chronic pain.

MACLEOD PHARMACEUTICALS, INC.

Fort Collins

www.macleodpharma.com

Develops and manufactures anti-bacterial pharmaceuticals for the veterinary industry.

MARTEK BIOSCIENCES CORPORATION

Boulder

www.martek.com

Develops, manufactures and sells products from microalgae. Products include nutritional supplements and food ingredients which play a role in promoting mental and cardiovascular health.

MBC PHARMA, INC.

Aurora

www.mbcpharma.com

Biopharmaceutical company focused on discovering and developing drugs for bone diseases such as cancer and osteoporosis.

MEDIMMUNE, LLC

Denver

www.medimmune.com

Strives to provide better medicines to patients, new medical options for physicians, and rewarding careers to employees.

MEDIRAL INTERNATIONAL, INC.

Denver

www.mediral.com

Develops, manufactures and sells homeopathic pharmaceuticals taking into consideration antidotes.

MENOGENIX

Aurora

www.menogenix.com

Clinical stage biotechnology company focused on the development of an approved drug, in a new indication, menopause, and the menopause-like symptoms that occur in certain breast and prostate cancer patients.

MERCK & CO., INC.

Denver

www.merck.com

Merck and Co. produces products that cover a broad range of areas, including heart and respiratory health, infectious diseases, sun care and women's health. And they focus their research on conditions that affect millions of people around the world – diseases like Alzheimer's, diabetes and cancer – while building strengths in new areas like biologics.

miRAGEN THERAPEUTICS

Boulder

www.miragentherapeutics.com

Improves patients' lives by developing innovative microRNA (miRNA) based therapeutics for the treatment of cardiovascular and muscle disease. miRNAs, are a recently discovered class of small RNAs encoded in the genome, are short, single-stranded RNA molecules.

MOLECULAR BIOSCIENCES, INC.

Boulder

www.molbio.com

Manufactures products such as water soluble biotinylation reagents, vitamin derivatives, crosslinking reagents, lipophilic probes, fluorophores, radioiodination reagents, and dendritic cores for preparing oligomers.

MONSANTO COMPANY

Englewood

www.monsanto.com

Leading global provider of technology-based solutions and agricultural products that improve farm productivity and food quality. Monsanto remains focused on enabling both small-holder and large-scale farmers to produce more from their land while conserving more of our world's natural resources such as water and energy.

MOSAIC BIOSCIENCES

Denver / Aurora

mosaicbio.com

Start-up company focused on the development of innovative materials for tissue regeneration and repair.

N30 PHARMACEUTICALS, LLC

Boulder

www.n30pharma.com

Drugs target nitric oxide reductase (NOR), the most important of which is s-nitrosoglutathione reductase (GSNOR) an enzyme of central importance in human health and disease.

NANOTRANS TECHNOLOGIES

Aurora

Early-stage company focused on developing a novel ophthalmic drug delivery platform that will topically deliver drug therapies to both the front and back of the eye. This system provides for enhanced uptake, greater penetration and sustained drug release into ocular tissue.

NEX STEP, INC.

Lakewood

www.nexstepcorp.com

Pharmacogenomic Decision Support Solutions.

NOVARTIS PHARMACEUTICALS CORPORATION

Broomfield

www.novartis.com

Researches and develops products to protect and improve health and well-being with core businesses in pharmaceuticals, vaccines, consumer health, generics, eye care and animal health.

NOVUS BIOLOGICALS, INC.

Littleton

www.novusbio.com

Develops, tests and markets antibodies for research of human diseases such as cancer, cardiovascular and neurological disorders.

NUTRACEUTIX, INC.

Lafayette

www.nutraceutix.net

Offers probiotic organisms (powders) and finished probiotic supplements. Specializes in custom crafting dietary supplements with advanced delivery technologies.

OBERON FMR

Aurora

www.oberonfmr.com

Early stage company with proprietary technology capable of producing a cost-effective, sustainably produced protein meal. Oberon's product serves as a fish meal replacement (FMR) or additive ingredient for animal feeds, primarily those destined for the aquaculture industry.

OMNI BIO PHARMACEUTICAL, INC.

Greenwood Village

www.omnibiopharma.com

Advancing broad-spectrum therapeutics targeting bacterial and viral diseases, biohazards, diabetes and transplant rejection.

ONCOTHERIX

Aurora

www.oncotherix.com

Clinical stage oncology company focused on the development of InCell-RT (Intracellular radiotherapy) for the treatment of locally-advanced cancers (LACs). InCell-RT is a unique, DNA-ligated, nanometer-scale intracellular radiotherapy with the potential to selectively kill cancer cells without causing damage to surrounding healthy tissue and without the development of treatment resistance.

ONKURE, INC.

Longmont

Exploring a highly potent and selective HDAC inhibitor as an anti-tumor drug.

OPX BIOLOGICALS

Boulder
www.opxbiotechnologies.com

Technology platform enables rapid, rational, and robust optimization of microbes and bioprocesses to manufacture bioproducts with equivalent performance and improved sustainability at lower cost compared to petroleum-based alternatives.

PAMBEC LABORATORIES, INC.

Loveland
Researches drug discoveries in the field of AIDS.

PEAK ANALYTICAL, INC.

