

# BUILDING THE COLORADO BIOSCIENCE INDUSTRY CLUSTER: A REMARKABLE SUCCESS STORY

BY JEANNE MCADARA-BERKOWITZ, PHD

Newcomers to the state of Colorado are likely to look at our diverse economy, high-wage job base, and highly educated workforce and assume our state represents another spontaneous, homegrown ecosystem like the bioscience centers in Boston and San Diego, or the high-tech industry hub in Silicon Valley. But to those who had a hand in the last decade's flurry of economic development activity, the real story is much more interesting.

In fact, Colorado's bioscience industry—which employs 27,000 people, translating to more than 122,000 direct and indirect jobs and \$10 billion in payroll for the state—is an amazing success story that has proven the effectiveness of purposeful economic development.

"When the team started this push to develop a bioscience industry cluster 10 years ago, it was really kind of a giant social experiment," recalls Tom Clark, chief executive officer of the Metro Denver Economic Development Corporation (MDEDC) and executive vice president of the Denver Metro Chamber of Commerce. "We were wondering whether we could really do it. Well, last May the Biotechnology Industry Organization issued new state-by-state bioscience industry rankings, and in that report Colorado had moved from near the bottom of the overall rankings up to the bottom of the top-tier states."

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*Tom Clark, chief executive officer of the Metro Denver Economic Development Corporation (MDEDC) and executive vice president of the Denver Metro Chamber of Commerce.*

frankly, I think we're all pretty amazed that it worked," Clark laughs.

Metro Denver is a textbook example for how to do purposeful economic development correctly. The term refers to a coordinated, sustained effort by stakeholders and policymakers to promote local economic health, social well-being, and regional competitiveness through job creation and

retention, workforce development, critical infrastructure, environmental sustainability, social inclusion, neighborhood development, health, safety, literacy, and other initiatives. A key driver of success in economic development has been industry clusters—geographically concentrated areas where related government agencies, institutions of higher learning, and commercial enterprises share common needs for talent, technology, and infrastructure.

## HOW WE BECAME A BIOSCIENCE STATE

The inspiration for the Metro Denver EDC and the expansion of the nascent Colorado BioScience Association (CBSA) came from a 2002 initiative by the Governor's Office of Innovation and Technology. Clark says that research from Michael Porter at the Harvard Business School had shown that achievement of regional competitiveness comes not from trying to recruit a few "hot" companies to an area, but by creating a self-sustaining economic ecosystem that is not primarily dependent on outside infusions of money and investment.

"By this time we had the Denver International Airport, we had cleaned up our air quality, and we had a bustling downtown with public transportation, arts, culture and the high-rise feel attractive to metropolitan dwellers. Now we needed industry clusters," says Clark. "We decided that our initial clusters would be bioscience and aerospace, and the next question was 'how do we become a bioscience state?'"

To answer that question, the Governor's Office partnered with a management team that included industry, university and government representatives—along with the Battelle Memorial Institute's Technology Partnership Practice—to assess the status of the Colorado bioscience sector and develop a plan outlining the action agenda needed to make the biosciences a key driver of Colorado's economy. That report, "Colorado's Place in the Sun: A Bioscience Future, An Action Plan to Grow Colorado's Bioscience Cluster," was published in March 2003 and outlined several key findings that kicked off the state's focus on developing Colorado as the next bioscience business cluster.

"Number one, it showed that we definitely weren't a bioscience state," Clark laughs. "But it also told us that we had to accomplish three things in order to become one. We needed to establish a locus of economic activity, we



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*The Rocky Mountain Innosphere, Fort Collins, Colorado*

needed an industry or academic ‘superstar’ to help attract other talented people here, and we needed a mechanism for funding the proof-of-concept studies that move technology out of the basic research lab and into commercial development.”

The team set out to make these recommendations a reality. The CU Denver Anschutz Medical Campus was already in the process of being built out, and low interest rates made it possible to accelerate that development plan. In 2006 the legislative advocacy efforts of CBSA paid off with the passage of HB 1360. Sponsored by Representative Jim Reisberg (D-Greeley) and Senator Ron Tupa (D-Boulder), this bill appropriated \$2 million to fund grants for bioscience proof-of-concept work and opened the doors to additional legislation that resulted in the establishment of the Colorado Office of Economic Development and International Trade’s Bioscience Discovery Evaluation Grants. And homegrown Nobel Laureate Tom Cech—who briefly left Colorado to become president of the Howard Hughes Medical Institute in Maryland—was persuaded to return to CU Boulder, bringing with him four rising stars and leading to the advent of the BioFrontiers Institute.

“Those accomplishments, along with the expansion and support of the CBSA as a critically important advocacy organization, have set us on the right course,” says Clark. “The world started to look at us and pay attention.”

Steve Vannurden is the president and CEO of the Fitzsimons Redevelopment Authority,

*Fitzsimons Redevelopment Authority, Bioscience Park Center, Aurora, Colorado*

(FRA), one of the entities involved in the development of the Fitzsimons Life Science District that neighbors the Anschutz Campus. As a newcomer to Denver—Vannurden just joined the FRA in August 2012—he agrees that the early development efforts are paying off for long-term success.

“As I was looking at coming here, I saw major healthcare players with Children’s Hospital, the University of Colorado Hospital, the CU medical, nursing, dental, and pharmacy schools all together in one place,” says Vannurden. “It was a critical set of stakeholders right there on campus, around which we can build a sustainable life science community.”

What the FRA aims to do is not only provide infrastructure to attract life science companies to settle in close proximity to academic sources of technology, but to facilitate collaborations and streamline commercialization.

“What’s interesting to me, personally,” says Vannurden, “is that we have such a unique opportunity to create the future of medicine right here on campus. This is an environment where we can take scientific talent, intellectual property, and entrepreneurial activity, and put them together to advance the practice of medicine and benefit patients across the US and around the world while creating good, high-paying jobs for Colorado. It’s good for all of us.”

