



## **BIOSCIENCE**

### ***Metro Denver and Northern Colorado Industry Cluster Profile***

The bioscience cluster is diverse in both size and scope including companies that research, develop, and distribute 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 healthcare and wellness, energy, information technology, and agriculture in the nine-county Metro Denver and Northern Colorado region.<sup>1</sup> Advances in biology and breakthroughs in human and animal health will continue to foster innovation and offer the nine-county region 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 about 14,110 bioscience workers in nearly 600 companies, the bioscience cluster offers numerous opportunities in both academic and clinical discovery and contributes to the region'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 1,010 workers in approximately 130 companies in the region and grew 2.1 percent between 2006 and 2011, compared with a 1.7 percent decline nationwide.

The nine-county region 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 Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology; the Linda Crnic Institute for Down Syndrome; the Marion Downs Hearing Center; 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 Biofrontiers Institute (formerly the Colorado Initiative in Molecular Biotechnology, or CIMB), the Center for Computational Biology, the Center for Translational Pharmacokinetics and Pharmacogenomics, and the Center for Pharmaceutical Biotechnology.

Evolving plans for the former Fitzsimons Army Medical Center will continue to transform the site into one of the nation's largest scientific and medical-related assets in the Rocky Mountain region. The 578-acre site in Aurora is the home of the Anschutz Medical Campus and the Fitzsimons Life Science District. Included at the site is the 184-acre Colorado Science + Technology Park at Fitzsimons, which offers 15 pre-built labs and access to more than 80 core laboratories, 21 executive office suites, and many shared services and amenities. Upon completion, the entire district and medical campus will account for approximately 18 million square feet of health- and science-related facilities. In 2011, Fitzsimons Redevelopment Authority broke ground on its three-story, 37,000-square-foot accelerator facility. The \$8 million facility is part of the Bioscience Park

<sup>1</sup> The nine-county Metro Denver and Northern Colorado region consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, and Weld Counties.

Center building expansion and space will be leased to existing tenants in the modest growth stage. Building completion is slated for 2012.

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, facilities for University Physicians, Inc, and houses the Schools of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health. Located adjacent to the Anschutz Medical Campus is the U.S. Department of Veterans Affairs (VA) Eastern Colorado Healthcare System hospital and facilities. Construction began in 2011 on the \$800 million VA Hospital that will replace the existing VA hospital and will be completed in 2015. The award-winning Children's Hospital Colorado is also adjacent to the campus and undergoing expansion.

Northern Colorado contributes to the region's growing biomedical center. Opportunities for research and development already exist through synergies with the cities of Fort Collins and Loveland, as well as CSU and Poudre Valley Health System (PVHS). CSU's Animal Cancer Center is an internationally recognized leader in clinical veterinary oncology and cancer research. In 2011, the World Small Animal Veterinary Association awarded the Center's founder Dr. Steve Withrow the International Award for Scientific Achievement for his pioneering work in cancer treatment for animals. The U.S. Department of Defense awarded CSU a three-year, \$1.3 million grant to develop an artificial wound-healing polymer for combat injuries. The material could be used to prevent infection and support overall cell growth. Further, CSU will receive a \$124.5 million bond package to finance renovations and upgrades to the campus, including \$7.5 million for improvements to the school's Animal Sciences Building. The enhancements will prepare the building for future expansion and support the needs of nearly 800 students majoring in agricultural sciences. 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 innovation capacity.

Many startup firms in the bioscience cluster stem from the region's incubators and accelerators. CSU's Research Innovation Center (RIC) is a hybrid academic research facility and bioscience incubator and includes a state-of-the-art, wet research laboratory capable of manufacturing clinical-grade vaccines or biologics. Further, the Rocky Mountain Innosphere (RMI) is the only innovation-based startup accelerator in Northern Colorado and provides assistance with raising capital and networking opportunities. The RMI supports bioscience, technology, and cleantech ventures through its FasTrac TechVenture entrepreneurial program developed by the Ewing Marion Kauffman Foundation. In 2011, CSU's School of Biomedical Engineering partnered with several bioscience industry leaders on a new educational collaboration. The Regulatory Affairs Industry/Academic Consortium will create online regulatory affairs courses and clinical trial management courses for the pharmaceutical, medical device, tissue, and in-vitro diagnostic industries to help prepare the bioscience workforce and promote future collaboration between academia and industry.

The presence of large research universities and supportive bioscience organizations and initiatives supports the nine-county region's bioscience cluster.

- Houston-based ConocoPhillips donated \$3.5 million to the University of Colorado Boulder's (CU-Boulder) Jennie Smoly Caruthers Biotechnology Building. The award secures ConocoPhillips the naming rights to a wing of the building that will house C2B2, the chemical and biological engineering departments, and the Renewable and Sustainable Energy Institute (RASEI). The ConocoPhillips Center for Energy Innovation could be occupied as early as 2012.
- The University of Colorado and local entrepreneurs partnered to form a statewide movement to connect new startup companies with entrepreneurial resources. The initiative—Startup Colorado—is part of the Startup America Partnership and will focus on six goals during the first year. The goals include spreading Boulder's entrepreneurial community to Fort Collins, Denver, and Colorado Springs, creating an entrepreneurial summer camp in Boulder for college students, supporting entrepreneurial education, evaluating barriers entrepreneurs face, engaging larger companies in the entrepreneurial ecosystem, and building the Startup Colorado website.

