



BIOSCIENCE

Colorado Industry Cluster Profile

The bioscience cluster is a dynamic, entrepreneurial group of companies that research, develop, and distribute a variety of products and services ranging from veterinary supplies and chemical testing kits to cutting-edge pharmaceuticals and medical devices and diagnostics. The cluster contributes to the growth and innovative capacity of other industries that transcend the bioscience cluster including energy, information technology, and agriculture in Colorado. Advances in biology and breakthroughs in human and animal health will continue to foster innovation and offers Colorado a leading role in forming collaborative bioscience partnerships and supporting bioscience infrastructure.

The bioscience cluster is divided into two subclusters, each of which specializes in distinct aspects of the biosciences: (1) medical devices and diagnostics and (2) pharmaceuticals and biotechnology. With nearly 16,490 bioscience workers in approximately 640 companies, the bioscience cluster offers numerous opportunities in both academic and clinical discovery and contributes to Colorado's overall economic productivity. A related subcluster, although not specifically included in the report, is agricultural biotechnology. The agricultural biotechnology subcluster includes companies that utilize distinct elements of conventional breeding, biochemistry, molecular genetics, and plant physiology to improve the health of humans and animals. This subcluster employs an estimated 1,390 workers in approximately 210 companies in Colorado and grew 1.8 percent from 2009 to 2010, compared with a 2.4 percent decline nationwide.

The state is also home to numerous public and private bioscience research assets that have demonstrated a strong commitment to building research excellence, including the Anschutz Medical Campus of the University of Colorado Denver; National Jewish Health; the Colorado Clinical and Translational Sciences Institute; the Barbara Davis Center for Childhood Diabetes; the Eleanor Roosevelt Institute; the Webb-Waring Institute for Cancer, Aging, and Antioxidant Research; the Centers for Disease Control and Prevention's National Center for Zoonotic, Vector-borne, and Enteric Diseases in Fort Collins; and Colorado State University's (CSU) Seed Laboratory and Animal Reproduction and Biotechnology Laboratory. The University of Colorado and CSU also created a collaboration of bioscience programs to coordinate bioscience research and commercialize innovative research technologies including the Colorado Institute for Drug, Device and Diagnostic Development (CID⁴), the Colorado Center for Drug Discovery (C2D2), the Institute of Bioenergetics and Immunology, the Colorado Initiative in Molecular Biotechnology (CIMB), the Center for Computational Biology, and the Center for Pharmaceutical Biotechnology.

The Fitzsimons Life Science District and the Anschutz Medical Campus in Aurora is one of the largest bioscience developments in the country and occupies a 578-acre site at the former Fitzsimons Army Medical Center. As projects are completed, Fitzsimons will continue to evolve as one of the most advanced scientific communities in the world. Included at the site is the 184-acre Colorado Science + Technology Park, which will ultimately offer a hotel and conference center, office space, and many shared services and amenities. Currently, the site offers completed incubator space in two buildings and direct access to over 80 core laboratories.

Another key partner at Fitzsimons is the \$1.5 billion Anschutz Medical Campus of the University of Colorado Denver, which includes the University of Colorado Hospital, as well as facilities for University Physicians, Inc. In 2009, the Department of Veterans Affairs broke ground on the \$300 million Department of Veterans Affairs (VA) Hospital which will replace the existing VA hospital and will be located adjacent to the Anschutz Medical Campus. The award-winning Children's Hospital is also adjacent to the campus and is currently expanding. Upon completion, the entire

district and medical campus will account for approximately 18 million square feet of development. Fitzsimons Village—developed by Kentucky-based Corporex Cos.—is the first new mixed-use development adjacent to Anschutz Medical Campus. The first phase of construction brings a 150,000-square-foot office building with 16,000 square feet of retail space, a SpringHill Marriot Hotel, and a regional bank branch. About 20 acres will be available for further development of retail, residential, research, and office space.

The City of Fort Collins and CSU have a vibrant biomedical community. CSU's Animal Cancer Center is an internationally recognized leader in clinical veterinary oncology and cancer research. In addition, CSU completed construction in May 2010 of a 72,000-square-foot Research Innovation Center (RIC) that is a hybrid academic research facility and bioscience incubator. The RIC is a state-of-the-art, wet research laboratory that includes a free-standing, 16,000-square-foot current Good Manufacturing Practices (cGMP) compliant building capable of manufacturing clinical-grade vaccines or biologics. In 2010, the Rocky Mountain Innovation Initiative (RMI²) launched the FastTrac TechVenture entrepreneurial program, focused on bioscience, technology, and cleantech ventures. Developed by the Ewing Marion Kauffman Foundation, the program promotes Northern Colorado's entrepreneurial activity and accelerates scientific and technology startup companies. RMI² also provides assistance with raising capital and networking opportunities. Both the RIC and RMI² are gold LEED certified facilities and are hubs for clean energy and biomedical entrepreneurial activity in Northern Colorado.

Colorado's research centers and universities serve as a cornerstone to fuel bioscience growth and product development.