Golden
www.peaklab.net
Specializes in materials and chemical analysis. Performs a variety of molecular and atomic level spectroscopic techniques to identify failures and defects.

PEPTIVIR

Aurora
peptivir.com
PeptiVir is an early stage biopharmaceutical company focused on the development and commercialization of a conformationally-constrained, synthetic peptide-based vaccine platform for the prevention of viral diseases.

PFIZER PHARMACEUTICAL COMPANY

Centennial
www.pfizer.com
Discovers, develops, manufactures, and markets prescription medicines for humans and animals.

PHOSPHOSOLUTIONS, LLC

Aurora
www.phosphosolutions.com
Designs and produces phosphoproteins solutions using phosphor-specific antibodies. Phosphoproteins are thought to be critical elements in neurological diseases such as Alzheimer's and in cancer.

PISCES MOLECULAR

Boulder
www.pisces-molecular.com
Applies molecular biology to problems in the aquatic environment.

PLURA BIOSCIENCES INC

Lafayette
www.plurabioscience.com
Specialized catalysts and chemicals that enable highly efficient, cost effective and green chemistry solutions in the manufacture of important life science products.

QGENTA

Aurora
Harnessing innovative chemistry and biology in the development of molecular targeted agents for the treatment of cancer.

QUARK PHARMACEUTICALS, INC.

Boulder
www.quarkpharma.com
Discovers and develops siRNA drug candidates for treating Age-related Macular Degeneration and prevention of Acute Renal Failure.

RECKITT BENCKISER (RB)

Fort Collins
www.rb.com
Fastest-growing companies in household, health and personal care products.

REGENERATIVE SCIENCES INC.

Broomfield
www.regenexx.com
Advances stem cell therapies through development of Regenexx™, an injection procedure to treat a wide variety of painful conditions.

ROCHE CUSTOM BIOTECH

Indianapolis, IN
www.roche-applied-science.com
Customize and supply reagents, products and services, customized to the quality and regulatory needs of the customer.

ROCKY MOUNTAIN BIOSYSTEMS, INC.

Wheat Ridge
Research and development of transdermal pharmaceuticals and delivery systems, cosmetic devices, and tissue adhesives.

ROCKY MOUNTAIN DIAGNOSTICS, INC.

Colorado Springs
www.rmdiagnosics.com
Provides immunodiagnostic assays and reagents for biogenic amines, research reagents, a CLIA certified reference laboratory and contract manufacturing services.

ROCKY MOUNTAIN INSTRUMENTAL LABORATORIES

Fort Collins
www.rockylab.com
Provides contract chromatographic and mass spectrometric analysis of pharmaceuticals (both traditional drugs and biotechnology products, such as proteins and peptides and oligonucleotides), veterinary and human endocrinology, and forensic toxicology.

ROCKY MOUNTAIN REAGENTS, INC.

Golden
www.rmreagents.com
Manufactures stains, culture media and chemistry solutions for the medical industry, as well as titration reagents, indicators, acids, bases, and a variety of chemicals for industrial uses.

RST BIOSCIENCE LLC

Aurora
Develop and commercialize assay system to monitor astronauts for viral infection during space flight.

SAIGENE BIOTECH INC.

Denver
www.saigene.com
Developing testing processes to identify harmful algae blooms.

SANDOZ

Broomfield
www.us.sandoz.com
Focuses on pharmaceuticals, consumer health, generics, eye care and animal health. Therapeutic categories include anti-infectives, anti-arthritis, cardiovasculars, gastrointestinal agents & psychotherapeutics.

SIVA THERAPEUTICS INC

Boulder
www.sivatherapeutics.com
Commercialize a proprietary therapeutic device technology, based on gold nanorods, that can be used both independently, and also in conjunction with existing and new cancer drugs.

STA LABORATORIES, INC.

Longmont
www.stalabs.com
Agricultural product testing laboratory that offers seed quality, genomics, plant health and diagnostic services and products.

SUMMIT PLANT LABORATORIES, INC.

Fort Collins
www.plantlabs.com
Applies laboratory plant cloning and greenhouse technologies to produce planting stocks for breeders, greenhouses, and field crop producers.

SUVICA, INC.

Boulder
www.suvica.com
Discovery and development of small molecules for the treatment of cancer.

TAIGA BIOTECHNOLOGIES, INC.

Aurora
www.taigabiotech.com
Develops cellular, biologic and small molecule approaches to treat hematological diseases, including cancers, immunodeficiencies and autoimmune conditions.

THERMO FISHER SCIENTIFIC

Lafayette
www.thermofisher.com
Scientific leadership and innovation in RNAi, Gene Expression, qPCR/PCR Detection, and Molecular Biology technologies come together with the Thermo Scientific Dharmacon, Open Biosystems, ABgene, Finnzymes, and Fermentas product lines to provide world-leading solutions for gene analysis.

TOLMAR, INC.

Fort Collins
www.tolmar.com
Develops and manufactures both proprietary and generic pharmaceutical products with specific focus in therapeutic areas of dental, dermatology, and oncology.

UPSHER-SMITH LABORATORIES, INC.

Denver
www.upsheer-smith.com
Develops, manufactures and markets a vast range of prescription and over-the-counter products for cardiology, dermatology, women's health and other areas.

