



Overview and Summary of Recent Initiatives

In 2003, the Colorado Office of Innovation and Technology, working with a management team that included industry, university, and government representatives, developed *An Action Plan to Grow Colorado's Bioscience Cluster*. The plan proposed that Colorado grow its bioscience sector by nurturing homegrown businesses, creating excellence in selected bioscience research areas, and addressing the complexity of the research and industry enterprise through cooperative endeavors.

The Action Plan is updated yearly to recognize activities that have been accomplished and to add new action steps to move the industry forward even more. In addition, the Larimer County/Fort Collins community created their own Action Plan that was based on the state plan. They have met several of their goals already and are seeing bioscience energy in the northern Colorado area.

Building Bioscience R&D Capacity

Recent state Investments in facilities

The University of Colorado Health Science Center (UCHSC), the University of Colorado Hospital (UCH), and The Children's Hospital are being relocated to a state-of-the-art medical campus at Fitzsimons. In addition, Congress recently appropriated \$53 million for the relocation of Denver's Veterans Affairs Hospital to the site; negotiations are ongoing.

The initial phase of the full campus move is estimated to cost \$1.3 billion, which will result in an increase from 2.7 million gross square feet on 46 acres to 3.4 million square feet on 210 acres at the new location. Another 1.5 million gross square feet of space, mostly for research, is slated for construction following the initial transition period. Completion of the entire Fitzsimons building program will require a total capital investment of nearly \$4 billion.

Examples of projects that have been completed since 2004 or are under construction at the Fitzsimons campus include

- **Research Complex 1**, 600,640 gross square feet, \$216 million, completed June 2004;
- **Barbara Davis Center for Childhood Diabetes**, 109,000 gross square feet, \$20.8 million; completed 2005;
- **The Children's Hospital**, 1.2 million gross square feet; \$462 million; construction began in 2004;
- **Research Complex II**, 400,000 gross square feet; \$205.8 million; under construction;

- **Denison Library at Fitzsimons**; 116,000 square feet; \$35 million; ground-breaking April 2006;
- **Education Facility II/Academic East/Education Bridge**, 250,000 gross square feet; \$75.7 million; ground-breaking April 2006;
- **Education Facilities IA and IB**, 94,669 gross square feet, \$28.4 million; ground-breaking April 2006;
- **Academic Office West**, 208,000 gross square feet, \$42 million; ground-breaking April 2006; and
- **Fitzsimons Commons**, the first phase of a new urban-centered residential/ commercial complex scheduled to open in 2006. The \$57 million project, developed by The Pauls Corporation, will emulate a traditional village center.

Research programs

See “Pending Proposals.”

Encouraging Academic/Industrial Interaction

See “Pending Proposals.”

Moving Technology into the Marketplace

Commercializing university technology

Colorado State University has created the **Commercial Opportunity Fund (COF)**, a fund to support early commercialization feasibility studies and analyses of promising technologies that emerge from the work of its faculty. The purpose of COF is to provide monetary support to increase the probability for commercial success of promising and commercially viable technologies. Due to the limited funds available, the typical budget for each project should be less than \$20,000 per year. Evaluation criteria to be used by the Colorado State University Research Foundation (CSURF) in making awards are commercial viability, proximity to completion/improvement, positioning/market research, and adequacy.

The **University of Colorado** has created a **Proof of Concept (POC) fund** to provide grants to enable the further development and validation of promising CU technologies that are, or will become, suitable for commercialization. POC awards can be either \$10,000 or \$25,000, and the technologies are selected by a competitive application process. Applications for POC awards are submitted to the Technology Transfer Office, which reviews the proposals, makes the final selections, and manages the awards.

Supporting bioscience entrepreneurs and emerging companies

The **Fitzsimons BioBusiness Incubator (FBBi)** is dedicated to promoting the growth and success of bioscience businesses in Colorado, with a special emphasis on forming a bioscience cluster at Fitzsimons. Services include business planning, strategy assessment, management, intellectual property protection, scientific and technical resources, access to laboratory space, regulatory issues, and capital formation. Funders include the Colorado Economic Development Commission, Aurora Economic Development Council, Fitzsimons Redevelopment Authority, University of Colorado, and the Metro Denver Economic Development Corporation. The incubator has eight current clients.

