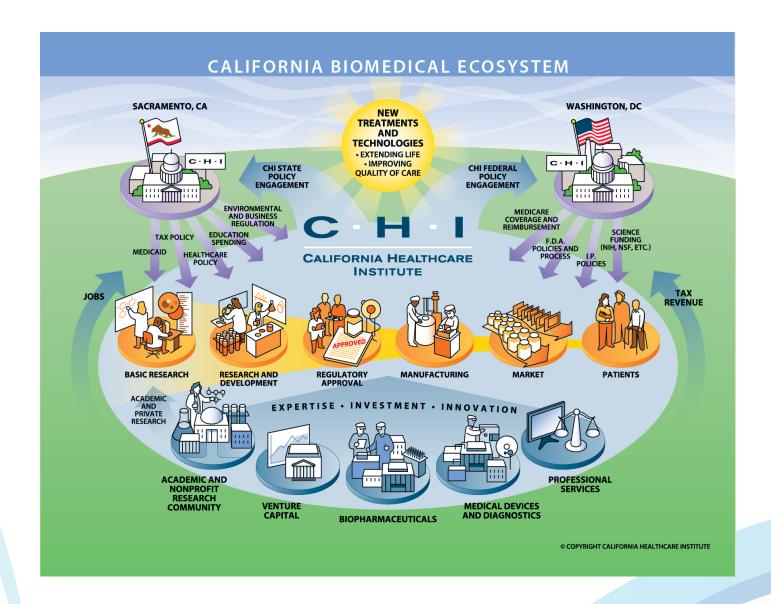
## 2014 California Biomedical Industry Report







## Letter from the Governor



Jerry Brown Governor of California

The State of California is the birthplace of the biomedical industry and a worldwide leader in health innovation advancements. California leads the nation in biomedical firms, jobs, output, federal grants and patents. The industry generates highly skilled and well-paid jobs in local communities all over the state. California is proud to be a leader in biomedical innovations that cure deadly diseases — each success promises to improve the lives of people worldwide.

This year California enacted several laws to bolster our biomedical industry, including AB 93 and SB 90, which revamped the way California approaches economic development and makes targeted investments in the biomedical industry. This exempts California biomedical companies from paying state sales tax when purchasing equipment used for manufacturing and research and development, making it easier for biomedical companies to invest more in their R&D operations and expand their manufacturing base in California.

The California Healthcare Institute is an important partner in our efforts to foster a stronger biomedical industry and boost job growth in California. I look forward to working with the many innovative biomedical companies around the state to advance new technologies and contribute to a healthier society.



EDMUND G. BROWN JR.

## Letter to Stakeholders

This year is CHI's twentieth anniversary, and in those twenty years California has developed a vast biomedical ecosystem. Today 267,000 Californians are employed by the academic research institutions, biopharmaceutical companies and medical technology manufacturers that constitute the industry's direct employment in the state. Beyond this, another half million additional jobs – from professional services to construction and real estate – depend on the biomedical industry.

For a generation California has been the world leader in life sciences innovation. We are home to the most jobs, the most biotech, device and diagnostics companies, the largest share of NIH grants and the world's greatest concentration of top-tier basic research institutions. But the challenges to our leadership have never been more serious. Other states and countries, like China, are aggressively courting California researchers and executives with promises of economic incentives. Recent gridlock in Washington, together with sequestration, pressure on discretionary spending and the need for skilled labor immigration reform, threaten California's (and the nation's) basic research enterprise, which is the foundation of our ecosystem.

Meanwhile, the State of California is taking steps to improve the environment for biomedical research and development. Governor Brown has signed legislation to reduce duplicative regulation of drug and device facilities and, recently, to offer tax incentives for firms to expand operations within the state. As this report demonstrates, California's medical device and biopharmaceutical industry was resilient through the worst of the Great Recession, being one of only two states to add employment in this industry from 2008–2012. With both federal research funding and venture capital investment down, our resilience faces new tests as we seek creative ways to advance our industry to the next level. Fortunately, California has the talent, creativity and entrepreneurial energy to pass these tests and open new paths for our industry's future.

Sincerely,



David L. Gollaher, Ph.D. President & CEO California Healthcare Institute



Peter Claude
Partner, Pharma &
Life Sciences
Advisory
PwC

DAVID GOLLAHER, Ph.D.