VENTRIA BIOSCIENCE

Fort Collins
www.ventria.com
Develops a protein expression technology platform called ExpressTec with a product pipeline in human nutrition and therapeutics.

VENTRUS BIOSCIENCES, INC.

Greenwood Village
www.ventrusbio.com
A specialty pharmaceutical company focused on the late-stage development and commercialization of gastroenterology products.

VERDANT BIOSCIENCES CORPORATION

Denver
www.verdantbio.com
Develops plant biochemical regulators that provide superior plant performance and unlock the productive power of plants in markets from floriculture to industrial agriculture.

VETDC

Fort Collins
www.vet-dc.com
Focused on development of novel devices, diagnostics and therapeutics for emerging veterinary markets.

VITRO DIAGNOSTICS, INC.

Golden

www.vitrodiag.com

Develops and commercializes products derived from human cell line research with a focus predominantly in stem cell R&D related to numerous diseases such as heart disease, stroke, Parkinson's and Alzheimer's disease.

VITROLIFE, INC.

Englewood

www.vitrolife.com

Develops, manufactures and sells products and systems for the preparation, cultivation and storage of human cells, tissue and organs. Product areas include fertility, transplantation and stem cell cultivation.

VITRO BIOPHARMA

Golden

www.vitrobiopharma.com

Owens US patents for production of FSH, immortalization of pituitary cells, and a cell line that produces beta islets for use in treatment of diabetes. Vitro also owns a pending international patent for generation of pluripotent stem cells.

VRL LABORATORIES

Centennial

www.vrl.net

Laboratory offers full service regulated donor eligibility testing for the human cell and tissue community.

VIVALDI BIOSCIENCES

Fort Collins

www.vivaldibiosciences.com

Developing advanced vaccines for prevention of common seasonal influenza and emergent pandemic flu.

WARREN ANALYTICAL LABORATORY

Greeley

www.warrenlab.com

Specializes in food microbiology, molecular biology, food chemistry, residue chemistry and nutritional labeling.

WESTERN STATES BIOPHARMACEUTICALS, INC.

Aurora

www.westernstatesbiopharm.com

Novel anti-inflammatory therapeutics for autoimmune diseases

WILDLIFE PHARMACEUTICALS, INC.

Fort Collins

www.wildpharm.com

Providing pharmaceuticals for the safe and humane care of non-domestic and exotic wildlife species.

YEWSAVIN, INC.

Fort Collins

www.ajorganica.com

Develops chemical and biochemical technologies. Successfully finished multi-step syntheses using Bromination, Grignard reaction, Suzuki coupling, Amidation, and Esterification reactions.

ZEOPONIX, INC.

Boulder

www.zeoponix.com

Develops NASA originated technology to produce a soil amendment/fertilizer zeoponic material that utilizes nutrients more efficiently and reduces nutrient leaching into the environment.

ZOOPHARM, INC.

Fort Collins

www.zoopfarm.net

Specialized veterinary compounding pharmacy. We custom compound analgesics, sedatives, their antagonists, and other unique drugs for use in veterinary medicine.

BIOFUELS AND RELATED COMPANIES**A1 ORGANICS**

Eaton

www.a1organics.com

Composts and recycles organic by-products from various waste: yard trimmings, wood, biocides, agricultural by-products, manure, brewery by-products, construction debris and food residuals.

A2BE CARBON CAPTURE, LLC

Boulder

www.algaeatwork.com

developing bio-secure, scalable, climate adaptive, and highly cost effective technology for producing valuable fuel and food from CO2 using algal photosynthesis and bio-harvesting.

AEROPHASE, INC.

Longmont

www.aerophase.com

Research and Development of technologies that reduce environmental impact, and efficient extraction system for biodiesel

BBI INTERNATIONAL

Lakewood

www.bbibiobiofuels.com

Offers consulting services, including feasibility studies, market analyses, site & resource assessments, economic impact studies, business plans, industry benchmarking and industry surveys to the biofuels sector.

THE BIOCER GROUP OF COMPANIES

Englewood

www.biocer.net

Emerging group of companies in Agriculture, Forestry, and Biotechnology space.

BIOENERGY OF COLORADO, LLC

Denver

www.bioenergycolorado.com

Produces biofuel alternatives utilizing Soy Biodiesel from virgin soy oil. Current product line includes Biodiesel (Gold and Green™) and BioHeat.

BIOFUEL ENERGY CORPORATION

Denver

www.bfenergy.com

Constructs large scale ethanol production facilities in cooperation with Cargill and owns and operates two of the largest dry mill ethanol facilities in the United States.

BIOLYNCEUS BIOLOGICAL SOLUTIONS

Estes Park

www.biolynceusturf.com

Working to help local governments, businesses and citizens to use environmentally safe alternatives to harsh toxic chemicals. Our Biological Solutions renew the natural ecological system with biologically sound products that do not contaminate soil or water resources.

BIOMASS ENERGY FOUNDATION (BEF)

Franktown

www.woodgas.com

Researches alternative fuels such as dried fruit pits, vegetable oil, wood, coffee grounds and the methods to produce biofuels.

BIOVANTAGE RESOURCES, INC.

Golden

www.biovantageresources.com

Delivers algae-based bioremediation solutions for municipal, industrial and agricultural wastewater treatment.

