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2016-2017

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Colorado bioscience: optimizing the future of health and wellness

From Cast-off to Cure
by TODD NEFF

//

On the Backs of Giants
by JOSHUA ZAFFOS

//

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Welcome to the Colorado BioScience Association's thirteenth anniversary edition of *Bioscience Colorado*. This publication is a key resource for companies, investors, legislators and economic developers, and has become the go-to source for our industry in the state. With a total audience of more than 7,500, including online impressions, this publication is one of the industry's greatest voices – locally, nationally and internationally.

In this year's edition, we are taking a closer look at one of our state's greatest challenges: Colorado is home to one of the nation's fastest-growing Baby Boomer populations, as well as one of the largest Millennial populations. Our industry is tasked with creating innovative means to serve the needs of both generations and improve the quality of life for people of all ages. This includes advancements in the pharmaceutical, biotech and medical device fields, but also the increasing role that mobile/digital health is playing in how we seek and receive care, and how we define the value of medicine. In addition, we investigate how Colorado companies and research institutions are uniquely positioned to offer assistance in combating the spread of pandemic disease, including influenza, Ebola and Zika.

The life science sector is made up of 725 companies and growing. Currently, Colorado directly employs 28,000 people in the industry, creating more than 156,000 direct and indirect jobs, translating into more than \$10 billion in payroll. The addition of global, commercial companies to the Colorado community highlights the value that the state presents to companies looking for a highly educated workforce and a strong industry network. The Colorado BioScience Association is proud to serve as the hub of our state's thriving bioscience sector, building and fostering these relationships, and advocating for the industry.

Colorado companies have created important, life-saving drugs and medical technologies, with more in the pipeline. We are proud to have continually grown the industry here and are excited for what the future holds.

Bioscience in Colorado truly is driving innovation, creating jobs and improving lives!

April Giles
President & CEO
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COLORADO AND THE LIFE SCIENCE INDUSTRY

The life science sector continues to grow in Colorado year after year.

The industry is made up of 725 companies and directly employs 28,000 people.

This creates more than 156,000 direct and indirect jobs.

This translates into more than \$10 billion in payroll.



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FROM CAST-OFF TO CURE

How time can uncover a life-saving therapy

The high cost of prescription drugs has been making headlines and serving as a political football for players on both sides of the aisle for many years. A pathbreaking Colorado drug's long road from lab to market sheds light on just how hard – and expensive – drug development can be.

WRITTEN BY TODD NEFF





Still's disease affects both large and small joints, and is usually accompanied with a rash and fever. Still's disease is difficult to diagnose because the rash and fever can come and go.

FOR DOMINIC FUCHS, IT STARTED WITH DISCOMFORT, then a rash, then swelling, and then joint pain that brought limping. The cause, the doctor explained, was a rare form of juvenile rheumatoid arthritis called Still's disease. Dominic had no idea what that meant; but then, he was only two years old at the time.

His parents, Robert and Kelly, soon learned that the obvious treatment, the steroid prednisone, not only made Dominic "blow up like a balloon," as Robert Fuchs put it, but also threatened to stunt his toddler's growth. "It was a terrible drug, but it gave him relief for his pain," he said.

The family's pediatrician referred them to Roger Hollister, MD, who led Children's Hospital Colorado's Pediatric Rheumatology program. Hollister prescribed Dominic other drugs – methotrexate, then Enbrel – which worked for a couple of years until they didn't.

"The disease kept breaking through," Fuchs recalled. "We were running out of options."

Hollister knew of another option, one discovered and developed in Colorado decades earlier. It was called anakinra, trade name Kineret, a drug that had once built and then crushed one of America's most promising biotech startups before being plucked from the ashes to treat rare diseases like Dominic's. The particulars of Kineret's long road from bench research to the bloodstream of a child in Castle Rock, Colo., may be unique. But in terms of time, money and effort in the high-risk game of drug development, anakinra's story may well be generic.

The research that led to Kineret started in the late 1970s. William Arend, a rheumatologist at the University of Washington, got interested in macrophages and immune complexes. Macrophages are a type of white blood cell named for their appetite for foreign cells or particles,

which they devour. In rheumatoid arthritis (RA), though, immune complexes that cling to joint tissues stimulate macrophages to secrete chemicals, primarily cytokines, that attack healthy cells in the joints and elsewhere. Arend sought to understand what was inciting such behavior.

"I was curious about this process, about how the biology works, about how the human body works both normally and in a disease process," Arend said. And he also wanted to find "single hits" to treat rheumatoid arthritis, one narrowly targeted with few side effects.

What he and lab colleagues Fenneke Joslin and Joseph Massoni eventually discovered was as complex as it was profound. Interleukin-1 (IL-1) is one of many cytokines (molecules that mediate cell-to-cell communication) that were

[Kineret] had once built and then crushed one of America's most promising biotech startups before being plucked from the ashes to treat rare diseases like Dominic's.

triggering an inflammatory response in joints. This wasn't the discovery. Others had figured out IL-1's complicity in inflammatory immune responses years before. Rather, Arend's team discovered that another protein was also involved – one that acted as a yang to the yin of IL-1. This protein settled into the same mouse, rabbit or human cell receptors as IL-1, but unlike IL-1, brought no immune response – no attack by macrophages or their proxies. They called it an IL-1 receptor antagonist, or IL-1Ra. This was the first described human protein that functioned as a receptor antagonist, binding to a specific receptor but triggering no responses.

Dominic Fuchs is a national-level snowboarding competitor in the half pipe and slopestyle.

The Journey OF KINERET

1970

William Arend starts researching specific molecular behaviors that eventually lead to the drug Kineret.

Arend and Swiss scientist Jean-Michel Dayer separately publish their discoveries around the human protein IL-1Ra.

Arend is contacted by Synergen, a Boulder biotech startup, suggesting a collaboration.

CU and Synergen published two articles in *Nature* describing their work.

Synergen goes public in 1991, raising \$300 million.

The drug enters clinical trials in which it is tested for treating severe sepsis.

The drug has promising Phase II trial results but fails Phase III clinical trials. Trials were halted in 1994.

Synergen is bought by Amgen for \$9.25 a share, down from \$75.00 a share.

Amgen wins FDA approval for the drug (now known as Kineret), but it was too late, as a more effective rheumatoid arthritis drug was already on the market.

Researchers and physicians continued research and found new uses for the drug. Roger Hollister, MD, prescribes Kineret off-label to Dominic Fuchs.

Sobi receives FDA approval for Kineret to treat NOMID in 2012.

Sobi plans to launch trials in 2017 seeking FDA approval for Kineret in the treatment of Still's disease and acute gout.

2016



Swiss scientist Jean-Michel Dayer, it turned out, had made the same discovery, Dayer publishing in 1984, Arend in 1985. Both were acts of biological archaeology unearthing a snippet of DNA that had been buried on the long arm of chromosome 2 in humans and other mammals for some 350 million years. It was a fundamental advancement in our understanding of the immune system, and one with great promise: drugs based on IL-1Ra might help not only patients with rheumatoid arthritis, but also those with skin, gastrointestinal, cardiovascular, and kidney diseases, diabetes, organ transplants, infections and maybe more. But first, the discovery had to become a therapy. That would take biotechnology, which revolves around reprogramming microbes to crank out great volumes of proteins they otherwise wouldn't, sort of like getting cows to produce Coke.

The leaders of a Boulder biotech startup called Synergen contacted Arend a few months after his team had published its findings, suggesting a collaboration. Arend was amenable. His team had run into problems purifying IL-1Ra. Synergen hired Charles Hannum, PhD, a protein chemist, who worked the problem for a couple of years. Synergen scientists also worked with Arend's team to reverse engineer the DNA sequence that created IL-1Ra in human cells and clone it in *E. coli* bacteria, which then produced human IL-1Ra. In 1989, CU and Synergen entered into a formal licensing agreement. In 1990, the team published two articles in the

The drug, Kineret, is given to patients as an injection.

prestigious journal *Nature* describing their work to create a first-in-class, general anti-inflammatory protein. They had filed their patent applications two years prior.

Arend's name was on the patent and, despite a decade of involvement in the IL-1Ra's discovery and development, he had a conflict of interest and could not participate in the clinical trials. Synergen's leadership decided to target severe sepsis, a disease in which a cytokine cascade triggers damaging inflammation in multiple organs. It was a killer, striking a half million people in the United States alone each year and killing nearly half of them.

Richard Duke, PhD, a CU professor of immunology and the founder and chief scientific officer of the Colorado Institute for Drug, Device & Diagnostic Development (CID4), consulted part-time for Janus Capital in the early 1990s; Synergen was part of its portfolio. Sepsis, Duke says, was not only a potential blockbuster target, but it also enabled a much quicker study than a chronic disease such as RA. Within a few weeks, the simple fact that a patient had lived or not would give researchers a good idea of whether or not a drug had worked. It could save lives, and the market would be much larger than that for, say, acute myeloid leukemia,

a cancer of the bone and marrow, for which IL-1 pioneer and CU immunologist Charles Dinarello, MD, had argued.

"It's canonical that all small biotech companies get approval for any indication," Dinarello said. "Then the world opens up if you're a biologic" – also called immunotherapy – "because all biologics extend to more than one disease." Plus, he told Synergen's leadership, "Every sepsis trial has failed."

It was the first real shakeout in biotech. People realized, "Maybe we have run out of easy stuff."

– RICHARD DUKE, PhD

But the animal studies had been promising, and a Phase II clinical trial – required by the U.S. Food and Drug Administration to determine dosing – had shown encouraging results, with mortality rates of 44 percent in the control group, dwarfing the 16 percent death rate of those taking the highest dose of Antril, which Synergen had named its IL-1Ra.

The company, already flush with biotech-boom private-equity and venture investment, went public in 1991. With \$300 million to spend, its

leadership would build a biotech company from the ground up while they conducted their Phase III sepsis trial in Europe to prove that the drug helped patients. The company's shares shot to \$75. *BusinessWeek* asked, "Is Synergen the Next Amgen?" One investor pegged the market for Antril at \$1.5 billion a year.

But the Phase III trial's results, published in February 1993, found Antril to have failed. A second trial, based on a retrospective analysis of the first, came to the same conclusion and was halted in July 1994. How could such a promising result in Phase II have bombed out in Phase III?

Larry Gold, PhD, chairman and founder of SomaLogic, was a

Synergen co-founder who had left the company by the time it connected with Arend. The Phase II trial consisted of just 100 patients divided into four cohorts of 25, he said. The error bars made it such that "you could have drawn any line you wanted. One could have done high to low, or flat, or could have made the drug look worthless," Gold said. "Nobody ever thought about it. That is the risk of an underpowered trial."

Synergen's stock price collapsed with the news; the company laid off 375 of its 625 employees

in August 1994. Some of those retained included a clinical group in Europe to oversee a Phase II clinical trial testing Antril on RA patients. But the die was cast. Rather than the next Amgen, Synergen became part of Amgen, bought for \$9.25 a share, in no small part for its cash, real estate and production facility in Boulder.

"It was the first real shakeout in biotech," Duke said. "People realized, 'Maybe we have run out of easy stuff.'"

Hollister, the Children's Hospital Colorado pediatric rheumatologist, said the unsuccessful trial very nearly killed Kineret.

"Everybody was wondering if this drug was going to be good for anything," Hollister said.

But Amgen forged ahead with the RA trial Synergen had started. It won FDA approval for what it renamed Kineret in 2001. It was too late. Enbrel, a more effective RA drug (it targets a different cytokine and stays in the patient's system longer than Kineret), had been approved in 1998. Amgen bought Enbrel's maker, Immunex, in 2002. The company lost interest in Kineret.

But the science kept advancing, and true to Dinarello's words, once FDA-approved, researchers and physicians found new possibilities for this biologic. So-called "orphan diseases" – ultra-small market, incurable conditions such as Still's disease – were among them.

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Hollister prescribed Kineret to Dominic Fuchs off-label. His parents saw improvement within a week. The drug quelled the fevers, rashes and the aches and pains. The child stayed on Kineret for a couple of years. Then slowly, Hollister reduced the dose from daily to less-frequent injections, weaning the young

Amgen doesn't sell Kineret anymore. Biovitrum (now called Sobi), a Swedish company specializing in recombinant protein drugs for orphan diseases, co-promoted Kineret in the EU starting in 2003. In 2008, Sobi obtained a worldwide sublicense for the drug. Later the agreement was extended to grant Sobi rights

to develop and commercialize Kineret for four IL-1-related orphan drug indications, neonatal-onset multisystem inflammatory disease (NOMID) being one. As Kineret was being widely prescribed off-label for NOMID, Sobi had an interest in securing FDA approval for the condition, which it did in 2012, said Geoffrey

McDonough, Sobi's CEO. The following year, Sobi acquired the full rights to develop and commercialize Kineret as it saw fit.

Sobi announced in late February that it will launch new trials in 2017, seeking FDA approval for Kineret in the treatment of Still's disease as well as in acute gout. McDonough said each would involve about 200 patients and cost from \$25 million to \$50 million. Still's disease involves a single, four-year trial, but one that will probably extend to 30 or 40 sites, given its rarity, he said. For gout, there will be Phase II and Phase III trials, taking five years. There are many other possibilities, McDonough said. They range from cancers to metabolic syndrome to heart failure. Dinarello

and colleagues from the Mayo Clinic recently submitted a study showing that Kineret can delay progression of pre-myeloma to multiple myeloma for a decade – normally something that happens within two years – and without side-effects.

"It doesn't make you sick, give you nausea, you don't lose your hair, there's no diarrhea," Dinarello said. "It's like drinking a glass of water."

Dinarello isn't alone in his enthusiasm.

"We literally get hundreds of applications related to diseases where Kineret seems to work," McDonough said. "The challenge now is to support existing indications while making staged, deliberate investments in new ones."

Hollister, who recently retired, says FDA approval will make a difference for patients with Still's disease. Kineret and drugs like it typically cost \$2,000 to \$3,000 a month.

"When you deal with insurance companies to pay for expensive medications like this, having FDA approval makes a big difference," he said.

The Kineret story is a window into "a tough business," as Arend, now a distinguished CU professor emeritus, put it. "These companies are under pressure all the time to find new drugs and make money for investors."

Gold said he doesn't like the high price of drugs, "but they have so many failures, you have to try a lot of things. They're wrong most of the time." He adds, "Biology is so much harder than engineering. Imagine someone handing you a bridge that had started being built four billion years ago. It's brutal – just brutal."

The data back them up. For all the attention, prescription drugs make up only about 10 percent of the U.S.'s annual \$3 trillion health care tab. Failure rates are astronomical: 1 in 10,000 new molecules yields a single FDA-approved medicine; just three in 10 of those medicines earn back their research and development costs.

Kineret, with \$95 million in 2015 sales and more than \$1 billion in lifetime sales, turned out to be one of the lucky few after all. As was Dominic Fuchs, whose father Robert now watches him rip down slopestyle courses rather than roll about in a wheelchair.

"If it wasn't for Kineret," Robert says, "I don't think that we would be where we are today." ©

Biology is so much harder than engineering. Imagine someone handing you a bridge that had started being built four billion years ago. It's brutal – just brutal.

– LARRY GOLD, PHD, CHAIRMAN AND FOUNDER OF SOMALOGIC

patient as he grew bigger and stronger and his immune system developed. Dominic is 14 now and hasn't had a Kineret shot in years, his dad says. He is a national-level snowboarding competitor in the half pipe and slopestyle.

Kineret may or may not have contributed to the disease's remission, Hollister said. Roughly a third grow out of Still's disease, and another third have their arthritis return cyclically. The rest, if untreated, suffer "dreadful joint damage," ultimately needing replacements.

"Those are the ones Kineret is really a miracle drug for," he said. "If you look around the country, or throughout the world, Kineret is used by basically all pediatric rheumatologists to treat these diseases."

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FUSING THE GENERATION GAP

Colorado's shifting demographics present challenge and opportunity for bioscience.

WRITTEN BY JEANNE BERKOWITZ, PhD

IT'S BEEN PREDICTED, ANALYZED AND PROJECTED, its consequences debated for decades: the massive and unprecedented aging of the overall US population as the so-called Baby Boom generation reaches retirement age. But that phenomenon, which long seemed theoretical, is now in full swing. The oldest members of this demographic cohort – which includes Americans born between 1946 and 1964, and represents approximately 26 percent of the total US population – began to turn 65 in 2011. Nationwide, it's estimated that they will be reaching retirement age at a rate of 10,000 per day until the year 2030.

The aging population is especially evident in Colorado. The State Demography Office recently issued a report showing that, out of all 50 states, Colorado has one of the fastest-aging populations. It is estimated that, by 2030, the population of Coloradans older than 65 will more than double, from around 500,000 in 2010 to more than 1.2 million. This increase will be from natural aging of the current population alone.

That staggering number is only part of the story. Colorado also boasts the fastest-growing Millennial population in the US. As young adults just hitting their career stride, they are the youngest members of our state's workforce.

It is estimated that, by 2030, the population of Coloradans older than 65 will more than double, from around 500,000 in 2010 to more than 1.2 million.

These two demographic shifts prompt important questions: What will be the economic, social and health consequences of the overall aging of Colorado's population? What are the specific needs of this population, and how will those be served by current and future industries here? What bioscience research and development will address health and wellness for Americans, and what about the needs and desires of the young people who are just establishing themselves? How do those needs intersect?

One place where those questions are actively being addressed is the new Knoebel Institute for Healthy Aging at the University of Denver (DU). According to Lotta Granholm-Bentley, professor of biology and executive director of the Knoebel

Institute, its genesis began six years ago with a \$10 million gift from Betty Knoebel and a pilot grant program to gauge interest in an interdisciplinary program on aging.

“An important differentiation between DU and other institutions that are looking at aging is that we are not co-located with a medical school,” Granholm-Bentley says. “So we have an eclectic group of disciplines, including not just biomedical science but also engineering, clinical psychology, social work – even performing arts and hospitality – involved in collaborations to approach these questions from a different angle.”

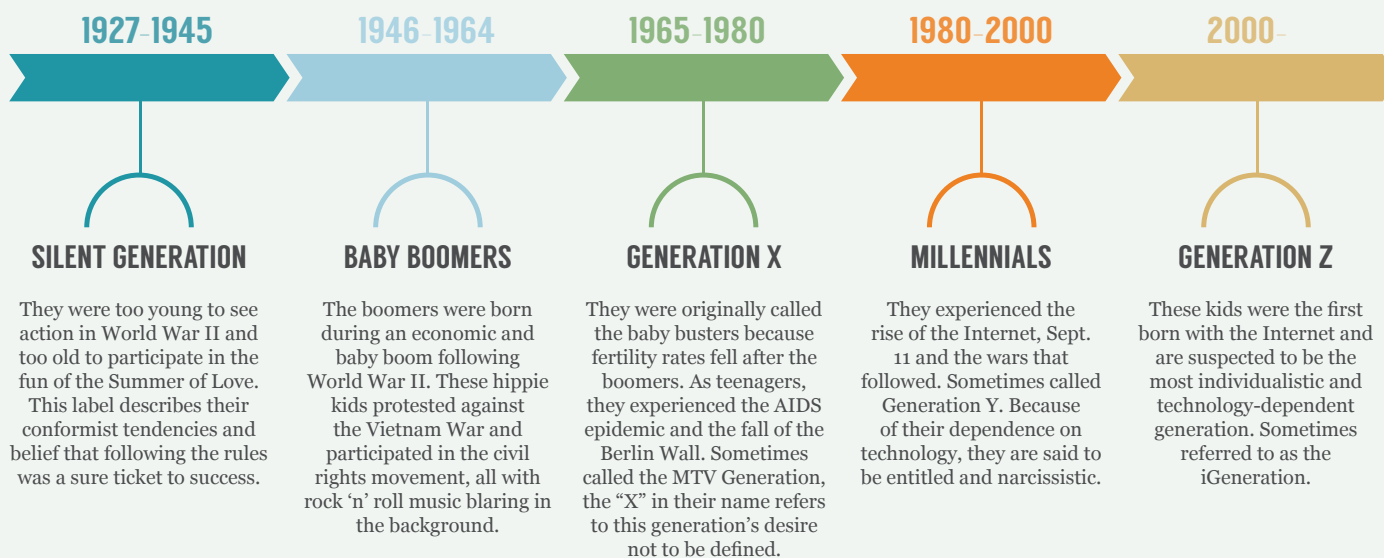
The Knoebel Institute, its faculty and students are unified around a vision: Quality in life, wellness, and community. Goals include:

- promotion and expansion of research;
- the building of an interdisciplinary community;
- engagement of the university's Millennial students with the elderly community; and
- engagement with government, policymakers and nongovernmental organizations that have an interest in issues related to aging.