CTEK is a statewide partnership that provides assistance to emerging technology companies through four venture centers. CTEK offers a variety of programs, ranging from a full-client relationship that examines all aspects of launching or growing a business, a limited-duration engagement focused on specific objectives, as well as one-shot business plan or investor presentation reviews. CTEK, with Venture Centers in Boulder, Longmont, Stapleton, and Denver, works with all technology companies including bioscience companies.

Making Capital Available

Venture capital

In March 2004, the Legislature passed and the Governor signed legislation creating a **Colorado Venture Capital Authority (VCA)** and transferring \$50 million in tax credits from the state's CAPCO program to the VCA for investment in venture capital funds. The legislation requires that the funds be used to provide seed and early-stage capital. In 2005, the VCA selected High Country Ventures as the fund manager and invested \$25 million in Colorado Fund 1. It is anticipated that a second fund will be created in 2010.

The first investment by High Country Ventures was in Taligen Therapeutics, a new biotech company spun out of the University of Colorado.

Providing Space for Bioscience Companies

Incubators

See CTEK and FBBi in "Supporting bioscience entrepreneurs and emerging companies."

Bioscience research parks

The **Colorado Bioscience Park Aurora** is being developed as part of the Fitzsimons Redevelopment Project. The 160-acre park, which is affiliated with the University of Colorado, is expected to accommodate 3 million square feet of space and 4,000 employees when fully developed. The park can accommodate research-oriented biomedical, biotechnology, and pharmaceutical operations in multitenant buildings and in single-tenant buildings to suit facilities.

The Fitzsimons Redevelopment Authority, master developer of Fitzsimons, has entered into exclusive negotiations with **Forest City Enterprises** to be Fitzsimons' long term development partner. This partnership will accelerate the build-out of the Colorado Bioscience Park Aurora campus.

- The first building built in the park is the **Bioscience Park Center**, a 60,000-square-foot facility designed to house emerging bioscience companies. The center provides support services as well as specialized equipment and facilities. The center, which opened in 2000, currently houses 18 bioscience companies.
- **Bioscience East**, a 25,000-square-foot facility undergoing renovation to accommodate bioscience companies, will be ready for occupancy in spring 2006. DMI Biosciences is its first tenant.

CSURF, in conjunction with Everitt Enterprises of Fort Collins, has developed a multiuse technology park, known as the **Centre for Advanced Technology**, which houses several bioscience companies. The

centre is home to the **Natural Resources Research Center**, which is a campus of five buildings that house between 800 and 1,000 federal employees.

Under development

Forest City Enterprises is developing the **Denver Bioscience Center at Stapleton**, a Bio City on the site of the former Stapleton Airport, which will consist of a 200-acre bioscience manufacturing park. The planned development will take advantage of the proximity to the Colorado Bioscience Park at Fitzsimons and the smaller start-up companies doing clinical trials and research. It is expected that the Stapleton development will provide space for the small spin-offs to expand their manufacturing operations at a location just across the street.

Addressing Talent Needs

Specialized postsecondary programs

The **Community College of Aurora** offers biotechnician training. Students can emphasize R&D or biotechnology manufacturing.

University of Colorado-Colorado Springs has created an **Institute for Bio-Energetics**. The purpose of the institute is to build a multidisciplinary approach to understanding cellular metabolism and cellular communication with the intention of treating or curing serious diseases.

K-12 outreach programs

The Denver Metro region recently received a 5-year, \$15 million WIRED grant from the U.S. Department of Labor for workforce development. The biosciences are one of the four targeted industry clusters. A bioscience coordinator will be hired to match up industry, university, K-12, and career/technical institutions in order to provide the best bioscience workforce needed to grow the industry in Colorado.

Pending Proposals

Four bills that will benefit Colorado's bioscience industry been introduced in the 2006 legislative session.

