

Industry Overview

The nine-county Metro Denver and Northern Colorado region¹ is home to a vibrant and growing bioscience hub of research institutions, life science expertise, and more than 670 bioscience-related companies that are developing breakthroughs in life-saving treatments. More than 81 percent of the state's bioscience firms are located along the Front Range, with the center of the Rocky Mountain region's life science center located at the Fitzsimons Innovation Campus and the adjacent Anschutz Medical Campus. As one of the largest bioscience developments in the nation, the \$5.4 billion project encompasses 578 acres and more than six million square feet of corporate and bioresearch space.



The region's top-rated research and educational institutions and entrepreneurial infrastructure offers access to a high concentration of top-tier life science talent. Further, the region's supportive business climate and competitive tax structure have facilitated research, development, and manufacturing for bioscience companies. The region's bioscience cluster is a major contributor to the state's economy. More than 1,270 medical devices, diagnostics, and pharmaceuticals are in development and approved by companies headquartered in Colorado. In fact, Colorado's biotechnology and pharmaceutical industry alone adds as much as \$14.5 billion to the state's economy, according to Pharmaceutical Research and Manufacturers of America.

The bioscience cluster is diverse in both size and scope, including companies that research, develop, and distribute products and services ranging from cutting-edge pharmaceuticals, medical devices, and diagnostics to veterinary supplies and chemical testing kits. The bioscience industry contributes to the growth and advancements of other industries including healthcare and wellness, energy, information technology, and agriculture in the region. Further, digital health is a congruent sector with substantial growth and national recognition. Many bioscience organizations, including the Colorado BioScience Association, are integrating healthcare innovation and technologies into their business strategies.

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 15,870 bioscience workers in more than 670 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 this 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 nearly 1,260 workers in 110 companies in the region and grew an average of 7 percent per year between 2011 and 2016, compared with a 0.7 percent increase nationwide.

The nine-county region is home to numerous public and private bioscience research and innovation assets, including:

- The Anschutz Medical Campus of the University of Colorado Denver (CU Denver)
- The Division of Biomedical Informatics & Personalized Medicine at CU Denver
- The Barbara Davis Center for Diabetes
- The BioFrontiers Institute at the University of Colorado Boulder (CU Boulder)
- The Centers for Disease Control and Prevention's National Center for Emerging and Zoonotic Infectious Diseases Division of Vector-Borne Diseases in Fort Collins
- The Charles C. Gates Center for Regenerative Medicine
- The Colorado Clinical and Translational Sciences Institute
- Colorado State University's (CSU) Institute for Biologic Translational Therapies
- CSU's Seed Laboratory and Animal Reproduction and Biotechnology Laboratory

¹ The nine-county region is comprised of two principal areas, Metro Denver and Northern Colorado. Metro Denver consists of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson counties. Northern Colorado consists of Larimer and Weld counties.

- The Linda Crnic Institute for Down Syndrome
- The Marion Downs Center
- National Jewish Health
- The Rocky Mountain Lions Eye Institute
- The Webb-Waring Center

Medical Devices and Diagnostics Economic Profile

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

The nine-county region ranked 11th out of the 50 largest metro areas for medical devices and diagnostics employment concentration in 2016. With direct employment in the medical devices and diagnostics subcluster of about 11,160 employees, the region ranked eighth.² Nearly 82 percent of Colorado's medical devices and diagnostics employees work in the nine-county region.

Medical Devices and Diagnostics Employment and Company Profile, 2016

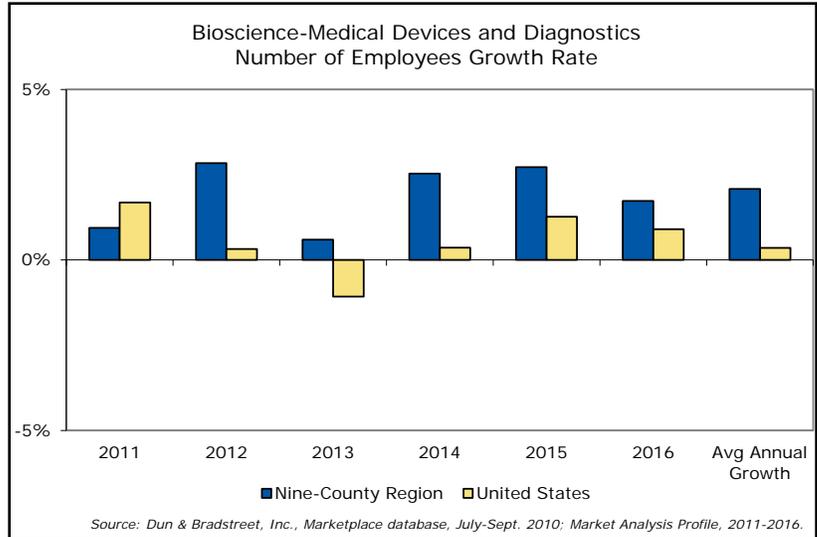
	Nine-County Region	United States
Direct employment, 2016	11,160	450,250
Number of direct companies, 2016	340	18,210
One-year direct employment growth, 2015-2016	1.7%	0.9%
Five-year direct employment growth, 2011-2016	10.8%	1.8%
Avg. annual direct employment growth, 2011-2016	2.1%	0.4%
Direct employment concentration	0.5%	0.3%

Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2010; Market Analysis Profile, 2011-2016; Development Research Partners.

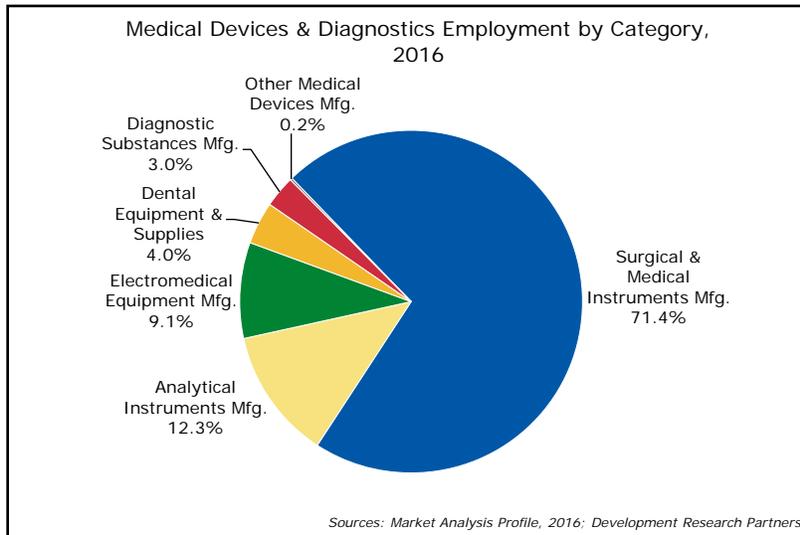
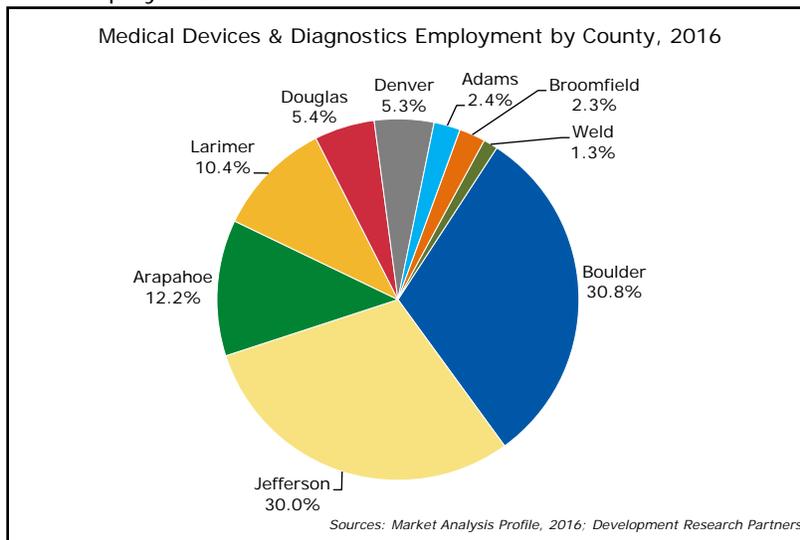
² Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest metropolitan statistical areas (MSAs). Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest MSAs.

Medical Devices and Diagnostics Employment

The nine-county region's medical devices and diagnostics subcluster employment (11,160 workers) rose 1.7 percent in 2016, compared with the previous year's level, adding 190 new jobs during the same period. National employment levels increased 0.9 percent over-the-year. The region employs 2.5 percent of the nation's medical devices and diagnostics workforce. Between 2011 and 2016, the region's medical devices and diagnostics employment rose 10.8 percent, compared with 1.8 percent at the national level. Medical devices and diagnostics companies employed 0.5 percent of the region's total employment base, compared with a 0.3 percent employment concentration nationwide.