BLUE SUN BIODIESEL

Golden

www.gobluesun.com

Distributes premium agricultural and renewable fuel products. Blue Sun Fusion™ a blend of premium Blue Sun Biodiesel (20%) with petroleum diesel fuel (80%), along with proprietary additive package specifically tailored for regional climates and seasons, is available at numerous retail pumps throughout Colorado, Wyoming, New Mexico, Nebraska, Utah, and Idaho.

CARBO ANALYTICS, LLC.

Fort Collins

www.carboanalytics.com

Commercial development of an online sugar monitor with immediate application for more cost effective biofuels production.

COLORADO CENTER FOR BIOREFINING AND**BIOFUELS (C2B2)**

Boulder

www.c2b2web.org

A cooperative research and educational center devoted to the conversion of biomass to fuels and other products. Works to establish ground-breaking research and educational programs for the advancement of renewable energy technologies.

CIRIS ENERGY, INC.

Centennial

www.cirisenergy.com

Start-up company developing a unique biotechnology for the conversion of fossil sources of carbon such as low rank coals to natural gas and valuable chemicals.

COMMUNITY POWER CORPORATION

Littleton

www.gocpc.com

Develops, commercializes and markets modular bio-power systems to meet the needs of distributed energy consumers in both developing and developed countries.

FRONT RANGE ENERGY, LLC

Windsor

www.frontrangeenergy.com

Ethanol producer since 2006. Will process approx. 40 million gallons of ethanol and 396,000 tons of wet distillers' grain annually.

GEOSYNFUELS, LLC

Golden

www.geosynfuels.com

Develops a low-cost method to convert cellulosic biomass into fuel. The technology uses biological mechanisms set in a solid-state fermenter ("SSF") to convert the biomass into ethanol and/or methane.

GEVO, INC.

Englewood

www.gevo.com

Develops advanced biofuels like isobutanol, butanol that will provide a sustainable path to the replacement of petrochemicals like gasoline, diesel and jet fuel.

INTERMOUNTAIN CHP CENTER

Boulder

www.intermountainCHP.org

Formed by the U.S. Department of Energy to increase adoption of Combined heat and power (CHP) in the states of Arizona, Colorado, New Mexico, Utah, and Wyoming.

LUCA TECHNOLOGIES, INC.

Golden

www.lucatechnologies.com

Researches the ability of naturally occurring micro-organisms to convert under-utilized domestic oil, organic-rich shale and coal resources to clean, renewable energy.

NOVO ENERGY LLC

Fort Collins

www.novoenergyllc.com

Colorado-based renewable energy company that provides state-of-the-art technology, equipment, and project support services for the renewable energy and solid waste disposal industries.

NUEMANN SYSTEMS GROUP

Colorado Springs

www.neumannsystemsgroup.com

Research, technology and product development focused on product prototyping of gas-liquid contactor systems for chemical processing and emissions control.

POLYNEW, INC.

Golden/Aurora

www.polynewinc.com

Developed a new class of PLA bioplastics which it terms "ecobionanocomposites." These are nanocomposites from 100% renewable resources that could be used in a wide variety of applications including medical device applications.

POWER ECALENE FUELS, INC.

Arvada

powerecalene.com

Exclusive licensor of a patented nano-catalyst technology that efficiently converts "syngas" or "producer gas" into a premium mixed alcohol transportation fuel called Ecalene™. Ecalene™ is usable as a stand-alone fuel for cars, trucks, buses, jet aircraft and boats.

PUREVISION TECHNOLOGY, INC.

Fort Lupton

www.purevisiontechnology.com

Develops a carbon-neutral biomass fractionation technology that converts cellulosic biomass into sugars, energy and fiber that are bio-based raw materials to make many industrial and consumer products.

RANGE FUELS

Broomfield

www.rangefuels.com

Converts biomass that cannot be used for food into low carbon biofuels and clean renewable energy using emerging clean energy technologies. Biomass includes all plant and plant-derived material, such as wood, switch grass, corn stover, and miscanthus grass – making it a renewable energy resource that produces no net greenhouse gases.

SAN JUAN BIOENERGY

Dove Creek

www.sanjuanbio.com

Pressed oil seed facility in the heart of a developing oil seed region.

SOLIX BIOFUELS, INC.

Fort Collins

www.solixbiofuels.com

Develops massively scaleable photo-bioreactors for the production of biodiesel and other valuable bio-commodities from algae oil.

STERLING ETHANOL, LLC

Sterling

www.sterlingethanol.com

Produces 42 million gallons of ethanol annually, using the distiller's grain produced as a co-product of ethanol to the areas cattle feeders for its high protein levels.

SUNDROP FUELS, INC.

Louisville

www.sundropfuels.com

A solar gasification-based renewable energy company.

ZEACHEM

Lakewood

www.zeachem.com

Developed a cellulose-based biorefinery platform capable of producing third-generation ethanol fuel and intermediate chemicals. Our indirect approach leapfrogs the yield and carbon dioxide (CO₂) problems associated with traditional and cellulosic based ethanol processes.