- The Office of Technology Transfer at the Colorado School of Mines extended its commercialization agreement with the Boulder Innovation Center for another three years. Since 2010, the Boulder Innovation Center accelerated the commercialization of technologies developed at the Colorado School of Mines using a database of 900 executives and entrepreneurs, conducted meetings with eight research teams, and started one company. The extended partnership will help the Boulder Innovation Center's mission to eventually partner with the University of Denver and CSU.

The Anschutz Medical Campus fosters collaboration among researchers to develop high-tech bioscience technologies.

- Campus researchers at the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology discovered a new technique to cultivate red blood cells, generating mature red blood cells in 14 days. While the technique is less than five years away from human clinic trials, the ability to make blood would benefit patients with combat injuries, cancer, and blood transfusion recipients.
- Two scientists at the Campus developed a biofeedback device to prevent prolonged sitting and promote weight loss. The Fit Companion is a Bluetooth-enabled sensor that ensures the user remains active throughout the day, tracks calories burned, and manages weight loss goals.
- Researchers at the University of Colorado Cancer Center discovered a new colon cancer biomarker that could diagnose the disease earlier. While a few years away, the enzyme could eliminate the need for colonoscopies.

The nine-county region's collaboration, bioscience expertise, and thriving research and development create an ideal location for private bioscience companies to establish and expand. Some key bioscience company announcements and new project developments in 2011 included:

- Boulder-based Array BioPharma announced a critical drug development deal with Swiss pharmaceutical company Genetech. Valued at \$685 million, the companies will develop two potential cancer drugs that inhibit a protein kinase—ChK-1—that stops cells from repairing genetic damage.
- Boulder-based miRagen Therapeutics approved a \$352 million agreement with French company Les Laboratoires Servier. Under the agreement, Servier will cover development and commercialization costs for three miRagen drug candidates designed to treat heart disease. The company could add additional positions under the Servier agreement.
- Broomfield-based ARCA biopharma, Inc. entered into an agreement with Switzerland-based Novartis under which Novartis acquired global patent rights to an undisclosed molecular target. ARCA will receive an upfront payment of \$2 million and is eligible to receive clinical, regulatory, and commercial milestones totaling \$17.5 million.
- Westminster-based Allos Therapeutics Inc. announced a licensing deal with English pharmaceutical company Mundipharma International Corp. Ltd. to co-commercialize Allos' cancer drug FOLOTYN®. Under the agreement, Mundipharma received the right to sell the drug outside of the U.S. and Canada and will share development costs with Allos. Allos began selling the drug in 2010 after becoming the first nine-county region biotechnology company to receive FDA approval to market a new medicine.
- Aurora-based Sharklet Technologies Inc. received a \$1.2 million National Institutes of Health grant to develop a microscopically textured material—modeled after shark skin—that naturally inhibits bacteria growth. The grant funds will help the company test its material on medical catheters, which can often cause infection.
- Centennial-based AlloSource broke ground on a new two-story building addition to their campus and will also include renovation of more than half of the company's existing facilities. The new building will include laboratory space, testing and research facilities, clean rooms, freezer storage and supply chain support, and equipment rooms. The renovation work will include freezer storage, receiving, material management, and cleaning and sterilization space. Both projects are slated for completion in 2012.
- Boulder-based Mosaic Biosciences Inc. raised \$1 million in venture capital to fund research into technologies that help a body generate new muscle, cartilage, bone, and other tissues. The technology has been effective in treating acute wounds

- Wisconsin-based MedPro Imaging Inc. expanded its U.S. presence by opening a new facility in Longmont. The company repairs and sells ultrasound equipment and instrument packages that allow hospitals to make their own repairs.
- Specialty chemical manufacturer Environmental Resource Associates (ERA) relocated its headquarters from Arvada to Golden and expanded to a new 66,000-square-foot facility in the Coors Technology Center. The company provides Certified Reference Materials and proficiency testing products to life science laboratories.
- Life science company Mitomics unveiled plans to move from its Fitzsimons Life Science District location to the district's Bioscience Park Center Expansion in mid-2012. The company develops early cancer detection products and revealed its prostate-cancer urine test that could replace conventional Prostate-Specific Antigen testing during the 2011 Rocky Mountain Life Science Investor and Partnering Conference in Denver.
- Broomfield-based Biodesix Inc. received \$20 million in financing to support ongoing commercialization activities for the company's first product VeriStrat®, a blood-based test that helps physicians guide treatment for patients with non-small cell lung cancer.
- Greenwood Village-based ValveXchange successfully performed three human surgeries using its Vitality™ heart valve system. The system inserts heart valves through veins without invasive surgery. The company will begin clinical trials in Europe in early 2012 with regulatory approval anticipated in late 2012 or 2013.
- Louisville-based GlobelImmune Inc. partnered with California-based Gilead Sciences Inc. to develop a hepatitis B therapy using GlobelImmune's Tarmogen yeast vector technology in conjunction with Gilead's anti-viral drug Viread to treat and eliminate the disease. Under the partnership, Gilead will support GlobelImmune's clinical trials and assume full responsibility for clinical development following successful clinical trials.