About 340 medical devices and diagnostics companies operated in the nine-county region in 2016. Approximately 71 percent of the region's medical devices and diagnostics companies employed fewer than 10 workers, while 2.3 percent employed 250 or more.



Major Medical Devices and Diagnostics Companies

- AlloSource
www.allosource.org
- Biodesix
www.biodesix.com
- CareFusion
www.carefusion.com
- Cochlear Americas
www.cochlear.com/us
- DePuy Synthes
www.depuyssynthes.com
- GE Healthcare
www3.gehealthcare.com
- Hach Company
www.hach.com
- JustRight Surgical, LLC
www.justrightsurgical.com
- LivaNova PLC
www.livanova.com
- Medtronic PLC
www.medtronic.com
- nSpire Health, Inc.
www.nspirehealth.com
- Particle Measuring Systems
www.pmeasuring.com
- Rocky Mountain Orthodontics
www.rmortho.com
- Sharklet Technologies, Inc.
www.sharklet.com
- SomaLogic, Inc.
www.somallogic.com
- Sparton Medical Systems
www.sparton.com
- Spectranetics
www.spectranetics.com
- Surefire Medical Inc.
www.surefiremedical.com
- Terumo BCT, Inc.
www.terumobct.com
- Water Pik, Inc.
www.waterpik.com
- Zimmer Biomet
www.zimmerbiomet.com

Pharmaceuticals and Biotechnology Economic Profile

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.

With direct employment in the pharmaceuticals and biotechnology subcluster of about 4,700 workers, the nine-county region ranked 17th out of the 50 largest metro areas in 2016. The region ranked 28th for pharmaceuticals and biotechnology employment concentration.³ About 94 percent of Colorado's pharmaceuticals and biotechnology employees work in the nine-county region.

³ Direct employment is the number of employees in the industry cluster in a region. No multiplier effects are included. Direct employment is estimated and ranked for the 50 largest metropolitan statistical areas (MSAs). Employment concentration is the direct cluster employment in a region expressed as a percent of total employment in all industries in the same region. Employment concentration is calculated and ranked for the 50 largest MSAs.

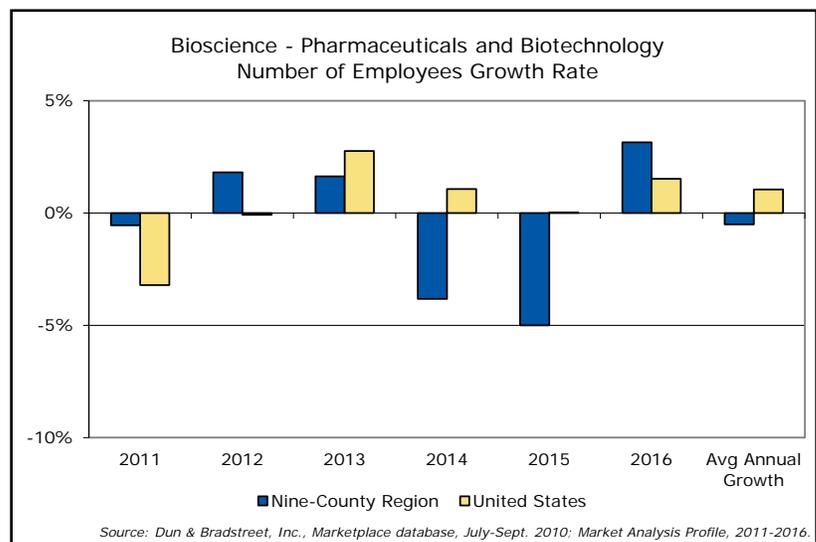
Pharmaceuticals and Biotechnology Employment and Company Profile, 2016

	Nine-County Region	United States
Direct employment, 2016	4,700	453,070
Number of direct companies, 2016	330	20,000
One-year direct employment growth, 2015-2016	3.2%	1.5%
Five-year direct employment growth, 2011-2016	-2.5%	5.4%
Avg. annual direct employment growth, 2011-2016	-0.5%	1.1%
Direct employment concentration	0.2%	0.3%

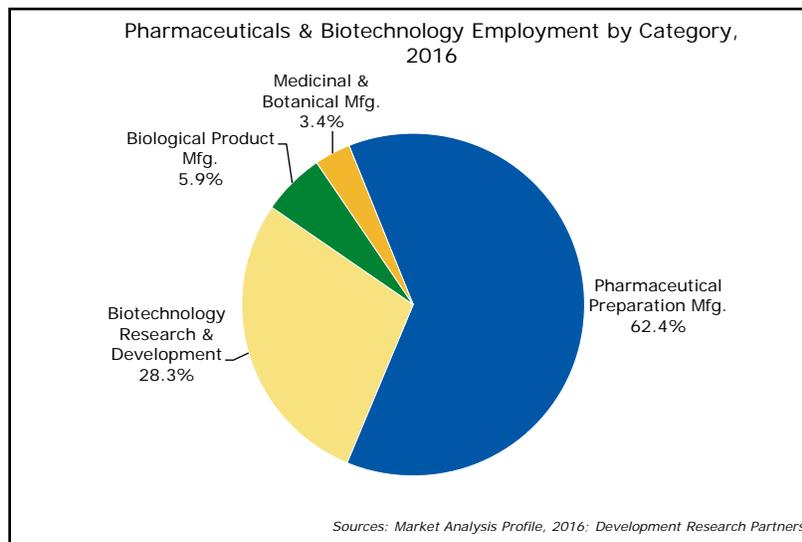
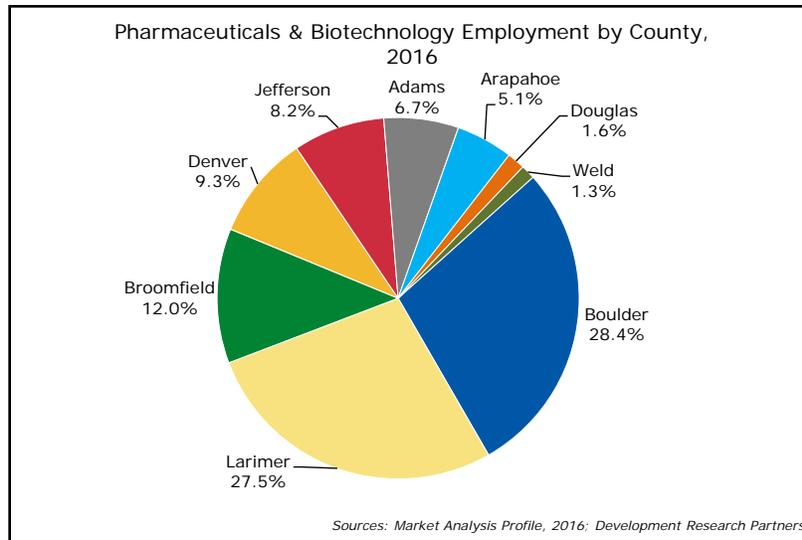
Sources: Dun & Bradstreet, Inc. Marketplace database, July-Sept. 2010; Market Analysis Profile, 2011-2016; Development Research Partners.

Pharmaceuticals and Biotechnology Employment

The nine-county region's pharmaceuticals and biotechnology subcluster employment (4,700 workers) rose 3.2 percent in 2016, compared with the previous year's level, adding more than 140 new jobs during the same period. National employment levels increased 1.5 percent over-the-year. Between 2011 and 2016, the region's pharmaceuticals and biotechnology employment decreased 2.5 percent, compared with a 5.4 percent increase at the national level. The local decline was primarily due to the closure of the Amgen facility in Boulder County, resulting in the loss of 1,000 employees between 2009 through 2015. Pharmaceuticals and biotechnology companies employed 0.2 percent of the region's total employment base, compared with a 0.3 percent employment concentration nationwide.



About 330 pharmaceuticals and biotechnology companies operated in the nine-county region in 2016. More than 80 percent of the region's pharmaceuticals and biotechnology companies employed fewer than 10 people, while 0.6 percent employed 250 or more.