The broad-based exposure and training young adults will receive through the institute's initiatives will help prepare them for a creative approach to their careers as they enter the workforce and are called on to solve the country's demographic challenges.

“Although DU doesn't have a medical school, we do have a large group of pre-medical

A TIMELINE OF THE AMERICAN GENERATIONS



*Information from NPR.org



The Accera team at the November 2015 Alzheimer's Association Education Symposium educating Colorado seniors about their work developing a new treatment for Alzheimer's disease.

students,” Granholm-Bentley says. “Thus a focus for the institute has been finding ways to immerse its students in collaborations with industry and health organizations.”

Recently, DU initiated a collaboration between students and the Colorado Neurological Institute’s neurologists and surgeons.

“We see this as a model for expanding relationships with other organizations,” Granholm-Bentley says. “As an undergraduate school, we’re excited about this successful effort to connect students to these opportunities.”

The Knoebel Institute’s future location – currently under construction – will also house engineering and computer science programs, placing the institute in a perfect position for collaboration between pre-med, engineering and other disciplines. Collaborative research programs already under way include studies in rehabilitation science to help injured elderly people regain strength and maximize their quality of life after injury. These programs focus on the interrelationships between positive physical training, biomarkers and memory function. They also build on basic research in mitochondrial oxidative stress in neurodegenerative disease and the effects of diet and nutrition on aging, health and dementia.

Alzheimer’s disease (AD) and dementia are of specific concern because, both in Colorado and nationally, the aging of the population will coincide with a dramatic rise in the prevalence of these diseases. According to the

Colorado chapter of the Alzheimer’s Association, approximately 65,000 Coloradans over the age of 65 are living with Alzheimer’s disease. That number is expected to grow to an estimated 92,000 by 2025.

AD already presents significant challenges to patients, caregivers, families, communities and facilities that care for older adults. This represents an area to be addressed through both social and scientific efforts.

According to the Colorado chapter of the Alzheimer’s Association, approximately 65,000 Coloradans over the age of 65 are living with Alzheimer’s disease. That number is expected to grow to an estimated 92,000 by 2025.

According to Dr. Charles Stacey, CEO of Accera Inc. in Boulder, Colo., AD represents a significant worldwide pandemic, and new AD treatments are desperately needed.

“There are nearly five million patients currently in the US alone, costing our healthcare system more than \$225 billion,” Stacey says. “With the aging of the general population, that figure could grow to exceed \$1 trillion by 2050.”

“What’s been very frustrating is that there is a real dearth of medications to treat this disease,” he says. “The five drugs available to manage the disease really belong to just two drug classes, and the last approval was 14 years ago, in 2002.”

Indeed, a 2014 study published in the journal *Alzheimer’s Research and Therapy* found that only 0.4 percent of the 413 clinical trials for Alzheimer’s therapies conducted between 2002 and 2012 were successful.

The need for new treatments is urgent, in terms of both human and economic costs. According to a recent analysis by the Alzheimer’s Association, a treatment capable of delaying the onset of AD, if it were introduced to market by the year 2025, could reduce the number of individuals affected by AD by 2.5 million within the first five years and reduce overall cases of AD by 42 percent by the year 2050. This could translate to savings in out-of-pocket and medical reimbursement costs in the hundreds of billions of dollars.

Founded in 2002, Accera has long been focused on treatments for Alzheimer’s disease and currently has a lead product, AC-1204, moving through Phase III clinical trials. The study will investigate the drug’s effects on memory and cognition, activities of daily life, resource use and quality of life.

What’s been particularly interesting about Accera’s clinical trial enrollment, according to Stacey, is how Colorado’s changing demographics have enabled the company to open two trial sites and begin patient recruitment in the state.

“The majority of Alzheimer’s cases occur in Florida and California, so that’s where the majority of clinical trials for this therapeutic area have historically taken place,” he says. “With the population of older adults growing in Colorado, we have opened two clinical trial sites here. This is somewhat unusual in our industry. If we succeed, it may provide leadership for other global pharmaceutical companies to offer their clinical trials to patients in the state as well.”

Since AD is a progressive disease, the need for new, effective treatments goes hand in hand with the need for better mechanisms for early detection. CereScan, headquartered in Littleton, Colo., has developed novel, advanced functional and structural brain imaging and processing software to improve the accuracy of diagnosis for AD – as well as a range of other brain conditions, including Parkinson’s disease, anxiety, ADD/ADHD, traumatic brain injury, PTSD and bipolar disorder. The goal is to begin treatment before extensive damage and cognitive decline have occurred.

Aside from AD and dementia, the management of health and wellness – as well as acute and chronic diseases, including diabetes, heart disease, Parkinson’s disease and cancer – is becoming more important as the population grows at both ends of the age spectrum.

For young adults, including Millennials and generations entering midlife, increasing emphasis will be placed on wellness, disease prevention and “the quantified self.” As so-called digital natives, young people increasingly rely on mobile and digital health apps and app-enabled devices to help them track their health habits with unprecedented granularity. At a time when Millennials are entering the workforce, paying for their own healthcare for the first time and building their knowledge on access and quality care, this higher level of engagement with digital health has the potential to provide increased attention to prevention, health and wellness, and to reduce healthcare costs.

Although the drive to track and quantify health parameters gained traction with apps to manage athletic fitness, exercise and diet, the range of health parameters people are now tracking has grown rapidly and continues to expand, reflecting the wellness-oriented interests and active lifestyles of Millennials and Colorado residents of all generations. For example, Leo Technologies, based in Centennial, Colo., is developing LeoSense, a system of sensors and apps for managing individual hydration through automatic, continuous, biometric monitoring. The company is collaborating with Samsung, using Samsung’s Simband research platform, which incorporates a wide array of biosensors and flexible modularity, to test its technology.

“Our collaboration with Samsung is a great example of how digital health and bioscience are working together, more now than ever before, with the common goal to improve health and wellbeing,” Steve Adams, CEO of Leo Technologies says.

Other mobile digital health companies located in Colorado include RXAssurance in Denver, whose companion applications for healthcare providers and patients – RxAdvisor and RxCompanion – collect and track patient data regarding adherence to prescribed drug regimens to help the provider-patient team maximize treatment outcomes. Telsano, with operations in Aurora, Colo., is developing a platform for capturing, tracking and monitoring personal biometric information,



With its wide array of biosensors and flexible modularity, Simband – a Samsung research platform – is the ideal testing platform for Leo Technologies.

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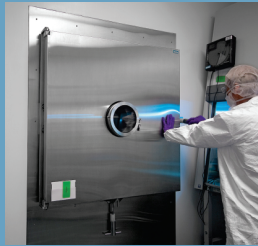
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and aggregating it with segmented body composition analysis. The data generated by Telsano's platform can be used by providers and corporate wellness programs to promote wellness and preventive health services to their patients and employees.

While not app-driven, extraordinarily advanced diagnostic technologies are being brought into the areas of personal wellness and disease prevention as well. SomaLogic, located in Boulder, Colo., is building on its successful history in protein biomarker detection to develop a "Wellness Chip" that will enable early detection of diseases and health conditions, monitor nutritional and fitness status and promote general wellbeing. The company envisions that, eventually, users will be able to monitor changes in the concentrations of key proteins in the body and make necessary adjustments to optimize health and wellness.

The proactive interest in aging-related issues in both academics and industry mirrors current efforts in Colorado state government and private industry to plan for the consequences of these major demographic shifts. Last year, the legislature passed HB15-1033 to establish a Strategic Action Planning Group on Aging

(SAPGA). This group is developing a report and recommendations for strategies to address infrastructure, workforce, social, and health and welfare needs for older Coloradans.

Mindy Kemp is director of the Division of Aging and Adult Services at the Colorado Department of Human Services. The goal of her team is to provide services and assistance to older adults so they can live and thrive in the communities of their choice. She says that getting the state ready for the growing aging population is a bigger issue than just providing services to people as they age.

We will continue to have a growing, older demographic, and it's something we should all be preparing for indefinitely.

- MINDY KEMP, DIRECTOR OF THE DIVISION OF AGING AND ADULT SERVICES, CO. DEPT. OF HUMAN SERVICES

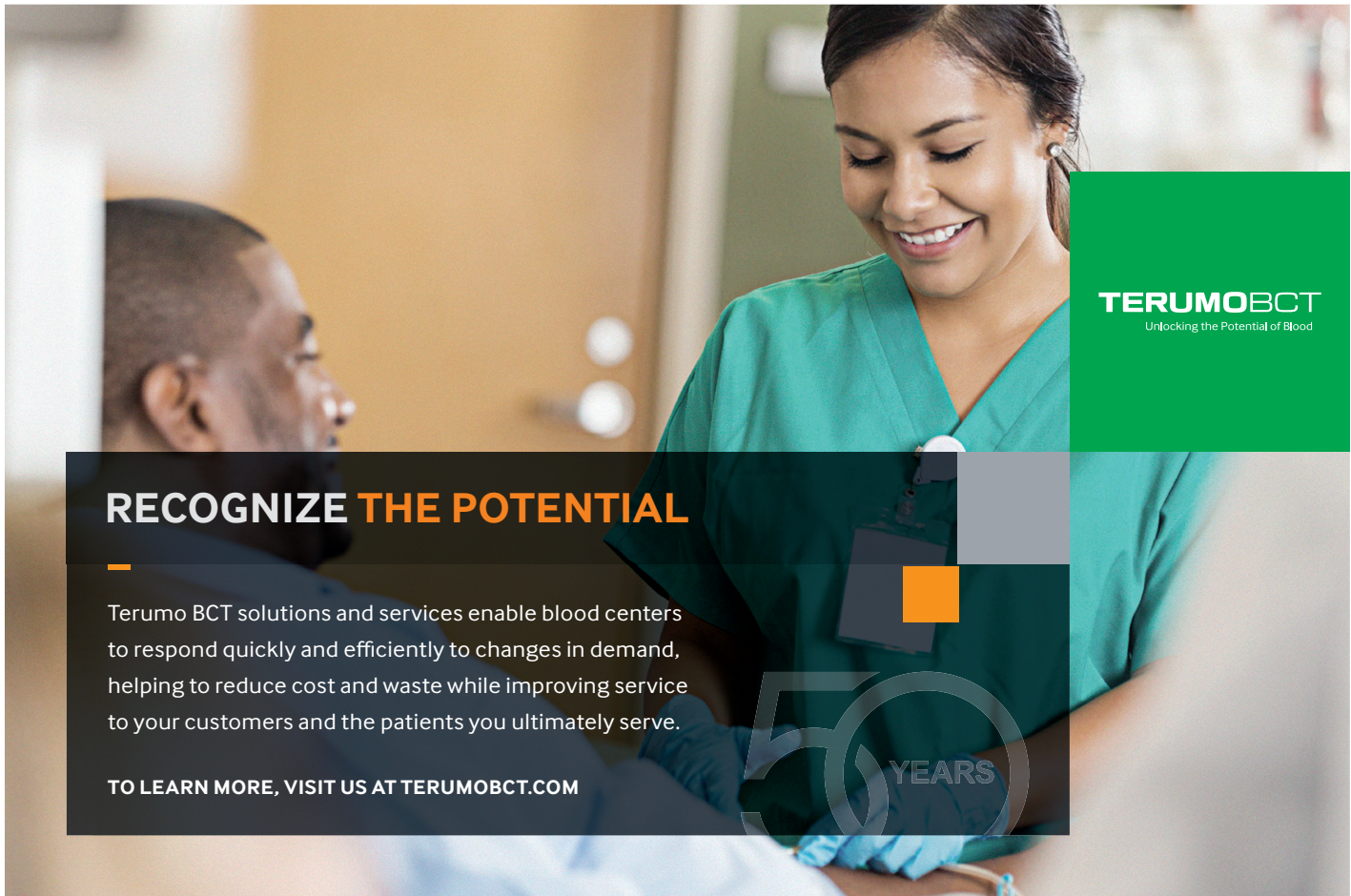
"We have to consider infrastructure, communities, transportation, healthcare, workforce issues and their impact on the economy and

SomaLogic's "Wellness Chip" will enable early detection of diseases and health conditions, monitor nutritional and fitness status and promote general wellbeing.

tax base," she says. "It's a really big issue that extends beyond just services. Industries like long-term care and healthcare will especially feel the impact of the rise in population, and our universities will need to be focused on how we can prepare the Millennial workforce to meet and address these challenges."

According to Kemp, the combination of demographic realities, longer lifespans and an influx of migrants into Colorado means that the shift to an older overall population is here to stay.

"We tend to think of the growing aging demographic as a brief uptick in the population and then that will end, but it's a trend that will continue," Kemp says. "We will continue to have a growing, older demographic, and it's something we should all be preparing for indefinitely."



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Aytu BioScience is developing and commercializing novel products in the field of urology, initially concentrating on prostate cancer, male sexual dysfunction and male infertility.



PEDIATRICS

JustRight Surgical develops precisely designed surgical instruments that allow access to confined spaces and often delicate structures.

Silvergate Pharmaceuticals focuses on filling the unmet medical needs of children by developing and commercializing innovative pediatric medications.

Nivalis Therapeutics is developing a novel class of disease-modifying therapies that are designed to preserve an endogenous molecule with cell signaling effects that are implicated in the pathophysiology of cystic fibrosis.





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RxREVU helps patients and payers save money on their prescriptions by identifying the most effective medication at the best possible cost.

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Flashback Technologies is a medical data analytics company whose CipherSensor™ platform is being applied to develop products that bring smart measures to continuous medical monitoring.



AGING

MenoGeniX is a clinical-stage biotechnology company focused on developing a drug to treat hot flashes and other menopausal symptoms.

Ocugen is a clinical-stage biopharmaceutical company developing novel treatments for sight-threatening diseases including ocular graft versus host disease, retinitis pigmentosa, geographic atrophy, wet age-related macular degeneration and diabetic retinopathy.

Accera, Inc. developed the first proprietary commercialized Alzheimer's disease therapy that addresses hypometabolism, the brain's inability to optimally metabolize glucose.



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VetDC develops breakthrough therapies that provide veterinarians with new tools and options to treat cancer in pets.

Membrane Protective Technologies' suite of products (collectively GameteGuard™) includes patented technologies to protect sperm from the damages of freezing and thawing while in transit to farms and dairies.

Jonah Ventures quantitatively reconstructs the diet of herbivores, omnivores, and certain carnivores using environmental DNA to advance ecological understanding.



GROWING THE DISTANCE

How regenerative medicine is changing the future of personalized therapy.

WRITTEN BY JEANNE BERKOWITZ, PHD

IMAGINE HAVING SKIN SO FRAGILE that even pressure from the seams in a piece of clothing could cause painful blistering and injury. For children with epidermolysis bullosa, a rare genetic disease that can be caused by a single point mutation in a structural protein of the skin, this scenario is a painful daily reality. An ongoing clinical research program in Colorado holds promise to provide relief to these patients, and highlights the intense activity currently ongoing in Colorado in the field of regenerative medicine.

Ganna (Anya) Bilousova, PhD, an assistant professor in the Department of Dermatology at the Charles C. Gates Center for Regenerative Medicine at the University of Colorado Anschutz Medical Campus, heads a research program that aims to harness the regenerative power of induced Pluripotent Stem (iPS) cells for renewal and replacement of aging tissues and organs. Together with Dennis Roop, PhD, a professor and director of the Gates Center, and with the assistance of colleague Igor Kogut, PhD, an instructor in the Department of Dermatology, Bilousova's laboratory is

also developing applications to ameliorate the debilitating effects of inherited genetic diseases like epidermolysis bullosa.

iPS cells represent a relatively recent advance in the field of stem cell research. By artificially inducing expression of a handful of specific genes in adult somatic cells, these cells can be reprogrammed to revert to an immature, highly undifferentiated, genetically rejuvenated state with properties similar to those of embryonic stem cells (ESCs). Like ESCs, iPS cells can be propagated and expanded indefinitely in vitro and, in theory, be induced to differentiate into any cell type in the body with the goal of growing replacement tissues or organs to treat diseases or the degenerative effects of aging.

"We can take cells from a patient as old as 80 years of age, induce those cells to become iPS cells, and they seem to revert to a rejuvenated phenotype," Bilousova says. "In theory, we can potentially use these cells to grow entire, new, young organs, with improved functionality, that are specific to the patient the iPS cells came from."







AlloSource employee working in the tissue processing area.

It's not difficult to see the potential of iPS cells for use in regenerative medicine. Unlike ESCs, iPS cells are derived from adult somatic cells, and therefore do not involve the use of in vitro fertilized embryos or ESC lines—sources associated with significant societal, ethical, legal, and scientific hurdles. They are also specific to the patient being treated, presumably avoiding or reducing the possibility of immune rejection after transplantation.

Bilousova's research program is tackling some of the technical hurdles of translating the basic science into the clinic. Her team is interested in identifying and developing optimal tissue sources for somatic cells that will be induced to become iPS cells, and optimizing

differentiation to produce the desired cell types. Perhaps most fundamentally, Bilousova, together with Korgut and Roop, is further improving so-called non-integrating approaches to reprogramming somatic cells using mRNA, in order to avoid the risks of introducing new, permanent genetic mutations that could, in themselves, cause disease.

"Our work is based on the fact that, fundamentally, proteins are the molecules that do the jobs within the cells, so that is what we need to express in order to reprogram the cells," Bilousova says.

The ultimate goal is to adapt iPS cells for therapeutic applications. Kogut's research program is working to identify strategies for manipulating

iPS cell genomes to safely correct faulty genes in order to treat epidermolysis bullosa as proof of concept for other genetic disorders.

"We want to make genetic corrections," Kogut says, "but that has to be achieved at the genome level, without introducing any additional nucleotide changes, and without leaving behind any kind of selection marker."

Kogut is therefore working with two different cutting-edge genome editing techniques: TALEN (Transcription Activator-Like Effector Nucleases) and CRISPR/Cas9 (Clustered, Regularly Interspaced, Short Palindromic Repeats) to repair the disease-causing mutation, after which the cells will be differentiated and grown into a skin substitute. Ultimately, the goal is to develop these advances for commercialization, leveraging the considerable resources and expertise of the Gates Center.

The partially demineralized allograft bone – the foundation for the AlloStem tissue [developed by AlloSource] – provides a natural scaffold for new bone formation. The naturally occurring growth factors present in allograft bone have been shown to promote new bone growth.

With more than 85 faculty members at the Anschutz Campus and from other institutions all over Colorado, state-of-the-art core facilities, and an advanced cGMP biomanufacturing facility, the Gates Center represents a central hub for translational research in the field of regenerative medicine in Colorado.

The center is not alone in its efforts to harness the powers of this field. Academic and commercial activities across the state indicate that stem cell research and regenerative medicine will be a major focus for bioscience in Colorado in the decades to come.

In Fort Collins, Colorado State University (CSU) recently received an anonymous \$20 million donation to fulfill its \$65 million fundraising goal to begin construction on the new CSU Institute for Biologic Translational Therapies.

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The center was originally launched in late 2014, with a \$42.5 million gift – the largest cash gift in CSU history – from Denver-area philanthropists John and Leslie Malone.

The Malones became interested in stem cell research and regenerative medicine through their experiences with the Gail Holmes Orthopaedic Research Center at CSU, which helped them treat lameness in one of their world-class dressage horses through arthroscopic surgery and the use of stem cell injections. After endowing a chair in Equine Sports Medicine at CSU, they decided to broaden their focus. They recognized that research and advances in veterinary regenerative therapies, including stem cells, gene therapies, replacement tissues and organs, and novel proteins, would have extraordinary value, not only for animals and their owners, but also for treating human disease, degenerative disorders and aging. The new institute will serve as a nucleus for that kind of translational approach, in which discoveries in basic and pre-clinical research can develop in parallel for both veterinary and clinical applications.