PETER CLAUDE

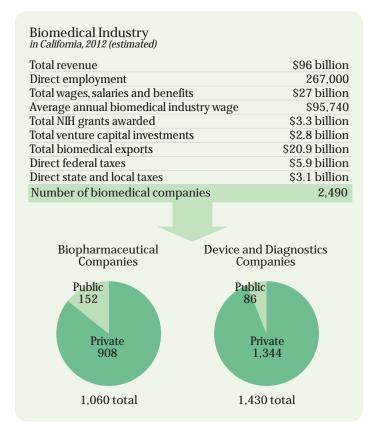
## An Economic Cornerstone

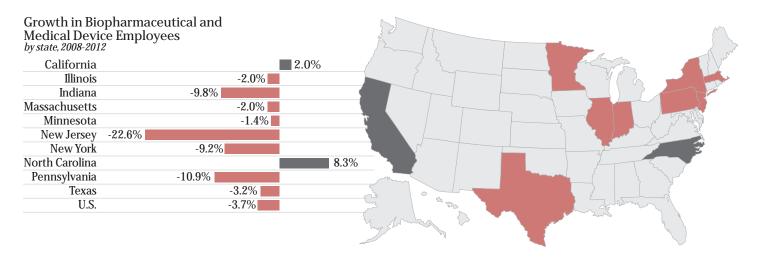
California's biomedical industry touches millions of people throughout the world. The drug therapies, diagnostic tests and devices these companies produce save lives. boost health and improve quality of life.

Closer to home, the industry is a powerful contributor to the state's economic health. California's biomedical industry employs 267,000 people with average annual salaries exceeding \$95,000.

Of the 2,490 biomedical companies in California, 2,252 are privately held. These are mostly small, innovative startups working to bring promising new technologies to the marketplace. It's a tough road, but their success is a key driver of economic growth.

During the recent recession, from 2008-2012, California's biopharmaceutical and medical device employment grew 2 percent, in contrast to traditional leaders such as New Jersey and Massachusetts, which lost jobs. This ability to grow while facing an economic headwind exemplifies the strength of California's biomedical sector. Only North Carolina outperformed California at 8.3 percent growth.



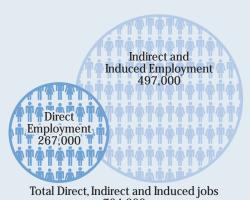


## Ripple Effect

The biomedical industry's footprint extends well beyond the institutions conducting innovative research and the businesses commercializing new products. Dozens of related industries generate jobs and expansive economic activity throughout California.

While the industry directly employs 267,000, there are 497,000 more Californians whose jobs are connected to the biomedical enterprise. These are computer programmers, construction workers, consultants, delivery people, attorneys and many others who are supported by the biomedical presence in their community.

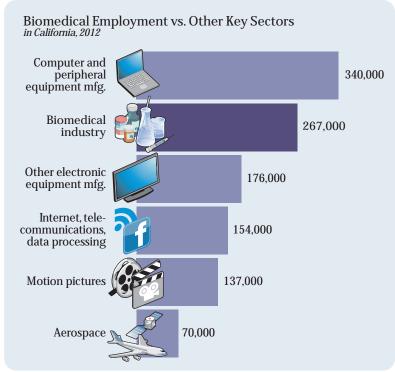
In addition, California's direct biomedical employees and companies pay more than \$9 billion in federal, state and local taxes. Governments receive \$11 billion more from those who depend on the industry for their own livelihoods.

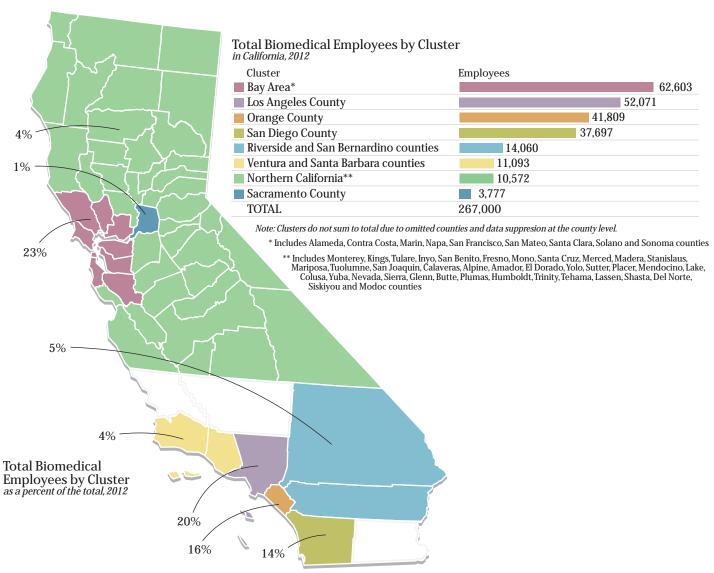


## A Statewide Industry

In terms of total high-tech employees, the industry's nearly 267,000 are second only to the computer and peripherals enterprise, which employs 340,000. While the biomedical industry is mostly clustered in geographic hubs—the San Francisco Bay Area, Los Angeles, Orange County and San Diego—the biomedical enterprise spans the entire state. California's ecosystem encompasses life sciences companies, universities, independent research institutes, diagnostics labs and wholesalers to create a uniquely productive economic environment.