Major Pharmaceuticals and Biotechnology Companies

- Agilent Technologies
www.agilent.com
- Array BioPharma Inc.
www.arraybiopharma.com
- AstraZeneca
www.astrazeneca.com
- Clovis Oncology
www.clovisoncology.com
- Corden Pharma Colorado Inc.
www.cordenpharma.com
- Heska Corporation
www.heska.com
- Pfizer Inc.
www.pfizer.com
- Sandoz, Inc.
www.sandoz.com
- Silvergate Pharmaceuticals
www.silvergatepharma.com
- Spectrum Pharmaceuticals
www.sppirx.com
- TOLMAR, Inc.
www.tolmar.com

2016 Industry Highlights

Bioscience Research and Innovation Assets

The \$5.4 billion, 578-acre Fitzsimons campus is the keystone of the region's bioscience cluster, which includes the adjacent Anschutz Medical Campus and the Fitzsimons Innovation Campus. The project is one of the world's newest bioscience developments that combine education, research, innovation, and patient care facilities. More than six million square feet of corporate and bioresearch facility space are being developed for companies and firms focusing on the science and technology sectors at the campus. Denver International Airport (DEN) and the Regional Transportation District celebrated the opening of the 23-mile, \$1.4 billion University of Colorado A Line in 2016, which connects DEN and downtown Denver. The R Line, opening in 2017, will connect the Anschutz Medical Campus to the A Line.

Located just 20 minutes from DEN and downtown Denver, the 184-acre Fitzsimons Innovation Campus offers an unrivaled range of opportunity from pre-built laboratories to furnished office space or build-to-suit space to life sciences research and development companies of all sizes, from small start-ups to established industry leaders. Further, the Bioscience Park Center features turnkey facilities for research, business development, and product commercialization. The Bioscience 1 and 2 buildings at the Anschutz Medical Campus include incubator and accelerator space, the University of Colorado's bioengineering program, and commercial space for established bioscience firms.

The Anschutz Medical Campus is the largest academic health center from Chicago to the West Coast. The site, which currently employs more than 21,000, has a \$5.4 billion annual economic impact to the state, and receives more than \$400 million in sponsored research awards annually. The Campus is home to top-ranked hospitals and facilities including the University of Colorado Hospital; Children's Hospital Colorado; University Physicians, Inc.; the Schools of Medicine, Nursing, Dental Medicine, Pharmacy, and Public Health; and several other centers for healthcare, biomedical research, and life sciences.

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 new VA Hospital that will replace the existing facility in Denver and is slated for completion in early 2018. The Anschutz Medical Campus is also home to the Charles C. Gates Center for Regenerative Medicine and Stem Cell Biology, which is Colorado's central hub for stem cell and regenerative medicine research. In 2015, the Gates Biomanufacturing Facility opened to serve academic, clinical, and commercial investigators to translate laboratory discoveries into clinical-grade protein and cell-based products for investigational use in humans.

Northern Colorado supports the region's bioscience hub through the efforts of Colorado State University (CSU), the University of Colorado Health (UCHealth), the Innosphere, the Research Innovation Center (RIC), and public and private enterprises. UCHealth has increased its capacity for clinical trials for national and local bioscience companies and has developed its own innovation capacity for surgical techniques and advancements in cancer treatment for animals. A partner to the RIC, Fort Collins-based Innosphere is an incubator formed to accelerate the success of high-impact scientific and technology companies, and to promote the development of a regional, entrepreneurial ecosystem in Colorado. Innosphere has satellite locations in Denver, Fort Collins, and Boulder to better serve entrepreneurs. Since 2009, Innosphere graduated over 50 companies, raised \$220 million in capital, and created more than 1,400 jobs in Colorado. Notable Northern Colorado bioscience assets and project developments in 2016 included:

- The Northern Colorado Bioscience Cluster (NoCoBio) formed through a partnership with the City of Fort Collins, CSU, CSU Ventures, UCHealth, the Colorado BioScience Association, and Innosphere to help advance bioscience in the region. NoCoBio brings together the region's scientists, physicians, leading innovators, and executive advisors who are working together inside world-class research and business incubator environments in order to maximize the impact on Northern Colorado resources.
- CSU's Flint Animal Cancer Center is an internationally recognized leader in clinical veterinary oncology and cancer research and is a flagship program for CSU's College of Veterinary Medicine and Biomedical Sciences through its translational research. In 2016, the Center opened an expanded and improved cancer unit. The \$1.75 million renovated Lucy Oncology Clinic in the James L. Voss Veterinary Teaching Hospital consolidated patient examination and treatment, improved efficiencies, and upgraded various technologies.
- CSU will build the \$65 million, 100-square-foot Institute for Biologic Translational Therapies in Fort Collins. The facility will provide the College of Veterinary Medicine and Biomedical Sciences with clinical and research laboratories, a technology-rich surgical center, and a 200-seat auditorium. The project will support the creation of advanced regenerative therapies for both humans and animals,

with applications being tested in veterinary patients as a precursor to the development of human treatments. The project is slated for completion in 2019.

- Fort Collins is home to the Centers for Disease Control and Prevention's National Center for Emerging and Zoonotic Infectious Diseases Division of Vector-Borne Diseases. The Division is a national and international leader in researching, preventing, and controlling viruses and bacteria, spread by vectors such as mosquitoes, ticks, and fleas.

Key Company Announcements

The region's rich intellectual talent and educational resources, supportive bioscience infrastructure, and business-friendly environment provide an ideal location for bioscience companies to grow and expand. Key company announcements in 2016 included:

- Boulder-based Accera announced plans to double its size as the company expands to European markets and completes clinical trials of AC-1204 that could be the first new Alzheimer's treatment marketed in 13 years. The 22-employee company has raised more than \$130 million in debt and equity financing since 2009.
- Agilent Technologies broke ground on a new 130,000-square-foot production facility on 20 acres in Weld County. The facility will enable the company to more than double its commercial manufacturing capacity for nucleic acid active pharmaceutical ingredients. The company plans to hire 150 to 200 people at the new facility.
- AstraZeneca began renovating the former Amgen facility in Boulder to ready the site for production of its experimental bladder cancer drug, durvalumab. The company will add about 250 full-time employees to the facility as the renovation is underway during the next year.
- AstraZeneca purchased a 696,000-square-foot biotech manufacturing plant on 228 acres in Longmont. The company plans to renovate the space to support its Boulder drug manufacturing property. The new site will provide its global biologics research and development arm with flexible biological manufacturing capacity to quickly bring new innovative treatments to patients.
- Avista Pharma, a contract testing, development, and manufacturing organization, plans to expand its Longmont facility. The company will invest \$1.79 million in building improvements and \$1 million in equipment.
- ChromaDex, a California-based company, plans to open a location in Longmont to expand its research and development team. The company develops and brands natural ingredients and products within the dietary supplement, food, beverage, or cosmetic market. It plans to add one or two new hires to its Boulder employees that will be relocating, but plans to add an additional 30 to 40 jobs within five to seven years.
- Strategic partners, Broomfield-based Corgenix Medical Corporation and Maryland-based Zalgen labs, opened an advanced product development center in the Fitzsimmons Bioscience Park Center. The new development site will serve as Zalgen's primary site for its work on viral hemorrhagic fever diagnostics, technology it received via transfer from Corgenix.
- Westminster-based Flagship Biosciences increased its operational footprint by approximately 30 percent over the last year, and doubled its staff. The company also acquired new laboratory equipment to meet increasing demand for its specialty tissue image analysis solutions in the immune-oncology market.
- Loveland-based Hach Co. broke ground on a multimillion-dollar research and development facility on its existing campus. The 86,000-square-foot building will give the company room to expand as well as access to advanced equipment and development resources. Hach employs an estimated 800 associates in Northern Colorado.
- Viveve Medical Inc. plans to relocate its headquarters from California to Arapahoe County in early 2017. The company, which manufactures non-surgical devices for vaginal conditions, will create 130 jobs with the relocation.
- Zimmer Biomet Spine Inc. plans to relocate and expand its Westminster operations into a 104,000-square-foot building at the Westmoor Technology Park. The expansion will provide 207 high-paying jobs with an average salary of \$79,000.

Agricultural Biotechnology Announcements

Northern Colorado is a leading region for agricultural biotechnology advancements.

- Boulder-based AeroGrow International Inc. deepened its partnership with Scotts Miracle-Gro Co. AeroGrow will work with Scotts to grow its direct-to-consumer business segment and develop

large-scale gardening and consumer lighting products. Scotts has invested several million dollars in AeroGrow over the past few years.