The commercial potential of veterinary stem cell research at the Holmes Orthopaedic Research Center has been demonstrated by the spin-out of a commercial entity, ART (Advanced Regenerative Therapies, Fort Collins). ART was co-founded in 2007, by Dr. David Frisbie, PhD, and Dr. John Kisiday, PhD, both of whom are associate professors at the center. The company's services focus on providing autologous bone marrow stem cell collection, expansion and banking to treat equine and canine musculoskeletal injuries and disorders.

Another Colorado company, Regenexx, located in Broomfield, Colo., also offers autologous bone marrow stem cell therapies, but its focus is on orthopedic procedures in humans. Its principal therapeutic offering in the US is the so-called "same-day" stem cell transplant, in which bone marrow is aspirated from a patient's hip bone, processed to rapidly isolate the mesenchymal stem cells, and reintroduced into the patient's knee, shoulder, back, and other joints to alleviate pain from tendon, ligament and bone injuries, arthritis and other degenerative conditions. Regenexx tracks all of its patients in a treatment registry in order to collect and analyze treatment outcomes and complications. According to the company, its proprietary isolation and injection protocols are associated with

improved outcomes for patients compared to other commercially available stem cell transplant technologies.

Regenexx also conducts extensive research in stem cell therapies, including a procedure using cultured mesenchymal stem cells in place of freshly isolated ones. While that procedure is not currently available as an approved therapy in the US, Regenexx has conducted clinical studies for the procedure and continues to investigate its potential for further development.

The healthy and expanding ecosystem of academic and commercial activity in this field suggests that our state will be well positioned to address this growth.

The non-profit organization AlloSource, located in Centennial, Colo., is another key player in regenerative medicine in Colorado. Founded in 1994, AlloSource develops, processes and distributes donated human tissue for use as allografts in medical procedures such as knee replacement, joint repair, bone grafting, spinal fusions and skin grafts for wound and burn care. Its tissue bank includes more than 200 kinds of bone, cartilage, skin, soft-tissue and custom-machined allografts for use in an array of life-saving and life-enhancing medical procedures.

Its most recent innovation, AlloStem, is partially demineralized allograft bone combined with adipose-derived mesenchymal stem cells. The partially demineralized allograft bone – the foundation for the AlloStem tissue – provides a natural scaffold for new bone formation. The naturally occurring growth factors present in allograft bone have been shown to promote new bone growth. The adult mesenchymal stem cells present in AlloStem naturally adhere to the bone substrate and may contribute to the formation of new bone.

With the overall aging of the population, both in Colorado and nationally, the demand for therapies for repair, restoration, rejuvenation and replacement of diseased or degenerating tissues and organs is growing. The healthy and expanding ecosystem of academic and commercial activity in this field suggests that our state will be well positioned to address this growth. ©



BOETTCHER PROGRAM BRINGS TOP-NOTCH STUDENTS INTO RESEARCH LABS

WRITTEN BY MARISA POOLEY

THE BOETTCHER FOUNDATION CHAMPIONS excellence across Colorado by investing in the state's most talented citizens and high-potential organizations. Among the most talented citizens are those who are awarded the Webb-Waring Biomedical Research Awards and those awarded the Boettcher Scholarship.

The Boettcher Foundation's Webb-Waring Biomedical Research Awards program aims to support scientific innovation in Colorado by providing biomedical research funding for early career investigators at the state's research institutions. Similarly, the Boettcher

Scholarship supports Colorado's top high school students by providing them with an excellent in-state college education.

Many of these scholars are interested in research and choose to pursue life science majors in college, which spurred the Boettcher Foundation's creation of a new opportunity for investigators and scholars to collaborate.

"We invest in these two groups of individuals because they are dynamic thinkers and leaders capable of propelling Colorado forward," said Tim Schultz, president and executive

director of the Boettcher Foundation. "We realized that matching a highly skilled undergraduate scholar who is interested in science with an investigator who represents one of the most innovative scientific minds would be incredibly powerful."

Twelve Boettcher Investigators took advantage of the collaboration grant program in its first year; each selected a qualified Boettcher Scholar to work in their lab.

Typically, college students do not have the opportunity to work with a biomedical

QUICK FACTS

- 1 The Boettcher Foundation is in its 7th year of awarding the Webb-Waring Biomedical Research Awards.
- 2 The Boettcher Foundation was established in 1937 by Claude Boettcher and his father, Charles.
- 3 Recipients of the Webb-Waring Award are given grants of \$235,000, covering up to three years of research.
- 4 The foundation aims to support scientific innovation in Colorado through the Webb-Waring program.

researcher until graduate school or later. The collaboration grants provided an opportunity for scholars to gain hands-on experience, while the investigators served their communities by mentoring future scientists.

“Overall, I can’t begin to describe how enriching this experience was. Through the collaboration, I developed my personal and scientific skills, gained access to a network that will help me immensely and kindled a lasting curiosity for science and discovery,” said Andrew Pham, a Boettcher Scholar and undergraduate student at the University of Denver. Over the summer, he worked in Dr. Chad Pearson’s lab at University of Colorado Denver Anschutz Medical Campus, testing the effect of cilia-generated forces on striated fibers.

Their work resulted in publication of their findings in *The Company of Biologists* in 2015. Pearson and Pham have chosen to extend their research and work together for a second year.

“I love mentoring at all levels. Andrew was bright-eyed, excited about the research and ready to dive in and change things,” Pearson said. “Since I’ve been part of the Boettcher network, I’ve seen how amazing the scholars are. Having the ability to tap into that group of quality students is great, and brings new energy into the lab that we really like.”

Some of the other collaboration projects between Boettcher Scholars and Boettcher Investigators included:

- At Colorado College, Dr. Amy Dounay and scholar Maddie Walden researched a drug to treat African Sleeping Sickness, which will be presented by the Boettcher Scholar at Posters on the Hill in Washington, D.C.
- At Colorado School of Mines, Dr. Melissa Krebs and scholar Cameron Whiteside worked to develop drug-releasing bone grafts.
- At National Jewish Health, Dr. Rachel Zemans and scholar Lucas Suazo tested the effect of smoking on lung cells, while the student also shadowed patient visits in clinic.

These students had the opportunity to contribute to meaningful research, but perhaps more importantly, they were trained by some of Colorado’s best.

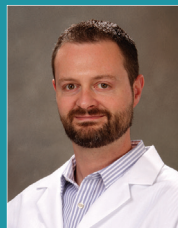
“As trustees of the Boettcher Foundation, we are constantly looking for ways to support hard work and leadership so our community can give back for years to come,” said Dr. Theodore Schlegel, chairman of the Boettcher Foundation Board of Trustees. “Funding these collaboration grants allowed us to bring two talented groups of funding recipients together so they could achieve more collectively.”

The Webb-Waring Biomedical Research Awards stemmed from an innovative agreement among the Boettcher Foundation, the Webb-Waring Foundation for Biomedical Research and the University of Colorado.

Now in its seventh year, the Webb-Waring Biomedical Research Awards have been awarded to 45 early-career investigators. So far, they have proven to be highly effective in their aim of providing gap funding to early-stage researchers, resulting in the investigators receiving major national and federal funding for their next stage of research. ©

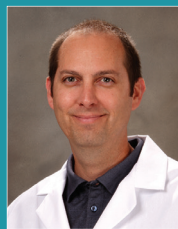
Boettcher Investigators

CLASS OF 2015



James Costello, Ph.D.

*University of Colorado Anschutz Medical Campus
Assistant Professor of Pharmacology
Cancer systems biology and pharmacogenomics*



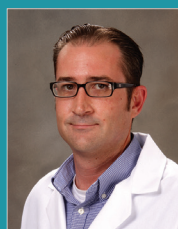
Santos J. Franco, Ph.D.

*University of Colorado Anschutz Medical Campus
Assistant Professor of Pediatric Stem Cell Biology
Brain stem cells in development and disease*



Melanie Cree Green, M.D., Ph.D.

*University of Colorado Anschutz Medical Campus
Instructor of Pediatric Endocrinology
Fatty liver in adolescents with polycystic ovarian syndrome*



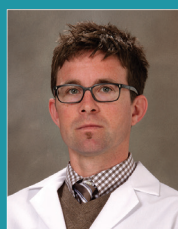
Aaron N. Johnson, Ph.D.

*University of Colorado Denver
Assistant Professor of Integrative Biology
Molecular mechanisms of congenital myopathies*



Erik B. Oleson, Ph.D.

*University of Colorado Denver
Assistant Professor of Psychology
Dopaminergic contributions to behavior and psychopathology*



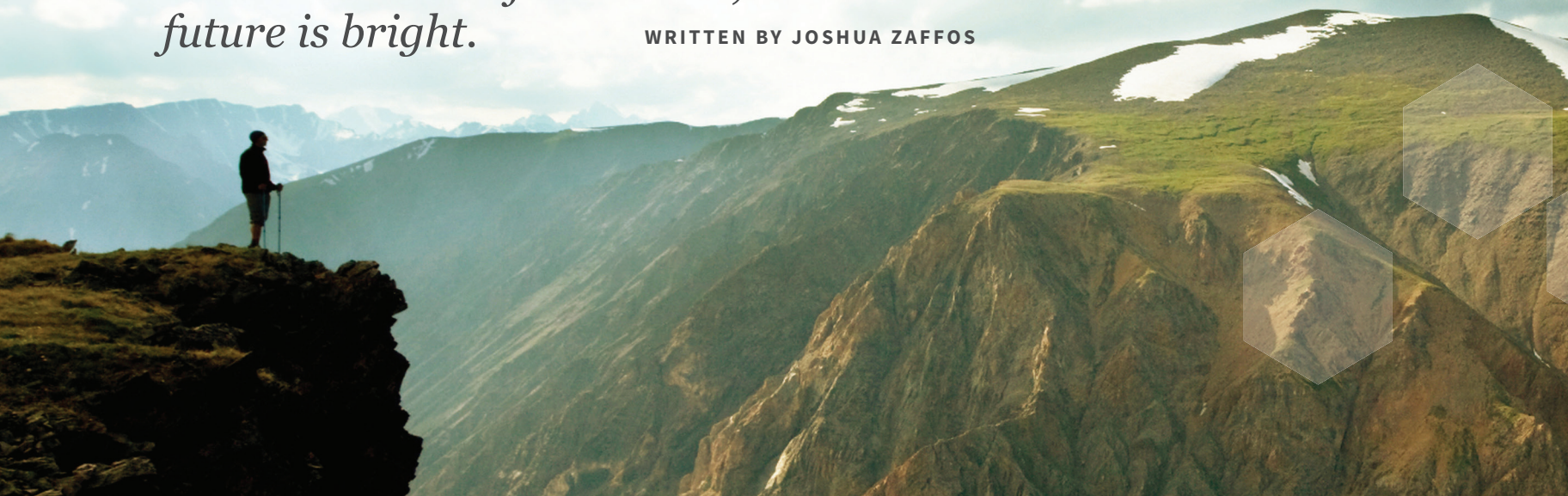
Tai Montgomery, Ph.D.

*Colorado State University
Assistant Professor of Biology
MicroRNA regulation of drug resistance*

ON THE BACKS OF GIANTS

Colorado's thriving life science industry stands on a solid foundation, and the future is bright.

WRITTEN BY JOSHUA ZAFFOS



COLORADO EXPERIENCED AN AVALANCHE OF GROWTH IN 2015. More than 100,000 people moved to the Centennial State during that 12-month span, making it the seventh-fastest growing state in the country.

What's behind the latest boom? According to economists at the University of Colorado's Leeds School of Business, the state's impressive concentration of high-tech industry development and research institutions, as well as its growing health services business sector, have contributed significantly to recent trends, and are fueling projections for steady economic and job growth.

The ebullient rise in population and a bullish economic outlook harken back to the boom years of the 1970s and 1980s, when biotechnology and life science companies helped to spur an incredible four percent jump in the state's population, and transform metro Denver and the Front Range into a professional destination for large businesses and startups.

Today, Colorado is home to approximately 725 life science companies. The evolving industry sector includes large and small operations, established entities and startups alike, contributing more than \$10 billion in annual payroll to the state's economy. In addition, each job in the life

science field creates an additional 4.6 jobs to support the industry. In sum, the life science industry accounts for 156,800 direct and indirect jobs in the state.

Once considered a fly-over state, overlooked by investors and entrepreneurs, Colorado is beginning to turn heads. In recent years, the Denver-Boulder-Fort Collins corridor has earned comparisons to the country's more established research and innovation hubs, including Boston and Silicon Valley. A record number of investors attended the Colorado BioScience Association's Rocky Mountain Life Science Investor and Partnering Conference in 2015, another nod of approval to the maturation and growth of the industry in the state.

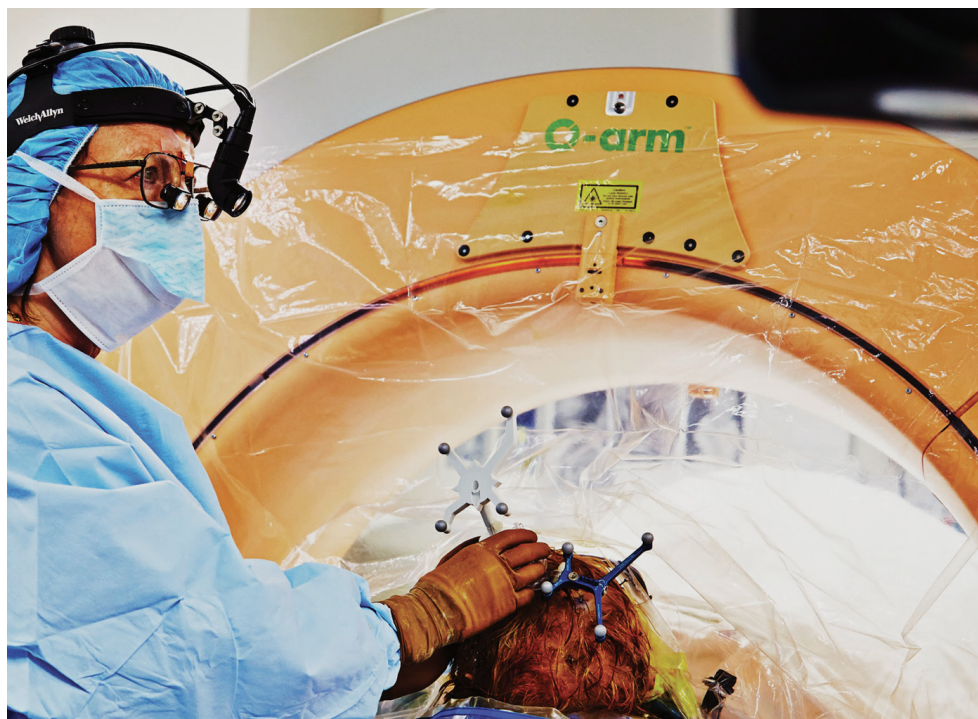
The state itself deserves high praise for its work in nurturing the life science industry. Since 2006, Colorado has awarded more than 333 life science-related grants and provided more than \$37 million in matching grant funding to bioscience ventures, generating more than \$465.4 million in follow-on grants and investments for these companies.

"Colorado has become home for several businesses interested in biosciences, specifically those in medical and research," says Robert



Reddy, a senior director of global marketing for Medtronic. “The higher education outlets in Colorado offer excellent, well-educated, highly skilled workers. Medtronic has been fortunate in finding qualified, talented employees who are dedicated to finding innovative solutions to support our mission.”

Colorado’s friendly relationship with the life science industry goes back to the mid-1960s, when COBE Laboratories and Valleylab laid the groundwork that would ultimately form the bedrock for the life science industry in the state. Back then, the state’s affordable real estate and central location in the country, its universities and research programs, and the burgeoning tech sector surrounding major companies, such as IBM in Boulder, offered an untapped base for firms working at the intersection of the medical and technology sectors.



Dr. Kathryn Holloway of Virginia Commonwealth University uses Medtronic products designed and manufactured in Louisville, Colo., during a neurosurgical procedure.

After a series of acquisitions, COBE was purchased by the Terumo Corporation of Japan, creating Terumo BCT – the world’s largest blood-transfusion equipment manufacturer. Terumo BCT opened a new, expanded global headquarters in Lakewood, Colo., in 2015, employing more than 2,200 people.

Valleylab began as an electronic medical-device manufacturer and distributor in 1970. At the time, it was run by scientists working for Minneapolis-based Medtronic, Inc. During an era when medical devices were still a novel concept, Valleylab thrived in Boulder, thanks to an educated workforce of software engineers and product designers, as well as economic support, including a county revenue bond that helped finance the company’s growth.

Tyco International acquired Valleylab in 1998, and when the conglomerate split its businesses in 2007, Tyco created Covidien as an independent medical-device firm encompassing its Colorado operations. In 2015, Medtronic, already a significant employer in Colorado, acquired Covidien for \$49.9 billion, a mega-deal creating the world’s largest medical-device company.

Today, the company employs 2,400 people in the state, making Colorado its third-largest domestic footprint and an important hub for its surgical-device development and spinal and neurosurgery navigation technology group. As the company continues to evolve, Colorado will continue to feature prominently in its success.

After a series of acquisitions, COBE was purchased by the Terumo Corporation of Japan, creating Terumo BCT – the world’s largest blood-transfusion equipment manufacturer. Terumo BCT

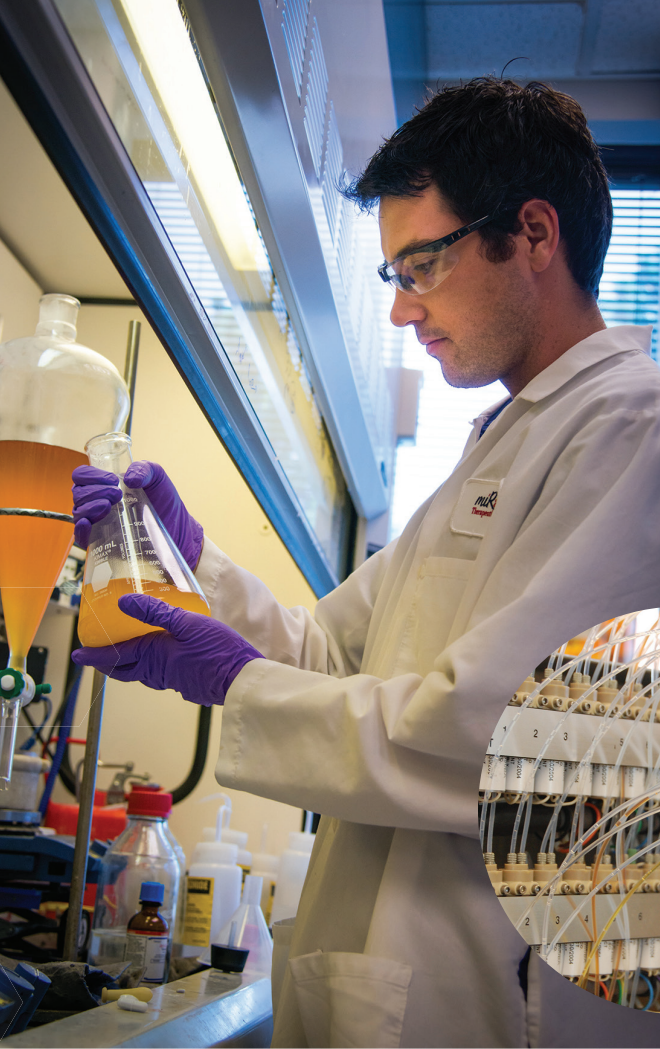
“This past year alone, Medtronic has invested \$1.5 billion in research and development to bring meaningful innovations to market,” Reddy says. “We’re not just thinking about things at the product level – we’re developing innovations for the therapy, procedure and system levels, as well.”

With ties to the early days of Colorado’s medical technology sector, the reinforced presence of Terumo BCT and Medtronic anchors the growing medical-device field and the overall life-sciences economy in the state. Today, Colorado is home to more than 300 medical device companies, including Surefire Medical, EndoShape, Cerapedics, JustRight Surgical and Mighty Oak Medical, among many others. Colorado has one of the highest concentrations of life science industry jobs and the sixth-largest medical technology cluster in the country.