Companies in the nine-county region announced several mergers and acquisitions in 2011.

- Tokyo-based Terumo Corp. acquired Lakewood-based CaridianBCT. The Japanese medical device manufacturer will combine its transfusion products business with Caridian's blood collection and processing equipment operations. The two companies will operate independently until spring 2012 when they will combine to form blood component technology company Terumo BCT and will be based in Lakewood.
- Germany-based International Chemical Investors Group acquired Roche Colorado Corp. and will operate the Roche manufacturing facility in Boulder as Corden Pharma Colorado Inc. Under the agreement, Roche will have improved access to pharmaceutical components and contract manufacturing offerings.
- In an effort to expand its portfolio of products, Illinois-based Baxter International Inc. acquired Englewood-based Baxa Corp. Baxter manufactures recombinant and plasma-based proteins to treat bleeding disorders, develops plasma-based therapies to treat immune deficiencies, and provides products for regenerative medicine.
- The University of Colorado Hospital and PVHS unveiled plans for a joint operating agreement. The combination of higher healthcare costs and healthcare workforce shortages created the need for the joint operating agreement which will combine a majority of their operations. Both hospital systems will continue to have local boards and separate assets.

Government support complements existing public and private investments in the region's active 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, 116 grants totaling \$19 million were distributed to research institutions and early-stage bioscience companies. In fiscal year (FY) 2010-11, 41 grants were awarded in three program areas, including 30 proof-of-concept grants, eight early-stage company grants, and three Commercialization Infrastructure grants.
- Formed in 2009 through the BDEGP, 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 region's 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. As of 2011, the CID4 invested \$1.25 million in project companies and awarded an additional \$1.3 million in third-party financing to project companies. In 2011, the CID4 awarded funding and management assistance to Fort Collins-based Veterinary Emerging Technologies Development (VetDC) and Longmont-based Flashback Technologies, Inc. to support VetDC's Lead Molecule, VDC 1101, and development and Flashback Technologies proprietary framework for real-time, physiological data.

- In May 2011, Colorado Gov. John Hickenlooper signed legislation that created the Clean Technology Discovery Evaluation Grant Program. The program requires the state to divert 50 percent of any future increase in income tax collections from businesses in the bioscience industry to support research and development of new products and technologies, early-stage companies, and infrastructure. The program could generate as much as \$2 million each year in new seed money for the bioscience industry.

## ***Bioscience Economic Profile***

### **Medical Devices and Diagnostics**

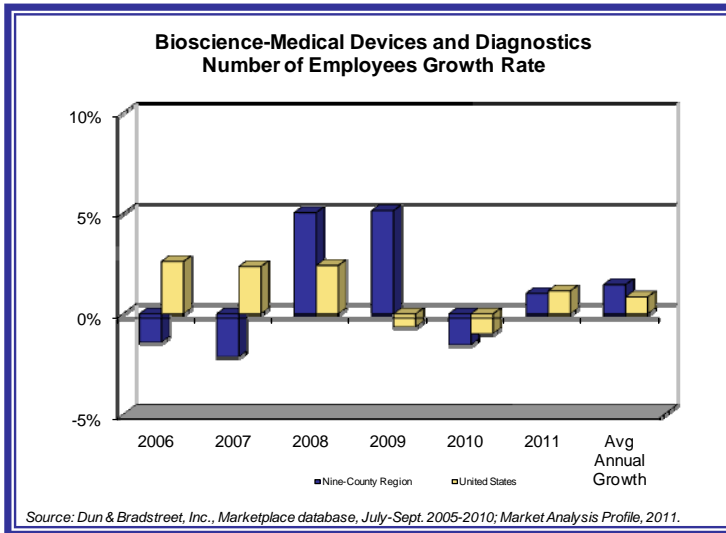
The medical devices and diagnostics subcluster includes companies that engineer, research, design, and manufacture medical equipment used in the healthcare industry. The medical devices and diagnostics subcluster consists of eight, six-digit North American Industry Classification System (NAICS) codes.

***The nine-county region ranked eighth out of the 50 largest metro areas for medical devices and diagnostics employment concentration in 2011.*** With direct employment in the medical devices and diagnostics subcluster of about 9,480 employees, the region ranked eighth in absolute employment. About 91 percent of Colorado's medical devices and diagnostics employees worked in the nine-county region.