- Agrium Inc., a global leader in agricultural products and services, will consolidate 400 employees from several sites in Loveland into two buildings at a new, 30-acre project on the west side of Interstate 25. The company plans to add 300 new employees once the buildings are completed.
- Fort Collins-based BayoTech Inc. raised \$1.5 million to develop a smaller and more cost-effective system for manufacturing nitrogen fertilizer. The new system is also expected to decrease transportation costs by decentralizing production and bringing local facilities closer to end-users. The system can be shipped in three 40-foot shipping containers and can produce up to 50 tons of urea, or nitrogen fertilizer, per day.
- The Cargill Specialty Seeds and Oils Innovation Center, located in Fort Collins, is a center for research and development of next-generation Clear Valley™ canola oils. Scientists at the center focus on the discovery, development, and delivery of high-stability oils with reduced saturates and zero trans fats per serving.
- Fort Collins-based VetDC Inc. was granted conditional approval of a treatment of lymphoma in dogs from the U.S. Food and Drug Administration's (FDA) Center for Veterinary Medicine. The company's Tanovea-CA1 will be available to veterinarians in the spring of 2017, which is administered intravenously every three weeks for up to five doses.
- CSU broke ground on the new Institute for Biologic Translational Therapies. CSU received \$20 million to build the Institute in 2016, fulfilling a \$65 million matching challenge from lead donors John and Leslie Malone. The Institute will provide regenerative medical therapies for animals and humans, including patient-derived stem cells, to treat musculoskeletal disease and other ailments.

Innovative Technologies and Regulatory Approvals

Bioscience companies in the region received notable regulatory approvals to advance product development to facilitate commercialization.

- Centennial-based AlloSource will pioneer its research on bioengineered blood vessels, and will be entering clinical trials. AlloSource collaborated with North Carolina-based Humacyte to develop the blood-vessel grafts that will be tested in kidney dialysis patients and will improve current surgical methods involving synthetic implants.
- Golden-based BiO2 Medical Inc. received FDA approval to market and distribute its Angel Catheter® that protects trauma patients from blood clots entering their lungs. The company is readying to expand production and hire staff to its sales team, corporate operations, and production crew. The company raised \$3 million in venture debt financing to fund domestic sales.
- Boulder-based Array BioPharma partnered with Japanese pharmaceutical firm Asahi Kasei Pharma Corp. to move its pain inhibiting drug TrkA to clinical trials. The partnership gives Array \$12 million in upfront funding for Asahi Kasei's right to develop and commercialize the drug in Asia. Array will receive up to \$64 million in additional payments as well as royalties on sales once the drug meets certain developmental milestones.
- Array BioPharma received positive results from Phase III clinical trials of its melanoma treatment drug binimetinib. Based on the results, Array submitted a new drug application with the FDA and raised \$115 million by selling new stock. Phase III trials testing the effectiveness of binimetinib in combination with other drugs in Array's portfolio are ongoing.
- The FDA granted clearance to Boulder-based Flashback Technologies to market the first medical device containing its Compensatory Reserve Index (CRI) algorithm. CRI is a breakthrough technology that provides real-time, noninvasive measurement of a patient's ability to tolerate changes in intravascular volume. It is the first algorithm to be classified by the FDA as an adjunctive cardiovascular status indicator.
- CHD Bioscience Inc. is anticipating FDA approval and subsequent commercialization of its first product, VERIOX®. VERIOX® is a novel antimicrobial agent used in coatings that CHD envisions could be used with implants, bandages, and dressings to prevent and treat infections. CHD anticipates expansion once Veriox is approved and comes to market.
- The FDA granted accelerated approval for Boulder-based Clovis Oncology's genetically targeted ovarian cancer treatment drug Rubraca. The oral therapy treats women with advanced ovarian cancer who have received two or more prior chemotherapies and whose tumors have a BRCA gene mutation.
- CoorsTek Medical won federal approval for a ceramic hip replacement implant that will give providers a domestically manufactured alternative to currently imported implant technologies. CoorsTek's CeraSurf®-p implants have been used successfully in South America since 2011 and in Europe since

2012. Production is initially planned for CoorsTek's facilities in Golden, with expansion anticipated for the next several years.

- Fort Collins-based biopharmaceutical company St. Renatus received FDA approval for its first product, Kovanaze™. Kovanaze™ is a dental anesthetic that is administered nasally, circumventing the use of a needle for dental procedures.
- JustRight Surgical received FDA clearance for its pediatric vessel-sealing device that allows safer cauterization of vessels in teens, children, infants, and neonates while using significantly less energy. The Louisville-based company notes electrosurgical devices were approved 15 years ago, but the clearance will allow the company to market the device specifically for pediatric surgery.
- Parker-based VibraLung, Inc. began marketing its Vibralung® Acoustical Percussor to home care providers and patients. Vibralung's technology treats respiratory conditions associated with cystic fibrosis, chronic obstructive pulmonary disease, bronchitis, asthma, pneumonia, and neuromuscular disease, among others. Vibralung utilizes soundwaves to promote bronchial drainage, airway clearance, and improve expectoration.
- Aytu BioScience Inc., located in Englewood, announced it will launch sales of NATESTO™. NATESTO™ is the only FDA-approved testosterone replacement therapy delivered in a nasal spray. Aytu won a bid for exclusive rights to sell the product in the United States. The company has grown from about 25 employees to 70.
- Boulder-based ASD's spectrum analysis technology has been used in efforts to understand and control the spread of Zika virus. Australian researchers have used ASD's equipment to measure the presence of the bacteria Wolbachia in the mosquito population, a microbe that significantly reduces the likelihood the mosquito will carry the Zika virus. To control the virus, groups of infected mosquitoes are released into the wild with the hope the bacterial infection will spread in the population.
- Louisville-based AntriaBio Inc. partnered with South Korea-based pH Pharma Co. to manufacture and sell its diabetes drug, AB101, in eight Southeast Asian countries. The joint agreement will allow the company to use AntriaBio's proprietary microsphere platform for various therapeutic opportunities.
- Broomfield-based Colibri Heart Valve LLC formed a joint venture with China-based Venus Medtech Inc. The joint venture will develop a pre-packaged, ready-for-use transcatheter heart valve system and will be funded to conduct clinical and regulatory development work in both China and Europe.
- Englewood-based Mighty Oak Medical's 3D printed FIREFLY® Pedicle Screw Navigation Guides received a second FDA clearance. The clearance extends compatibility to essentially all currently cleared pedicle screw systems.
- Greenwood Village-based Silvergate Pharmaceuticals Inc. received FDA approval for its Qbrelis™ (Lisinopril) Oral Solution, the first and only FDA-approved Lisinopril oral solution. Qbrelis™ treats hypertension in adults and children, symptomatic heart failure, and asymptomatic left ventricular dysfunction.

Industry Infrastructure Support

The region's organizations and professional associations are dedicated to advancing the vibrant bioscience industry.

- The Colorado BioScience Association (CBSA) serves as the hub of Colorado's thriving bioscience sector by connecting innovators to funding, infrastructure, research, and talent. From promising young companies to established corporations and institutions, CBSA provides opportunities for networking, education, and professional development. CBSA grows the bioscience workforce and leads business expansion policies to advance the industry in the state. In 2016, CBSA held its inaugural Colorado Life Science Innovation Forum in 2016, which convened Colorado's researchers, scholars, policymakers, healthcare professionals, and companies to educate and connect.
- The Colorado Office of Economic Development and International Trade (OEDIT) awarded its fourth round of grants for the Advanced Industries Accelerator Programs in 2016. The programs support key industries in Colorado, including bioscience and medical device manufacturers, by providing up to \$150,000 for Proof-of-Concept grants, up to \$250,000 for Early-Stage Capital grants, and \$15,000 matching grants for businesses looking to export to global markets. Since 2006, Colorado has awarded more than 330 life science-related grants and provided \$45.9 million in matching grant funding to bioscience ventures, generating \$530 million in follow-on grants and additional investments for these companies. The program created 56 new life science companies and 597 new, direct jobs.
- Formed in 2009 through the Bioscience Discovery Evaluation Grant Program, the Colorado Institute for Drug, Device and Diagnostic Development (CID4) accelerates life science discoveries and bridges the gap between research and successful product developments. CID4 serves universities, bioscience companies, academic groups, and professional associations by providing seed funding, active

management, investor connections, and strategic consulting. As of 2016, CID4 invested more than \$2 million in nine portfolio companies.