Smaller companies in related fields have followed the lead.

miRagen Therapeutics is developing innovative microRNA (miRNA)-targeting therapies to improve human health, specifically for indications in fibrosis, hematological malignancies, cardiovascular disease and neuro-inflammation.

Discoveries by miRagen researchers and others have identified specific miRNAs that are powerful regulators of extracellular matrix production, pro-fibrotic signaling, and the cellular changes that accompany fibrosis. New miRNA-targeting drugs that coordinately modify multiple pro-fibrotic pathways will provide urgently needed novel therapeutic approaches for the treatment of pathological fibrosis.



companies have benefited from the opportunity to access this top talent. Colorado boasts the second most highly educated workforce in the country and is one of the

miRagen Therapeutics is developing (miRNA)-targeting therapies to improve human health, specifically for indications in fibrosis, hematological malignancies, cardiovascular disease and neuro-inflammation.

top three hotbeds for technology innovation.

The synergy between its technology, bioscience and healthcare fields makes Colorado a national leader in the expanding digital

health sector. The state now boasts the nation's seventh-largest digital-health community, with Children's Hospital of Colorado, University of Colorado Health, Kaiser Permanente, and other healthcare systems supporting new technologies. A validation center on the Anschutz Medical Campus is also testing new mobile/digital technologies and providing data on its utility and outcome measures. In addition, new start-ups and independent developers continue to bring new, innovative applications to market.

Prima-Temp, launched in 2013, began as a concept: a temperature sensor for women to alert them when their body temperature is most receptive to pregnancy. The sensor, now called Priya, is an intravaginal ring that measures core temperature to provide more precise and accurate information on peak fertility windows.

To foster its growth, Prima-Temp benefited from both public and private resources and support. Early, essential funding came through the Colorado Office of Economic Development's Advanced Industry Accelerator Grant Program. The company was also one of eight winners in Colorado's 2015 Digital Health Challenge, hosted by Prime Health. Prima-Temp expects to deliver Priya to the market later this year.

Another rising star in the digital-health space is RxRevu, a cloud-based platform enabling health systems and payers to enrich existing electronic health records (EHR) workflows and alerts with patient cost, personalized efficacy and adherence, and align with clinical protocols to drive consistent and measurable prescription decisions. RxRevu

was also awarded an Advanced Industry grant and is partnering with UC Health to validate the technology.

The Colorado BioScience Association – through its training programs, partnerships, and advocacy efforts – offers critical guidance and access to early seed funding for medical device, diagnostic, biotech, and digital health companies.

In addition, digital health-focused partners, such as Prime Health, the Innosphere, Catalyst and BoomTown, are building tremendous infrastructure to accelerate this newly emerging but high-impact sector.

"We have a lot to offer with bringing and recruiting people here as far as quality of life," says Lauren Costantini, CEO of Prima-Temp. "It's sometimes seen as a negative that we're in Colorado or we may not have the hiring power or resources, but that's becoming less so."

After all, she adds, even Google is setting up shop in Boulder, reinforcing the region's status as a tech hotspot.

The future of the life science industry in Colorado is bright. The Fitzsimons Innovation Campus offers a glimpse into the industry's anticipated growth and potential. The area includes the research-oriented University of Colorado Anschutz Medical Campus and three hospital systems: University of Colorado Health, Colorado Children's Hospital and the VA Hospital. Adjacent to the top-rated research and educational institutions is the enterprise-driven Fitzsimons Innovation Campus, consisting of 46 life science companies that are strategically positioned to interact with the graduate schools, researchers and patient-care institutions.

According to Steve VanNurden, president and CEO of the Fitzsimons Redevelopment Authority (FRA), the collective economic impact of \$3.6 billion is larger than the Colorado ski economy, and VanNurden says those numbers are poised



Prima-Temp CEO Lauren Costantini explaining the Prima-Temp device.

In November 2015, the company closed a \$41 million financing round and initiated its first clinical trial for anti-fibrosis candidate MRG-201. The double-blind, placebo-controlled trial is a first-in-human safety, tolerability and dose-range finding trial.

Clovis Oncology is a biopharmaceutical company focused on acquiring, developing and commercializing cancer treatments. Its approach combines personalized medicine with companion diagnostics to help pair patients with the therapy they are most likely to benefit from. The company currently has two products in clinical development, including rucaparib (in Phase II and Phase III clinical trials for the treatment of ovarian cancer), which has received Breakthrough Therapy designation from the FDA. This designation is designed to expedite the development and review of drugs that may demonstrate substantial improvement over currently available therapies.

In addition to a nationally ranked business climate, Colorado is well known for its quality of life and was highlighted this year as the best place to live in the country by *US News & World Report*. The opportunity to enjoy the great outdoors has proven to be a strong draw for younger generations, and

to keep growing. The Anschutz Medical Campus has made strategic investments, including a \$63 million Center for Personalized Medicine, announced in 2014, and \$80 million in Transformational Research Funding Initiatives this year to support the development of multidisciplinary research programs.

The Fitzsimons Innovation Campus strategically places innovators close to the resources offered by the adjacent medical campus and hospital facilities, lending direct access to critical partners.

The Bioscience Park Center is home to 60,000 square feet of bioscience incubation space and an additional 30,000 square feet of accelerator space. Additionally, in August 2015, the Innovation Campus opened the 112,000-square-foot Bioscience 2 Building, promising to propel medical advances and collaborations in its multifaceted role as an education center, research hub and industry incubator. VanNurden and others hope the arrangement helps foster new discoveries among students and researchers that can be further developed and commercialized by startups and firms.

“We have several companies that are starting to grow, expanding operations and moving into bigger spaces,” VanNurden says. “We want them to continue to grow and develop on campus.”

Among the campus’s thriving businesses is Precision Biopsy, which raised \$33.6 million in equity capital in Fall 2015. The company is developing technology to detect prostate cancer using an “optical biopsy needle” and 3D tissue-mapping technologies. Lohocla Research Corporation, housed in the Bioscience Park Center, is also gaining momentum. The firm secured a \$6.5 million, five-year grant through the National Institute on Alcohol Abuse and Alcoholism, part of the National Institutes of Health (NIH), to run clinical trials on a cutting-edge molecule designed to treat alcoholism.

With a new, 20-year master plan, Fitzsimons could have twice as many employees on campus. Plans for a Bioscience 3 building, another mixed research and work facility, are in progress.

“The goal is to make the campus a place to live, work and play,” VanNurden says. “It’s not just an isolated industrial hub.”

The goal is to make the campus a place to live, work and play. It’s not just an isolated industrial hub.

– STEVE VANNURDEN, PRESIDENT AND CEO, FITZSIMONS REDEVELOPMENT AUTHORITY

Fitzsimons is surrounded by a huge range of options for recreation, dining and entertainment, including on-campus apartments, a credit union and an early learning center. Arriving winter 2016, the University of Colorado A Line, otherwise known as light rail, will connect the campus to both the airport and downtown Denver.

“Because of all the capabilities on this campus, we can be an anchor for the state,” VanNurden says. “We have the location, and we have all the physicians, patients, research and other elements that we need to develop the biotech industry.”

Prior to his current role, VanNurden spent 22 years at the Mayo Clinic, where he ran its invention arm, Mayo Clinic Ventures. He sees similar assets and advantages now in Colorado ready to support continued growth and exciting breakthroughs from the bustling digital-health field, to the steady medical-device sector and the growth of biotech. Small firms and new technologies are taking off and carrying on the successes of past companies that have made it big in the state.

“You have a highly educated workforce, the expertise, a very entrepreneurial spirit and the quality of life in Colorado,” VanNurden says. “There is a tremendous amount of potential here.” ©

The Anschutz Medical Campus selections for the Transformational Research Funding Initiatives:

- 1 The Patient-Integrated Value and Organizational Transformation and Data Sciences for Health;
- 2 The GI and Liver Innate Immune Center, the nation’s first digestive disease center focused on innate immunity;
- 3 The Center for Human Immune Innovation;
- 4 The RNA Bioscience Center; and
- 5 The Center for Fibrosis Research and Translation, which unites investigators in studying the causes and treatment of fibrotic diseases across organ systems.

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THE NEXT ZIKA

How can we better prepare for more frequent infectious disease outbreaks?

WRITTEN BY ALAN S. RUDOLPH, PHD

WE ARE EXPERIENCING AN INCREASING NUMBER of outbreaks and epidemics associated with microbial diseases, bacteria and viruses. They are affecting animals, people, food and the environment. While the Zika virus is front and center as the most recent example, the threat of pandemic disease has been gaining attention since the Ebola outbreak in 2014, and reports of food borne illnesses impacting the national and international landscape in the last several years.

With long-standing, federally funded investments in infectious disease in the Colorado Front Range, Colorado is uniquely poised to offer a strategic shot in the arm to combat this issue. The state is home to research universities and federal laboratories such as the Rocky Mountain Centers for Disease Control and Prevention (CDC), United States Department of Agriculture (USDA), United States Geological Survey (USGS) and National Wildlife Research Center (NWRC).

Outbreak response is costly. The World Health Organization (WHO) estimated the cost of 2014's Ebola epidemic to be \$32 billion. Food-borne illness from microbes such as E.Coli, salmonella and listeria is estimated by the USDA to cost the nation \$15 billion annually. Additionally, the CDC estimates that each year in the US, one in six Americans (or 48 million people) gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases.

Experts project that we will continue to see a rise in the frequency of new outbreaks and epidemics.

The rapid transit of material and commerce across state, national and international borders allows these disease outbreaks to move quickly across large geographic regions. Widespread use of antibiotics and increasing global temperatures have created new challenges, including resistant strains of existing diseases as well as the opportunity for microbes to occupy and adapt to new environments.

The increase in outbreaks creates the opportunity to address the need for more resilience and agility in our public health response.

An integrated "systems" approach will allow for improved information sharing, and ultimately a more coordinated surveillance and response framework. This approach crosses government and industry, and includes community-based inputs.

For instance, AgConnect, a suite of customizable data integration and analysis products designed to enhance situational awareness, incorporates climate data and animal health data from livestock producers to provide the earliest warning of potentially infectious cases in regional zones across the western US. Social media has already proven to be a more effective rapid-communication platform than our current system. During Germany's 2012

E.Coli outbreak, Twitter feeds and health blogs alerted the community to the outbreak faster than the public health system of surveillance, detection and response.

Programs that promptly identify the potential for rapid spread of new contagions create opportunities to develop countermeasures in

Experts project that we will continue to see a rise in the frequency of new outbreaks and epidemics.


response. These responses include vaccines, therapeutics, diagnostics, barrier protections and policies and practices to reduce public health consequences.

Colorado is positioned to create coalitions that can model a resilient and agile outbreak response for the country. Over the last decade, Colorado State University has constructed a National Institutes of Health

(NIH)-funded regional center of excellence in infectious disease, with hundreds of faculty and staff active across a spectrum of discovery and translation, including a cGMP biomanufacturing facility, BioMarc. BioMarc is designed to produce and commercialize diagnostics, vaccines and therapeutics for infectious disease outbreak response.

Many companies in our region are playing a critical role in progressing research and formulating commercial development in infectious diseases. Terumo BCT has developed a novel way to inactivate known, unknown and emerging pathogens in blood that is seeing expansion and acceleration in the increasing outbreak era. Companies such as Corgenix, ViroCyt and SomaLogic are developing rapid signatures and diagnostic tests that can determine if individuals have been exposed or infected. New materials for infection control are also under development by companies including Sharklet Technologies and Diazamed. In addition, companies like Birko help food producers control, clean and sanitize their facilities, and reduce the levels

of bacteria, including pathogens, on fresh food products. Major sectors in agriculture, livestock and food are more active in managing disease outbreaks as regulation and public pressure reduce the use of antibiotics and agrochemicals in practices in these industries.

While we don't know the course Zika will take in the current outbreak, our country and our state stand ready to position new systems to create resilience and agility in our public health response, and to create new public-private partnerships to provide rapid response to new threats from infectious diseases. 

Alan S. Rudolph PhD, MBA, is the vice president of research and a professor of biomedical sciences at Colorado State University.

THESE COLORADO COMPANIES ARE AMONG OTHERS IN LEADING OUTBREAK PREVENTION

1 Terumo BCT

Advancing the safety of donated blood components, the Mirasol Pathogen Reduction Technology System uses a simple, non-toxic process to inactivate a broad range of viruses, bacteria and parasites, as well as residual white blood cells in blood components. This can benefit patients who require blood components, as the Mirasol PRT system reduces the risk of transfusion-transmitted infections and adverse reactions associated with blood transfusion. The Mirasol system is not approved for use in the US. Terumo BCT is currently pursuing US FDA approval.

2 Corgenix

The ReEBOV™ Antigen Rapid Test is authorized for use in individuals with signs and symptoms of Ebola virus infection in conjunction with epidemiological risk factors (including geographic locations with high prevalence of Ebola infection) for the presumptive detection of Ebola Zaire virus (detected in the West Africa outbreak in 2014).

3 ViroCyt

The Virus Counter 3100 is a novel approach for determining total virus particle concentration that provides precise results in minutes, not days. The system provides a quantitative picture of viral growth that's simple, compliant and cost-effective.

4 SomaLogic

SomaLogic discovers and develops unique, reproducible and cost-effective antigen-binding reagents called "SOMAmers," which can be used in place of antibodies in a wide array of diagnostic tests and research assays.

5 Sharklet Technologies

The company has developed a micropattern that mimics a shark's skin and is resistant to the growth of bacteria and other microorganisms without the use of chemicals or antibiotics. The micropattern can be ingrained into any surface, creating a safer, cleaner environment.

6 Diazamed

The company's technology is a unique anti-thrombogenic and anti-infective material that can be integrated into any biocompatible polymer. The technology, while not a coating, acts as a self-clearing catalyst to continually produce low levels of nitric oxide (NO) on the surface of any medical device that encounters blood. This enables the production of medical devices that replicate the human body's management of thrombus and infection in the bloodstream.

7 Birko

The company has developed meat antimicrobials from food-grade, generally recognized as safe (GRAS) ingredients based on organic acids. The compounds are designed for use on beef, chicken, pork and other proteins. Other specialties include antimicrobials for direct application to further processed meats and fruits and vegetables.

Total CO Studies by Status

ADVANCING

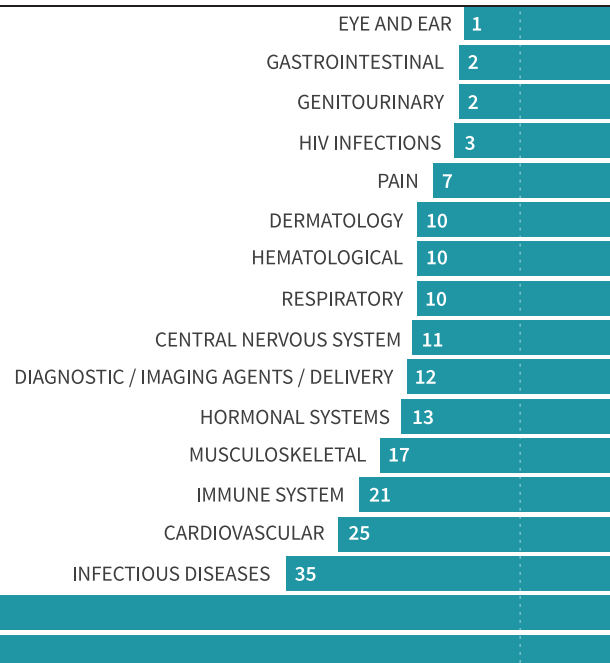
the drug, device & therapy assets in Colorado



Studies Completed (329)
 Studies In Progress (157)
 Studies Recruiting (289)

in development & approved
DRUGS
 from Colorado HQ companies

437 TOTAL DRUGS



Top five companies ranked in order of the most investigational devices

- 21 Spectranetics Corporation
Colorado Springs
- 15 Corgenix Medical Corporation
Broomfield
- 13 nSpire Health
Longmont
- 10 AlloSource
Centennial
- 6 Surefire Medical
Westminster

Top five companies ranked in order of the most approved devices

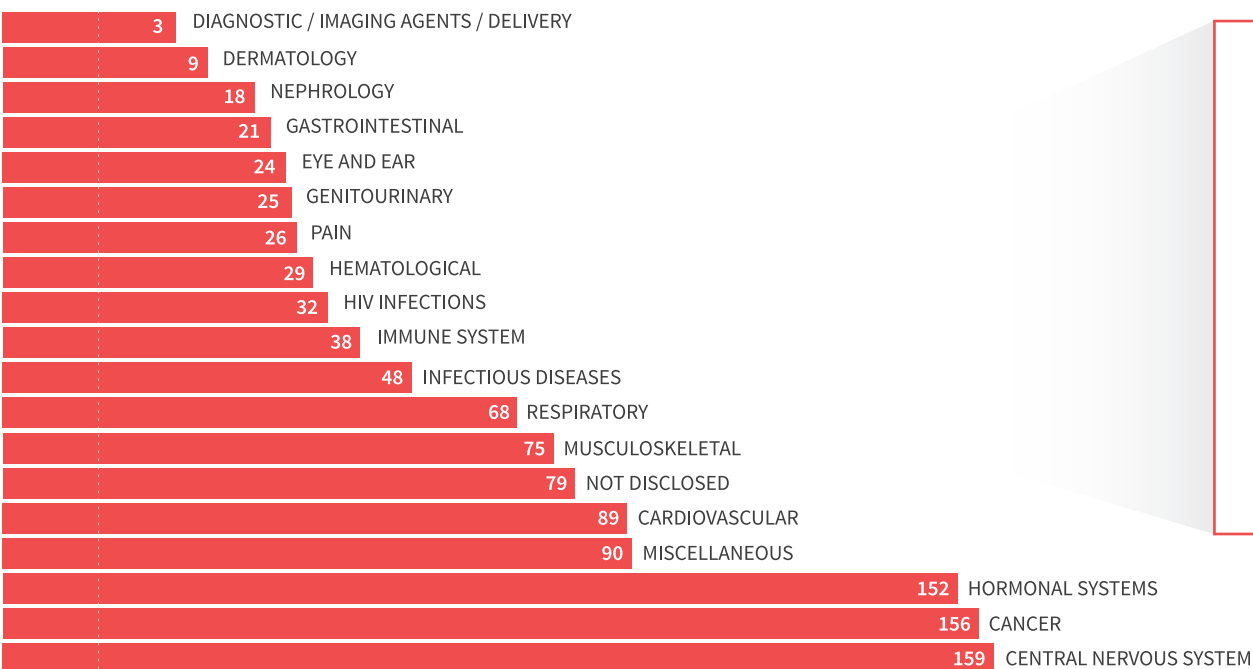
- 172 Spectranetics Corporation
Colorado Springs
- 104 ValleyLab
Boulder
- 73 Unipath, LLC
Denver
- 70 Fischer Medical Technologies
Broomfield
- 64 Terumo BCT
Lakewood

TOTAL APPROVALS

in 2015

510k (1) PMA (9)