Bioscience Net Operating Loss Bill: As part of the Governor's economic development package, this bill would permit the Colorado economic development commission to purchase the right to make a deduction for a net operating loss from a bioscience company (future tax benefit). It will require the general assembly to appropriate at least \$2.5 million for each of the next five state fiscal years to purchase these future tax benefits. The bill also establishes criteria for a bioscience company to be eligible to sell the future tax benefit to the commission.

Concerning the advancement of new bioscience discoveries at Colorado research institutions through evaluation: This bill provides for matching funds up to \$150,000 per project to support the development of life science technologies that come from new discoveries within Colorado's research institutions. This investment occurs before the technologies are licensed or sold to a commercial company; and the investment will result in a better valuation of the technology, a greater understanding of its value to health care, greater interest by investors in Colorado's private companies that develop the technology, and an earlier weeding out of technologies that should not compete for scarce development and investment funds.

Concerning an incentive to help Colorado bioscience companies offset the indirect costs associated with research services performed by Colorado research institutions: The bill provides for a subsidy up to \$25,000 of the indirect cost portion of a contract for core laboratory services at a Colorado research institution by a Colorado bioscience company. Many Colorado bioscience companies are engaged in the research and development of new products and need to access the unique, high-end technologies that exist in core laboratories that were developed to provide services to internal research projects. The subsidy will incent Colorado companies to contract for services with Colorado research institutions and will incent Colorado research institutions to identify excess capacity and provide business-friendly services to the bioscience industry.

Concerning the creation of a performance-based incentive for employers that create high-quality new jobs in the state: This legislation would provide a performance-based incentive to any employer that creates a certain number of new full-time jobs in the state as a result of opening a new business or relocating or expanding an existing business. It differentiates between job creation in rural and urban areas