- The University of Colorado Denver unveiled plans for a bioengineering program that will offer undergraduate, masters, and doctoral degrees. The program will help students apply engineering advances in bioscience- and health-related fields and provide them access to research facilities and faculty at the University of Colorado at Boulder (CU-Boulder) and the University of Colorado School of Medicine.
- CU-Boulder's CIMB program received a \$15 million federal stimulus grant to continue construction of the new 257,000-square-foot biotechnology and biomedical research building on its East Campus. The Jennie Smoly Caruthers Biotechnology Building will house more than 500 faculty researchers, graduate students, and support staff, the chemical and biological engineering departments, CIMB, and the biochemistry division. The first phase of construction is slated for 2011.

Various organizations in Colorado foster innovation and entrepreneurial activity to create new bioscience technologies and facilitate the commercialization of these technologies.

- The Boulder Innovation Center is expanding its entrepreneurial program with the Office of Technology Transfer at the Colorado School of Mines in Golden. The Boulder Innovation Center was established in 2005 to connect inventors with local and national investors, mentors, and advisers and works with CU-Boulder as the Center's commercialization partner and the City of Boulder to bring together scientific talent, entrepreneurial skills, strong leadership, and financial resources.
- The Fitzsimons BioBusiness Partners (FBBp) serves as the premier advisory group to the Colorado bioscience community. The incubator houses growing bioscience companies that are working to commercialize products and processes at the Colorado Science + Technology Park at Fitzsimons. FBBp provides industry-specific expertise that bioscience companies need to be successful.

Colorado is a key location for private bioscience companies to grow and thrive. Some key bioscience company announcements and new project developments include:

- Clinical-trial company CPC moved its headquarters from downtown Denver to the Colorado Science + Technology Park at Fitzsimons. The company is the first tenant in the new University Physicians building on the campus and will run the school's clinical trials in stem-cell research that could ultimately help the school attract additional grant dollars.
- Three divisions of the Canadian agricultural biotechnology company Agrium Inc. plan to relocate to Loveland in 2010. Agrium Advanced Technologies—a micronutrient and fertilizer supplier—closed its Alabama and Ontario, Canada operations and moved its

headquarters and the company's information technology services division—Shared Services Group—to Loveland in August. Agrium will also move its headquarters and consolidate its retail business unit—Crop Production Services—from Greeley to Loveland. The company plans to expand its workforce at its new location in the next few years.

- Boulder-based Array BioPharma announced a critical licensing deal with Swiss pharmaceutical company Novartis. Valued at \$467 million, Novartis received the right to sell several of Array's anti-cancer drugs. The first in the series of drugs is currently undergoing clinical testing and the second trial phase is set for 2011 to treat patients with colorectal cancer.
- Biotechnology company Amgen Inc. received FDA approval for a new osteoporosis drug manufactured at the company's Boulder division as a preventive therapy to protect against bone loss.
- Greenwood Village-based Omni Bio Pharmaceutical, Inc. received FDA approval to begin clinical trials at the Barbara Davis Center for Childhood Diabetes at the Anschutz Medical Campus for its Type I diabetes treatment. The drug could provide relief for a number of debilitating medical disorders associated with diabetes.
- The Lakewood-based U.S. division of Swedish medical device manufacturer Gambro AB acquired CHF Solutions, Inc. The announcement is one more in a series of recent changes to Gambro's corporate structure. In 2008, the company's blood component technology (BCT) division spun off to create CaridianBCT.
- Colorado Springs-based Westone Laboratories is working on new in-ear monitoring technology. In 2009, the hearing healthcare company began manufacturing in-ear monitors to protect musician's ears. Five years ago, the company partnered with the Air Force Research Laboratory to develop an earpiece for F-22 pilots that protects hearing and improves communication.
- Two Colorado pharmaceutical companies received a \$15.5 million National Institutes of Health grant to complete development of the mosquito-borne dengue fever vaccine. Fort Collins-based Inviragen will combine its dengue fever vaccine with needle-free injector technology designed by Golden-based PharmaJet. The technologies will help save lives and avoid problems with needle re-use in developing countries.
- Highlands Ranch-based Sandhill Scientific, Inc. optioned a diagnostic device for gastrointestinal diseases developed at the University of Colorado Denver School of Medicine in conjunction with the University of Illinois at Chicago College of Medicine in 2010. The optioned technology offers a less invasive way to diagnose esophageal inflammation and gastroesophageal reflux disease.

Government support and private investment are essential to the development of a thriving bioscience cluster.

- In 2006, the Colorado Legislature created the Bioscience Discovery Evaluation Grant Program (BDEGP) to foster new companies and support existing companies to develop and commercialize cutting-edge technologies. Since the program's inception, 106 grants totaling \$10.8 million were distributed to research institutions and early-stage bioscience companies. To date, this successful program has created over 22 companies that support 598 direct and indirect jobs.
- Formed in 2009 through the BDEGP, the Colorado Institute for Drug, Device and Diagnostic Development (CID⁴) accelerates life science discoveries and bridges the gap between life sciences research and successful product developments. The institute is a collaborative effort of all sectors of the Colorado bioscience community, including universities, bioscience companies, academic groups, and professional associations. When it launched, CID⁴ received \$4.75 million in total funding for grants from the state of Colorado and the Fitzsimons Redevelopment Authority. The CID⁴ awarded funding to Boulder-based Sophono, Inc. and Aurora-based PetiVir, Inc. based on its first solicitation. Sophono is receiving \$600,000 to further the development of its Alpha 1 Magnetic Bone Anchored Hearing System. PeptiVir will receive \$300,000 to further develop its universal flu vaccine.