- Founded in 2014, the Blackstone Entrepreneurs Network is designed to help entrepreneurs find resources and thrive in Colorado. The network has a variety of business advisors in fields for entrepreneurship, technology, biotechnology, and health technology industries.
- The Colorado Venture Capital Authority (VCA) was established in 2004 to provide seed and early-stage capital investments in Colorado companies with the potential for rapidly scaling their businesses. The managing partner, High Country Venture, reviews funding deals and makes investments in selected businesses by using debt, equity, or debt with a conversion option into equity. VCA also established Colorado Fund I and II, each with approximately \$25 million.
- The University of Colorado's BioFrontiers Institute established the Olke C. Uhlenbeck Endowed Graduate Fund to support first-year graduate students pursuing doctoral degrees. The endowment was made possible by a \$1 million gift from John F. Milligan and Kathryn Bradford-Milligan. The BioFrontiers Institute was chosen specifically because of the IQ Biology program which exposes students to applied aspects of biological sciences such as writing computer code and applied math.
- The Knoebel Center for the Study of Aging at the University of Denver celebrated its grand opening in 2016. The Center focuses on ways to increase the healthy years of life in an aging population and supports complementary research and scholarship on aging and aging-related conditions in a variety of science, technology, engineering, and mathematics disciplines.
- Colorado PERA launched The Colorado Mile High Fund in 2012, a \$50 million co-investment program designed to invest in a diversified, high-quality portfolio of companies with a nexus to Colorado. With an established bioscience industry, strong growth opportunities, a dedicated research community, and an active private equity market, the nine-county region is poised for investment.
- The Denver Office of Economic Development offers the *Denver Capital Matrix*, a resource directory of over 400 funding sources for small business and entrepreneurs including traditional bank lending, venture capital firms, private equity firms, angel investors, mezzanine sources, and others that have funded Colorado businesses.
- The Boettcher Foundation's Webb-Waring Biomedical Research Awards provides biomedical research funding for early career investigators at Colorado's research institutions. Recipients of the awards receive research grants of \$235,000, covering up to three years of biomedical research. The grants help Boettcher Investigators become competitive for major awards from federal agencies and private sources.

Cross-Cluster Convergence

The region's bioscience companies are developing breakthrough therapies to support the state's aging population and growing millennial population. For example, Boulder-based Accera opened two trial sites in the state to research Alzheimer's disease. Additionally, more than 130 digital health companies are appealing to health and wellness goals for millennials. Boulder-based SomaLogic is developing a wellness chip to enable early detection of diseases and health conditions to monitor well-being. The synergy between bioscience, healthcare, and software supports the nine-county region as a national leader in expanding digital health. Other digital health companies including Prima-Temp, RxREVVU, Welltok, iTriage, RxAssurance, and Cerescan are developing advanced technologies to improve health.

- Metro Denver is an emerging digital health community. Founded in July 2012 by the Denver South Economic Development Partnership and Innovation Pavilion, Prime Health is a growing statewide community of 1,600+ health care executives, physicians, technologists, academics, entrepreneurs, and investors dedicated to improving health and lowering healthcare costs through the commercialization of digital health technologies. Prime Health is a resource ecosystem for Digital Health—the convergence of the digital and genetics revolutions with bioscience, healthcare and wellness, and information technology-software. Colorado is home to more than 130 digital health companies.
- StartUp Health Colorado launched to create a health innovation hub in the Rocky Mountain region. The organization partnered with Children's Hospital Colorado, UCHHealth, and the University of Colorado to streamline the pathways for health entrepreneurs to innovate and grow.
- Plans were announced for Catalyst HTI, a health-tech industry integration project slated to open in 2018 in Denver's River North neighborhood. The project will integrate building space for startups, Fortune 500 companies, and healthcare providers in one location, enabling startups with resources to grow and exposing providers and larger companies to emerging technologies and human capital. The concept will be the first of its kind and has already received support from Terumo BCT, the University of Colorado Anschutz Medical Campus, and the American Diabetes Association.

Collaboration across the region's industries including aerospace and bioscience has fueled innovation, discoveries, and advancements.

- Centennial-based AlloSource announced a collaboration with NASA and the Jet Propulsion Laboratory (JPL) to study the effects of zero gravity on antibiotic resistant genes in microorganisms from the International Space Station (ISS). The research will help NASA and JPL identify microbes in the ISS and prescribe antibiotics more effectively. AlloSource is one of the largest providers of skin, bone, and soft tissue allografts for use in surgery and other medical procedures.

Venture Capital and Funding Awards

Several bioscience companies received significant venture capital and funding awards to advance new technologies and support product development.

- Boulder-based Array BioPharma initiated a \$115 million stock sale to fund research and development. The funding will also be used for clinical trials for its proprietary candidates, to build and scale commercial capability, and for general corporate purposes.
- SomaLogic Inc., based in Boulder, received a \$60.5 million investment from New York-based Visium Healthcare Partners to advance the company's diagnostic products. SomaLogic's technologies identify disease-indicating biomarkers on proteins that revolutionize how diseases are diagnosed and treated. SomaLogic's technologies are used in clinics and research laboratories, including the U.S. Department of Agriculture's National Center for Toxicological Research.
- Boulder-based PanTheryx acquired \$53 million of private-equity investment to fund the global launch of DiaResQ®, a product used to treat acute infectious diarrhea in children. PanTheryx will add 15 to 20 new workers, invest in new product research and development, and expand the marketing and distribution of DiaResQ®.
- Biodesix, a Boulder-based diagnostic test maker, raised \$29 million in 2016 toward the development of its VeriStrat and GeneStrat blood tests for use with immunotherapies in the treatment of cancer. The tests will help identify which patients would best benefit from various cancer drugs and treatments. The company also entered into an international collaboration agreement with China-based Bioyong Technology Company Ltd. to commercialize a version of its blood test in China.
- Louisville-based JustRight Surgical raised \$11.2 million to increase sales and marketing efforts for its precisely designed surgical devices in the U.S. and Europe. The company's devices help reduce scarring and the length of hospital stays.
- Westminster-based Cerapedics completed an \$11 million Series D financing round to expand commercialization of its FDA-approved i-FACTOR™ Peptide Enhanced Bone Graft. The product is used in anterior cervical discectomy and fusion (ACDF) procedures in patients with degenerative cervical disc disease. It is the first bone graft to be approved for use in the cervical spine by the FDA.
- Golden-based Bio2 Medical, Inc. raised \$10 million in a Series D funding round to initiate commercialization of its Angel® Catheter. Preparations for commercialization include hiring a sales and clinical team, upgrading IT infrastructure, establishing customer service, and building inventory to support its projected sales demand.
- Aurora-based Ocugen Inc. raised \$6 million in a round of Series A financing. The funding will be used to advance its research to treat retinitis pigmentosa, macular degeneration, and ocular graft versus host disease.
- Broomfield-based Colorado Therapeutics closed on \$4.3 million of angel funding to complete FDA approval of its first product, Xenograft. The company added manufacturing and production staff to support its product development.
- BackJoy Orthotics LLC, a Boulder-based company that makes posture improving products and apparel, raised \$2.3 million in an equity-funding round. The latest funding follows an \$8.7 million investment from Sandbridge Capital in 2014 that will help the company ramp up its footwear and apparel product lines.
- Boulder-based startup Prima-Temp completed its third round of funding in three years, raising \$1.64 million. The funding will be used on the manufacture, marketing, and sales of its Priya™ sensor technology that helps women track their fertility.
- CardioNXT secured an additional \$1.5 million in equity funding to expand its products that enable a better understanding of complex cardiac arrhythmias including atrial fibrillation, and deliver targeted therapy to affected areas within the heart. CardioNXT expects regulatory approval for its products in targeted markets in 2017.
- Louisville-based medical device startup Eximis Surgical closed on a \$995,000 seed round of funding toward the development of a specimen removal device in laparoscopic surgeries such as

hysterectomies and tumors. The startup has plans to join Innosphere as it grows and works toward product commercialization.

Mergers and Acquisitions

Several mergers and acquisitions in the region's bioscience cluster drove company growth and expanded product offerings in 2016.

- Canada-based Agrium and Potash Corp. plan to merge to create one of the largest crop-nutrient companies in the world with nearly 20,000 employees. The \$27 billion deal will allow the combined company to produce fertilizers and sell them directly to farmers through a network of retail stores. Agrium has facilities in Loveland, Greeley, and Denver and employs several hundred people in Colorado.
- Germany-based Sartorius acquired Broomfield-based startup ViroCyt in a \$16 million deal. The company will maintain its leadership and branding as it develops instrumentation used to quantify virus particles. The acquisition will help the company reach new markets and find new applications for its product.
- New Jersey-based Zoetis, a developer of animal-health products with a location in Longmont, was acquired by Bulgarian pharmaceutical company Huvepharma in a deal valued at \$40 million. The acquisition will facilitate Huvepharma's continued growth in the United States.
- Zimmer Biomet Holdings Inc., whose spine division is headquartered in Broomfield, acquired LDR Holding Corp. for \$1 billion. The deal will increase Zimmer's share of the spinal device market, complementing its primary business of manufacturing replacement hips, knees, and other reconstructive and orthopedic devices.
- Tecomet Inc., a global contract manufacturer, purchased Boulder-based Mountainside Medical, a medical device components and surgical devices manufacturer. Mountainside Medical employs just over 100 people and no job cuts are planned. Tecomet plans to invest to expand the Boulder business.
- Castle Rock-based Venaxis®, Inc. acquired Boulder-based BiOptix Diagnostics, Inc. in a \$2.6 million deal. The merger will allow Venaxis® access to BiOptix's proprietary technology platform for the detection of molecular interactions.