RESEARCH AND EDUCATION INSTITUTIONS

ADVANCED DIAGNOSTIC LABORATORIES (ADX) AT NATIONAL JEWISH HEALTH

Denver

www.njllabs.org

National Jewish Health is known worldwide for treatment of patients with respiratory, cardiac, immune and related disorders, and for groundbreaking medical research. The Advanced Diagnostic Laboratories provide innovative services within the extraordinary clinical and research environment of National Jewish Health. Leveraging our expertise in both laboratory medicine and personalized medicine, we offer an ever-expanding menu of diagnostic tests, as well as contract research services. Our laboratories are CAP and CLIA certified, and have earned the prestigious CAP 15189 accreditation.

AMC CANCER RESEARCH CENTER

Denver

www.amc.org

AMC is a national, not for profit research institute dedicated to the prevention and control of cancer and other chronic diseases. AMC is conducting innovative and important research in the areas of cancer causation and prevention, behavioral research, nutrition, clinical and community studies and health communication.

BIOFRONTIERS INSTITUTE

Boulder

biofrontiers.colorado.edu

State-of-the-art research and education facility that links the basic sciences, engineering, clinical practice, and industry at the University of Colorado's Boulder campus.

BIOLOGICAL SCIENCES CURRICULUM STUDY (BSCS)

Colorado Springs

www.bsccs.org

A nonprofit corporation that endeavors to improve all students' understanding of science and technology by developing exemplary curricular materials, supporting their widespread and effective use, providing professional development, and conducting research and evaluation studies.

BONFILS BLOOD CENTER

Denver

www.bonfils.org

One of the nation's leading community blood centers through their commitment to quality service, innovation, research and technology. They offer a full range of blood products and services to healthcare partners including supplying rare blood units or helping to determine the best cross-matched unit to endure the best possible patient outcomes.

CENTERS FOR DISEASE CONTROL AND PREVENTION/DIVISION OF VECTOR-BORNE INFECTIOUS DISEASE

Fort Collins

www.cdc.gov/ncidod/dvbid

The Division of Vector-Borne Infectious Diseases (DVVID) is part of the U.S. Centers for Disease Control and Prevention (CDC). CDC is the lead federal agency for protecting the health and safety of people at home and abroad. DVVID serves as a national and international reference center for vector-borne viral and bacterial diseases, such as West Nile virus, Lyme disease, plague, tularemia, yellow fever and dengue. It coordinates national disease monitoring activities, conducts field and laboratory research, responds to epidemic situations, develops strategies for disease prevention and control, provides diagnostic reference and epidemiologic consultation, and conducts technical assistance and professional training activities.

CHILDREN'S HOSPITAL COLORADO

Aurora

www.childrenscolorado.org

Children's Hospital Colorado has been ranked for more than a decade as one of the best children's hospitals nationally in U.S. News & World Report, and as the consistent choice eight years in a row by area physicians for the care of their loved ones. Founded in 1908, Children's Colorado is a private, not-for-profit pediatric health-care network dedicated 100 percent to caring for kids. With 1,130 pediatric specialists and more than 2,300 full-time employees, Children's Colorado is home to a number of nationally and internationally recognized medical programs.

COLORADO CENTER FOR DRUG DISCOVERY (C2D2)

Fort Collins

c2d2.org

A non-profit organization funded through the State of Colorado. The organization promotes drug discovery research with Colorado through a combination of funding, medicinal chemistry and modeling expertise.

COLORADO SCHOOL OF MINES

Golden

www.mines.edu

A public research university internationally recognized for its leadership in engineering, applied science and related disciplines, with a special emphasis on the Earth and its resources. These programs, with strong interdisciplinary linkages across the campus, have led to the integration of bioscience and biotechnology into educational and scholarly activities. CSM has created a Bioengineering and Life Science Program that draws upon faculty and students from all of the academic units.

COLORADO STATE UNIVERSITY

Fort Collins, Pueblo

www.colostate.edu

As one of the nation's leading research universities, Colorado State University is committed to realizing its vision as a 21st century land-grant university. CSU leads the world in such areas as infectious disease research, atmospheric science and environmental science. Its faculty members are tackling such issues as the reemergence of tuberculosis, the brown cloud of air pollution in Asian cities, severe weather forecasting, nutrition and wellness, and bioterrorism. In addition to its excellent programs in those areas, CSU offers among the very best professional programs in the United States in areas like veterinary medicine, occupational therapy, journalism, Master's in Engineering with a Specialization in Biomedical Engineering and Regulatory Affairs Certificate.

CSU RESEARCH INNOVATION CENTER

Fort Collins

csuric.org

The Research Innovation Center (RIC) serves as a vehicle to perform collaborative translational-stage research with CSU's life sciences community of researchers, giving it the promise to become the birthplace of medical breakthroughs.

COMMUNITY COLLEGE OF AURORA (CCA)

Aurora

www.ccaurora.edu

CCA provides lifelong educational opportunities, prepares the current and future workforce, and promotes excellence in teaching, learning and service. CCA offers a unique Biotechnology Technician Research and Development Certificate designed to train highly skilled lab personnel for the biotech industry.

COLORADO INSTITUTE FOR DRUG, DEVICE AND DIAGNOSTIC DEVELOPMENT (CID4)Aurora
www.cid4.com

CID4 provides management expertise to efficiently transform emerging life science technologies into commercial successes. We do this by identifying and funding potential opportunities, and by utilizing an advanced leadership team to ensure speed to market, putting new products and services to work where they are needed.