- In April 2008, Colorado Governor Bill Ritter signed a five-year, \$26.5 million package that created a Bioscience and Life Science Fund. The fund provides grants to Colorado startup companies and research institutions seeking to commercialize new biotechnology drugs, medical devices, and nanotechnology.
- A total of \$7 million in grant funding in 2010 was awarded to several Colorado universities to improve drug discovery capabilities. CIMB received \$3.75 million to expand animal testing facilities and create a molecule library to aid researchers in identifying disease compounds. CSU's C2D2 received \$2.25 million to assist Colorado researchers with medicinal chemistry and pharmacology for identifying small molecule therapeutics. The University of Colorado at Denver Department of Pharmaceutical Sciences' Drug Discovery Center received \$1 million to create medicinal chemistry laboratories and a molecular compound library.

The ongoing demand for medical services and specialized treatments is driving facility expansions in Colorado. In 2010, the University of Colorado Hospital unveiled plans for a \$400 million expansion that will add a new emergency department and critical care wing, additional beds and operating rooms, diagnostic treatment centers, and additional parking facilities. The University of Colorado Cancer Center also announced plans for a \$20 million expansion, including renovation of the existing facility plus a 36,000-square-foot addition that will provide radiation treatment and chemotherapy. The two expansion projects and the addition of a new medical records system will ultimately support a significant number of permanent jobs at Anschutz Medical Campus. Builders will break ground on the project in early 2011, and construction could be completed in 2013.

The Patient Protection and Affordable Care Act of 2010 enacted the Qualifying Therapeutic Discovery Project (QTDP) and awards grants and tax credits to bioscience projects across the nation that demonstrate the potential to produce new- and cost-saving therapies, improve U.S. competitiveness, and support jobs. Since the program's inception, Colorado bioscience recipients received more than \$23 million in QTDP grants and tax credits and ranked 12th overall in the amount of money received under QTDP. A notable award, Broomfield-based ARCA Biopharma Inc. received a \$489,000 grant to support the first potential genetically-targeted therapy for heart failure. Other Metro Denver-based bioscience companies received multiple awards, including Allos Therapeutics Inc., ApogLogic Inc., Biodesix Inc., Clovis Oncology, Crestone Inc., EndoShape Inc., GlobelImmune Inc., Inviragen Inc., MicroPhage, Inc., Rocky Mountain Biosystems Inc., SomaLogic Inc., and Ventria Bioscience.

Bioscience Economic Profile

Medical Devices and Diagnostics

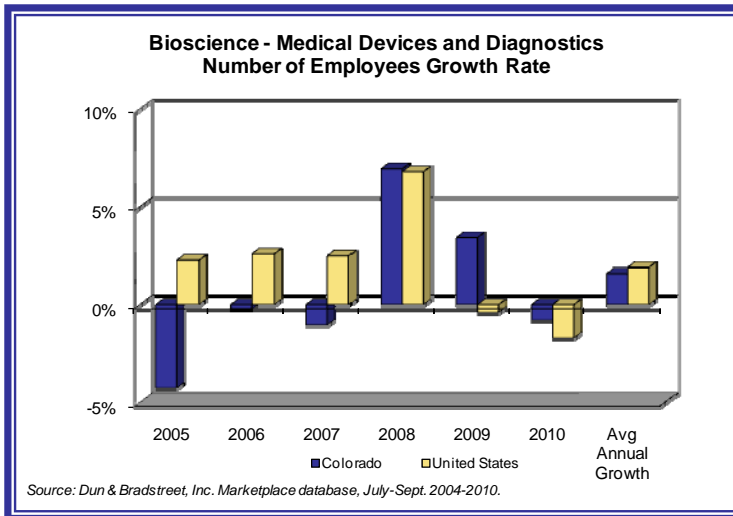
The medical devices and diagnostics subcluster includes companies that engineer, research, design, and manufacture medical equipment used in the healthcare industry. The medical devices and diagnostics subcluster consists of eight, six-digit North American Industry Classification System (NAICS) codes.

Colorado ranked sixth out of the 50 states for medical devices and diagnostics employment concentration in 2010. With direct employment in the medical devices and diagnostics subcluster of more than 11,080 workers, Colorado ranked 11th out of the 50 states in absolute employment.

	Colorado	U.S.
Direct Employment, 2010	11,080	447,930
Number of Direct Companies, 2010	350	14,910
One-Year Direct Employment Growth, 2009-2010	-0.5%	-1.7%
Five-Year Direct Employment Growth, 2005-2010	8.1%	9.8%
Avg. Annual Direct Employment Growth, 2005-2010	1.6%	1.9%
Direct Employment Concentration	0.5%	0.4%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2005-2010; Development Research Partners.

Medical Devices and Diagnostics Employment



- In 2010, the medical devices and diagnostics subcluster directly employed about 11,080 workers in Colorado.
- The medical devices and diagnostics subcluster accounted for 0.5 percent of Colorado's total employment base, compared with a 0.4 percent concentration nationally.
- Employment in the medical devices and diagnostics subcluster increased 8.1 percent between 2005 and 2010, compared with a 9.8 percent increase nationally.