	<u><b>Nine-County Region</b></u>	<u><b>U.S.</b></u>
Direct Employment, 2011	9,480	438,120
Number of Direct Companies, 2011	330	17,830
One-Year Direct Employment Growth, 2010-2011	1.0%	1.1%
Five-Year Direct Employment Growth, 2006-2011	7.5%	4.3%
Avg. Annual Direct Employment Growth, 2006-2011	1.5%	0.8%
Direct Employment Concentration	0.5%	0.3%

*Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2006-2010; Market Analysis Profile, 2011; Development Research Partners.*

## Medical Devices and Diagnostics Employment



- The medical devices and diagnostics subcluster directly employed about 9,480 workers in the nine-county region in 2011.
- Medical devices and diagnostics companies accounted for 0.5 percent of the region's total employment base, compared with a 0.3 percent employment concentration nationally.
- Employment growth in the region's medical devices and diagnostics subcluster averaged 1.5 percent per year over the past five years. Total medical devices and diagnostics employment increased 7.5 percent between 2006 and 2011.
- More than 68 percent of the region's medical devices and diagnostics

employees manufactured surgical instruments and appliances, orthopedics, and prosthetics. Analytical instrument manufacturers employed another 12 percent.

- Nearly 73 percent of the region's medical devices and diagnostics employees worked in Boulder (32 percent), Jefferson (29 percent), and Larimer (12 percent) Counties.

## Medical Devices and Diagnostics Wages

The 2010 average annual salary for medical devices and diagnostics subcluster workers in the region was \$66,950, compared with \$72,450 nationwide. Given this average salary, the region's medical devices and diagnostics payroll totaled \$628 million in 2010.

### Denver-Aurora-Broomfield MSA Occupational Salaries, 2010 Annual Average

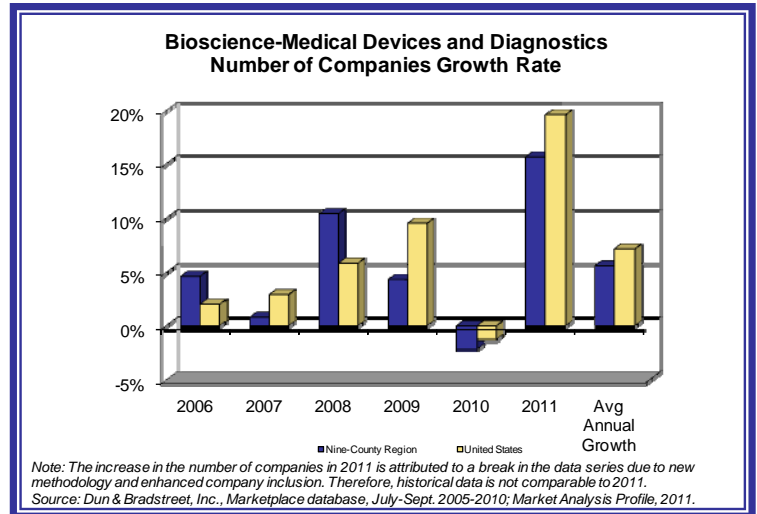
Natural Sciences Managers	\$122,450
Biochemists and Biophysicists	\$89,510
Chemists	\$70,460
Biomedical Engineers	\$65,970
Medical and Clinical Laboratory Technologists	\$57,180
Medical and Clinical Laboratory Technicians	\$43,140

Note: Mean annual salary data is for the 10-county Denver-Aurora-Broomfield Metropolitan Statistical Area (MSA) consisting of Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson, and Park Counties.

Source: U.S. Bureau of Labor Statistics, Metropolitan Area Occupational Employment and Wage Estimates, May 2010, [www.bls.gov](http://www.bls.gov).

## Medical Devices and Diagnostics Companies

- Approximately 330 medical devices and diagnostics companies operated in the nine-county region in 2011.
- About 63 percent of the region's medical devices and diagnostics companies employed fewer than 10 workers, while 1.8 percent employed 250 or more.
- More than 56 percent of the region's medical devices and diagnostics companies manufactured surgical instruments and appliances, orthopedics, and prosthetics.
- Nearly 56 percent of the region's medical devices and diagnostics companies were located in Boulder (21 percent), Jefferson (20 percent), and Arapahoe (15 percent).



## Major Medical Devices and Diagnostics Companies

- Baxa Corporation  
[www.baxa.com](http://www.baxa.com)
- CaridianBCT, Inc.  
[www.caridianbct.com](http://www.caridianbct.com)
- Cochlear Americas  
[www.cochlearamericas.com](http://www.cochlearamericas.com)
- ConMed Corporation  
[www.conmed.com](http://www.conmed.com)
- Covidien  
[www.covidien.com](http://www.covidien.com)
- Gambro  
[www.gambro.com](http://www.gambro.com)
- Hach Company  
[www.hach.com](http://www.hach.com)
- HEI, Inc.  
[www.heii.com](http://www.heii.com)
- Medtronic Surgical Technologies  
[www.medtronic.com](http://www.medtronic.com)
- nSpire Health, Inc.  
[www.nspirehealth.com](http://www.nspirehealth.com)
- Particle Measuring Systems  
[www.pmeasuring.com](http://www.pmeasuring.com)
- Sandhill Scientific  
[www.sandhillsci.com](http://www.sandhillsci.com)
- Sharklet Technologies, Inc.  
[www.sharklet.com](http://www.sharklet.com)
- SomaLogic, Inc.  
[www.somalogic.com](http://www.somalogic.com)
- Sorin Group USA, Inc.  
[www.sorin.com](http://www.sorin.com)
- Sparton Medical Systems  
[www.sparton.com](http://www.sparton.com)
- Sunrise Medical  
[www.sunrisemedical.com](http://www.sunrisemedical.com)
- Water Pik, Inc.  
[www.waterpik.com](http://www.waterpik.com)