DENVER BOTANIC GARDENSDenver
www.botanicgardens.org

One of the top-ranked botanical gardens in the US, Denver Botanic Gardens offers spectacular plant displays and unlimited opportunities for lifelong learning.

DENVER MUSEUM OF NATURE AND SCIENCEDenver
www.dmns.org

The Denver Museum of Nature & Science is the Rocky Mountain region's leading resource for informal science education. A variety of exhibitions, programs, and activities help Museum visitors experience the natural wonders of Colorado, Earth, and the universe.

DSST PUBLIC SCHOOLS (DENVER SCHOOL OF SCIENCE AND TECHNOLOGY)Denver
www.dsstpublicschools.org

DSST Public Schools is dedicated to providing a diverse student body with an outstanding liberal arts high school education with a science and technology focus. By creating a powerful learning community centered on core values and a shared commitment to academic excellence, DSST will increase the number of under-represented students (women, minorities and economically disadvantaged) who attain college science and liberal arts degrees. DSST Public Schools operates three schools on two campuses, Stapleton (grades 6-12) and Green Valley Ranch (6th). A third DSST campus, Cole Arts and Sciences, will open with a 6th grade in the fall of 2011. DSST: Stapleton is widely considered to be one of the leading open enrollment STEM schools (Science, Technology, Engineering and Mathematics) in the U.S. and has become a destination for educators nationwide. DSST: Stapleton has consistently been the highest performing secondary school in DPS, based on growth and absolute performance. DSST: Stapleton's first four graduating classes earned 100% acceptances into four-year colleges. Fifty percent of DSST's 2010 graduating class is first generation college-bound.

FRONT RANGE COMMUNITY COLLEGEBrighton, Fort Collins, Longmont and Westminster
www.frontrange.edu

Front Range Community College, Colorado's largest community college, provides instruction, in both general education and occupational areas, which may lead to a certificate, an associate degree, or transfer to a four-year institution. The college also provides college preparatory education, non-credit instruction for personal and professional development, and workplace skill development. With campuses located in Fort Collins, Longmont and Westminster, the college is proud of its many partnerships to provide quality programs that are responsive to the needs of its local communities.

KEYSTONE SYMPOSIA ON MOLECULAR AND CELLULAR BIOLOGYSilverthorne
www.keystonesymposia.org

Keystone Symposia is a nonprofit organization committed to connecting the scientific community across disciplines and borders by convening open, international conferences across the full range of the biomedical and life sciences. We strive to be a catalyst

for innovation and accelerating life science discovery. Conferences are held in the Rocky Mountain West and around the world in venues conducive to interaction and are planned by a peer review process drawing on the expertise of pre-eminent life scientists. Founded in 1972 as UCLA Symposia, we are celebrating our 40th anniversary in 2012.

NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)Boulder
www.nist.gov

NIST is a non-regulatory federal agency that operates eight different science and advanced technology research divisions in Colorado. NIST's list of research accomplishments includes a NIST senior scientist winning the Nobel Prize in 2001 for creating the world's first "Bose-Einstein condensate." In 2003 another NIST scientist won a MacArthur Fellowship for discovering a new quantum gas and was named by Science as one of the top ten scientific advances of the year.

NATIONAL JEWISH HEALTHDenver
www.njhealth.org

National Jewish Health, the nation's #1 respiratory hospital in the US, attracts thousands of adult and pediatric patients each year who come to us to team up with our expert physicians and researchers and seek treatment for respiratory, cardiac, immune and related conditions. National Jewish Health is also one of the most influential independent biomedical research centers in the world. More than 100 faculty members conduct basic, translational, and clinical research in immunology, respiratory medicine, allergy, cancer, and cell and molecular biology. National Jewish Health ranks among the top ten percent of all institutions for NIH support and for the impact of its research papers in the fields of Molecular Biology, Genetics, and Biology and Biochemistry.

NATIONAL RENEWABLE ENERGY LABORATORYGolden
www.nrel.gov

The nation's primary laboratory for renewable energy and energy efficiency research and development (R&D). NREL's mission and strategy are focused on advancing the U.S. Department of Energy's and our nation's energy goals. NREL's R&D areas of expertise are: renewable electricity (solar, wind, biomass, geothermal), renewable fuels (biomass, hydrogen), integrated energy system engineering and testing (buildings, electric systems and transportation infrastructures), and strategic development and analysis (economic, financial, and market analysis, planning and portfolio prioritization).

POUDRE VALLEY HEALTH SYSTEM/ MEDICAL CENTER OF THE ROCKIESLoveland, Fort Collins
www.pvhs.org

Poudre Valley Health System operates as a private, not-for-profit organization providing a regional network of health care services for the people of northern Colorado, western Nebraska, and southern Wyoming. The system is comprised of the Poudre Valley Hospital, the Medical Center of the Rockies, as well as several community clinics that provide primary and specialized medical services. Poudre Valley Hospital was named one of the nation's top 100 hospitals for the fifth year, has been considered a Magnet Nursing Practice since 2000 and has been presented with the American Nurses Association's highest award for sustained overall excellence in nursing quality.