Bioscience Grants and Incentive Programs

The state of Colorado has several financing, tax credits, and incentive programs to support early-stage and growth companies in the bioscience cluster.

- Colorado offers various bioscience tax incentive programs to promote growth including:
 - Biotechnology Sales and Use Tax Refund was created for Colorado taxpayers to refund state sales and use taxes paid on purchases of tangible personal property used directly in biotechnology R&D.
 - Manufacturing Sales & Use Tax Refund Colorado provides an exemption from state sales and use tax paid on the purchases of manufacturing machinery and machine tools and parts.
 - Cleanroom Sales & Use Tax Exemption Colorado provides an exemption from state sales and use tax paid on the purchase of machinery that comprises a cleanroom from July 1, 2007 to July 1, 2017.
 - Advanced Industry Workforce Development provides companies a reimbursement for expenses related to hiring an intern or apprentice.
- The Advanced Industry Investment Income Tax Credit allows investors to receive tax credits for investing in early-stage, advanced industry companies. Investors can claim tax credits worth 25 percent of their investment in the company if they do not own more than 30 percent of the business before the investment was made or 50 percent after, up to a maximum of \$50,000 in tax credits.

Bioscience Workforce Profile

Many companies choose locations because of the available workforce. With nearly half of the nine-county region's 3.8 million residents under the age of 35, employers can draw from a large, young, highly educated, and productive workforce. Of the region's adult population, 42.6 percent are college graduates and 91 percent have graduated from high school. The state has the nation's second-most highly educated workforce as measured by the percentage of residents with a bachelor's degree or higher.

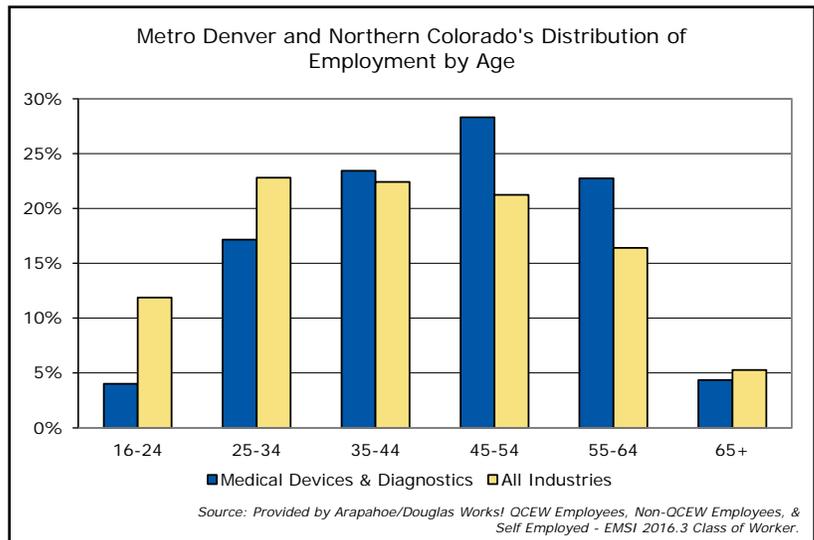
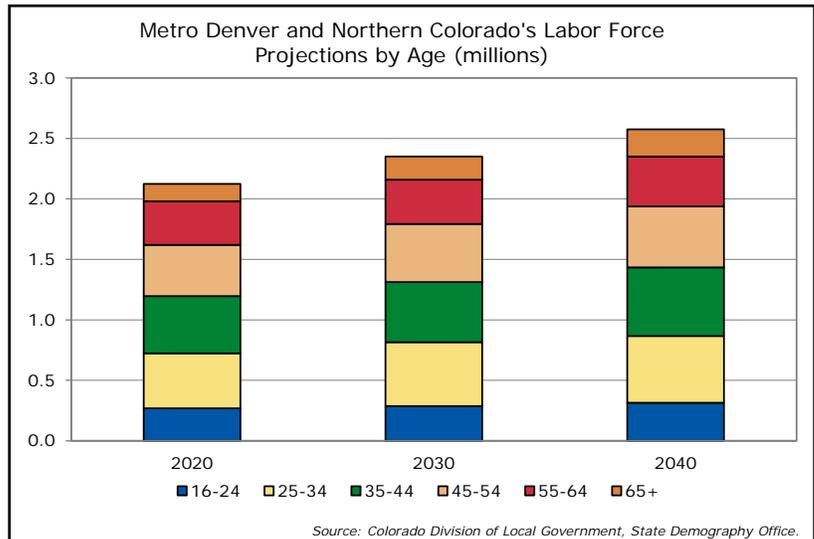
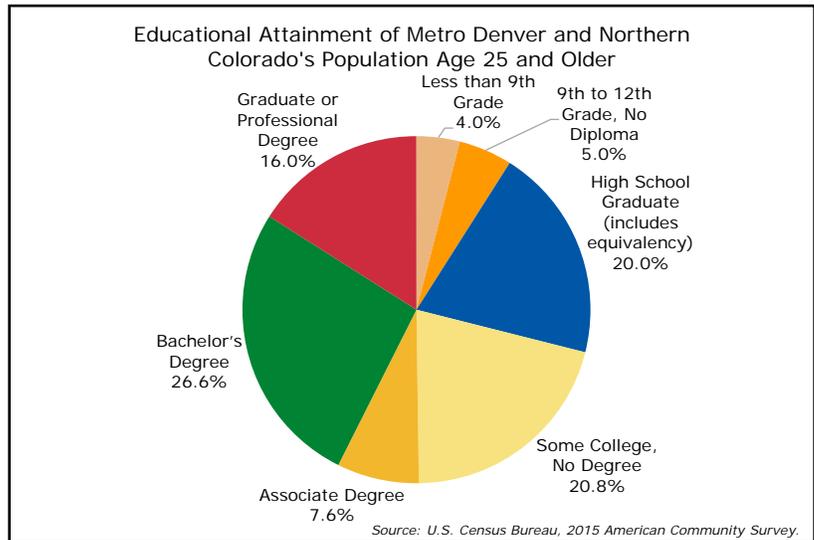
The attractiveness of the region draws new residents through in-migration. The region's population is expected to grow 31 percent from 2020 to 2040, driving a 21.2 percent increase in the region's labor force over the same period. It is important to note the changing composition of the workforce supply as the baby boomers begin to retire, which will pose implications for businesses whose employee pool includes significant numbers of these workers.

Medical Devices and Diagnostics Workforce Profile

Age Distribution

The nine-county region's medical devices and diagnostics subcluster employs 11,160 people and includes a large pool of talented, well-educated, and highly skilled workers. The medical devices and diagnostics subcluster has a larger share of employees (51.1 percent) that are between the ages of 45 and 64 years old, compared with the age distribution of all industries across the nine-county region (37.7 percent).

The medical devices and diagnostics workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline. The Metro Denver and Northern Colorado Occupation & Salary Profile below includes the 10 largest medical devices and diagnostics occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the



BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

number of available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

The 2015 average annual salary for medical devices and diagnostics subcluster workers in the nine-county region was \$75,400, compared with \$84,970 nationwide. Total payroll in the region's medical devices and diagnostics subcluster exceeded \$827 million in 2015, an increase of 3.6 percent over-the-year.

Metro Denver & Northern Colorado Medical Devices & Diagnostics Occupation & Salary Profile, 2016

10 Largest Medical Devices and Diagnostics Occupations in Metro Denver and Northern Colorado	Total Working Across All Industries (2016)	Number of Available Applicants (2016)	Number of Graduates (2015)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Electrical & electronic equipment assemblers	2,925	111	4	\$32,230	\$21,342	\$25,005	\$42,838	\$55,687
2. Electromechanical equipment assemblers	1,730	66	0	\$35,728	\$25,481	\$31,787	\$39,887	\$44,393
3. Team assemblers	4,367	166	0	\$29,666	\$20,562	\$23,826	\$37,132	\$46,729
4. Dental laboratory technicians	527	20	0	\$33,484	\$25,302	\$27,945	\$45,586	\$55,992
5. Industrial engineers	2,768	69	4	\$90,696	\$57,010	\$72,137	\$113,205	\$135,370
6. Mechanical engineers	5,533	138	721	\$85,096	\$56,118	\$68,661	\$112,174	\$141,503
7. Electronics engineers, except computer	4,938	123	441	\$101,396	\$64,980	\$77,300	\$122,914	\$150,057
8. Inspectors, testers, sorters, samplers, & weighers	3,658	139	0	\$40,160	\$23,170	\$31,213	\$53,235	\$67,867
9. First-line supervisors of production & operating workers	4,956	188	1	\$58,811	\$36,795	\$46,494	\$73,886	\$93,787
10. General & operations managers	31,830	2,642	6,292	\$112,133	\$50,365	\$73,238	\$174,412	\$254,484

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. Source: Provided by Arapahoe/Douglas Works!, QCEW Employees, Non-QCEW Employees, & Self Employed - EMSI 2016.3 Class of Worker.