## Pharmaceuticals and Biotechnology

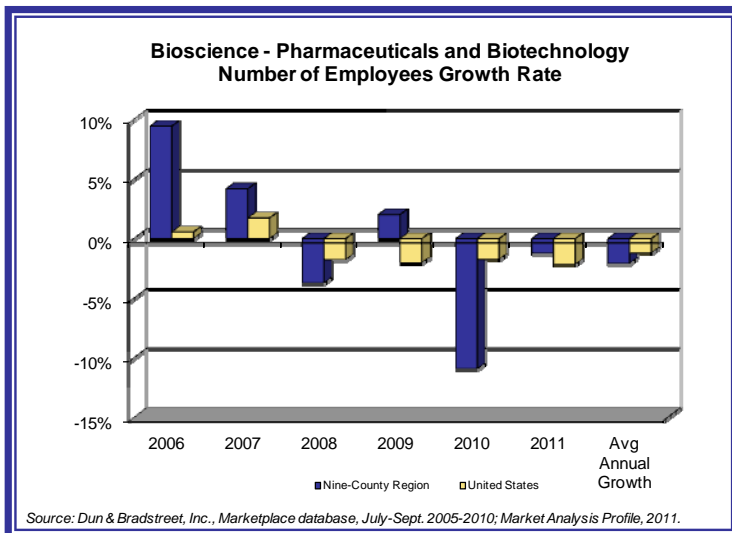
Pharmaceutical companies manufacture, research, and develop pharmaceutical drugs. Biotechnology companies utilize cellular and molecular biology and medicinal chemistry to develop and commercialize therapeutic medicines. The pharmaceuticals and biotechnology subcluster consists of four, six-digit North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

***The nine-county region ranked 21st out of the 50 largest metro areas for pharmaceuticals and biotechnology employment concentration in 2011.*** With direct employment of about 4,630 pharmaceutical and biotechnology workers, the region ranked 16th in absolute employment. About 90 percent of Colorado's pharmaceuticals and biotechnology employees worked in the nine-county region.

	<b>Nine-County Region</b>	<b>U.S.</b>
Direct Employment, 2011	4,630	434,500
Number of Direct Companies, 2011	270	16,800
One-Year Direct Employment Growth, 2010-2011	-1.2%	-2.2%
Five-Year Direct Employment Growth, 2006-2011	-9.9%	-5.9%
Avg. Annual Direct Employment Growth, 2006-2011	-2.1%	-1.2%
Direct Employment Concentration	0.3%	0.3%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2006-2010; Market Analysis Profile, 2011; Development Research Partners.

## Pharmaceuticals and Biotechnology Employment

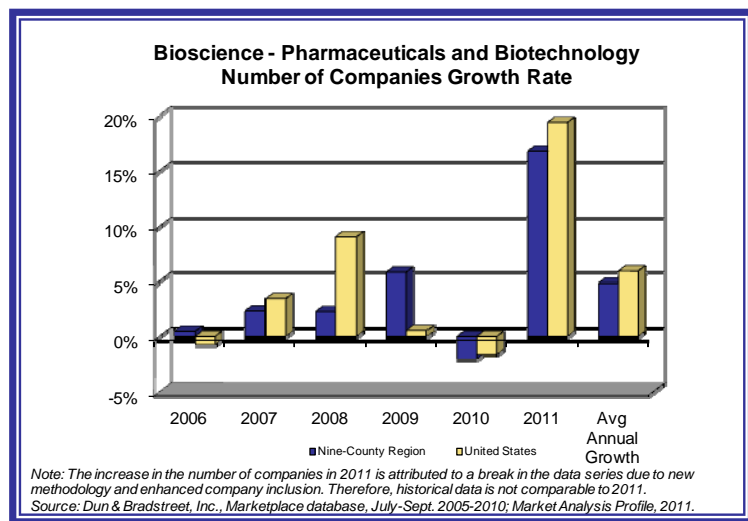


- In 2011, the pharmaceuticals and biotechnology subcluster directly employed about 4,630 workers in the nine-county region.
- The most recent recession significantly impacted the pharmaceuticals and biotechnology subcluster. Nine-county region employment declined in 2010 and remained sluggish through 2011 as a result of company consolidations and financial restructuring.
- Pharmaceuticals and biotechnology companies employed 0.3 percent of the region's total employment base, the same employment concentration as the national average for the subcluster.

- Nearly 67 percent of the region's pharmaceuticals and biotechnology employees worked in the pharmaceutical preparations industry.
- More than 77 percent of the region's pharmaceuticals and biotechnology employees worked in Boulder (38 percent) and Larimer (22 percent) Counties, and in the City and County of Broomfield (17 percent).