The economic development efforts close

in to Denver have inspired companion efforts in Northern Colorado, especially around the Colorado State University (CSU) campus in Fort Collins.

The Rocky Mountain Innosphere, a technology accelerator in Fort Collins, has been a leader in the recent push to develop the bioscience presence there. Mike Freeman, CEO at the Innosphere, says that they made the conscious decision to broaden their focus from technology, hardware, and software in 2004, when they noted the beginnings of increased bioscience activity.

“We realized that in northern Colorado there was not a huge concentration of bioscience companies and, out of CSU, we were most likely to see technologies coming from the veterinary school or infectious disease department,” says Freeman. “So with that focus we have built up enough of an ecosystem to legitimately support eight biotech companies [at the Innosphere] in addition to our other companies.” By recent estimates, Fort Collins is home to well over 50 young and growing bioscience companies.

In Freeman’s view, collaboration with CBSA has been critical to the region’s success. “In the early years we didn’t have a formal entity like the CBSA, so working with them and the City of Fort Collins gave us the ability to promote the industry here, help build a brand around Northern Colorado Bioscience, and collaborate on co-branded events and panels. Expanding on this, I see 2013 as a critical year for us to tighten our integration with CSU ventures and technology transfer, and find new ways to work together with CBSA and with CU health sciences.”

Bioscience economic development efforts at CSU dovetail nicely with the Innosphere’s plans, says Rick Lyons, director of the Infectious Disease Research Complex and Supercluster, and the Research Innovation Center (RIC) at CSU Fort Collins. “The RIC and the Innosphere



companies housed there are homegrown, and most of the rest had close CSU connections.

“We offer a turnkey facility for infectious disease companies,” he says. “We provide built-out, biosafety-level-2 laboratories with all of the approved HVAC and other utilities they need to get going right away. We think that will help to drive entrepreneurship and build momentum for a novel paradigm of industry-academic collaboration here at CSU.”

Looking southward from Denver, the past 10 years have seen dramatic growth in bioscience in Colorado Springs as well. David White, chief business development officer at Colorado Springs Regional Business Alliance, says that the medical device industry has proven a particular bright spot there.

“We’ve seen a sizable increase in all forms of bioscience activity here, but medical devices seem to be a particular strength for Colorado Springs,” says White. “Our region features an interesting intersection of sports and human-performance technology, military and defense applications, information technology and software, manufacturing, medical device companies, and universities, and we are seeing these sectors working

have a very tight relationship. We kind of view our two sites as the infrastructure for the city of Fort Collins. When companies come here our collaboration puts us in a better marketing position to make sure they are aware of opportunities, and then we can work together to place them where they’ll be most successful depending on their needs.”

According to Lyons, the goals of the CSU infectious disease supercluster are to encourage entrepreneurship among faculty

*Research Innovation Center (RIC) at CSU Fort Collins, Colorado*

members, and assist in translating innovative discoveries into products. In support of that goal, the RIC building was opened in 2011. This facility houses CSU faculty on the first floor and a research incubator on the second floor, bringing academics and entrepreneurs into close proximity for cross-talk and collaboration. Lyons estimates that 40% of the



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together to form new opportunities.”

White notes that a number of companies have either grown up in Colorado Springs or migrated here from California and elsewhere in the past few years, drawn by the high standard of living and a cost of doing business that is attractive to manufacturing companies. Combined, these companies employ thousands of people and provide a nucleus for the industry.

Scott Hawranek, a Colorado Springs intellectual property attorney adds, “We also have a good number of startups working to bring their devices and combination products to the next level. At their stage, they are aided by the ready availability of prototyping facilities and regulatory and intellectual property services here.”

No matter what part of the state, an inclination toward collaboration and excitement for the future seems to be shared throughout Colorado. Says Vannurden, “We’re all working together pretty closely because acting separately doesn’t give us the strength we need. Rather than having to fight over the size of our individual slices, the focus is on making the whole pie bigger for all of us.”

#### CHALLENGES DOWN THE ROAD

All of this is not to say that Colorado’s industry cluster’s challenges are safely in the rear view mirror. The consensus among those interviewed was that the biggest challenges, for now, are related to lack of locally sourced funding and investment.

“There is a real ‘can-do’ attitude in these companies, but that only carries them so far,” says Lyons. “Ultimately, they need access to venture capital.”

Freeman agrees. “There are few active funds in Colorado that will entertain proposals from biotech. So the issue looms: can we be successful without a strong local investor base, or will startups move to Boston or San Francisco once they need significant funding?”

White also worries about the potentially chilling effect of new tax legislation, such as the Medical Device Excise Tax. “It’s going to be very challenging for companies to expand if their profits have to go toward this tax,” he says.

Finally, White asserts that workforce development will be another area for focused improvement over the next decade.

“One thing we consistently hear from the companies we talk to is that they are finding it necessary to import talent,” says White. “We as a community and a region need to work on continually improving our educational system so that companies here can rely on local, homegrown talent to fuel growth and innovation.”

Whatever the future holds, the architects of Colorado’s economic development successes can look back over the last decade with pride. Says Clark, “There are so many heroes in this story, and what they’ve proven is that we truly can change the shape of our economy. In 1983, Colorado’s economy relied pretty heavily on fossil fuels. We weren’t in the top 25 states in terms of diversity of economy, and now we’re ranked third behind California and New York. Bioscience has been an important part of that diversification strategy.”

Why does this matter? Because bioscience, as an industry, creates primary jobs and high wages to satisfy Colorado’s highly educated workforce.

“And also, it’s cool,” says Clark. “We’re improving people’s health and their lives.”



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