- About 60 percent of medical devices and diagnostics employees manufactured surgical instruments and appliances, orthopedics, and prosthetics.
- Approximately 81 percent of Colorado medical devices and diagnostics employment was located in Boulder (31 percent), Jefferson (24 percent), El Paso (13 percent), and Arapahoe (13 percent) Counties.

Medical Devices and Diagnostics Wages

The 2009 average annual salary for medical devices and diagnostics workers in Colorado was \$63,920, compared with \$69,260 nationwide. Colorado's total medical devices and diagnostics payroll reached nearly \$712 million.

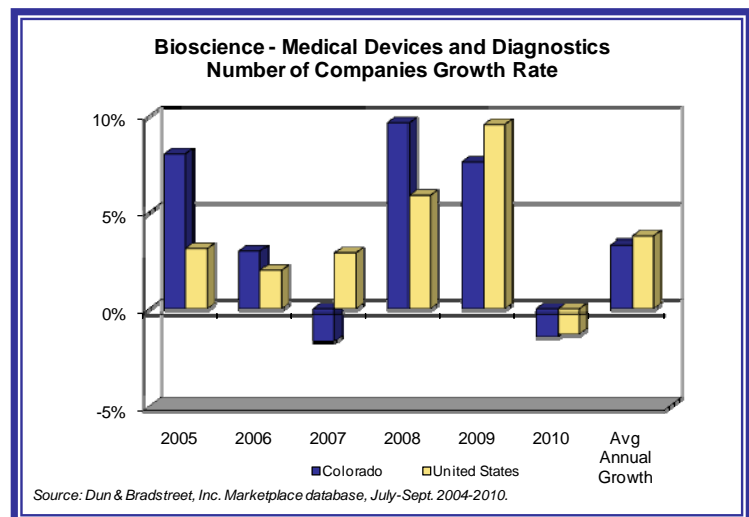
Colorado Occupational Salaries, 2009 Annual Average

Biochemists and Biophysicists	\$89,540
Biomedical Engineers	\$74,650
Medical and Clinical Laboratory Technologists	\$55,920
Medical and Clinical Laboratory Technicians	\$36,530

Source: U.S. Bureau of Labor Statistics, State Occupational Employment and Wage Estimates, May 2009, www.bls.gov.

Medical Devices and Diagnostics Companies

- Approximately 350 medical devices and diagnostics companies operated in Colorado in 2010.
- About 70 percent of Colorado's medical devices and diagnostics companies employed fewer than 10 workers, while 2.6 percent employed 250 or more.
- The number of medical devices and diagnostics companies in Colorado grew 3.4 percent per year between 2005 and 2010, compared with a 3.8 percent increase nationwide.
- About 57 percent of the state's medical devices and diagnostics companies were located in Boulder, Jefferson, Arapahoe, and El Paso Counties.



Major Medical Devices and Diagnostics Companies

- Baxa Corporation
www.baxa.com
- CaridianBCT, Inc.
www.caridianbct.com
- CEA Technologies
www.ceatechnologies.com
- Cochlear Americas
www.cochlearamericas.com
- ConMed Corporation
www.conmed.com
- Covidien
www.covidien.com
- Gambro
www.gambro.com
- Hach Company
www.hach.com
- HEI, Inc.
www.heii.com
- Medtronic Navigation
www.medtronicnavigation.com
- nSpire Health
www.nspirehealth.com
- Particle Measuring Systems
www.pmeasuring.com
- Sandhill Scientific
www.sandhillsci.com
- Sharklet Technologies, Inc.
www.sharklet.com
- SomaLogic, Inc.
www.somallogic.com
- Sorin Group USA, Inc.
www.sorin.com
- Sparton Medical Systems
www.spartonmedicalsystems.com
- Spectranetics Corp.
www.spectranetics.com
- Sunrise Medical
www.sunrisemedical.com
- Synthes, Inc.
www.synthes.com
- Water Pik, Inc.
www.waterpik.com
- Westone Laboratories
www.westone.com

Pharmaceuticals and Biotechnology

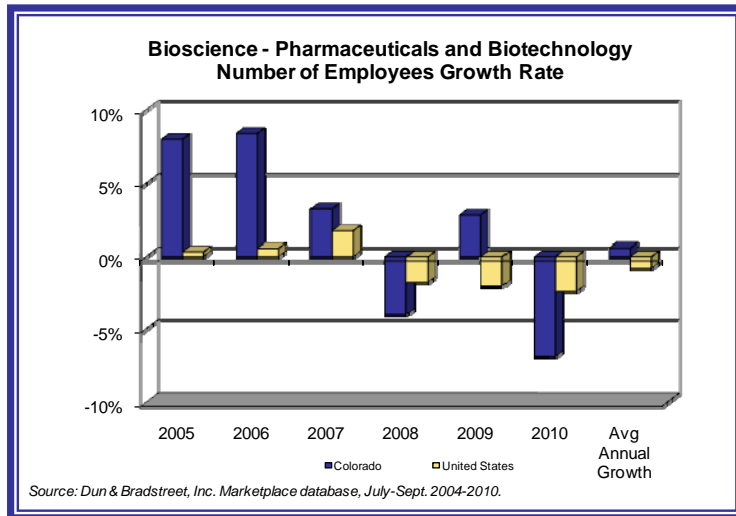
Pharmaceutical companies manufacture, research, and develop pharmaceutical drugs. Biotechnology companies utilize cellular and molecular biology and medicinal chemistry to develop and commercialize therapeutic medicines. The pharmaceuticals and biotechnology subcluster consists of four, six-digit North American Industry Classification System (NAICS) codes.