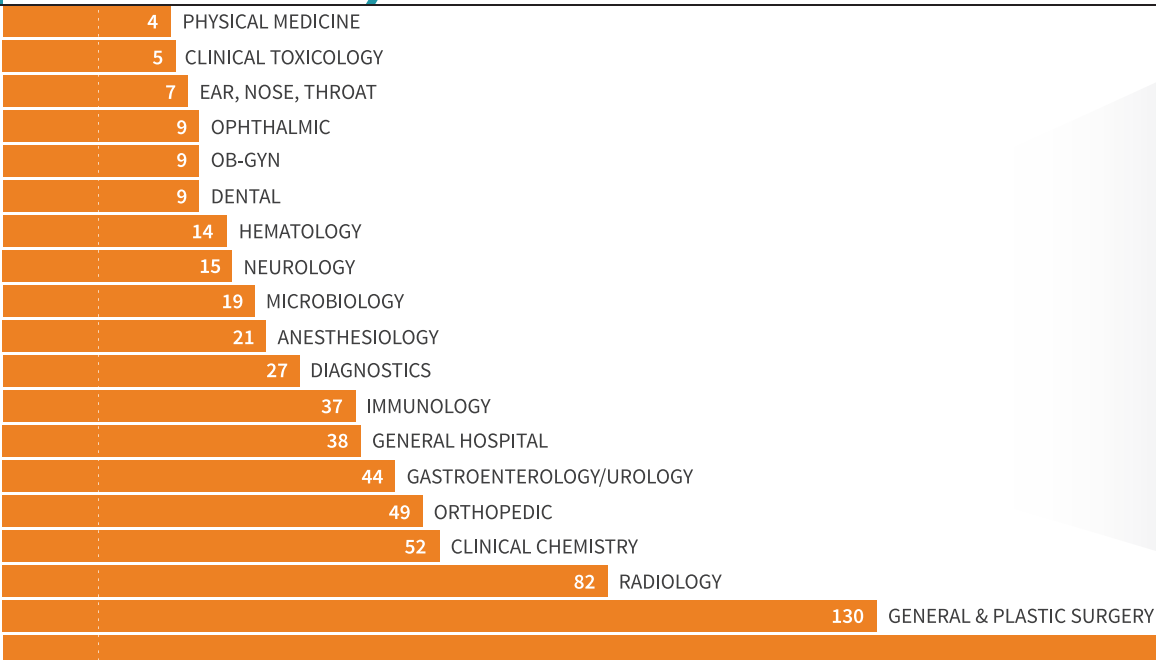
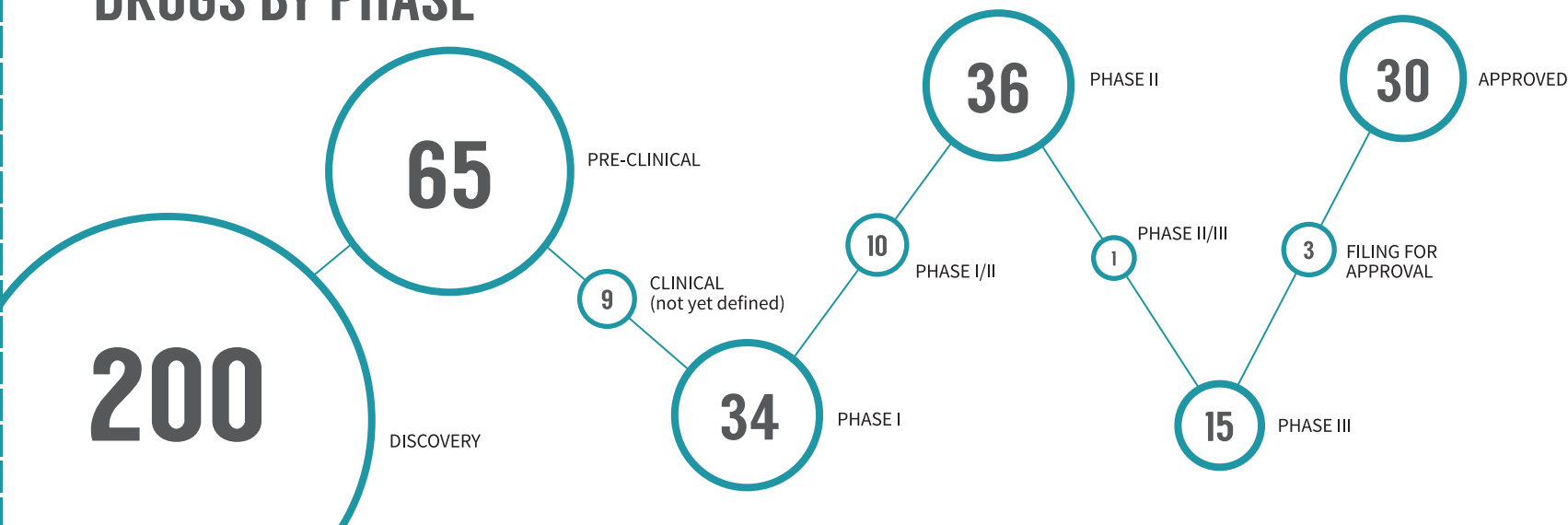


STUDIES

performed by Colorado HQ companies

775 TOTAL STUDIES

DRUGS BY PHASE



investigational & approved

DEVICES

by medical specialty

837 TOTAL DEVICES

COLORADO BY THE NUMBERS

2015 FINANCINGS

| Company | Public Ticker | City | \$USD M | Type of Event/Round | Investor/Partner | Industry Type |
|---------------------------------|---------------|------------------|-------------|----------------------|---|-------------------|
| 2B Technologies, Inc | | Boulder | .50 | Grant Funding | NIH | Device |
| Aerophase, Inc. | | Longmont | .50 | Grant Funding | NIH | Pharmaceutical |
| ARCA Biopharma, Inc. | ABIO | Westminster | 37.0 | Financing Agreements | Franklin Advisers, Venrock Associates, H&Q Life Sciences Investors, New Enterprise Associates (Nea), RA Capital Management | Pharmaceutical |
| Aytu BioScience, Inc. | AYTU | Englewood | Undisclosed | Contract/Agreements | | Pharma/Diagnostic |
| Aytu BioScience, Inc. | AYTU | Englewood | Undisclosed | Earnings/Dividends | | Pharma/Diagnostic |
| Aytu BioScience, Inc. | AYTU | Englewood | 5.2 | Financing Agreements | | Pharma/Diagnostic |
| Biodesix, Inc. | | Boulder | 38.0 | Venture Financing | | Diagnostic |
| Biodesix, Inc. | | Boulder | 12.0 | Venture Financing | | Diagnostic |
| Biomimetix JV, LLC | | Englewood | .98 | Grant Funding | NIH | Pharmaceutical |
| Biorealm | | Monument | 4.0 | Grant Funding | NIH | Biotechnology |
| Bolder BioTechnology, Inc. | | Boulder | 1.0 | Grant Funding | NIH | Biotechnology |
| Bolder BioTechnology, Inc. | | Boulder | .40 | Grant Funding | NIH | Biotechnology |
| Boulder Nonlinear Systems, Inc. | | Lafayette | .50 | Grant Funding | NIH | Device |
| Cerapedics | | Westminster | 4.0 | Debt Financing | | MedTech |
| Clovis Oncology, Inc. | CLVS | Boulder | 275.0 | Financing Agreements | | Pharmaceutical |
| Clovis Oncology, Inc. | CLVS | Boulder | Undisclosed | IPO's/Offerings | | Pharmaceutical |
| Corgenix Medical Corporation | | Broomfield | 1.0 | Grant Funding | NIH | MedTech |
| Crestone, Inc. | | Boulder | 4.3 | Grant Funding | NIH | Pharmaceutical |
| Globelimmune, Inc | | Louisville | 1.0 | Grant Funding | NIH | Biotechnology |
| InDevR LLC | | Boulder | 1.3 | Grant Funding | NIH | MedTech |
| Invisible Hand Enterprises, LLC | | Westminster | .46 | Grant Funding | NIH | Device |
| Lohocla Research Corporation | | Aurora | 6.5 | Grant Funding | NIH | Pharmaceutical |
| MBio Diagnostics | | Boulder | 6.3 | Venture Financing | | Diagnostic |
| MBio Diagnostics | | Boulder | .93 | Grant Funding | NIH | Diagnostic |
| Meadowlark Optics, Inc. | | Frederick | .21 | Grant Funding | NIH | Device |
| Mesa Laboratories, Inc. | MLAB | Lakewood | Undisclosed | Earnings/Dividends | | MedTech |
| Microbiome Therapeutics | | Broomfield | Undisclosed | Venture Financing | | Pharmaceutical |
| miRagen Therapeutics, Inc. | | Boulder | 41.1 | Venture Financing | Remeditex Ventures LLC; Atlas Venture, Ltd.; Brace Pharma Capital; Amgen, Inc.; Boulder Ventures, Ltd.; Jafco Ventures; Merck & Co., Inc.; Mp Healthcare Venture Management, Inc. | Biotechnology |
| PharmaJet | | Golden | 6.8 | Venture Financing | | Device |
| Precision Biopsy | | Aurora | 33.6 | Venture Financing | | Device |
| QuSpin | | Louisville | .73 | Grant Funding | NIH | Device |
| Sharklet Technologies | | Aurora | .89 | Grant Funding | NIH | MedTech |
| Spectranetics Corporation | SPNC | Colorado Springs | 110.0 | Financing Agreements | | MedTech |
| Surefire Medical | | Westminster | 15.1 | Venture Financing | | Device |
| Surefire Medical | | Westminster | 11.0 | Venture Financing | | Device |
| Suvica, Inc. | | Boulder | 2.9 | Grant Funding | NIH | Pharmaceutical |
| TDA Research, Inc. | | Wheat Ridge | .55 | Grant Funding | NIH | Device |
| Topogen, Inc. | | Buena Vista | .32 | Grant Funding | NIH | Diagnostic |
| Ventria Bioscience | | Fort Collins | .31 | Grant Funding | NIH | Biotechnology |
| VetDC | | Fort Collins | 2.1 | Venture Financing | | Pharmaceutical |
| Nivalis Therapeutics, Inc. | NVLS | Boulder | 89.0 | IPO's/Offerings | | Pharmaceutical |

2014 FINANCINGS

| Company | Public Ticker | Close Date | City | \$USD M | Type of Event/Round | Investor/Partner | Industry Type |
|--------------------------------------|---------------|------------|--------------|-------------|----------------------------|--|----------------|
| 2B Technologies, Inc. | | 5/16/14 | Boulder | 0.15 | Grant Funding | NIH | Diagnostics |
| Access Sensor Technologies, Inc. | | 6/30/14 | Fort Collins | 0.15 | Grant Funding | NIH | Diagnostics |
| Advanced RNA Technologies, LLC | | 8/19/14 | Boulder | 0.72 | Grant Funding | NIH | Pharmaceutical |
| Advanced RNA Technologies, LLC | | 9/8/14 | Boulder | 0.19 | Grant Funding | NIH | Pharmaceutical |
| Ampio Pharmaceuticals, Inc. | AMPE | 3/5/14 | Englewood | 68.0 | IPOs/Offerings | | Pharmaceutical |
| Ampio Pharmaceuticals, Inc. | AMPE | 2/27/14 | Englewood | 55.0 | IPOs/Offerings | | Pharmaceutical |
| Ampio Pharmaceuticals, Inc. | AMPE | 2/24/14 | Englewood | Undisclosed | IPOs/Offerings | | Pharmaceutical |
| Ampio Pharmaceuticals, Inc. | AMPE | 12/13/13 | Englewood | Undisclosed | Alliances | Vyrix Pharmaceuticals | Pharmaceutical |
| ARCA Biopharma, Inc. | ABIO | 2/4/14 | Westminster | 9.0 | IPOs/Offerings | | Pharmaceutical |
| Biodesix, Inc. | | 4/10/14 | Broomfield | Undisclosed | Alliances | AVEO Oncology | Diagnostics |
| Biodesix, Inc. | | 1/13/14 | Broomfield | 6.1 | Venture Financing/Series E | | Diagnostics |
| Biodesix, Inc. | | 1/10/14 | Broomfield | 20.0 | Financing Agreements | Capital Royalty Partners LP | Diagnostics |
| Bolder BioTechnology, Inc. | | 2/27/14 | Boulder | 1.0 | Grant Funding | NIH | Biotechnology |
| Bolder BioTechnology, Inc. | | 4/22/14 | Boulder | 0.73 | Grant Funding | NIH | Biotechnology |
| Clovis Oncology, Inc. | CLVS | 9/9/14 | Boulder | 37.5 | IPOs/Offerings | | Biotechnology |
| Clovis Oncology, Inc. | CLVS | 9/3/14 | Boulder | 250.0 | Stock Offering | | Biotechnology |
| Clovis Oncology, Inc. | CLVS | 9/3/14 | Boulder | 200.0 | Stock Offering | | Biotechnology |
| Clovis Oncology, Inc. | CLVS | 4/3/14 | Boulder | Undisclosed | Alliances | Foundation Medicine | Biotechnology |
| Colorado Photopolymer Solutions, LLC | | 8/11/14 | Boulder | 0.15 | Grant Funding | NIH | Pharmaceutical |
| Corgenix Medical Corporation | CONX | 6/5/14 | Broomfield | 0.99 | Grant Funding | NIH | Medical Device |
| Corgenix Medical Corporation | CONX | 6/26/14 | Broomfield | 2.9 | Grant Funding | NIH | Diagnostics |
| Corgenix Medical Corporation | CONX | 12/24/14 | Broomfield | 0.82 | Grant Funding | Bill & Melinda Gates Foundation and Paul G. Allen Family Foundation | Diagnostics |
| Crestone, Inc. | | 7/3/14 | Boulder | 1.0 | Grant Funding | NIH | Biotechnology |
| Crestone, Inc. | | 7/25/14 | Boulder | 0.15 | Grant Funding | NIH | Biotechnology |
| dBMEDx | | 9/10/14 | Littleton | 0.0075 | Award | CBSA | Medical Device |
| Fluonic, Inc. | | 9/18/14 | Boulder | 0.15 | Grant Funding | NIH | Medical Device |
| Globeimmune, Inc. | GBIM | 7/28/14 | Louisville | 1.0 | Grant Funding | NIH | Biotechnology |
| Globeimmune, Inc. | | 7/8/14 | Louisville | 17.25 | IPOs/Offerings | | Biotechnology |
| Globeimmune, Inc. | | 7/1/14 | Louisville | 15.0 | IPOs/Offerings | | Biotechnology |
| Globeimmune, Inc. | | 4/29/14 | Louisville | Undisclosed | IPOs/Offerings | | Biotechnology |
| InDevR, Inc. | | 4/30/14 | Boulder | 0.3 | Grant Funding | NIH | Diagnostics |
| InDevR, Inc. | | 7/22/14 | Boulder | 0.96 | Grant Funding | NIH | Diagnostics |
| InDevR, Inc. | | 9/15/14 | Boulder | 14.7 | Contract | HHS/BARDA | Diagnostics |
| Invisible Hand Enterprises, Inc. | | 7/18/14 | Westminster | 0.47 | Grant Funding | NIH | Medical Device |
| Kestrel Labs, Inc. | | 4/11/14 | Boulder | 0.65 | Grant Funding | NIH | Medical Device |
| Lohocla Research Corporation | | 6/25/14 | Aurora | 0.16 | Grant Funding | NIH | Biotechnology |
| MBC Research, Inc. | | 9/16/14 | Aurora | 0.1 | Grant Funding | NIH | Pharmaceutical |
| MBio Diagnostics, Inc. | | 7/2/14 | Boulder | 0.7 | Grant Funding | NIH | Diagnostics |
| MBio Diagnostics, Inc. | | 7/2/14 | Boulder | 0.99 | Grant Funding | NIH | Diagnostics |
| Meadowlark Optics, Inc. | | 9/4/14 | Frederick | 0.27 | Grant Funding | NIH | Photonics |
| MenoGeniX, Inc. | | 7/30/14 | Aurora | Undisclosed | Private Financing | | Biotech/Pharma |
| miRagen Therapeutics, Inc. | | 6/26/14 | Boulder | 7.0 | Financing Agreements | Servier | Biotechnology |
| MusclePharm Corp. | MSLP | 9/17/14 | Denver | 8.0 | Financing Agreements | ANB Bank | Pharmaceutical |
| MusclePharm Corp. | MSLP | 5/13/14 | Denver | Undisclosed | Financing Agreements | | Pharmaceutical |
| MusclePharm Corp. | MSLP | 1/6/14 | Denver | Undisclosed | Mergers and Acquisitions | BioZone Pharmaceuticals, Inc | Pharmaceutical |
| Nivalis Therapeutics, Inc. | | 11/19/14 | Boulder | 30.0 | Venture Financing | Wellington Management; RA Capital Management, LLC; Jennison Associates LLC; Rock Springs Capital Management LP; Sabby Management LLC | Pharmaceutical |
| Nivalis Therapeutics, Inc. | | 11/12/14 | Boulder | Undisclosed | Corporate Event | | Pharmaceutical |
| Omni Bio Pharmaceutical, Inc. | OMBP | 4/29/14 | Fort Collins | Undisclosed | Alliances | Gallus BioPharmaceuticals, LLC | Pharmaceutical |
| Omni Bio Pharmaceutical, Inc. | OMBP | 4/24/14 | Fort Collins | 3.0 | Financing Agreements | Bohemian Investments LLC | Pharmaceutical |
| Op-t-mune, Inc.OP | | 6/11/14 | Denver | 0.21 | Grant Funding | NIH | Diagnostics |
| QuSpin, Inc. | | 1/13/14 | Louisville | 0.76 | Grant Funding | NIH | Diagnostics |
| QuSpin, Inc. | | 8/22/14 | Louisville | 0.5 | Grant Funding | NIH | Diagnostics |
| QuSpin, Inc. | | 12/19/14 | Louisville | 0.73 | Grant Funding | NIH | Diagnostics |

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ENGINEERING | ARCHITECTURE | CONSTRUCTION | CONSULTING

2014 FINANCINGS *continued*

| Company | Public Ticker | Close Date | City | USD M | Type of Event/Round | Investor/Partner | Industry Type |
|-----------------------------|---------------|------------|--------------|-------------|---------------------|------------------|----------------|
| Sapphire Technologies | | 10/7/14 | Denver | 0.2 | Grant Funding | CID4 | Dental |
| Sharklet Technologies, Inc. | | 7/11/14 | Aurora | 0.68 | Grant Funding | NIH | Medical Device |
| Sharklet Technologies, Inc. | | 9/5/14 | Aurora | 0.025 | Grant Funding | NIH | Medical Device |
| Sharklet Technologies, Inc. | | 9/18/14 | Aurora | 0.22 | Grant Funding | NIH | Medical Device |
| Siva Therapeutics | | 3/18/14 | Boulder | Undisclosed | Alliances | SomaLogic, Inc. | Medical Device |
| Siva Therapeutics | | 1/23/14 | Boulder | Undisclosed | Alliances | Plexxikon Inc. | Medical Device |
| SmartMove, Inc. | | 4/25/14 | Fort Collins | 0.007 | Grant Funding | NIH | Medical Device |
| SomaLogic, Inc. | | 10/20/14 | Boulder | Undisclosed | Research Agreement | Novartis | Diagnostics |
| Taiga Biotechnologies, Inc. | | 9/5/14 | Aurora | 0.19 | Grant Funding | NIH | Biotechnology |
| Taiga Biotechnologies, Inc. | | 9/12/14 | Aurora | 0.18 | Grant Funding | NIH | Biotechnology |
| TDA Research, Inc. | | 7/30/14 | Wheat Ridge | 0.18 | Grant Funding | NIH | Chemical |
| TDA Research, Inc. | | 9/12/14 | Wheat Ridge | 0.15 | Grant Funding | NIH | Diagnostics |
| Ventria Bioscience | | 4/3/14 | Fort Collins | 0.26 | Grant Funding | NIH | Biotechnology |
| Ventria Bioscience | | 12/24/14 | Fort Collins | 0.31 | Grant Funding | NIH | Biotechnology |

2015 ACQUISITIONS

| Close Date | Target Company | Bidder | USD M |
|------------|--|---|-------------|
| 2/24/15 | ProNerve, LLC | SpecialtyCare Services Group, LLC | Undisclosed |
| 3/26/15 | Sophonon, Inc. | Medtronic, Inc. | Undisclosed |
| 5/20/15 | REGENXBIO Inc. | Cormorant Asset Management, LLC; Foresite Capital Management, LLC; Janus Capital Management LLC; Jennison Associates LLC; Perceptive Advisors LLC; QVT Financial LP; RTW Investments, LLC; Sectoral Asset Management Inc; Tourbillon Global Ventures; Vivo Ventures | 71.0 |
| 6/2/15 | Array BioPharma, Inc.(CMC operation) | Accuratus Lab Services | Undisclosed |
| 8/6/15 | North Bay Bioscience, LLC | Mesa Laboratories, Inc. | 11.0 |
| 8/18/15 | WAVE Life Sciences Ltd. | Clough Capital Partners, L.P.; Cormorant Asset Management, LLC; Fidelity Management & Research Company; Foresite Capital Management, LLC; Jennison Associates LLC; Kagoshima Shinsangyo Sosei Investment; New Leaf Venture Partners; RA Capital Management, LLC; Redmile Group, LLC | 66.0 |
| 8/22/15 | DSI Renal, Inc. | U.S. Renal Care, Inc. | Undisclosed |
| 8/24/15 | Renal Ventures Management, LLC | DaVita HealthCare Partners Inc. | 415.0 |
| 9/2/15 | Synergetics USA, Inc. | Valeant Pharmaceuticals International, Inc. | 158.0 |
| 11/3/15 | QRx Medical Management, LLC ; Questcare Medical Services, P.A. | Envision Healthcare Holdings, Inc. | 135.0 |
| 8/22/15 | DSI Renal, Inc. | U.S. Renal Care, Inc. | Undisclosed |

2015 NEW COMPANIES

| Company | City | Industry Type |
|-------------------------------|--------------|-----------------|
| Arthroventions | Denver | Medical Device |
| Corvectra | Denver | Medical Device |
| FluoroFinder | Fort Collins | Mobile/Digital |
| SI Technology | Fort Collins | Medical Device |
| ValidCare | Centennial | Mobile/Digital |
| Gaugewear | Boulder | Mobile/Digital |
| VitriVax | Boulder | Biotechnology |
| Allander Biotechnologies | Aurora | Biotechnology |
| ImmunoMolecular Therapeutics | Aurora | Pharmaceutical |
| Loxo Oncology | Aurora | Pharmaceutical |
| Beacon Biotechnology | Aurora | Biotechnology |
| Cerebral Therapeutics | Aurora | Pharmaceutical |
| FindCure.org | Aurora | Biotechnology |
| FluTrends International Corp. | Aurora | Biotechnology |
| Machavert Pharmaceuticals | Aurora | Pharmaceutical |
| Metabionics Corp. | Aurora | Diagnostic |
| Omix Technologies | Aurora | Biotechnology |
| Peak Pharmaceuticals Inc. | Aurora | Biotechnology |
| ProTechSure Scientific | Aurora | Medical Device |
| VisuGen Global LLC | Aurora | Diagnostic |
| Ursa Holdings | Aurora | Pharmaceutical |
| Vitan-Biotech | Aurora | Diagnostics |
| Zenith BioPharma | Aurora | Pharmaceuticals |
| Avista Pharma | Longmont | Pharmaceuticals |

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 Disease is our enemy. Working to save lives is our job.