REGIS UNIVERSITYDenver
www.regis.edu

The School of Pharmacy aspires to be the foremost school of pharmacy in the United States where students

are nurtured and developed to become leaders in pharmacy practice, research, education, and public service. As a result, students graduate as professionals who are knowledgeable, skillful, and principled, and who are able to make a positive impact on the dramatically changing role of pharmacists in our transforming society. They are educated to be committed to excellence in healthcare, evidenced not only by their knowledge and abilities, but also by their quality of care, integrity, compassion, respect, advocacy, initiative, service and leadership. To achieve these goals, faculty members are dedicated to providing innovative practice models, exploring novel applications of basic and clinical research, and illustrating the value of lifelong learning. Regis University, a Colorado college, has been meeting the needs of students with campus education and online programs centered in academic excellence.

ROCKY MOUNTAIN INNOSPHEREFort Collins
www.rmi2.org

At Rocky Mountain Innosphere (RMI), we are helping new clean energy, technology and scientific startup companies turn their great ideas into great businesses. These businesses, in turn, create high wage job opportunities for the community and fuel the growth of the industries of the future.

ROSE MEDICAL CENTERDenver
www.rosemed.com

Has earned a reputation as Denver's "Baby Hospital" while becoming a leader in comprehensive women's services, internal medicine, endoscopy, heart and vascular care, orthopedics and total joint replacement, bariatric surgery, sports medicine and aesthetic surgery.

ROCKY VISTA UNIVERSITY COLLEGE OF OSTEOPATHIC MEDICINE (RVUCOM)Parker
www.rockyvistauniversity.org

Rocky Vista University College of Osteopathic Medicine (RVUCOM) is one of the newest of the 28 colleges of osteopathic medicine currently established or in development in the United States. With five departments – biomedical sciences, structural medicine, primary care, Osteopathic Principles and Practices, Specialty Medicine and Medical Informatics the faculty and staff of RVUCOM are committed to osteopathic philosophy and heritage, and to advancing the science and the art of the practice of osteopathic medicine.

SCIENTIFIC EDUCATION & RESEARCH INSTITUTE (SERI)Thornton
www.theseri.com

SERI is a unique institute, which combines an orthopedic clinic, specializing in spine surgery, with a clinical research unit and education and training program. Our facility has available to rent an amphitheater with full AV setup for presentations, as well as a bioskills lab with cadaveric dissection capabilities. We host a variety of educational programs including summer science camps. Additionally we host a large number of training programs sponsored by surgical and medical companies.

SWEDISH MEDICAL CENTEREnglewood
www.swedishhospital.com

Level I Trauma Center, serves as the region's referral center for neurotrauma and is a recognized leader in the treatment of stroke. An acute care hospital with 368 licensed beds.

UNITED STATES GEOLOGICAL SURVEY (USGS) - CENTER FOR BIOLOGICAL INFORMATICSDenver
biology.usgs.gov/cbi

The Center for Biological Informatics, at the Denver Federal Center, operates the national Biological Information Infrastructure (NBII). This is the first comprehensive electronic gateway dedicated exclusively to biological science data and information from sources throughout the world.

UNIVERSITY OF COLORADO

Boulder, Denver, Aurora, Colorado Springs

www.cu.edu

The University of Colorado System's 52,000 students and 28,000 faculty and staff contribute to every facet of life in Colorado. The state's economic vitality, educated workforce, entrepreneurial climate, cultural capital, health care delivery, and scientific explorations all rely on the driving force of a vigorous state university. By working with other CU academic and research units, as well as local, state, and federal funding agencies, commercial business, and nonprofit organizations, CU is creating a collaborative synergy in important areas that will better the wellness of society. The CU Institute of Bioenergetics, BioFrontiers Institute, the Center for Computational Biology, and the Center for Pharmaceutical Biotechnology attract intellectual strength to Colorado, provide new educational opportunities, and inspire innovative health care advances. Research and teaching hospitals affiliated with the University of Colorado include: The University of Colorado Hospital, The Children's Hospital, National Jewish Medical and Research Center, Denver Health and the VA Medical Center.

UNIVERSITY OF DENVER

Denver

www.du.edu

Strives to provide the most modern educational and research facilities in the life sciences. Their history spans the Denver Research Institute's development of the first NASA life monitoring sensors, the establishment of a state-of-the-art forensics laboratory, to the 2003 acquisition of the Eleanor Roosevelt Institute with pioneering efforts in genomics and bioinformatics. In 2004,

the School of Engineering and Computer Science unveiled Colorado's first undergraduate program in Bioinformatics and a master's degree in Bioengineering. The interdisciplinary mission of the University enabled the Department of Biology to launch new emphases in Bioengineering, Biophysics and Cognitive Neuroscience designed for molecular biology majors. In addition to strong and quality curricula, bioengineering and life sciences at DU carry multimillion-dollar-a-year research studies in the creation of new knowledge and leading edge biotechnologies to improve quality of life for a worldwide community.

UNIVERSITY OF NORTHERN COLORADO

Greeley

www.unco.edu

University of Northern Colorado (UNC) is a multi-purpose institution with a wide range of graduate and undergraduate programs. The university's mission is to prepare individuals for advanced study, professional careers, and positions of leadership.