Colorado ranked 21st in the nation for its 2010 concentration of pharmaceuticals and biotechnology employment. Colorado's pharmaceuticals and biotechnology subcluster ranked 19th out of the 50 states in absolute employment.

	Colorado	U.S.
Direct Employment, 2010	5,410	441,160
Number of Direct Companies, 2010	290	14,070
One-Year Direct Employment Growth, 2009-2010	-6.8%	-2.4%
Five-Year Direct Employment Growth, 2005-2010	2.9%	-3.9%
Avg. Annual Direct Employment Growth, 2005-2010	0.6%	-0.8%
Direct Employment Concentration	0.3%	0.4%

*Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2005-2010;
Development Research Partners.*

Pharmaceuticals and Biotechnology Employment



- In 2010, the pharmaceuticals and biotechnology subcluster directly employed about 5,410 workers in Colorado.
- Pharmaceuticals and biotechnology companies accounted for 0.3 percent of Colorado's total employment base, compared with a 0.4 percent concentration nationally.
- Pharmaceuticals and biotechnology employment in Colorado increased 2.9 percent between 2005 and 2010, compared with a 3.9 percent decline nationwide.

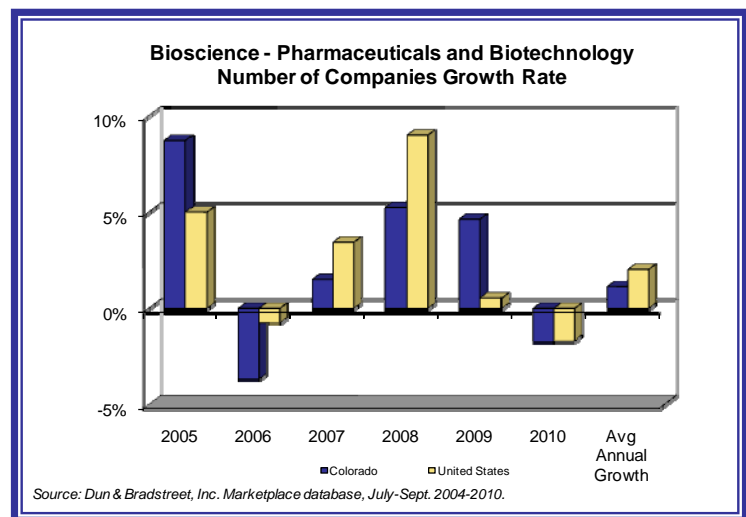
- About 62 percent of Colorado's pharmaceuticals and biotechnology employees worked in the pharmaceutical preparations industry.
- Nearly 72 percent of the employment in Colorado's pharmaceuticals and biotechnology subcluster was concentrated in Boulder (40 percent) and Larimer (18 percent) Counties and the City and County of Broomfield (14 percent).

Pharmaceuticals and Biotechnology Wages

The 2009 average annual salary for pharmaceuticals and biotechnology workers in Colorado was \$93,000, compared with \$105,390 nationwide. Total Colorado payroll in pharmaceuticals and biotechnology exceeded \$539 million in 2009. (Please see the "Medical Devices and Diagnostics Wages" section of this report for relevant occupational wage information.)

Pharmaceuticals and Biotechnology Companies

- About 290 pharmaceuticals and biotechnology companies operated in Colorado in 2010.
- The number of pharmaceuticals and biotechnology companies in Colorado increased 1.1 percent per year between 2005 and 2010, compared with a 2.1 percent increase nationally.
- About 74 percent of Colorado pharmaceuticals and biotechnology companies employed fewer than 10 people, while 1.7 percent employed 250 or more.
- Nearly 58 percent of companies in the pharmaceuticals and biotechnology subcluster were involved in medical or biological research.
- More than 58 percent of the pharmaceuticals and biotechnology subcluster companies were located in the City and County of Denver and in Boulder, Larimer, and Jefferson Counties.



Major Pharmaceuticals and Biotechnology Companies

- Allos Therapeutics, Inc.
www.allos.com
- Amgen Inc.
www.amgen.com
- Array Biopharma, Inc.
www.arraybiopharma.com
- Colorado Serum Company
www.colorado-serum.com
- GlobelImmune, Inc.
www.globeimmune.com
- Heska Corporation
www.heska.com
- Hospira, Inc.
www.hospira.com
- Inviragen, Inc.
www.inviragen.com
- miRagen Therapeutics
www.miragentherapeutics.com
- NextGen Pharmaceutical
www.nextgenpharma.com
- Quark Pharmaceuticals, Inc.
www.quarkpharma.com
- Roche Colorado Corp.
www.rochecolorado.com
- Sandoz, Inc.
www.sandoz.com
- Western States Biopharmaceuticals
www.westernstatesbiopharm.com

Key Reasons for Bioscience Companies to Locate in Colorado

Colorado is an emerging bioscience location offering:

1. The ability to recruit and retain technical and scientific employees

- Of Colorado's adult population, about 36 percent has completed a bachelor's or higher-level degree. That makes Colorado the second-most educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2009 American Community Survey)
- Colorado has 10 higher education institutions with bioscience programs. Biological sciences graduate programs at the University of Colorado at Boulder (CU-Boulder), the University of Colorado Denver, and Colorado State University (CSU) ranked within the nation's top 100 in 2010. The University of Denver also ranked in the nation's top 250 biological sciences graduate programs in 2010. (*U.S. News & World Report*, 2010)
- Colorado ranked 14th in the number of science and engineering graduate students per 1,000 individuals ages 25-34 years old in 2007. Universities such as the Colorado School of Mines, CU-Boulder, and CSU all offer competitive science and engineering doctorate programs and research facilities. (National Science Foundation, 2010)
- Colorado is home to numerous public and private bioscience research assets, including the Anschutz Medical Campus of the University of Colorado Denver; National Jewish Health; the Colorado Clinical and Translational Sciences Institute; the Barbara Davis Center for Childhood Diabetes; the Eleanor Roosevelt Institute; the Webb-Waring Institute for Cancer, Aging, and Antioxidant Research; the Centers for Disease Control and Prevention's National Center for Zoonotic, Vector-Borne, and Enteric Diseases in Fort Collins; and CSU's Seed Laboratory and Animal Reproduction and Biotechnology Laboratory.
- The Children's Hospital is part of one of the largest healthcare research complexes in the world and has continually ranked as one of the top pediatric hospitals in the nation. The hospital ranked in nine specialty areas in *U.S. News & World Report's* 2010 list of "America's Best Children's Hospitals" and ranked 10th in overall care in *Parents* magazine's 2009 listing of "10 Best Children's Hospitals". The hospital has received numerous awards including *ColoradoBIZ* magazine's Top Company in Healthcare and Best Companies to Work for in Colorado. (*U.S. News & World Report*, 2010; *Parents*, 2009)
- Poudre Valley Health System (PVHS) partnered with CSU and the Colorado Bioscience Association to form the Northern Colorado Health Research Coalition in 2008. The Coalition provides quarterly educational offerings and matches researchers, bioscience companies, and health professionals to specific research projects. In addition, PVHS has

dramatically increased its capacity for clinical trials for national and local bioscience companies and has developed its own capacity for innovation to improve patient medical care.

- HealthGrades gave numerous awards to Colorado hospitals in 2010. Centura Health-Penrose St. Francis Health Services in Colorado Springs ranked among “America’s 50 Best Hospitals” and joined Presbyterian/St. Luke’s Medical Center (Denver), The Medical Center of Aurora, North Colorado Medical Center (Greeley), and Poudre Valley Hospital (Fort Collins) as winners of HealthGrades’ 2010 Distinguished Hospital for Clinical Excellence Award. Nine of the state’s hospitals won awards for Outstanding Patient Experience and several won awards for excellence in various types of specialty care. (HealthGrades, Inc., 2010)
- *U.S. News & World Report’s* 2010-11 “Best Hospitals” recognized the University of Colorado Hospital among the nation’s best. The hospital ranked eighth in pulmonology, 15th in kidney disorders, 19th in rheumatology, and 44th in cancer care. The University of Colorado Cancer Center is the only nationally recognized adult cancer hospital in the Rocky Mountain region that partners with nearly all the cancer research scientists in Colorado to make basic discoveries relevant to patient care. The cancer center utilizes gene expression array technology to characterize certain cancers and offers clinical trials to bring leading edge treatments to cancer patients. (*U.S. News & World Report*, 2010)
- Denver’s Presbyterian/St. Luke’s Medical Center ranked among the nation’s top 50 cardiovascular hospitals in Thomson Reuters’ 2010 “50 Top Cardiovascular Hospitals” annual ranking and was among the top 20 teaching hospitals without a cardiovascular residency program. Using Medicare patient data, hospitals were assessed on efficiency measures, mortality and complication measures, and readmission rates for cardiovascular patients. (Thomson Reuters, 2010)
- Colorado had the nation’s 11th-highest rate of entrepreneurship in 2009, according to the annual *Kauffman Index of Entrepreneurial Activity*. The index measures the percentage of the adult, non-business owner population that start new businesses. Increased entrepreneur activity indicates a high level of innovation. (Ewing Marion Kauffman Foundation, 2010)
- Colorado ranked fourth in a Harris survey that asked more than 2,600 U.S. adults where they would most like to live. Notably, Colorado ranked highest as a desired home state for younger respondents—those ages 18 to 33—and respondents age 65 and older. A separate Harris survey ranked Denver ninth among the top-10 cities where adults would like to live. (Harris Interactive, 2010)

2. Affordable operating costs

- Bioscience companies can recruit affordable, productive employees as the state’s average wage for bioscience workers is slightly below the national average.
- Colorado offers a variety of real estate opportunities for bioscience companies, ranging from fully-furnished executive suites to build-to-suit laboratories and office space.
- The Colorado Science + Technology Park at Fitzsimons is a 184-acre development adjacent to the Anschutz Medical Campus. The business incubator in the Bioscience Park Center offers executive suites, build-to-suit laboratories, and office space. Since launching in July 2000, there are about 40 start-up companies in the incubator program at the Bioscience Park Center. At full buildout, the entire district and medical campus will offer 18 million square feet dedicated to bioscience, health, and research. (Fitzsimons Life Sciences District)
- CSU completed the 60,000-square-foot Research Innovation Center in 2010. With 21 molecular biology and chemistry laboratories, the Center will serve as a life science accelerator, fostering public-private collaboration among established and startup companies to conduct life science research and development. (Colorado State University)