## Pharmaceuticals and Biotechnology Companies

- About 270 pharmaceuticals and biotechnology companies operated in the nine-county region in 2011.
- Nearly 72 percent of the region's pharmaceuticals and biotechnology companies employed fewer than 10 people, while 1.8 percent employed 250 or more.
- Approximately 78 percent of the region's pharmaceuticals and biotechnology companies were involved in biological research (42 percent) and pharmaceutical preparations (35 percent).
- More than 54 percent of the region's pharmaceuticals and biotechnology companies were located in Boulder (20 percent) and Larimer (18 percent) Counties, and in the City and County of Denver (16 percent).



## Pharmaceuticals and Biotechnology Wages

The 2010 average annual salary for pharmaceuticals and biotechnology employees in the nine-county region was \$94,770, compared with \$105,360 nationwide. Given this average salary, nine-county pharmaceuticals and biotechnology payroll exceeded \$444 million in 2010. (Please see the "Medical Devices and Diagnostics Wages" section of this report for relevant occupational wage information.)

### Major Pharmaceuticals and Biotechnology Companies

- Allos Therapeutics, Inc.  
[www.allos.com](http://www.allos.com)
- Amgen Inc.  
[www.amgen.com](http://www.amgen.com)
- Array BioPharma Inc.  
[www.arraybiopharma.com](http://www.arraybiopharma.com)
- Colorado Serum Company  
[www.colorado-serum.com](http://www.colorado-serum.com)
- Corden Pharma Colorado Inc.  
[www.cordenpharmacolorado.com](http://www.cordenpharmacolorado.com)
- GlobelImmune, Inc.  
[www.globeimmune.com](http://www.globeimmune.com)
- Heska Corporation  
[www.heska.com](http://www.heska.com)
- Hospira, Inc.  
[www.hospira.com](http://www.hospira.com)
- Inviragen, Inc.  
[www.inviragen.com](http://www.inviragen.com)
- miRagen Therapeutics  
[www.miragentherapeutics.com](http://www.miragentherapeutics.com)
- N30 Pharmaceuticals  
[www.n30pharma.com](http://www.n30pharma.com)
- Quark Pharmaceuticals, Inc.  
[www.quarkpharma.com](http://www.quarkpharma.com)
- Sandoz, Inc.  
[www.sandoz.com](http://www.sandoz.com)
- TOLMAR, Inc.  
[www.tolmar.com](http://www.tolmar.com)

## Key Reasons for Bioscience Companies to Locate in the Nine-County Region

The region 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 highly educated state in the nation behind Massachusetts. (U.S. Census Bureau, 2010 American Community Survey)
- Colorado has 10 higher education institutions with bioscience programs. Biological sciences graduate programs at the University of Colorado 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*, 2011)
- Colorado ranked 14th in the number of science and engineering graduate students per 1,000 individuals ages 25 to 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, 2011)
- Jones Lang LaSalle's 2011 *Life Sciences Cluster Report* named Metro Denver an emerging bioscience market and ranked the region as the 12th-best location for life science ventures. Researchers ranked 16 established and emerging bioscience markets based on their academic and research facilities, government and venture capital funding for bioscience, research and development spending, and depth and concentration of the science-based workforce. Metro Denver earned top 10 rankings for science and engineering students per 1,000 (seventh) and state research and development spending (ninth). (Jones Lang LaSalle, 2011)
- The University of Colorado's Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology aims to understand stem cell biology to develop new therapies for debilitating diseases such as juvenile diabetes, cancer, liver and vascular diseases, blood disorders, and neuronal diseases. Established in 2006, the Center focuses on four areas

of stem cell research including stem cell biology, stem cells and cancer, stem cells and disease, and stem cells and regenerative medicine.

- 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.
- Metro Denver ranked eighth on *Forbes'* list of "America's Biggest Brain Magnets" in 2011. The ranking selected metro areas with at least one million residents and used Census data to measure each area's increase in college-educated population between 2007 and 2009. (*Forbes*, 2011)
- *Forbes* ranked Metro Denver seventh among "America's Best Cities for Young Professionals." Rankings of the nation's 100 largest metropolitan areas were based on seven factors ranging from unemployment rate and average salary for college graduates to affordability and public company presence. Denver received particular accolades for its highly educated population, healthy job growth rate, and large concentration of small businesses. (*Forbes*, 2011)
- Colorado ranked among the top five states in the nation for entrepreneurship in 2010, according to the annual *Kauffman Index of Entrepreneurial Activity*. The index measures the percentage of the adult, non-business owner population that starts new businesses. Colorado's fifth-highest ranking indicates increased innovation with the ability to attract potential investors. (Ewing Marion Kauffman Foundation, 2011)
- *The Daily Beast* ranked Denver first among the nation's 30 fittest cities. The ranking reflects each city's percentage of physically active residents, the percentage of residents in good or excellent health, the percentage of residents characterized as obese, each city's placement on the Gallup-Healthways "Well-Being Index," and healthy behavior. (*The Daily Beast*, 2011)
- Denver ranked fourth among the nation's "Top 10 Best Cities for Recent College Graduates," according to a 2011 ranking by Apartments.com and CareerRookie.com. The ranking considered each city's average apartment rent, availability of early-career jobs, and concentration of youth in their early- to mid-twenties. (Apartments.com, 2011; CareerRookie.com, 2011)
- Colorado ranked fifth in a Harris survey that asked more than 2,400 U.S. adults where they would most like to live. Colorado ranked third-highest as a desired home state for younger respondents ages 18 to 34. Denver ranked as the 10th-most favored city in a separate Harris survey. (Harris Interactive, 2011)
- The U.S. Department of Labor awarded the Colorado Department of Labor and Employment (CDLE) a \$5 million grant in 2011 to retrain and prepare 800 workers for careers in advanced manufacturing, information technology, and science, technology, engineering, and math (STEM) capabilities. The state will partner with local workforce centers, businesses, and nonprofit organizations to target workers for training and skill advancement.