GRANT PROGRAMS:

Innovation Engines

THE GROWTH AND SUCCESS OF COLORADO'S LIFE SCIENCE ECOSYSTEM would not be as robust as it is today without some valuable assistance from the state's Advanced Industries (AI) Accelerator Program. Initiated in 2006, and known as the Bioscience Discovery Evaluation Grant Program, Colorado recognized the need to support the development of its novel technologies and make an effort to advance commercialization. The program's success led to the passage of additional legislation in 2013, enacting the AI Accelerator Program we know today.

Since 2006, Colorado has awarded more than 333 life science-related grants and provided more than \$37 million in matching grant funding to bioscience ventures, generating more than **\$465.4 million in follow-on grants and investments for these companies.**

The AI Accelerator Program promotes growth and sustainability in Colorado's seven advanced industries – advanced manufacturing, aerospace, bioscience, electronics, energy, infrastructure engineering and technology – by helping drive innovation, accelerate commercialization, encourage public-private partnerships, increase access to early stage capital and create a strong ecosystem that increases the state's global competitiveness.

Since 2006, Colorado has awarded more than 333 life science-related grants and provided more than \$37 million in matching grant funding to bioscience ventures, generating more than \$465.4 million in follow-on grants and investments for these companies. The program has created 49 new life science companies and 445 new, direct jobs.

The AI Accelerator Program offers three grant types:



Proof of Concept Grants

Identify and pull technologies from research institutions where they were discovered and connect them to the private sector, where they can be developed into products for commercialization.



Early-Stage Capital & Retention Grants

Fund companies using technologies developed in proof-of-concept grants and other early-stage start-ups that have created viable products that meet a market need and that can be created or manufactured in Colorado and exported globally.



Infrastructure Funding Grants

Used to accelerate commercialization and innovation of AI products and services by building capacity and workforce for the AI ecosystem.

In addition, the AI Export Grant Program supports many small and medium-sized businesses in the advanced industries, and offsets international business development and related marketing costs.

These programs exemplify the importance of investment to promote growth and sustainability to drive innovation, accelerate commercialization and encourage public-private partnerships.

Proof of Concept Grants by Institution

Investigator: Eric Hoffman

Institution: National Jewish Health

Title: The KneeTap

Impact: The KneeTap™ is a medical device used to facilitate the aspiration of fluid from or the injection of medication into the joint space. The technology uses pressure to move the synovial fluid from the pockets of the joint space to a target area. Since the synovial fluid is under positive pressure, a smaller gauge needle can be utilized for aspiration thereby reducing patient discomfort.

Investigator: Ozkan Celik

Institution: Colorado School of Mines

Title: Wrist Gimbal

Impact: Wrist Gimbal is an innovative, robust and versatile upper-extremity rehabilitation exoskeleton. It enables a platform to administer robot-aided motor rehabilitation in a clinical setting to improve and assess wrist and forearm motor function of stroke patients through therapeutic movement exercises.

Investigator: Chris Cox

Institution: Colorado School of Mines

Title: Phage-based MALDI-TOF MS bacteria

Impact: Pre-commercial proof-of-concept for phage-based MALDI-TOF MS bacterial identification and antibiotic resistance determination.

Investigator: Wei Zhang

Institution: University of Colorado

Title: Advanced Polymer Technology

Impact: Developing an advanced polymer technology for commercialization in the orthopedics/prosthetics industry.

Investigator: Shandra Brown Levey

Institution: University of Colorado

Title: CoACH

Impact: CoACH is a software tool that practices use to estimate the costs and potential reimbursement associated with the ever-changing models of health care delivery. CoACH provides a framework for analyzing these changes, making that analysis possible and doing it in an easy and low-cost manner.

Investigator: Justin Casey

Institution: University of Colorado

Title: Oto-pen

Impact: Oto-pen is an easy-to-use, accurate and reliable handheld device, which will fill a definite clinical need to diagnose and treat conductive hearing loss.

Investigator: Shandra Brown Levey

Institution: University of Colorado

Title: IHealth Connect

Impact: IHealthConnect helps improve patient care beyond the doctor's office or a hospital room. IHealthConnect collects data from patients electronically to aid health care providers in staying connected with their patients outside of their in-person visits. The health information technology will provide inexpensive and simple yet effective means for health care providers to better serve their patients.

Investigator: Judi Holtrop

Institution: University of Colorado

Title: CM Connector

Impact: CM Connector creates a bridge between health care providers and the digital health apps their patients are using, making those applications useable in the context of patient-centered care delivery. CM Connector allows providers to put data garnered by their

patients from the digital health apps they are using into the context of a care plan. Furthermore, it enables providers to share data with their patients.

Investigator: Bethany Kwan

Institution: University of Colorado

Title: Filament

Impact: Filament aims to bring together patients and available health care resources within their communities through their primary health care provider. With Filament, health care providers will be able to recommend community-based health care resources to their patients that enable them to address their health needs in a manner still tailored to their primary care plans. Additionally, health care providers can manage their list of community resources electronically.

Investigator: Donald Nease

Institution: University of Colorado

Title: EMR Lens

Impact: EMR Lens seeks to improve existing models for electronic medical records by providing a user-friendly interface. EMR Lens's intuitive and streamlined presentation of a patient's clinical data at the point of care will enable health care providers to increase the quality and efficacy of their service.

SHERIDAN ROSS attorneys at innovation pc

proud to protect bioscience innovations
patent / trademark / copyright / litigation

As the region's largest intellectual property law firm, we are honored to be a member of the Colorado Bioscience Association.

www.sheridanross.com 303.863.9700 Denver / Broomfield

Early-Stage Capital and Retention Grants

CardioNXT, Inc

The CardioNXT iMap system creates and displays Electroanatomical Mapping Geometries to locate problem areas of atrial fibrillation while allowing doctors to speed up the procedure time and obtain more accurate results than those currently available with today's mapping technologies.

Evolutionary Genomics, Inc.

www.evolgen.com

Evolutionary Genomics uses its patented gene identification technology, the Adapted Traits Platform, to identify genes in crops that can improve agricultural productivity and product desirability through trait improvement like natural pest and disease resistance in multiple crops without the use of toxins. Successes also include increasing sweetness in tomatoes and yield improvements in rice and corn.

Fluonic, Inc.

fluonic.com

Fluonic is a medical device startup developing a market disruptive, new generation of infusion devices and information systems, driven by a breakthrough MEMS flow sensor technology. Fluonic infusion products improve patients' safety and compliance, and healthcare practitioners' productivity, while reducing costs, which will set a new standard of care for the industry.

Ocugen, Inc.

ocugen.com

Ocugen is a biopharmaceutical company whose mission is to deliver best-in-class solutions to patients suffering from sight-threatening eye diseases. OCU200 is a fusion protein based on Tumstatin and Transferrin with application in wet age-related macular degeneration (Wet AMD) and Diabetic Retinopathy (DR). The molecules are proprietary recombinant proteins that have shown superior efficacy in well established in-vitro and animal models.

ProTechSure Scientific, Inc.

www.protechsure.com

DIFINSA53™ is a new OTC skin protectant that will help cancer patients to better tolerate their treatments and lower the likelihood of severe skin damage.

Tissue Fusion

www.tissuefusion.com

Tissue Fusion is a laser-based device for closing wounds designed to fuse nasal tissue together as an alternative to sutures or staples.

Commercialization Infrastructure Grants

The BioFrontiers Institute

www.biofrontiers.colorado.edu

The culture of the BioFrontiers Institute, its interdisciplinary spirit and entrepreneurial reputation are fully embodied within its core facilities: the Advanced Light Microscopy Core, the Next-Generation Sequencing Core, and the Scientific Computing Core. Together, they aim to support the local bioscience industry through a series of targeted multi-day workshops along with providing ongoing practical and personal support. This coordinated resource will aid in the recruitment, retention, and advancement of skilled labor.

The Colorado Institute for Drug, Device and Diagnostic Development (CID4)

www.cid4.com

The Colorado Institute for Drug, Device, and Diagnostic Development (CID4) is a unique 501(c)(3) nonprofit organization whose mission is to accelerate commercialization of new drugs, medical devices and diagnostics based on research and development activities at Colorado's research institutions. CID4's purpose is to improve healthcare outcomes, reduce healthcare costs, and promote the growth of the bioscience industry in Colorado. CID4 was launched in 2009 to provide mentoring by seasoned executives and commercialization funding to promising research institution-affiliated companies.

Colorado Bioscience Institute (CBSI)

www.cobioinstitute.com

The Colorado Bioscience Institute is a non-profit entity entering its fourth year providing education, workforce and career development for life science professionals, companies, students and educators related to the bioscience industry in Colorado. The Institute has grown exponentially since its formation and has created a very successful slate of pipeline programs, including the Research Experience for Teachers (RET) and Executive Leadership Programs (ELP).

CSU-BioMARC

biomarc.colostate.edu

BioMARC of CSU is a service unit specializing in high-containment production facilities for BSL-3 organisms, CDC "Tier 1" select agents, and spore-forming bacteria. CSU-BioMARC's BSL-3 good manufacturing practice (GMP) facilities produce biologics for human clinical trials and commercialization that has included a successful FDA Pre-Approval Inspection.

CU-Gates Biomanufacturing

gatescenter.org

As an academic contract manufacturing organization, the Gates Biomanufacturing Facility at the University of Colorado Anschutz Medical Campus provides process development, scale-up and cGMP manufacturing services to academic researchers, clinicians and biotech companies. This facility was recently established to support the development and manufacture of cell- and protein-based therapeutics with state-of-the-art clean rooms, scale-up laboratories, an analytical testing laboratory and electronic quality management systems.

State of Life

At Colorado State University our passion is improving well-being.

As the world's population increases, there is a critical need to address problems in health, food, energy, and environment, all of which take center stage in our research and scholarship. As we seek solutions for these pressing issues, we harness the collaborative efforts of our researchers and innovators who bring CSU-born advancements from lab to market.



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MEDICAL DEVICE, DIAGNOSTIC & RELATED COMPANIES

3D Systems

www.3dsystems.com

Provides comprehensive 3D products and services, including 3D printers, print materials, on-demand parts services and digital design tools. Its ecosystem supports advanced applications from the product design shop to the factory floor to the operating room.

C **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.

Baby Genes Inc.

Golden

www.babygenes.net

Genomics services company using Next-Generation Sequencing assays to deliver more advanced newborn screening.

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

Beacon's BrightSPOT Reader will address new markets in home diagnostics, point-of-care diagnostics and bioterrorism that are limited by the shortcomings of existing technologies.

Bell Dental Products, LLC

Englewood

www.belldental.com

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

C **BiO2 Medical, Inc.**

Golden

www.bio2medical.com

BiO2 Medical is working to investigate, manufacture, and commercialize the Angel® Catheter; an innovative medical device designed to provide prophylactic Pulmonary Embolism protection and access to the central venous system in critically ill patients.

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.

C **Biodesix, Inc.**

Aurora, Boulder

www.biodesix.com

Molecular diagnostics company advancing the revolution in personalized medicine by providing physicians timely and clinically useful information.

C **BiOptix**

Boulder

www.biopixinc.com

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

Biotricity Medical Inc.

Aurora

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.

C **Boulder Biomed**

Boulder

www.boulderbiomed.com

Boulder BioMed is a creative product and business development firm specializing in bringing medical technologies to market.

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

Boulder

www.broadwest.com

Develops and manufactures ergonomic mammography viewing equipment.

C. R. Bard, Inc./ Medivance

Louisville

www.medivance.com

Leading multinational developer, manufacturer and marketer of innovative, life-enhancing medical technologies in the fields of vascular, urology, oncology and surgical specialty products.

C5 Medical Werks

Grand Junction

www.c5medicalwerks.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

Arvada

www.canberra.com

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

Care Electronics, Inc.

Broomfield

www.medicalshoponline.com

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

Car-May, LLC

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.

Cascade TEK

Longmont

www.cascadetek.com

Medical device testing laboratory specializing in package testing, accelerated aging, photostability, UV, temperature/humidity, vibration, shock testing services.

CEA Medical Manufacturing

Colorado Springs

www.ceamedicalmanufacturing.com

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

C Cerapedics, Inc.

Westminster

www.cerapedics.com

Developing and commercializing novel osteobiologic products based on a proprietary small peptide technology, P-15™ on anorganic bone mineral (ABM).

C CereScan

Littleton

www.cerescan.com

Specializes 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.

Chart Industries, Inc.

Denver

www.chartindustries.com

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.

Clean Room Devices, LLC

Westminster

www.cleanroomdevices.com

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

ClearSight, LLC

www.clearsightiol.com

Creating a device designed to give ophthalmologists a comprehensive solution to contain posterior capsular opacification. The ClearSight IOL features Sharklet, a micropattern designed to redirect cellular migration away from the field of vision.

Cochlear Americas

Centennial

www.cochlearamericas.com

Global leader in implantable hearing solutions. Manufacturer of Nucleus cochlear implants and the Baha programmable bone conduction system.

C Colibri Heart Valve

Broomfield

www.colibrihv.com

Researches and develops novel heart valve technologies.

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.

Confi-Dental Products Company

Louisville

www.confidental.com

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

C 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 physician's office.

CoorsTek

Golden

www.coorstek.com

Custom engineering, materials expertise, operational excellence, and rapid execution.

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.

Corvectra, Inc.

Fort Collins

corvectra.com

Corvectra is the creator of a hand held biosensing platform that enables healthcare professionals to non-invasively diagnose and treat patients with a single point of care device.

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.

Darkhorse Technologies

Nederland

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

DataWave Technologies Corporation

Loveland

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.

C dBMEDx

Littleton

www.dbmedx.com

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

Denver Optic Company

Englewood

www.eyeprosthesis.com

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

C DePuy Synthes, Companies of Johnson & Johnson

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. Depuy Synthes is a wholly owned subsidiary of the Johnson & Johnson Company.

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.

Double Helix

Boulder

www.doublehelixoptics.com

Double Helix LLC develops and commercializes computational optical-digital technologies used in range estimation, super-resolution microscopy and 3D imaging. Double Helix's core technologies include the patented Double Helix-Point Spread Function method for 3D super-resolution imaging.

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.

C EJ BioMed – A Division of Eldon James Corporation

Denver

www.EJBioMed.com

Manufactures, assembles and packages PVC Free tubing and connectors in a single cleanroom environment. Custom design and product development available. ISO 13485:2003, ISO 9001:2008, and ISO/TS 16949:2009 certified.

Electronic Materials, Inc. (EMI)

Breckenridge

www.emiuv.com

Offers a complete line of ECAST 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.

C Empirican Group, LLC

Denver

www.empirican.com

We exist to help CROs and small Pharma handle the heavy lifting associated with completing clinical trials.

Excision, Inc.

Boulder

www.excision.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.

C EndoShape, Inc.

Boulder/ Aurora

www.endoshape.com

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

es2 technologies, Inc.

Englewood

www.es2technologies.com

Developing proprietary devices and contract design.

C 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.

C Eximis Surgical, LLC

Louisville

www.eximissurgical.com

Eximis Surgical has developed a proprietary cutting technology that utilizes a single instrument with a receptacle for the minimally invasive removal of tissue during laparoscopic procedures.

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/products

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

C Faster Path Dx, LLC

Boulder

A functional testing service that leverages new understanding and new technologies to overcome the challenges that have previously limited functional testing.

C 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.

FitBionic

Boulder

Creating groundbreaking experiences for amputees and prosthetics based on organic design.

C 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.

FOOTBEAT

Grand Junction

footbeat.com

FOOTBEAT is a micro-mobile engine that provides cyclic thrusting pressure to the foot capillary bed at the plantar venous plexus. FOOTBEAT applications include a range of prescriptive and elective medical therapies, athletic recovery and extended periods of sitting and immobility.

Futura Surgical Inc.

Wheat Ridge

www.futurasurgical.com

Development, manufacture and sales of orthopedic products.

C Galaxy Ophthalmics

Denver

www.galaxy-eyes.com

Galaxy Ophthalmics is developing technologies related to new therapies for Glaucoma, Wet and Dry Macular Degeneration and Diabetic Retinopathy. Our first product for Glaucoma is currently undergoing in vivo studies, with additional products for Macular Degeneration and Diabetic Retinopathy in prototype testing.

Gaugewear

Boulder

www.gaugewear.com

With patented technology using radiometric thermometry, gaugewear is creating a wearable, non-invasive, core body temperature sensor.

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.

Green Sun Medical

Fort Collins

www.greensunmedical.com

Green Sun Medical develops innovative treatments to address Adolescent Idiopathic Scoliosis (AIS) through non-fusion scoliosis solutions.

C Groesanoak Product Development, Inc.

Frederick

www.groesanoak.com

Creates innovative proprietary new medical devices focusing on areas of injury management, neonatal care and performance monitoring.

HEI Advanced Medical Operations

Boulder

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

C High Precision Devices, Inc.

Boulder

www.hpd-online.com

High Precision Devices, Inc. provides design engineering and manufacturing services for custom instrumentation development. We have recently commercialized a line of quantitative MRI phantoms for standardization of scanners and protocols involved in precision medicine.

Hirsh Precision Products, Inc.

Boulder

www.hppi.com

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

C Immunocept Medical Products, LLC

Denver

www.immunocept.com

Early-stage medical device company with a platform therapy for diseases of destructively amplified inflammation. Our first device, the Septi-Flux™ hollow fiber membrane therapeutic blood filter, has been produced as a clinical product and has IDE approval for feasibility study.

C InDevR, Inc.

Boulder

www.indevr.com

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.

Instec, Inc.

Boulder

www.instec.com

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

Intelligent Imaging Innovations (3i)

Denver

www.intelligent-imaging.com

Designs and builds systems around the newest automated fluorescence microscopes and the most advanced peripheral devices.

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.

Jortek Surgical, Inc.

Boulder

www.jortek.com

Develops innovative orthopedic devices with a focus on joint and tissue preservation and augmentation.

C JustRight Surgical

Boulder

www.justrightsurgical.com

Developing precisely designed surgical instruments that allow access to confined spaces and often delicate structures.

C 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.