3. A pro-business environment and competitive tax structure

- Colorado offers a simple corporate income tax structure based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the

state. Colorado's corporate income tax rate of 4.63 percent is one of the lowest and most competitive tax structures in the nation. (State of Colorado; The Tax Foundation)

- Two bills signed during the 2009 legislative session have helped grow Colorado's bioscience cluster. House Bill 09-1035 renewed and expanded sales and use tax refunds of up to \$50,000 paid on personal property for research and development of new products and technologies to foster growth of spin-off and startup companies. House Bill 09-1105 created the Colorado Innovation Investment Tax Credit (CIITC) providing up to \$750,000 in tax incentives for investors of life sciences startups and companies involved in research and development of new products, processes, and technologies.
- Manufacturing equipment used in clean room operations is exempt from state sales tax. (Exemption clarified in Colorado House Bill 07-1277)
- Colorado has one of the nation's most favorable business tax climates. The state ranked among the top 15 in the nation in the Tax Foundation's *2011 State Business Tax Climate Index*. The index measures how corporate and individual income taxes, property and sales taxes, and unemployment insurance tax affect economic activity. (The Tax Foundation, 2010)
- Colorado ranked 10th among the nation's best tax climates for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council's "Best Tax Index 2010." The index considers state taxes on 16 different measures including capital gains, property, income, and other factors to determine each tax system's overall cost to small business. (Small Business & Entrepreneurship Council, 2010)
- Colorado is the nation's third-best state for business, according to an annual ranking by CNBC.com. The ranking reflects states' composite scores on 40 metrics in 10 broad categories, and Colorado received top-10 rankings in the categories that measure quality of life (second), business friendliness (fourth), overall economy (eighth), and workforce (10th). (CNBC, 2010)
- Colorado has the eighth-best small business climate in the nation, according to the Small Business & Entrepreneurship Council. The council's annual "Small Business Survival Index" considers government spending, individual and corporate tax rates, healthcare costs, and regulatory burden. Colorado earned top-15 scores on the criteria for state and local excise taxes and taxes on capital gains and corporate income. (Small Business & Entrepreneurship Council, 2010)
- Colorado ranked second in the 2010 Beacon Hill Institute's *State Competitiveness Report*. The report classified states using 43 indicators in eight categories: business incubation, environmental policy, government and fiscal policy, human resources, infrastructure, openness, security, and technology. Colorado earned top-10 rankings for technology (third), business incubation (fourth), and infrastructure (fifth). (Beacon Hill Institute, 2010)
- Colorado ranked fourth overall on *Forbes'* 2010 "Best States for Business and Careers" list. Rankings were based on each state's regulatory environment, business costs, labor supply, quality of life, economic climate, and growth potential. Colorado received top-20 rankings for five of the six criteria, including top-10 rankings for labor supply (first overall), growth prospects and economic climate (sixth overall), and quality of life (ninth overall). (*Forbes*, 2010)
- Colorado is a top state for workforce development and training, and received recognition in innovation, infrastructure, and tax and regulation categories, according to the U.S. Chamber of Commerce and the National Chamber Foundation's *Enterprising States* report. States with top rankings support job growth and emphasize business-friendly policy, training, infrastructure, and entrepreneurship. (National Chamber Foundation, 2010)

4. Access to financial resources to fund research and development

- The Colorado Legislature created the Bioscience Discovery Evaluation Grant Program in 2006. Since the program's inception, 106 grants totaling \$10.8 million were distributed to research institutions and early-stage bioscience companies to advance research and development in a variety of areas ranging from the treatment of autoimmune disease and

portable tests for food contaminants to the detection of heart and lung diseases and cancer. (Colorado Office of Economic Development and International Trade, 2010)