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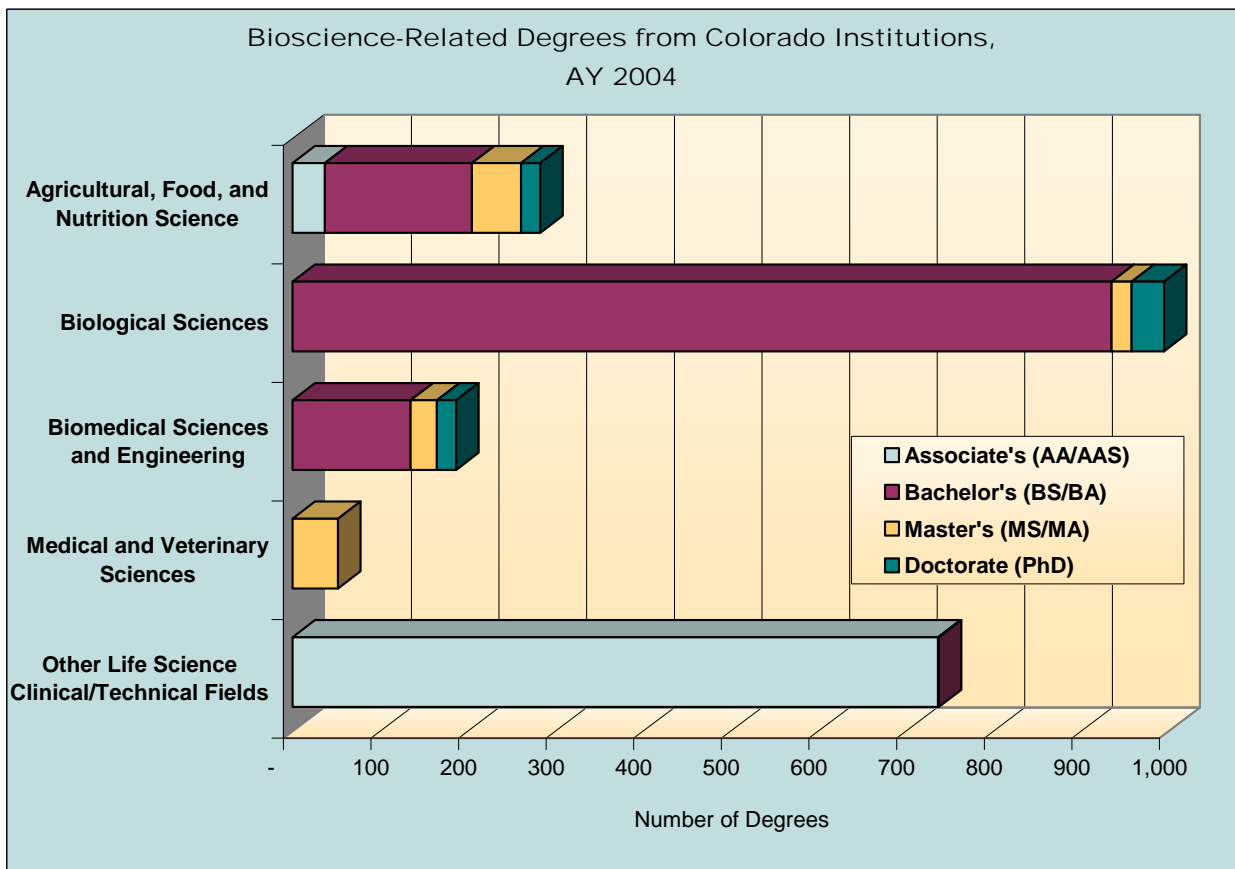
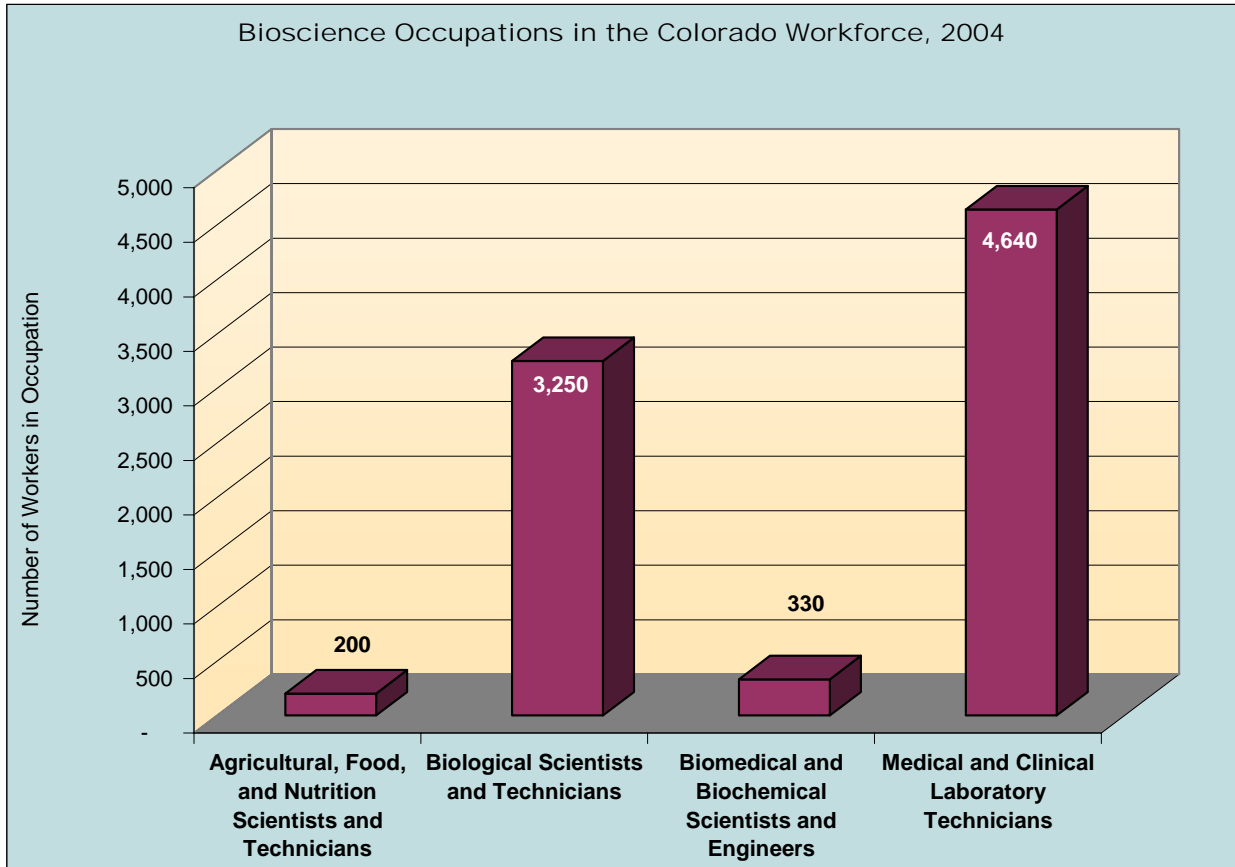
The Colorado BioScience Association is a not-for-profit corporation providing services and support for Colorado's growing bioscience industry. Colorado is embarking on an aggressive plan to grow the state's bioscience industry into one of the country's premier bioscience clusters.