Lenox MacLaren Surgical Instruments

Louisville

www.lenoxmaclaren.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.

Lumed

Denver

www.lumedscience.com

Lumed Science Inc. is a company specializing in creating medical devices that integrate and improve user vision. Our goal is to increase visibility, simplify procedures, lower costs, and improve patient outcomes.

Magnelab, Inc.

Longmont

www.magnelab.com

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

C Mallinda, LLC

Aurora

Mallinda has developed the first hard plastic that can be repeatedly molded and even reshaped at mild temperatures by the end user.

C Matrix Analytics, Inc.

Denver

matrix-analytics.com

Matrix Analytics is a collection of clinical and business experts aligned in the belief that conquering illness and disease requires data, creativity, and an unrelenting focus on always learning. The Nodule Project is Matrix Analytics' clinical decision support platform designed to improve patient outcomes by aiding in the early detection, diagnosis, and cost-effective treatment of pulmonary nodules and lung cancer.

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.

C mBio Diagnostics

Boulder

www.mbiidx.com

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

C Med-Botics

Colorado Springs

Med-Botics is developing the Ulive Hypoxemia Prevention System.

C Medtronic, Plc.

Louisville and Gunbarrel

www.medtronic.com

In Colorado, Medtronic is represented by its Brain Therapy Solutions, ENT Solutions and Minimally-Invasive Surgical Solutions campuses in the North Boulder area.

Mesa Laboratories, Inc.

Lakewood

www.mesalabs.com

Provides dialysis meters and related supplies to dialysis clinics world wide.

Metabiomics**Aurora****www.metabiomics.com**

Focused on developing a non-invasive microbiome test for the earlier and more accurate detection of colon polyps and colorectal cancer. Also developing services for characterizing gut microbiome health and disease.

Metamatrix, LLC**Boulder****www.zorbent.com**

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

Micro Imaging Solutions, LLC (MIS)**Denver****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**

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.

C Mighty Oak Medical**Englewood****www.mightyoakmedical.com**

Develops cutting-edge spinal technologies for use in spine surgery.

Mikron Corporation**Aurora****www.mikron.com**

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

Mile High Ophthalmics**Aurora****www.milehighophthalmics.com**

Ophthalmic device for enhanced precision in cataract surgery.

Mind Studios**Colorado Springs**

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.

Montview Biomedical Design Inc. (MBD Inc.)**Aurora****www.montviewbiomed.com**

Designs, develops and creates engineering solutions for the biomedical industry.

MuscleSound, LLC**Denver****www.musclesound.com**

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

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.

C Neuro Assessment Systems**Littleton****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.

C Neuromonics, Inc.**Westminster****www.neuromonics.com**

Manufacturers and distributes clinically proven devices to treat tinnitus. The Sanctuary provides situational relief for those suffering from mild to moderate tinnitus.

nSpire Health, Inc.**Longmont****www.nspirehealth.com**

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

OcuTherix**Aurora**

Non-invasive glaucoma treatment device.

C Optibrand Ltd., LLC**Fort Collins****www.optibrand.com**

Developed optical imaging system for veterinary diagnostics.

OptiEnz Sensors**Fort Collins****www.optienzensors.com**

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

C Osypka Medtec, Inc.**Longmont****www.osypka-medtec.com**

Manufactures medical devices.

Otologics, LLC**Boulder**

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

OvaCue**Aurora****www.ovacue.com**

Manufactures the OvaCue family of ovulation prediction products.

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.

PCC/Advanced Forming Technology**Longmont****www.aftmim.com**

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

Peak Analysis & Automation Ltd.**Colorado Springs****www.paa-automation.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 Peddle 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.

C 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.

Phase Three Product Development**Fort Collins****www.phasethreedev.com**

Technology and product development of microfluidics based devices and systems.

Porta-Lung, Inc.**Lakewood****www.portalung.com**

Provides non-invasive ventilator support for long-term patients who need more portability.

C Precision Biopsy**Aurora****www.precisionbiopsy.com**

In partnership with Allied Minds, developing technology for the accurate diagnosis of prostate cancer which uses advanced spectroscopy imaging techniques in combination with tissue biopsy.

Precision Glassblowing

Centennial

www.precisionglassblowing.com

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

Preferred Medical Products, Inc.

Englewood

www.preferredmedicalproducts.com

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

Prescott's, Inc.

Monument

www.surgicalmicroscopes.com

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

C Prima-Temp, Inc.

Boulder

www.prima-temp.com

Innovative biometric approaches to early disease detection and reproductive medicine through the application of 21st century thermometry.

Products Group International, Inc.

Lyons

www.productsgroup.com

Researches, develops and engineers ultrasound medical and veterinary equipment.

Propel Labs, Inc.

Fort Collins

www.propel-labs.com

Experienced and knowledgeable instrument development team designing the next generation of bio-instrumentation tools. Focused on research tools, such as single cell analyzers and cell sorters.

ProTechSure Scientific, Inc.

Aurora

www.protechsure.com

ProTechSure Scientific, Inc. is a company dedicated to providing scientifically validated skin protection.

Protomed, Inc.

Denver

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.

C Purewater Therapeutics

Longmont

www.purewater-therapeutics.com

Purewater Medical Inc develops products and technologies that simplify the delivery of medical fluids.

C Quandary Medical, LLC

Denver

www.trans1.com

Seeks to develop and commercialize elegant and minimally invasive surgical solutions to address spinal pathologies.

C QuSpin, Inc.

Louisville

www.quspin.com

Develops very high-performance atomic sensors.

Radiological Imaging Technology, Inc.

Colorado Springs

www.radimage.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, design and other manufacturing services for the medical device industry.

Research Electro-Optics

Boulder

www.reoinc.com

Volume manufacturer of high-precision thin film coatings, optics and optomechanical assemblies for the ultraviolet through the long-wave infrared.

Rocky Mountain Instrument Company (RMI)

Lafayette

www.rmico.com

Designs and manufactures optics and coatings (ultraviolet through far infrared) for the medical industry.

C 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.

Sapien, LLC

Fort Collins

sapienllc.com

Sapien, LLC aims to enhance the human experience by providing innovative solutions to human problems using sensory substitution, human-machine interfaces, and human-machine integration.

C Sapphire Technology, LLC

Denver

www.sapphire-technology.com

The SGS Instrument line is developed specifically to overcome the inherent composite adhesion and pullback issues associated with other composite instruments currently at market.

Sartorius TCC

(formerly Denver Instrument Company)

Arvada

www.sartorius.us

Designs and manufactures analytical balances, electrochemistry instruments, moisture analyzers, and titration controllers.

Science Care

Denver

www.sciencecare.com

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

Sciencetech, Inc.

Boulder

www.sciencetech-inc.com

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

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.

C 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.

Shape Ophthalmics LLC

Aurora

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

C Sharklet Technologies, Inc.

Aurora

www.sharklet.com

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

- C Shippert Medical Technologies**
Centennial
www.shippertmedical.com
Manufactures and distributes medical disposable products and instruments.
- Sinopsys Surgical**
Boulder
www.sinopsyssurgical.com
Proprietary Lacrimal Sinus Diversion offers functional therapy for the 7 million sufferers of chronic sinusitis with minimal response to current pharmaceutical and surgical options.
- C SI-Technology, LLC**
Fort Collins
www.si-technology.co
An orthopedic medical device company currently developing new techniques and implants as part of the patent-pending SI-DESIS™ Sacroiliac Joint Implant System to help physicians address the need for treatment, fixation and proper fusion of painful and dysfunctional sacroiliac joints (SIJ).
- C Siva Therapeutics, Inc.**
Boulder
www.sivatherapeutics.com
Commercializes 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.
- C Snoasis Medical**
Denver
www.snoasismedical.com
Focused on the development and commercialization of regenerative tissue and medical device products for use in dental surgery.
- C Soma Access Systems**
Englewood
www.somaaccesssystems.com
Focused on designing, developing, and commercializing unique, cost-effective solutions for problems arising during specific medical procedures.
- C SomaLogic, Inc.**
Boulder
www.somallogic.com
Uses aptamer array technology and bioinformatics capabilities to discover disease-specific biomarkers and protein signatures. Develops medical diagnostics based on these signatures.
- Sontec Instruments, Inc.**
Centennial
www.sontecinstruments.com
Provides a broad line of instruments as well as custom instrument manufacturing and in-house repair service.
- C Sophono, Inc.**
Boulder
www.sophono.com
Developed the world's first non-percutaneous, implantable bone anchored hearing device.
- C Sorin Group**
Arvada
www.sorin.com
Global medical device company and a leader in the treatment of cardiovascular diseases.
- Sound Surgical Technologies, LLC/Solta Medical, Inc.**
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.
- C 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.
- C 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.
- C Strand Life Sciences**
Aurora
www.strandls.com
Strand Life Sciences is a global clinical genomics and bioinformatics company with three business verticals, including Research Software products, Biopharma services and Personalized Medicine.
- Sundance Diagnostics, Inc.**
Boulder
www.sundancedx.com
Working to develop the world's first genetic safety tests to predict a patient's risk of antidepressant-induced suicidal thinking or behavior.
- Sunrise Medical Inc.**
Longmont
www.sunrisemedical.com
Provides home healthcare products, including wheelchairs, respiratory, daily living aids, and speech augmentation devices.
- Supreme Cable Technologies, Inc.**
Denver
www.supremecable.com
Manufactures quality custom cable assemblies and wire harnesses.
- C Surefire Medical, Inc.**
Westminster
www.surefiremedical.com
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.
- C 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.synergyhealthplc.com
Offers electron beam sterilization for medical and pharmaceutical devices.
- Tapeless Medical**
Englewood
www.tapelessmedical.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.
- TeraBAT**
Longmont
www.terabat.com
Developing a disruptive detection platform based on terawaves technologies that will revolutionize disease diagnosis and patient care.
- C Terumo BCT**
Lakewood
www.terumobct.com
A global leader in blood component and cellular technologies, Terumo BCT 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.

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.

C Thinklabs Medical, LLC

Centennial
www.thinklabs.com

Creates digital stethoscopes, including One, the smallest, most powerful stethoscope in the world.

Tissue Fusion, LLC

Colorado Springs
www.tissuefusion.com

Laser-based medical devices to fuse biological tissue together as an alternative to sutures or staples.

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.

C Transverse Medical Inc.

Evergreen
www.transversemedical.com

Developing the POINT-GUARD™ Embolic Protection System for cerebral and distal embolic protection during cardiovascular percutaneous interventions and surgical procedures.

TRS, Inc.

Boulder
www.trsprothetics.com

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

Ultrathera Technologies, Inc.

Colorado Springs
www.ultrathera.com

Applying advanced technologies to physiological and neurological needs. Maker of AeroStim™ and PointScribe™.

C Value Plastics, Inc. (Nordson Medical)

Fort Collins
www.valueplastics.com

Designs and manufactures plastic tubing fittings and connectors.

C Veramarx, Inc.

Aurora
www.veramarx.com

Focus to become the leading provider of credible clinical and scientific information, reliable and accurate diagnostic tools and effective treatment options for Lyme disease.

Vista LifeSciences

Parker
www.vistalifesciences.com

Innovative healthcare technology solutions for global healthcare challenges.

Vitan-Biotech, LLC

Aurora
www.vitan-biotech.com

Specializes in the development and commercialization of breakthrough life science instrumentation, novel biosensing systems and diagnostic devices. The novel life science instrumentation and biosensing systems are based on a broad range of cutting-edge biosensors, biochip and microarray platforms, and nanomaterial-based imaging reagents.

WalkMed Infusion, LLC

Englewood
www.walkmed.net

Offers solutions for ambulatory infusion therapy and pain management.

Wi LLC

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.

Yamato Corporation

Colorado Springs
www.yamatocorp.com

Manufactures and sells weighing equipment and systems for medical facilities.

Zimmer Biomet

www.zimmerbiomet.com

Treat disorders of, or injuries to, the bones, joints and supporting soft tissues. The company designs, develops, manufactures and markets orthopaedics products, including knee, hip, shoulder, elbow, foot and ankle artificial joints and dental prostheses.

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

C AbbVie

Austin, TX
www.abbvie.com

A pharmaceutical company that discovers, develops and markets both biopharmaceuticals and small molecule drugs.

Accera, Inc.

Broomfield
www.accerapharma.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 addresses 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

Development and commercialization of innovative technologies.

Agilent Nucleic Acid Solutions

Boulder
www.agilent.com

Develops and manufactures therapeutic oligonucleotide.

AKTIV-DRY

Boulder
www.aktiv-dry.com

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

C Allander Biotechnologies

Aurora

Allander Biotechnologies aims to develop proprietary biologics to improve wound healing and treat scar, fibrotic and inflammatory disorders.

Allergan, Inc.

Highlands Ranch
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.

American Allied Biochemical, Inc.

Aurora
www.aablabs.com

Specializes in the purification and distribution of restriction endonucleases enzymes.

C Amgen, Inc.

www.amgen.com

Discovers, develops, manufactures and markets human therapeutics based on advances in cellular and molecular biology.

C 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.

- C Ampio Pharmaceuticals, Inc.**
Greenwood Village
www.ampiopharma.com
Development-stage biopharmaceutical company focused on the discovery and development of novel therapies aimed at treating common inflammatory conditions for which there are limited treatment options.
- Anabolic Laboratories**
Colorado Springs
www.anaboliclabs.com
Focused line of nutritional products, with state-of-the-art pharmaceutical manufacturing facilities in California and Colorado.
- C AntriaBio**
Denver
www.antriabio.com
Lead diabetes product candidate, AB101, is a once-a-week injectable basal insulin that is currently in preclinical development. AB101 is administered by subcutaneous injection and targets patients with type 1 and type 2 diabetes who require basal insulin for the control of hyperglycemia.
- C ApopLogic Pharmaceuticals, LLC**
Aurora
www.apoplogic.com
ApopLogic Pharmaceuticals, LLC is a startup-phase biopharmaceutical company focused on the discovery, development, and commercialization of therapeutic products that target apoptotic cell death pathways found in cancers, leukemias and lymphomas.
- C ARCA biopharma, Inc.**
Broomfield, Aurora
www.arcabiopharma.com
Specializes in developing and commercializing genetically targeted therapies for heart failure and other cardiovascular diseases.
- C 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.
- C AstraZeneca**
Boulder
www.astrazeneca.com
Global, innovation-driven biopharmaceutical business that focuses on the discovery, development and commercialization of prescription medicines, primarily for the treatment of cardiovascular, metabolic, respiratory, inflammation, autoimmune, oncology, infection and neuroscience diseases.
- C Atlas Biologicals, Inc.**
Fort Collins
www.atlasbio.com
Manufactures, markets and distributes animal sera and cell culture reagents.
- 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 to treat various brain disorders.
- Aurora Oncology**
Aurora
Researching DT-EGF Toxic Fusion Protein for treatment of bladder cancer.
- C Avidity, LLC**
Aurora
www.avidity.com
Develops and sells molecular affinity tools for connecting molecules.
- C Aytu BioScience**
Englewood
www.aytubio.com
Aytu BioScience is a specialty healthcare company focused on developing and commercializing novel products in the field of urology.
- C BaroFold, Inc.**
Aurora
www.barofold.com
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.
- C BioResponse, LLC**
Boulder
www.bioreponse.com
Researches, develops and commercializes dietary supplements for better absorption and functional foods.
- 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.
- Boulder Scientific Company**
Mead
www.bouldersci.com
Provides organometallic compounds to the pharmaceutical, polymer, and specialty chemical industries.
- C CariCord**
Aurora
www.caricord.com
Our mission is to provide parents with the confidence that they have taken the right steps to protect their children's future, by securing the finest processing and storage of umbilical cord blood and stem cell products available, anywhere in the world.
- C 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.
- 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.
- Cerebral Therapeutics**
Aurora
www.cerebraltherapeutics.com
Combines advanced micro-dosing technology with proprietary medications to precisely deliver treatments to the other side of the blood-brain barrier to improve the lives of patients with uncontrolled neurological disease.
- C Cetya Therapeutics, Inc.**
Fort Collins
www.cetyatherapeutics.com
Founded to commercialize analogs of the class I isoform selective histone deacetylase inhibitor (HDACi) largazole, targeting unmet medical needs, especially in oncology, neurodegeneration, autoimmunity, and hemoglobinopathies.
- Cévan International, Inc.**
Longmont
www.cevan.com
Delivers vitamins, minerals and botanical extracts as well as specialty nutraceutical formulations and antioxidants.
- C CHATA Biosystems**
Fort Collins
www.chatasolutions.com
Manufactures blended reagents, HPLC mobile phases, standards, buffers and dissolution media.
- C CHD Bioscience, Inc.**
Fort Collins
www.chdbioscience.com
Advancing patient care through the creation of novel antimicrobials for the prevention and treatment of infectious disease.
- C Click Nucleic Acids, Inc.**
Boulder
www.clicknainc.com
Combining thiol-ene-based click chemistry and oligonucleotide synthesis to produce a new class of oligonucleotide and polynucleotide derivatives.
- C ClinImmune Labs**
Aurora
www.clinimmune.com
Comprises five laboratories to provide services to kidney, heart, lung, pancreas, and hematopoietic stem cell transplant programs around the world.
- C 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.

C 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.

Corden Pharma

Boulder

www.cordenpharmacolorado.com

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

C Crestone, Inc.

Boulder

www.crestonepharma.com

Drug discovery and development company focused on developing novel treatments for serious bacterial infections.

C 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.

C ELISA Tech

Aurora

www.elisatech.com

Provides immunoassays for the measurement of cytokines, growth factors, and lipid inflammatory mediators.

Entero Track

Centennial

Next-generation monitoring of gastrointestinal allergic diseases.

Flagship Biosciences

Boulder

www.flagshipbio.com

Oncology drug development, tissue analytics and pathology services.

C FluoroFinder LLC

Broomfield

www.fluorofinder.com

Software as a Service (SaaS) experiment design tool for flow cytometry that dramatically improves a medical researcher's productivity and quality while reducing costs.

FluTrends International/ STS Health

Denver/ Aurora

www.stshealth.com

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

C Gates Biomanufacturing Facility

Aurora

www.ucdenver.edu/academics/colleges/medical-school/centers/StemCell/Pages/StemCell.aspx

Good Manufacturing Practices Facility FDA approved for production of biologicals from Cell Culture and microbial fermentation suitable for early clinical trials in humans.

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.

C 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.genetheranet

Develops and markets the latest molecular technologies to eradicate “cross over” diseases such as John’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.

C Genovus Biotechnologies, Inc.

Louisville

www.genovusbiotech.com

Genovus Biotechnologies is pioneering the development of biophysical medicine-based treatments for neuromuscular conditions. Our lead developmental product is a non-invasive, neuromodulating medical device for the treatment of functional symptoms of multiple sclerosis.

C 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.

Globelimmune, 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

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

Greffex, Inc.

Aurora

www.greffex.com

Global leader in the delivery of accelerated pandemic and bio-terror vaccines using the world’s first universal platform, the GREVAX™ Vaccine Platform. Our vibrant pipeline of vaccines, transplantation and gene therapy products continue to create value for our people, partners and investors.

Hauser Laboratories, Division of Microbac

Boulder

www.hauserslabs.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.

C 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.

Hiberna Corporation

Boulder

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.

C i2 Pharmaceuticals, Inc.

Boulder

Using a variety of technologies, i2 creates tools for pharmaceutical drug discovery and development; in addition to proprietary medicinal chemistry services for the expansion of intellectual property protection of early- late-stage pharmaceutical assets.