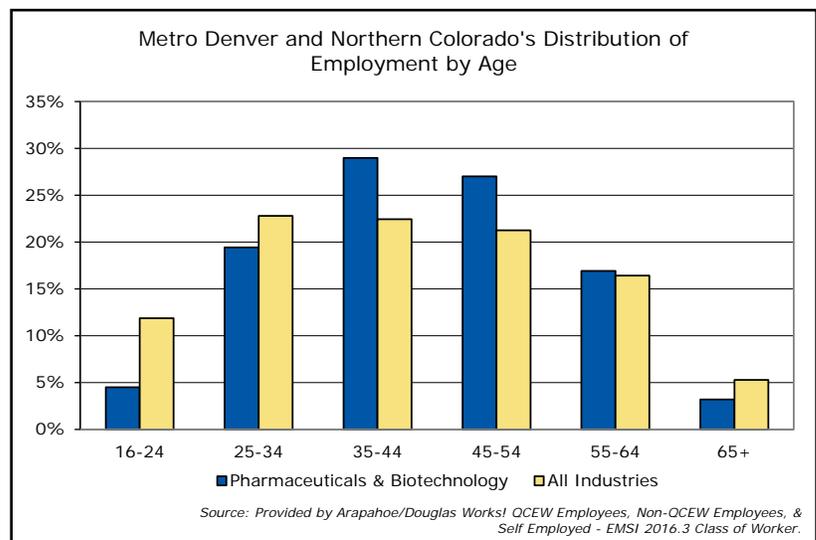
Pharmaceuticals and Biotechnology Workforce Profile

Age Distribution

The nine-county region's pharmaceuticals and biotechnology subcluster employs 4,700 people and includes a large pool of talented, well-educated, and highly skilled workers. The pharmaceuticals and biotechnology subcluster has a larger share of employees (56 percent) that are between the ages of 35 and 54 years old, compared with the age distribution of all industries across the nine-county region (43.7 percent).

The pharmaceuticals and biotechnology workforce supply consists of four main components: those currently working in the industry; those doing a similar type of job in some other industry; the unemployed; and those currently in the education pipeline.

The Metro Denver and Northern Colorado Occupation & Salary Profile below includes the 10 largest pharmaceuticals and biotechnology occupations in the region. For these 10 largest occupations, the chart details the total number of workers employed in that occupation across all industries, the number of



BIOSCIENCE: Metro Denver and Northern Colorado Industry Cluster Profile

available applicants that would like to be working in that occupation, the number of recent graduates that are qualified for that occupation, and the median and sample percentile annual salaries.

Wages

Total nine-county payroll in the pharmaceuticals and biotechnology subcluster exceeded \$471 million in 2015. The 2015 average annual salary for pharmaceuticals and biotechnology employees in the region was \$103,370, compared with the national average of \$137,580.

Metro Denver and Northern Colorado Pharmaceuticals and Biotechnology Occupation & Salary Profile, 2016

10 Largest Pharmaceuticals and Biotechnology Occupations in Metro Denver and Northern Colorado	Total Working Across All Industries (2016)	Number of Available Applicants (2016)	Number of Graduates (2015)	Median Salary	10th Percentile Salary	25th Percentile Salary	75th Percentile Salary	90th Percentile Salary
1. Chemists	1,693	14	266	\$75,832	\$39,285	\$51,230	\$105,206	\$125,470
2. Packaging & filling machine operators & tenders	4,046	154	0	\$32,909	\$19,614	\$22,416	\$40,191	\$57,375
3. Biological technicians	2,465	20	1	\$43,578	\$29,106	\$34,426	\$56,637	\$69,687
4. Business operations specialists, all other	33,547	1,510	50	\$79,615	\$41,759	\$54,434	\$97,749	\$126,953
5. Chemical equipment operators & tenders	623	6	0	\$36,015	\$23,492	\$29,521	\$45,711	\$61,625
6. Natural sciences managers	1,252	104	3,068	\$126,982	\$87,944	\$105,550	\$157,165	\$259,747
7. Medical scientists, except epidemiologists	1,165	9	739	\$65,568	\$39,722	\$47,943	\$98,932	\$148,472
8. Biochemists & biophysicists	477	4	155	\$64,538	\$38,670	\$49,047	\$91,769	\$127,899
9. Inspectors, testers, sorters, samplers, & weighers	3,658	139	0	\$40,160	\$23,170	\$31,213	\$53,235	\$67,867
10. General & operations managers	31,830	2,642	6,292	\$112,133	\$50,365	\$73,238	\$174,412	\$254,484

Notes: The number of available applicants is a point-in-time measurement of the number of people who have registered in Colorado's workforce development system's statewide database, Connecting Colorado, as being able and available to work in a particular occupation. Results should be interpreted with caution since registration in Connecting Colorado is self-reported. In addition, the skills rubric may assign up to four occupation codes for each registrant. Therefore, the number of available applicants could be inflated. *Source: Provided by Arapahoe/Douglas Works!, OCEW Employees, Non-OCEW Employees, & Self Employed - EMSI 2016.3 Class of Worker.*

Education & Training

Colorado's higher education system provides an excellent support system for businesses in the region. There are 28 public higher education institutions in Colorado, of which seven four-year and six two-year public institutions offering comprehensive curricula are located in the nine-county region. In addition, there are more than 100 private and religious accredited institutions and more than 350 private occupational and technical schools offering courses in dozens of program areas throughout the state. Although not exhaustive, a list of the major, accredited educational institutions with the greatest number of graduates for each of the 10 largest bioscience occupations in the nine-county region are included below. A directory of all higher education institutions with corresponding websites may be accessed via <http://higher.ed.colorado.gov>.

- Colorado School of Mines
www.mines.edu
- Colorado State University
www.colostate.edu
- Colorado State University Global Campus
www.colostate.edu
- Front Range Community College
www.frontrange.edu
- Metropolitan State University of Denver
www.msudenver.edu
- Regis University
www.regis.edu
- University of Colorado: Anschutz Medical Campus, Boulder, Denver
www.cu.edu
- University of Denver
www.du.edu
- University of Northern Colorado
www.unco.edu
- University of Phoenix-Colorado
www.phoenix.edu

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 and entrepreneurial talent

- Colorado has 10 higher education institutions with bioscience programs. Biological sciences graduate programs at the University of Colorado Boulder (CU Boulder), Colorado State University (CSU), and the University of Colorado Denver ranked within the nation's top-100 in 2014. (*U.S. News & World Report*, 2014)
- Colorado ranked ninth for the number of science, engineering, and health graduate students per 1,000 individuals ages 25 to 34 years old in 2013. (National Science Foundation, 2015)
- Colorado ranked fifth for the number of scientists and engineers as a share of all occupations in 2014. (National Science Foundation, 2015)
- Colorado ranked second in the 2016 *State Technology and Science Index*. Colorado received top-five rankings in all five categories, and received its highest individual score in human capital investment (first). (Milken Institute, 2016)
- Colorado ranked among the top 10 states that have a specialized concentration of medical device and equipment jobs and ranked seventh for bioscience-related venture capital distribution dollars per 1 million population. Colorado bioscience companies have received \$1 billion in venture capital investments since 2012. (Battelle Memorial Institute, 2016)
- The first U.S. Department of Commerce United States Patent and Trademark Office west of the Mississippi opened in Denver in 2014 due to the state's educated workforce, innovative ecosystem, and entrepreneurial culture. (U.S. Patent and Trademark Office, 2016)
- The Denver-Aurora-Broomfield metropolitan area ranked among the top 10 for economic development and job growth in the "Leading Locations for 2016" list. Areas recognized in the study exhibited economic strength and capacity to support business prosperity. (*Area Development*, 2016)
- Metro Denver ranked as the fourth-best metro area for science, technology, engineering, and mathematics (STEM) professionals in 2016. Metro Denver ranked seventh for the projected number of STEM jobs needed by 2020. (WalletHub, 2016)
- Boulder ranked as the third-best place for STEM graduates in 2016. STEM jobs in Boulder represented more than 14 percent of all jobs, earning an annual mean wage of \$91,800. (NerdWallet, 2016)
- Boulder and Fort Collins ranked among the top five most-educated metro areas in the nation in 2016. (ValuePenguin.com, 2016)
- Metro Denver ranked as the fourth-best metro area for young entrepreneurs in 2016. The metro area received accolades for its highly educated population and high rate of small business loans. (NerdWallet, 2016)
- Denver ranked third among the top 25 U.S. cities for fostering innovation and entrepreneurial growth. The city ranked among the top five for a healthy quality of life, a well-connected ecosystem, a vibrant cultural foundation, and a highly educated young population. (U.S. Chamber of Commerce Foundation, 2016)
- Denver ranked as the nation's third-easiest city to find a job, with 96 jobs posted for every 1,000 residents. (*Forbes*, 2016)
- Boulder ranked sixth among the "Best Cities for New College Grads" in 2016. The city's growing tech hub, student and young professional population, and amenities contributed to its notable rank. (Zumper, 2016)