WORK, EDUCATION AND LIFELONG LEARNING SIMULATION (WELLS) CENTER

Aurora

www.wellssimulationcenter.org

For the first time in Colorado, one facility offers a complete array of state-of-the-art patient simulation tools for building clinical knowledge. Even more exciting, high-speed datacasting technology makes this unique resource available remotely. Students, faculty and practicing nurses and physicians from throughout Colorado can enhance their diagnostic and clinical skills at the WELLS Center either on-site or on-line. Housed in the new Bioscience East building at Fitzsimons, the WELLS Center represents a unique collaboration among educators, providers and policymakers.

MEMBER FOUNDATIONS**BOETTCHER FOUNDATION
WEBB-WARING BIOMEDICAL RESEARCH PROGRAM**

Denver

www.boettcherfoundation.org

Founded by the Boettcher Family in 1937 to effectively assist, encourage and promote quality of life for the citizens of Colorado, the Boettcher Foundation invests in education, community services, health, and arts & culture through merit awards, scholarships and capital grants. In 2008, the Webb-Waring Institute became a part of the University of Colorado and is now known as the Webb-Waring Center. The Boettcher Foundation was entrusted with the stewardship of the Webb-Waring Foundation's assets. Through an innovative agreement between the Boettcher Foundation, the Webb-Waring Foundation and the University of Colorado, a new funding area was established at the Boettcher Foundation that supports the work of early-career investigators in the biomedical sciences in Colorado.

CHILDRENS HOSPITAL COLORADO FOUNDATION

Aurora

www.childrenscoloradofoundation.org

In 1978, Children's Hospital Colorado Foundation was formally established as a separate charitable 501(c)(3) organization dedicated solely to advancing the mission of Children's Hospital Colorado.

COLORADO STATE UNIVERSITY RESEARCH FOUNDATION (CSURF)

Fort Collins

www.csurf.org

CSURF is a private, not-for-profit Colorado Corporation established (in 1941) to aid and assist the University campuses (Colorado State University and recently Colorado State University Pueblo) governed by the Board of Governors of the Colorado State University System in their research and educational efforts. Functions include patent and licensing management; equipment leasing and municipal lease administration; financing of equipment, real estate and buildings through mortgage debt obligation(s); and land acquisition, development and management.

MEDICAL CENTER OF THE ROCKIES FOUNDATION

Loveland, Fort Collins

pvh.org/mrcfoundation

The Medical Center of the Rockies Foundation was created to support the cutting-edge research opportunities and educational advancements that have been established since the opening of Medical Center of the Rockies.

UNIVERSITY OF COLORADO FOUNDATION

Boulder

www.cufund.org

The University of Colorado Foundation is a privately governed nonprofit corporation whose mission is to support the University of Colorado. As a valued and trusted partner, the University of Colorado Foundation generates the private support needed in perpetuity for CU to achieve international preeminence as a public research university. Our donors enable CU to reach its full potential to transform lives world-wide through education, research, clinical care and community service.

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BOULDER ECONOMIC COUNCIL
www.bouldereconomiccouncil.org

BROOMFIELD ECONOMIC DEVELOPMENT CORPORATION (BEDC)
www.broomfieldedc.com

CANADIAN CONSULATE
www.international.gc.ca

CITY & COUNTY OF BROOMFIELD
www.broomfield.org

CITY OF WESTMINSTER
www.ci.westminster.co.us

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COLORADO SMALL BUSINESS DEVELOPMENT CENTER
www.coloradosbdc.org

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INNOVATION CENTER OF THE ROCKIES
www.boulderinnovationcenter.com

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www.FitzScience.com

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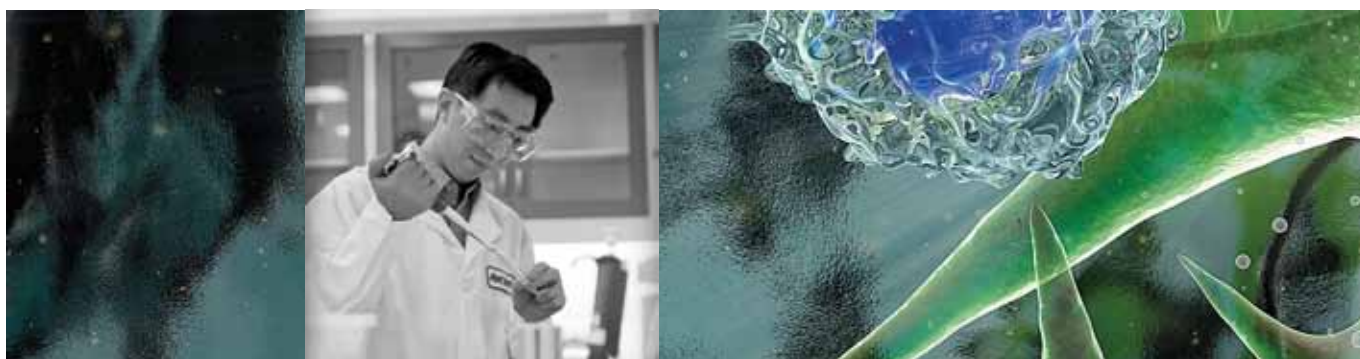
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*Transforming the language
of life into vital medicines*



At Amgen, we believe that the answers to medicine's most pressing questions are written in the language of our DNA. As pioneers in biotechnology, we use our deep understanding of that language to create vital medicines that address the unmet needs of patients fighting serious illness – to dramatically improve their lives.

For more information about Amgen, our pioneering science and our vital medicines, visit www.amgen.com