- C ICVrx, LLC**
Denver
Creating a new treatment category for epilepsy by reformulating drugs for brain delivery administered through implantable pumps. Site specific computerized drug delivery is promising for improving epilepsy therapy in a significant proportion of refractory patients.
- C Immunomolecular Therapeutics**
www.imtherapeutics.com
A private clinical-stage biotech company developing a revolutionary therapeutic approach for the treatment of Type I Diabetes.
- 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.
- C InDevR, Inc.**
www.indevr.com
A leader in providing progressive analytical technologies that enhance and accelerate vaccine characterization and production. The company is also committed to developing next-generation diagnostic products that will enable unprecedented tracking of seasonal and emerging influenza viruses around the globe.
- Invenux, LLC**
Windsor
Pharmaceutical research and development for orphan diseases.
- 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 and regenerative medicine, life science research and diagnostics.
- JHPIEGO-Denver**
Aurora
www.jhpiego.org
Designing and implementing effective, low-cost technologies – first product aimed at improving the management of postpartum hemorrhage.
- C 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.
- 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.
- C 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.
- C 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.
- Lohocla Research Corporation**
Aurora
www.lohocla.com
Research and development company that is at the forefront of discovery of medications for chronic pain, addictive and other mental health and neurological disorders.
- Loxo Oncology**
Aurora
www.loxooncology.com
Our mission is to translate scientific knowledge about the drivers of cancer into drugs that can provide substantial benefits for patients.
- C Machavert Pharmaceuticals**
Aurora
www.machavert.com
Machavert develops a new class of immunotherapies to help the human body to fight various diseases such as cancer or autoimmune disorders. Machavert currently focuses on preclinical research to build up a portfolio of drug candidates for clinical trials.
- C MBC Pharma, Inc.**
Aurora
www.mbcpharma.com
Biopharmaceutical company focused on discovering and developing drugs for bone diseases such as cancer and osteoporosis.
- Mediral International, Inc.**
Denver
www.mediral.com
Develops, manufactures and sells homeopathic pharmaceuticals taking into consideration antidotes.
- C MenoGeniX**
Aurora
www.menogenix.com
Clinical-stage biotech company developing MNGX-100, a therapeutic biologic, as a novel, non-hormonal, non-SSRI/SNRI, alternative to treat hot flashes and related vasomotor symptoms in women with natural or surgically-induced menopause.
- C Merck & Co., Inc.**
Denver
www.merck.com
Merck & Co. produces products that cover a broad range of areas, including heart and respiratory health, infectious diseases, sun care and women's health. Its research focuses 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.
- MicroChemica, LLC**
Fort Collins
Company is focused on environmental remediation using on-line systems and portable units for analysis.
- C 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, 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, cross-linking reagents, lipophilic probes, fluorophores, radioiodination reagents, and dendritic cores for preparing oligomers.
- MonImmune Therapeutics**
Fort Collins
Developing a pipeline of repurposed compounds focused on monocyte regulation as vaccine adjuvants.
- C Montana Molecular**
Bozeman, MT
www.montanamolecular.com
Fluorescent technologies for drug discovery in living cells.
- C Mosaic Biosciences**
Denver, Aurora
www.mosaicbio.com
Start-up company focused on the development of innovative materials for tissue regeneration and repair.
- Mother's Milk Is Best**
Fort Collins
www.mothersmilkisbest.com
MMIB has developed Human Milk Concentration (HMC) - advanced filtration technology that produces pure, concentrated mother's milk containing the native essential human proteins, beneficial nutrients and immune factors that promote optimal neonate growth and play a profound role in the survival and health of a newborn.

Mycotechnology

Aurora

www.mycotechcorp.com

Mycotechnology is a food technology company that has developed a natural food processing platform that is solving some of the biggest challenges in the food and beverage industry.

C Nanoly Bioscience, Inc.

Denver

www.nanoly.info

Developing a safe and proprietary polymer encapsulation to stabilize and protect therapeutic biological molecules, such as vaccines and enzymes, from below freezing to beyond tropical room temperatures.

C NanoSphere Health Sciences

Greenwood Village

www.nanospherehealth.com

NanoSphere Health Sciences is an emerging biotech company that has created an advanced delivery system platform of new products. We are changing the way people take and benefit from nutraceutical supplements and medications.

C Nivalis Therapeutics, Inc.

Boulder

www.nivalis.com

Nivalis is a clinical-stage pharmaceutical company committed to the discovery, development and commercialization of novel therapeutics for patients with cystic fibrosis (CF).

C 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.

C Novus Biologicals, Inc.

Littleton

www.novusbio.com

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

C Nutrinsic, Inc.

Aurora

www.nutrinsic.com

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

Ocugen

Aurora

www.ocugen.com

A clinical-stage biopharmaceutical company developing novel treatments for sight threatening diseases, including ocular graft versus host disease, retinitis pigmentosa, geographic atrophy, wet age-related macular degeneration and diabetic retinopathy.

Omix Technologies

Aurora

Omix Technologies, Inc functions solely as the owner of the two subsidiary LLCs Endura and Matriqs Biology.

OncoTherix

Aurora

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.

Pambec Laboratories, Inc.

Loveland

Researches drug discoveries in the field of AIDS.

C Pathways Bioscience, Inc.

Aurora

www.pathwaysbio.com

Pathways Bioscience, Inc. is an early-stage bioscience company focused on discovering and developing new agents for modifying gene expression and regulating stress-response pathways that contribute to cell defense mechanisms.

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.

Peak Pharmaceuticals, Inc.

Aurora

peakpharma.com

Peak Pharmaceuticals, Inc. ("Peak Pharma") specializes in the development, manufacturing, sales and marketing of pharmaceutical-grade, hemp-based nutraceutical and supplement products for the human- and animal-health markets.

C Peak Serum, Inc.

Fort Collins

peakfbs.com

Peak Serum, Inc., is a privately owned and independent supplier of life science laboratory products. Our core focus is Fetal Bovine Serum (FBS) for cGMP / clinical trial research and diagnostics applications.

PeptiVir

Aurora

www.site.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.

C 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.

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.

C Pyxant Labs, Inc.

Colorado Springs

www.pyxant.com

Provides GLP regulatory bioanalytical support for non-clinical through clinical development programs. Specialties include rare tissues, RNA and oligonucleotide therapeutics, nucleoside antivirals, and agricultural and industrial biotech applications.

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.

Quicksilver Scientific

Lafayette

www.quicksilverscientific.com

Clinical and environmental mercury lab and dietary supplement manufacturing.

Recreo Pharma

Aurora

Resistance-modifying agents to combat antibiotic resistance.

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.

Renaptys Vaccines, LLC

Aurora

www.renaptys.com

Developing innovative Stable Peptide Immuno-gen (SPI) platform that targets α -helical epitopes, initially, fusion receptors on viruses.

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.

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 and psychotherapeutics.

C Scilex Pharmaceuticals, Inc.

Malvern, PA
www.scilexpharma.com

Scilex Pharmaceuticals is an emerging-growth pharmaceutical company focused on acquiring and commercializing late-stage prescription products with more efficient and effective delivery solutions for the treatment of pain.

C Silvergate Pharmaceuticals, Inc.

Greenwood Village
WWW.silvergatepharma.com

Developer and manufacturer of pharmaceutical products focused on the pediatric market.

SixOne Solutions, LLC

Aurora
www.sixonesolutions.com

Developing novel products for the treatment and diagnosis of breast cancer.

STA Laboratories, Inc.

Longmont
www.stalabs.com

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

Sudhin Biopharma Company

Superior
www.sudhinbio.com

Focus on developing the most efficient biological manufacturing platform technologies and demonstrating these platforms with a few selected biosimilar drugs.

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.

C 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.

Takeda America Holdings, Inc.

Fort Collins
www.takeda.us

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.

C The BioCollective, LLC

Centennial
www.thebiocollective.com

The BioCollective is the first direct-to-consumer biobanking company for microbiome samples. The BioCollective is a collective commons business model.

C 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.

C TOLMAR, Inc.

Fort Collins
www.tolmar.com

Develops and manufacturers both proprietary and generic pharmaceutical products with specific focus in therapeutic areas of dental, dermatology, and oncology.

C TopGear Automation

Denver
www.topgearautomation.com

Development and validation of biomarkers for environmental exposure, oncology, and related diseases.

UBPBio

Aurora
www.ubpbio.com

UBPBio manufactures and sells bioreagents related to the ubiquitin-proteasome pathway. The ubiquitin-proteasome pathway is responsible for degradation of the majority of cellular proteins.

C UCB, Inc.

Brussels, Belgium
www.ucb.com

Global biopharma focused on severe diseases with operations in about 40 countries.

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.

Ursa Medical Technologies

Aurora
www.ursamedical.com

Ursa Holdings, LLC is a pharmaceutical research company working with a breast cancer treatment compound, spun off from a major university. Researching the use of enzyme inhibitors in the cholesterol biosynthetic pathway, Ursa will explore the safety and efficacy of the compound on a variety of hormonal cancers. We plan to commence pre-clinical studies in advance of an Investigational New Drug application with FDA proceeding through phase I and phase II clinical trials.

Venaxis Inc.

Castle Rock
www.venaxis.com

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

Ventria Bioscience

Fort Collins
www.ventria.com

Develops a protein expression technology platform called ExpressTec with a product pipeline in human nutrition and therapeutics.

Verkko Biomedical, LLC

Aurora
Verkko Biomedical was formed to commercialize the combustion synthesis technology and manufacture medical grade customized alpha-, beta-phase tricalcium phosphates ($\alpha\beta$ -TCP, β -TCP) as precursor components for customers who operate in the biomedical/medical industry. Verkko will be operating in ceramic segment of the biomaterials market.

C ViroCyt, LLC

Denver
www.virocyt.com

Focused on the commercialization of novel technologies that enable rapid quantification of viruses, such as the Virus Counter 2100.

C VisuGen Global, LLC

Aurora

www.visugenglobal.com

VisuGen Global will advance a new proprietary approach to concentrate and detect gene targets in a method that is simple to perform anywhere needed. The products will have high impact in that testing will be enabled in global regions and in on-site locations where rapid results inform an actionable response.

VitriVax

Boulder

VitriVax is committed to the development of affordable, highly stable vaccines for use in resource-poor areas of the world. The current lead product is a next-generation vaccine against human papillomavirus infection (HPV).

C VitroBiopharma

Golden

www.vitrobiopharma.com

Develops and commercializes adult stem cell technology for applications in stem cell research, drug discovery and development, and therapeutic products for treatment of disease, injury and tissue regeneration.

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.

C Vivaldi Biosciences

Fort Collins

www.vivaldibiosciences.com

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

VRL Laboratories

Centennial

www.vrl.net

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

Xalud Therapeutics

Boulder

www.xaludthera.com

Novel therapies for the treatment of neuro-inflammatory diseases and inflammatory joint disorders.

yuScience, LLC

Aurora

Focusing on the development of early disease biomarkers in patients with multiple sclerosis (MS).

Z Biotech, LLC

Aurora

www.zbiotech.com

Cost-effective biochemical analysis solutions, our focus is to develop innovative microarray and carbohydrate products and related services.

Zenith BioPharma

Aurora

Zenith BioPharma, LLC. is a cancer therapeutics research and development company.

ZeoponiX, Inc.

Boulder

www.zeoponix.com

They are investigating the immune-pathogenesis of MS, and identifying key players in disease progression.

AG BIO & ANIMAL HEALTH COMPANIES

Advanced Environmental Technologies

Fort Collins

aetecs.com

Provider, specializing in sustainable technologies for treating wastewater, contaminated soils, groundwater, and sediments.

Advanced Regenerative Therapies

Fort Collins

www.art4dvm.com

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

Agripro COKER

Berthoud

www.agriprowheat.com

Develops and delivers superior wheat seed genetics in North America.

Animal Health Options

Golden

www.animalhealthoptions.com

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

C AnImmune, LLC

Golden

Infectious disease-centric company focused on enhancing efficacy of animal vaccines using knowledge accumulated through decades of human vaccine technology.

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.

Beacon Biotech

Aurora

www.beaconbiotechnology.com

Beacon's BrightSPOT™ shows boundless potential to enable next generation point-of-care diagnostics, drug discovery, biodefense, food and environmental testing and more.

Behavioral Response Technologies, Inc.

Boulder

www.behavioralresponsetechnologies.com

Fresh Cow Manager simply gets your cows up and eating when they are most nutritionally deprived.

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.

BioVantage Resources, Inc.

Golden

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

Bovine Reproduction Specialists

Loveland

www.bovinetraining.com

International Bovine Training Solutions is a unique training experience focused on improving the reproductive performance on dairy and beef operations.

CarboAnalytics

Fort Collins

www.carboanalytics.com

We develop systems that give accurate sugar analysis, simply and quickly, for the BioFuel, brewing and distilling, food processing and pharmaceuticals industries.

Cargill Research

Fort Collins

www.cargill.com

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

C Chata Biosystems, Inc.

Fort Collins

www.chatasolutions.com

ChromaDex Analytics, Inc.

Boulder

www.chromadex.com

ChromaDex® was established in 1999 in response to growing demand for natural product reference standards, materials, and services.

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.

Colorado Corn

Greeley

www.coloradocorn.com

Colorado Genetics Inc.

Loveland

www.coloradogenetics.com

CGI specializes in embryo transfer and reproductive technologies utilized in the purebred and commercial cattle industries for domestic and international markets.

Colorado Quality Research Inc./Feathertech, Inc.

Wellington

www.cqrco.com

Leading innovator in poultry research.

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.

CSU Ventures, Inc.

Fort Collins

www.csuventures.org

CSU Ventures, Inc. (CSUV) is a 501(c)(3) non-profit corporation that actively supports and promotes the transfer of Colorado State University (CSU) research and innovations into the marketplace for the benefit of society. CSU Ventures serves CSU faculty and researchers who wish to protect and license intellectual property; builds relationships with industries and investors seeking to engage with CSU; and leverages CSU innovation to foster business formation and enhance regional economic vitality.

FindCure.org

Aurora

findcure.org/index.html

We are developing and delivering biomedical discoveries that naturally improve the immune system. Our efforts have helped people with allergies, asthma, cancer, Chronic Fatigue Syndrome, colds, Fibromyalgia, hay fever, Hepatitis, infections, Lyme Disease and Lymphoma.

University of Colorado Office of Advancement

Aurora, Boulder, Colorado Springs

www.giving.cu.edu

The University of Colorado Office of Advancement collaborates with faculty, staff, benefactors, alumni and friends to raise private support for the university by matching the passions of benefactors with the needs, priorities and goals of each campus.

TRADE ORGANIZATIONS

FRaBSA (Front Range Biological Safety Association)

www.frabsa.org

Local affiliate chapter to International ABSA (American Biological Safety Association).

Focus is promoting the principles of biological safety and providing a forum for dissemination of information. Membership includes EH&S officers at universities, government, industry and service providers that support their needs.

RM ISPE (Rocky Mountain Chapter of International Society of Pharmaceutical Engineers)

www.ispe.org/rockymountain

Local chapter of ISPE (International Society of Pharmaceutical Engineers), The Rocky Mountain Region is among the fastest growing biotechnology/pharmaceutical communities in the nation. The chapter was established in 1996 to accelerate the awareness and visibility of the biopharmaceutical and medical device community through networking and educational opportunities. With nearly 300 members and a diverse membership, the strengths of the chapter are visible with its large user involvement and the depth of technical programs provided. National speakers are invited often to share current trends and other relevant technical material to the chapter.

AIHA RMS (American Industrial Hygienist Association Rocky Mountain States)

www.aiha-rms.org

Local chapter of AIHA (American Industrial Hygienist Association) Focus is on occupational and environmental health and safety. Local membership includes government, universities hospitals, industry and the service providers that support their needs.

PDA MS (Parenteral Drug Association, Mountain States Chapter)

www.pda.org/chapters/north-america/mountain-states

Local chapter of PDA (Parenteral Drug Association), the leading global provider of science, technology and regulatory information and education for the pharmaceutical and biopharmaceutical community.

Rocky Mountain Branch ASM (American Society for Microbiology)

www.asm.org/index.php/branches2/73-membership/branches/8505-rocky-mountain-branch-asm-region-6

Regional branch of ASM (American Society for Microbiology).

RMRAS (Rocky Mountain Regulatory Affairs Association)

www.rmras.org

The Rocky Mountain Regulatory Affairs Society (RMRAS) is a non-profit organization for professionals involved in the regulation of medical devices, pharmaceuticals, biologics, and nutritional products. Our vision is to advance the understanding and practice of worldwide medical regulatory affairs for members in the Rocky Mountain region.

ASQ (American Society of Quality)

asq.org/perl/section_list.pl?Colorado

ASQ is a global community of people passionate about quality, who use the tools, their ideas and expertise to make our world work better.

RMRCSCQA (Rocky Mountain Regional Chapter Society of Quality Assurance)

www.rmrcsqqa.org

SQA is an association of over 2,200 QA professionals who are dedicated to implementing Good Clinical Practices (GCPs), Good Laboratory Practices (GLPs) and Good Manufacturing Practices (GMPs) in industry, governments, academia and consulting.

i2sl Colorado Chapter

www.i2sl.org/globalcommunity/chapters/colorado.html

The I2SL Colorado Chapter, which formed in 2013, is I2SL's second regional chapter. The I2SL Colorado Chapter seeks to be a local resource and community for high-tech laboratory and data center users, builders, and suppliers. The chapter offers quarterly and annual meetings focused on technical topics, visiting built projects, and meeting with like-minded individuals to collaborate and develop further ideas for the industry.

Distribution, Packaging and Sales Force

Pozzetta Scientific
www.pozzettascientific.com

Economic Development

Adams County Economic Development, Inc. (ACED)
www.adamscountyed.com

Aurora Economic Development Council
www.auroraedc.com

Boulder Economic Council of the Boulder Chamber
www.bouldereconomiccouncil.org

Broomfield Economic Development Corporation
www.broomfield.org

Colorado Institute for Drug, Device and Diagnostic Development (CID4)
www.cid4.com

Colorado Office of Economic Development and International Trade (OEDIT)
www.advancecolorado.com

Colorado Springs Regional Business Alliance
www.coloradospringsbusinessalliance.com

Metro Denver Economic Development Corporation
www.metrodenver.org

Town of Parker
www.parkeronline.org

Electronic Submissions

TruSubmit
www.trusubmit.com

European Representation and Global Development Strategies

CBR Biotech Strategies GmbH
www.cbrbiotech.com

Finance, Investment and Export Services

CoBiz Financial
www.cobizfinancial.com

Crowe GHP Horwath
www.crowehorwath.net

EKS&H
www.eksh.com

EY
www.ey.com

High Country Venture LLC
www.highcountryventure.com

KMG Capital Partners, LLC
www.kmgcap.com

Morgenthaler Ventures
www.morgenthaler.com

Silicon Valley Bank (SVB Financial Group)
www.svb.com

Quandary Financial
www.quandaryfinancial.com

Incubator

Fitzsimons Life Science District
www.fitzscience.com

Innovation Center of the Rockies
www.innovationcenteroftherockies.com

Rocky Mountain Innosphere
www.innosphere.org

Insurance

Chubb Group of Insurance Companies
www.chubb.com

CoBiz Insurance
www.cobizinsurance.com

Medmarc
www.medmarc.com

Customized Insurance Products and Risk Management Solutions

Products Liability | Global Clinical Trials

- Medical Devices
- Pharmaceuticals
- In Vitro Diagnostics
- Biotechnology

MEDMARC. Treated Fairly. THE HARTFORD

800.788.0194 | Medmarc.com

TriNet
www.trinet.com

Woodruff Sawyer
www.wsandco.com

Legal Services

Cooley LLP
www.cooley.com

Dorsey & Whitney LLP
www.dorsey.com

Greenberg Traurig LLP
www.gtlaw.com

Gross Cutler Sieler Dupont
www.gcsdlaw.com

Hogan Lovells
www.Hoganlovells.com

HolzerIPLaw, PC
www.HolzerIPLaw.com

King & Spalding
www.kslaw.com

Kendall, Koenig & Oelsner PC
www.kkofirm.com

Lathrop & Gage
www.lathropgage.com

Sheridan Ross PC
www.sheridanross.com

Snell & Wilmer
www.swlaw.com

Swanson & Bratschun
www.sbiplaw.com

Marketing, Communications, Events/Hotel and Public Relations

Aegis Creative
www.aegiscreative.com

The Bawmann Group
www.morethanpr.com

Biolexica
www.biolexica.com

Golden Printing Company
www.goldenprinting.com

Griff SMC, Inc.
www.griffsmc.com

Primavera Group
www.theprimaveragroup.com

Sprint Press
www.sprintdenver.com

Public Policy

Advanced Medical Technology Association (AdvaMed)
www.advamed.org

Biotechnology Industry Organization (BIO)
www.bio.org

PhRMA
www.phrma.org

We Work for Health
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