With its large area encompassing nine counties, the San Francisco Bay Area leads the pack, followed by Los Angeles, Orange and San Diego counties. Elsewhere, the industry has a significant presence in Ventura, Santa Barbara, Riverside, San Bernardino and Sacramento counties, as well as less-populated areas throughout Northern California.





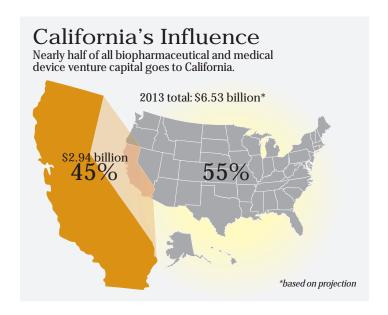
## Venture Capital Investment

A leading indicator of California's biomedical industry strength is venture capital (VC) investment. Projections for 2013 indicate that California will receive around 45 percent of the total biopharmaceutical and medical device venture capital invested in the United States.

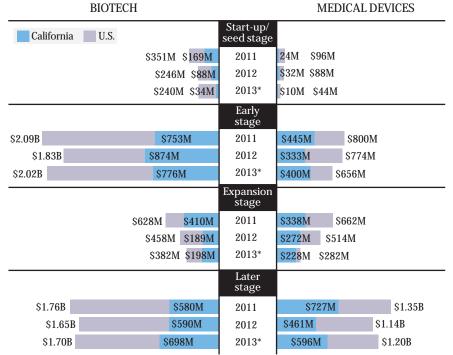
This is a concrete endorsement of California's biomedical leadership, as VCs look within the state for potential "winners" that reward investors with attractive returns. In recent years, however, VC funding has come under pressure. As noted, most biomedical businesses in California are small and privately held. These companies are heavily reliant on venture capital to fund their initial operations. Unfortunately, both California and the United States as a whole have seen a steady decline in start-up funding from VCs.

The medical device industry has been hit especially hard. With the 2.3 percent medical device tax included in the Affordable Care Act, start-up medical device companies are struggling to find investors. Since 2007, medical device VC investment is down more than 40 percent across the U.S. In the same period, biotech investment declined by 28 percent. The biomedical

industry has been forced to become more creative to find early-stage funding, including forming new partnerships, collaborations and seeking funds from private foundations.

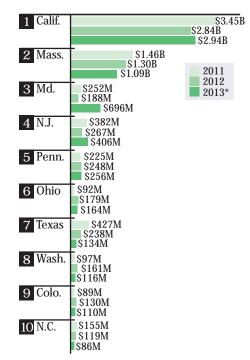


Venture Capital Investment, Biotech and Medical Devices by stage, U.S. and California, 2011-2013\*