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.
- Denver ranked as the 13th-best market for life sciences based on employment, employment growth, venture capital funding, and NIH funding in the *2016 Life Science Outlook*. (Jones Lang LaSalle, 2016)
- The nine-county region offers a variety of real estate opportunities for bioscience companies, ranging from fully furnished executive suites to build-to-suit laboratories and office space.

3. A pro-business environment and competitive tax structure

- Colorado has one of the nation's most favorable corporate income tax structures. The state's corporate income tax rate of 4.63 percent is one of the lowest in the nation and is based on single-factor apportionment, which allows companies to pay taxes based solely on their sales in the state. (State of Colorado; The Tax Foundation)

- Colorado has the nation's ninth-best tax climate for entrepreneurship and small business. (Small Business & Entrepreneurship Council, 2016)
- Metro Denver ranked No. 1 among *Forbes'* 2016 "Best Places for Business and Careers" for the second-straight year. Four other Colorado metropolitan areas were included on the list. The Colorado Springs metro area ranked 12th, Fort Collins ranked 18th, Boulder ranked 26th, and Greeley ranked 51st. (*Forbes*, 2016)
- Colorado ranked among the top five "Best States for Small Business Friendliness" in 2016. Fort Collins received an "A" grade and Denver received an "A-" grade for overall friendliness. (Thumbtack.com, 2016; Ewing Marion Kauffman Foundation, 2016)

4. Access to financial resources to fund research and development

- Colorado offers several public and private sources of business funding including the Certified Capital Companies Program, the Venture Capital Authority, and Colorado Capital Access. (Contact the Colorado Office of Economic Development and International Trade for more information.)
- Since 2006, Colorado has awarded more than 330 life science-related grants and provided \$45.9 million in matching grant funding to bioscience ventures, generating \$530 million in follow-on grants and additional investments for these companies. (Colorado BioScience Association, 2016)
- The nine-county region has six venture firms currently investing in bioscience: Boulder Ventures, Lightstone Ventures, Morgenthaler Ventures, Stakeholder Ventures, Tango/HCV, and Three Leaf Ventures.
- Colorado ranked third in the nation for Small Business Innovation Research (SBIR) grants per worker. The state received more than 200 grants totaling nearly \$82.1 million, or \$32.90 in grants per worker compared with the U.S. average of \$11.80. (U.S. Small Business Administration, 2016; U.S. Bureau of Labor Statistics, 2016)
- Research expenditures at CSU reached \$332 million in fiscal year 2016, the ninth consecutive year that research expenditures topped \$300 million. (Colorado State University, 2016)
- The University of Colorado ranked among the nation's top-25 institutions in total NIH funding reaching \$173.5 million in fiscal year 2015. (National Institutes of Health, 2016)

5. Business organizations and public policy programs designed to encourage industry growth

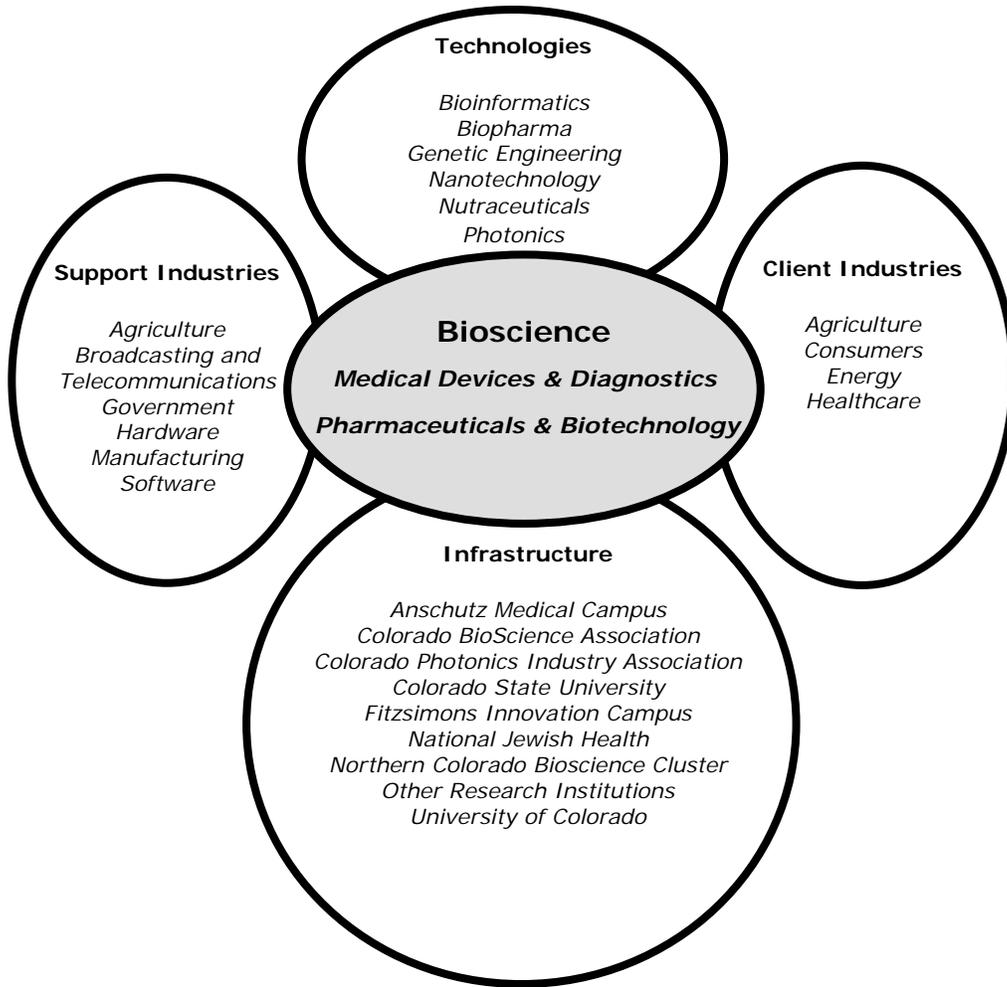
- The Advanced Industries Accelerator (AIA) Programs promote growth and sustainability in Colorado's advanced industries, including advanced manufacturing, aerospace, bioscience, electronics, energy and natural resources, infrastructure engineering, and technology and information. Since 2013, the AIA program has granted over \$35 million to nearly 230 organizations. These industries account for nearly 30 percent of the state's wage earnings, nearly 30 percent of the total sales revenue across all industries, and nearly 35 percent of the state's total exports. (The Colorado Office of Economic Development and International Trade, 2016)
- Sales and use tax is exempt for equipment used in R&D of medical devices or clean technology. The exemption refunds up to \$50,000 per year in sales and use taxes for companies with less than 35 employees and more than 50 percent employed in Colorado. (Exemption clarified in Colorado House Bill 15-1180)
- Startup Colorado is a regional initiative to increase the breadth and depth of the entrepreneurial ecosystem across Colorado's Front Range. The initiative focuses on increasing connections among entrepreneurs and mentors, improving access to entrepreneurial education, and building a more vibrant entrepreneurial community. (Startup Colorado, 2016)
- The Colorado Innovation Network is a catalyst for economic prosperity through innovation by partnering with government, business, and civil society to foster collaboration around global ideas, talent, capital, and the entrepreneurial spirit.

Bioscience Industry Cluster Definition

NAICS Code*	NAICS Description	SIC Code	SIC Description
Medical Devices and Diagnostics			
325413	In-vitro diagnostic substance mfg.	2835	Diagnostic substances
333249 (P)	Other industrial machinery mfg.	3559-9922	Pharmaceutical machinery
334510	Electromedical & electrotherapeutic 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
Pharmaceuticals and 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 org.

**(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:



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Economic Development Corporation

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