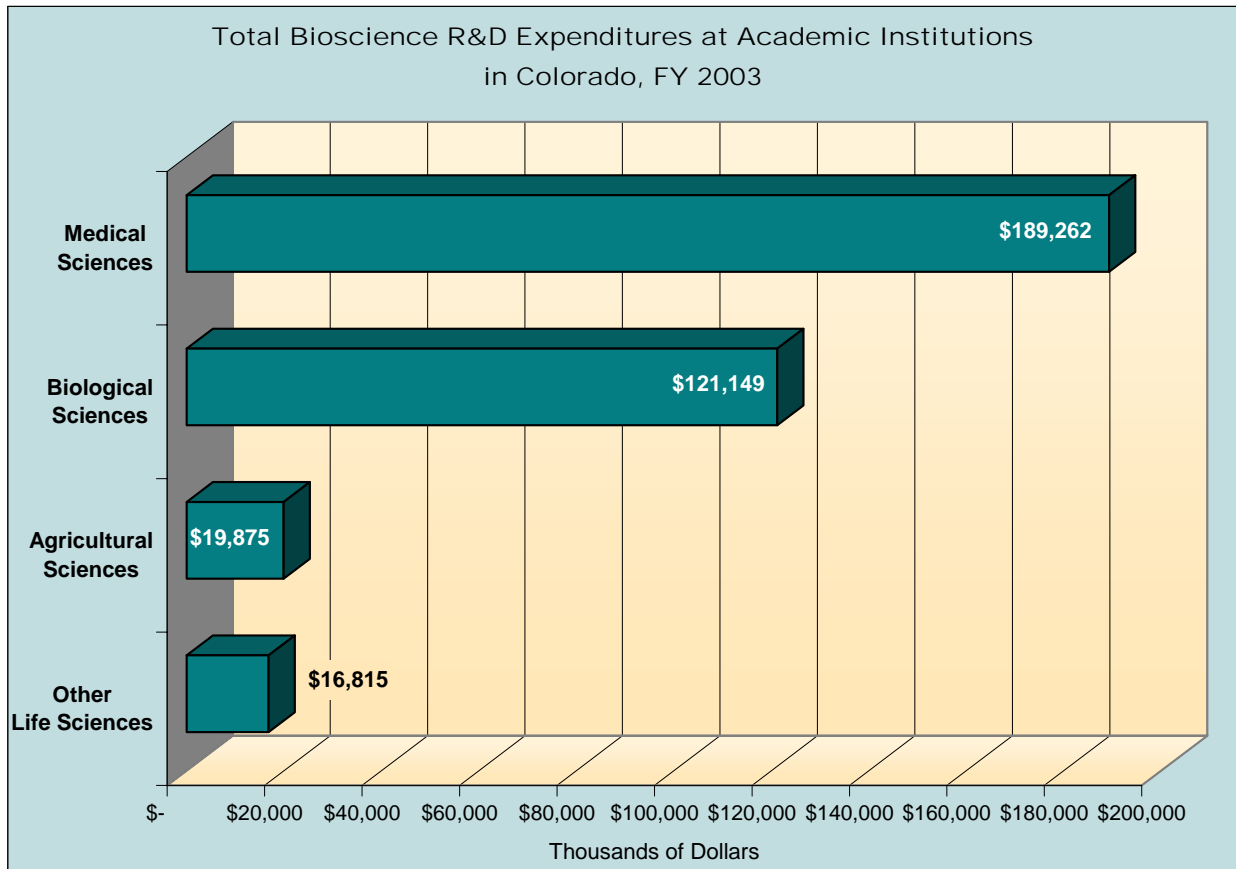
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Industry Subsector	Colorado	United States
Agricultural Feedstock & Chemicals		
Establishments 2004	22	2,111
2001-2004 Establishment % Change	-1.0%	0.4%
Employment 2004	263	104,893
2001-2004 Employment % Change	-38.5%	-6.9%
Share of U.S. Employment	0.3%	100.0%
Location Quotient	0.15	n.a.
Average Annual Wage 2004	\$37,008	\$63,383
Direct-Effect Employment Multiplier	4.23	10.91
Total Employment Impact	1,113	1,212,094
Drugs & Pharmaceuticals		
Establishments 2004	49	2,589
2001-2004 Establishment % Change	-9.3%	-0.6%
Employment 2004	2,794	313,207
2001-2004 Employment % Change	-5.1%	2.7%
Share of U.S. Employment	0.9%	100.0%
Location Quotient	0.54	n.a.
Average Annual Wage 2004	\$67,633	\$79,303
Direct-Effect Employment Multiplier	5.23	9.51
Total Employment Impact	14,613	2,731,321
Medical Devices & Equipment		
Establishments 2004	338	15,190
2001-2004 Establishment % Change	2.7%	0.2%
Employment 2004	8,492	411,460
2001-2004 Employment % Change	-3.6%	-3.6%
Share of U.S. Employment	2.1%	100.0%
Location Quotient	1.25	n.a.
Average Annual Wage 2004	\$51,792	\$56,449
Direct-Effect Employment Multiplier	2.97	4.56
Total Employment Impact	25,183	1,817,705
Research, Testing, & Medical Laboratories		
Establishments 2004	416	20,565
2001-2004 Establishment % Change	32.7%	19.4%
Employment 2004	5,079	413,550
2001-2004 Employment % Change	7.2%	8.2%
Share of U.S. Employment	1.2%	100.0%
Location Quotient	0.75	n.a.
Average Annual Wage 2004	\$63,100	\$65,414
Direct-Effect Employment Multiplier	2.55	3.15
Total Employment Impact	12,933	1,272,936
TOTAL PRIVATE SECTOR		
Establishments 2004	160,065	8,156,137
2001-2004 Establishment % Change	5.9%	4.8%
Employment 2004	1,800,773	109,249,195
2001-2004 Employment % Change	-3.8%	-0.7%
Share of U.S. Employment	1.6%	100.0%
Location Quotient	n.a.	n.a.
Average Annual Wage 2004	\$40,217	\$39,003

Source: Battelle calculations -- based on Bureau of Labor Statistics QCEW data from the Minnesota Implan Group, RIMS II Employment Multipliers from the Bureau of Economic Analysis, and the Census Bureau's Economic Census.

Note: n.a. = metric is not applicable.





	Colorado	United States	Rank
University R&D Expenditures, FY 2003			
Total (\$ thousands)	\$694,862	\$40,104,621	19
Life Science R&D (\$ thousands)	\$347,333	\$24,062,088	23
Percent of Total R&D	50.0%	60.0%	
Life Sciences Per Capita	\$76.33	\$82.74	
Change in Life Sciences FY 1999–2003	39.2%	52.7%	
NIH Support to Institutions, FY 2004			
Total (\$ thousands)	\$333,750	\$22,556,459	20
Per Capita Expenditures	\$73.34	\$77.56	
Change in Expenditures FY 2000–2004	36.8%	53.2%	
Higher Education Degrees in Bioscience Fields, AY 2004	2,255	111,329	18
Bioscience Occupations in the Workforce, 2004	8,420	616,140	22