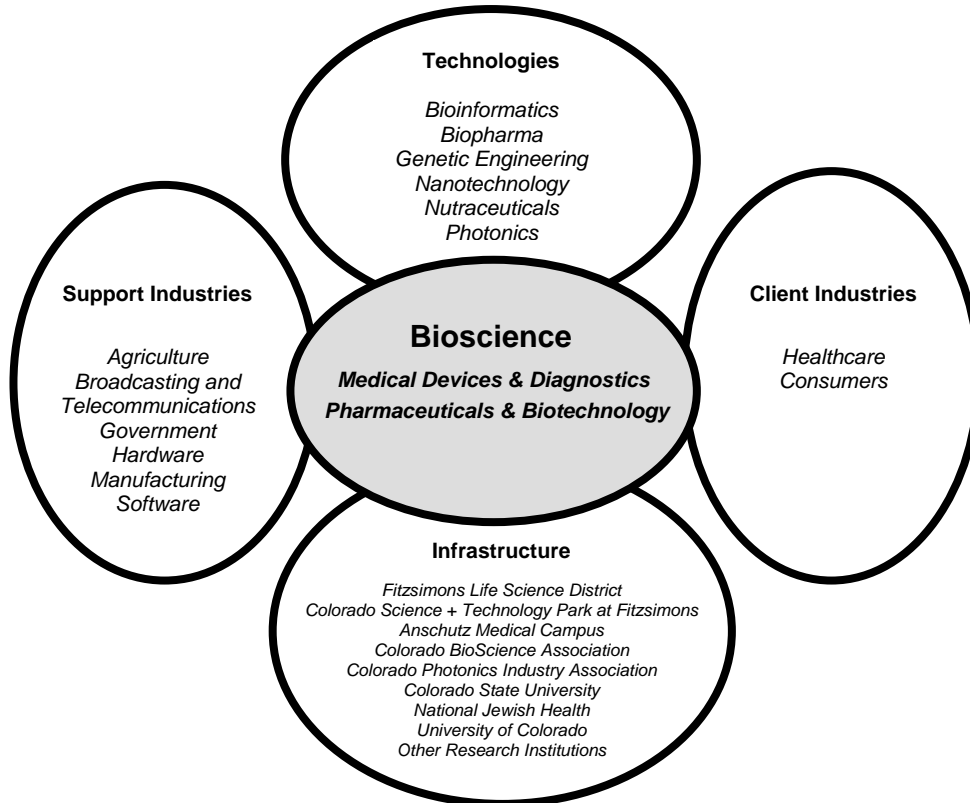
- Colorado Governor Bill Ritter signed two executive orders in 2010 to boost venture capital investment in bioscience startups. The first order forms the Colorado Advisory Committee on Venture Capital Investment, which will pair industry representatives with finance professionals who will meet quarterly with the governor. The second order creates the Colorado Bioscience and Clean Technology Investment Opportunity Index, which will serve as a clearinghouse of information on Colorado startups with opportunities for venture capital investment.
- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program, the Colorado Venture Capital Authority, and CTEK Angels and Venture Fund. (Contact the Colorado Office of Economic Development and International Trade for more information)
- Colorado has five venture firms currently investing in bioscience: Morgenthaler Ventures, Sequel Venture Partners, Tango/HCV, Boulder Ventures, and Aweida Venture Partners.
- Colorado ranked second in the nation for funds raised per worker from the Small Business Innovation Research (SBIR) grant program in 2009. More SBIR funding indicates a higher level of technological sophistication. (U.S. Small Business Administration, 2010; U.S. Bureau of Labor Statistics, 2010)
- The U.S. Department of Treasury's Community Development Financial Institutions (CDFI) Fund awarded a \$750,000 grant to the Colorado Enterprise Fund (CEF) to support small business lending in Colorado. CEF's award was the largest amount awarded out of 147 organizations across the nation receiving funding in 2010. CEF was designated as a CDFI in 1995, which is given to organizations successfully implementing innovative financing strategies for economic development and demonstrating financial capacity. (Colorado Enterprise Fund, 2010)
- The University of Colorado ranked 17th among public universities for research and development expenditures in fiscal year 2008. The university ranked even higher (eighth) for federally-funded research expenditures. CU won a total of \$535.6 million in research awards in fiscal year 2008. (National Science Foundation, 2010)
- The University of Colorado system ranked among the top-20 colleges and universities for total spending on science and engineering research in 2009. Combined, the University of Colorado campuses spent \$648 million on science and engineering-related research. (National Science Foundation, 2010)
- CSU received record research expenditures totaling \$302.8 million in fiscal year 2010 and was the second consecutive year that federal awards increased. The university also set a record for grant awards totaling \$285.6 million in fiscal year 2010. Increased funding indicates a high level of innovation among university scientists and researchers. (Colorado State University, 2010)
- The University of Colorado School of Medicine ranked 25th out of 126 academic medical schools for total National Institutes of Health (NIH) funding in fiscal year 2009. (National Institutes of Health, 2010)

Bioscience Industry Cluster Definition

NAICS Code*	NAICS Description	SIC Code	SIC Description
Medical Devices & Diagnostics			
325413	In-vitro diagnostic substance mfg.	2835	Diagnostic substances
333298	(P) All other industrial machinery mfg.	3559-9922	Pharmaceutical machinery
334510	Electromedical apparatus mfg.	3845	Electromedical equipment
334516	Analytical laboratory instrument mfg.	3826	Analytical instruments
334517	Irradiation apparatus mfg.	3844	X-ray apparatus & tubes
339112	Surgical & medical instrument mfg.	3841	Surgical & medical instruments
339113	Surgical appliance & supplies mfg.	3821	Laboratory apparatus & furniture
339113	Surgical appliance & supplies mfg.	3842	Orthopedics, prosthetics, & surgical appliances
339114	Dental equip. & supplies mfg.	3843	Dental equipment & supplies
Pharmaceuticals & Biotechnology			
325411	Medicinal & botanical mfg.	2833	Medicinals & botanicals
325412	Pharmaceutical preparation mfg.	2834	Pharmaceutical preparations
325414	Biological product (except diagnostic) mfg.	2836	Biological products except diagnostic
541711	Research & development in biotechnology	8731-01	Biological research
541711	Research & development in biotechnology	8731-9902	Medical research (commercial)
541711	Research & development in biotechnology	8733-01	Noncommercial biological research organization

*(P) indicates that only part of the NAICS industry category is represented in the industry cluster definition.
 Note: NEC indicates "not elsewhere classified."

Bioscience Industry Cluster Relationships



For additional information, contact us:



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