## **2. Affordable operating costs**

- Bioscience companies can recruit affordable, productive employees as the nine-county average wage for bioscience workers is slightly below the national average.
- The nine-county region offers a variety of real estate opportunities for bioscience companies, ranging from fully-furnished executive suites to build-to-suit labs 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 is home to about 50 startup companies and offers turnkey facilities for research, business development, and product commercialization. At full buildout, more than 18 million square feet of space will be dedicated to bioscience, healthcare, education, and research. (Fitzsimons Life Sciences District)

- Located on CSU's Foothills Campus, the Judson M. Harper Research Complex is a life science park dedicated to bioscience research, preclinical testing, technology development, and product commercialization. The Complex houses the Infectious Disease Research Center; Rocky Mountain Regional Biocontainment Laboratory; Arthropod-borne and Infectious Diseases Laboratory (AIDL); the Centers for Disease Control and Prevention's National Center for Zoonotic, Vector-borne, and Enteric Diseases; the USDA-APHIS National Wildlife Research Center; and the newly completed \$53 million Research Innovation Center to develop bioscience products. (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. Along with few regulatory burdens, 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)
- The Colorado Innovation Network (COIN)—a privately funded alliance designed to foster new technology development across the state's existing and emerging industries—launched in 2011. COIN is part of Gov. John Hickenlooper's economic development plan, Blueprint Colorado, and will eventually operate from a business incubator in the Denver Tech Center.
- Manufacturing equipment used in clean room operations is exempt from state sales tax. (Exemption clarified in Colorado House Bill 07-1277)
- The Tax Foundation ranked Colorado's combined state and local tax burden 12th lowest in the nation in 2009. The percentage of a Coloradan's income paid to state and local taxes represented 8.6 percent of resident per capita income, compared with 9.8 percent of national per capita income. (The Tax Foundation, 2011)
- Colorado has the nation's 10th-best tax climate for small businesses and entrepreneurs, according to the Small Business & Entrepreneurship Council's "Business Tax Index 2011." The index examines each state's tax policies on 18 metrics ranging from rates of property, income, and sales taxes to unemployment insurance taxes and levies on online commerce. (Small Business & Entrepreneurship Council, 2011)
- Colorado has one of the nation's most small business friendly environments. The state ranked among the top 10 in the Small Business & Entrepreneurship Council's 2011 "Small Business Survival Index," which considers property rights, healthcare and energy costs, individual and corporate tax rates, and government spending. The state ranked most favorably for taxes on capital gains and corporate income. (Small Business & Entrepreneurship Council, 2011)
- Colorado ranked fifth among the nation's top states for business, according to an annual ranking by *CNBC*. The ranking evaluated each state's composite scores on 43 metrics in 10 broad categories, and Colorado earned top 10 rankings in the categories that measure business friendliness (sixth), quality of life (seventh), and workforce (seventh). (*CNBC*, 2011)
- Metro Denver ranked ninth on *Forbes'* 2011 list of the "Best Places for Business and Careers." Criteria for the ranking included costs of doing business, educational attainment, and projected economic growth. Four other Colorado metropolitan areas ranked among the top 50. The Fort Collins metro area ranked fifth overall, Colorado Springs ranked 30th, Greeley ranked 42nd, and Boulder ranked 44th. (*Forbes*, 2011)
- Colorado ranked second in entrepreneurship and innovation and seventh in workforce development and training, according to the U.S. Chamber of Commerce and the National Chamber Foundation's *Enterprising States* report. The state also received notable recognition in the infrastructure and tax and regulation categories. States with top rankings support job growth and emphasize business-friendly policy, training, infrastructure, and entrepreneurship. (National Chamber Foundation, 2011)

#### **4. Access to financial resources to fund research and development**

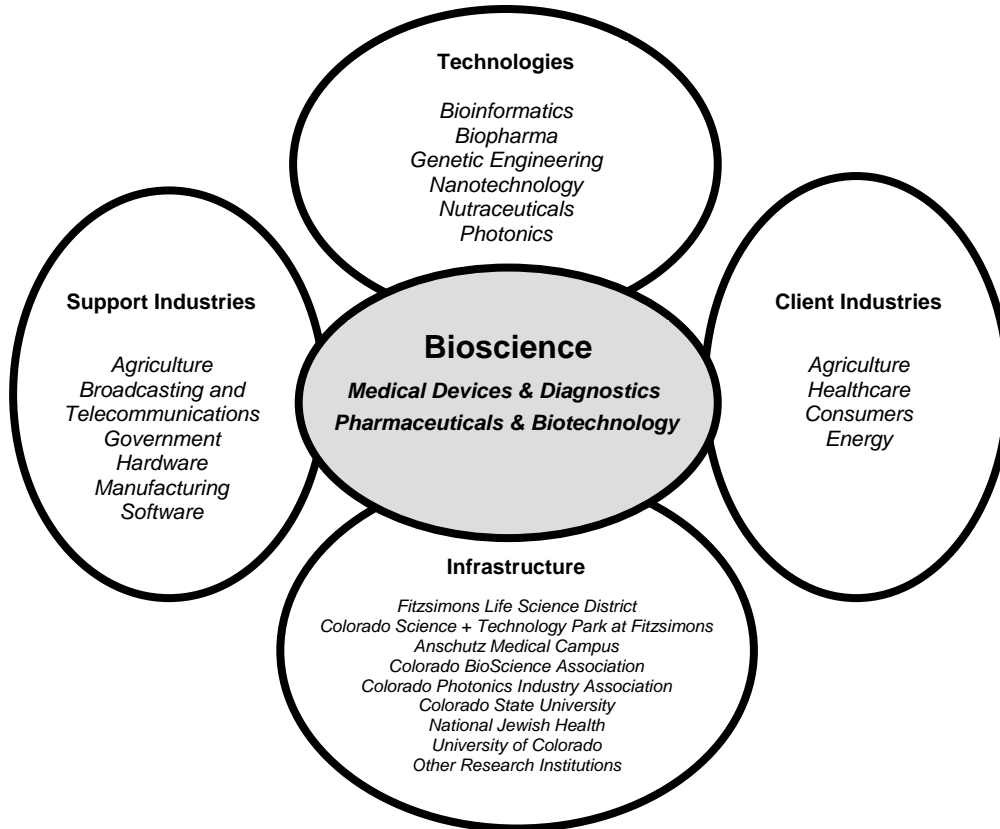
- The Colorado Legislature created the Bioscience Discovery Evaluation Grant Program in 2006. Legislation passed in 2011 extended the \$56 million program through 2018 and diverts \$5 million in gambling tax revenues annually to fund bioscience startups and technology commercialization projects. Since the program's inception, 116 grants totaling \$19 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 cancer and cardiac disease to the detection of food and water-borne illnesses. (Colorado Office of Economic Development and International Trade, 2011)
- Two bills signed during the 2011 legislative session will ensure future growth and success of the region's bioscience cluster. Senate Bill 11-047 established the Clean Technology Discovery Evaluation Grant Program—a sustainable funding program requiring the state to divert 50 percent of any future increase in income tax collections from businesses in the bioscience industry—to support research and development of new products and technologies, early-stage companies, and develop infrastructure. The new law could generate as much as \$2 million each year in new seed money for the bioscience industry. House Bill 11-1045 retained the Colorado Innovation Investment Tax Credit (CIITC), which provides 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.
- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program and the Colorado Venture Capital Authority (Contact the Colorado Office of Economic Development and International Trade for more information)
- The nine-county region has three venture firms currently investing in bioscience: Boulder Ventures, Morgenthaler Ventures, and Tango/HCV.
- Colorado ranked third in the nation for funds raised per worker from the Small Business Innovation Research (SBIR) grant program and received 284 grants totaling more than \$95.4 million in 2010. More SBIR funding indicates a higher level of technological sophistication. (U.S. Small Business Administration, 2011; U.S. Bureau of Labor Statistics, 2011)
- The University of Colorado system received record research and development expenditures totaling more than \$684 million in fiscal year 2009. The university ranked 12th among the nation's public universities for research and development awards and ranked fifth for federally funded research expenditures. (National Science Foundation, 2011)
- The University of Colorado School of Medicine ranked 27th out of 129 academic medical schools for total National Institutes of Health (NIH) funding in fiscal year 2010. (National Institutes of Health, 2011)

## Bioscience Industry Cluster Definition

NAICS Code*	NAICS Description	SIC Code	SIC Description
<b>Medical Devices &amp; Diagnostics</b>			
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 appl.
339114	Dental equip. & supplies mfg.	3843	Dental equipment & supplies
<b>Pharmaceuticals &amp; Biotechnology</b>			
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.

## Bioscience Industry Cluster Relationships



For additional information, contact us:



**Metro Denver**  
Economic Development Corporation

1445 Market Street  
Denver, CO 80202-1790  
303.620.8092  
email: [info@metrodenver.org](mailto:info@metrodenver.org)  
[www.metrodenver.org](http://www.metrodenver.org)  
[www.metrodenverGIS.org](http://www.metrodenverGIS.org)