\*2013 data based on projection from first two quarters

Top 10 States for Life Sciences Venture Capital Investment 2011-2013\*



<sup>\*2013</sup> data based on projection from first two quarters

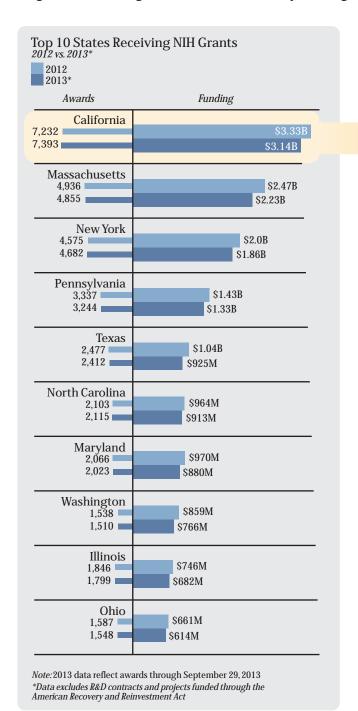
## The Innovation Engine

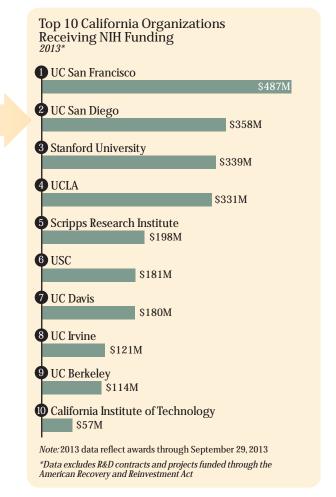
To a large degree, California's immensely successful biomedical industry is built on academic discovery science. Basic research in genomics, pharmacology, bioengineering and other areas find their way to established companies or inspire the creation of new start-ups. Outstanding doctoral and post-doctoral training programs supply talented scientists to transform basic discoveries into novel drugs, devices and diagnostics.

In 2013, California academics are expected to receive NIH grants exceeding \$3 billion, far and away leading

the nation. Institutions like UC San Francisco, UC San Diego, Stanford and UCLA lead the way, each topping \$300 million in grant revenue.

In recent years, though, government support for basic research has become increasingly constrained. NIH funding, which has been stagnant for more than a decade, has taken a further hit from sequestration, which has cut research grants by 5 percent. While it's good news that California is getting a larger percentage of this grant revenue, the total pie is getting smaller.





## NIH Small Business Grants

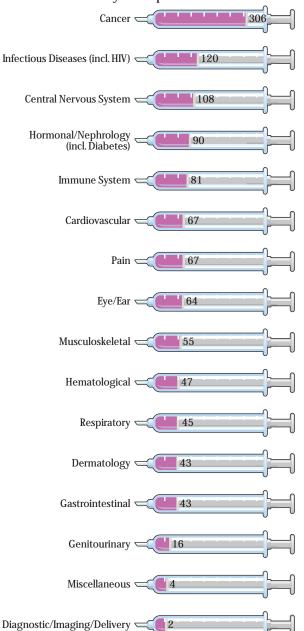
The Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs leverage government investment to commercialize innovative research and development. Similar to NIH academic funding, SBIR and STTR grants have been affected by the 2013 sequester; however, California has received the most. As of September 29, 2013, California received 312 awards totaling more than \$125 million. By comparison, the next closest state, Massachusetts, received 174 grants, worth \$70 million.

These grants are a particularly important income source for California's many early-stage biomedical companies, which must contend with the recent decline in venture capital funding.

## Results: A Robust Pipeline

Important as it is to analyze the many factors that contribute to California's successful biomedical industry, the ultimate goal is to produce drugs, devices and diagnostics that will improve health and reduce suffering. As of mid-October 2013, California companies had 1,158 drugs in the pipeline to treat cancer, heart disease, neurologic and infectious diseases and other conditions. In the most important metric of all, the ability to help people, California is excelling.

#### California Products by Therapeutic Area

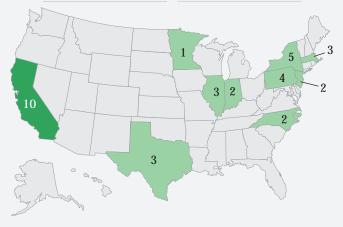


#### Best of the Best

California boasts the highest concentration of world class research institutions in the world. The state has 10 of the top 100 universities on the Shanghai Index. They are Stanford, UC Berkeley, California Institute of Technology, UCLA, UC San Diego, UC San Francisco, UC Santa Barbara, UC Irvine, UC Davis and USC. By contrast, New York has five and Massachusetts, three.

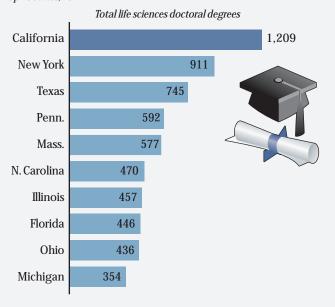
## Number of Universities in the World Top 100 Shanghai Index, 2013 rankings

California	10	Texas	3
New York	5	Indiana	2
Pennsylvania	4	New Jersey	2
Illinois	3	North Carolina	2
Massachusetts	3	Minnesota	1



California's excellent academic infrastructure is also reflected in the total number of life science doctorates awarded per year, with more than 1,200 in 2011. The next closest is New York with just more than 900.

## Doctoral Recipients in Life Sciences Disciplines $Top\ 10$ states, 2011



## **Looking Ahead**

Gaining regulatory approval and reimbursement for drugs and devices is a long, capital-intensive process, particularly for small companies. Decision makers in Washington and Sacramento will continue to play a key role. Thoughtful, forward-looking policies that bolster NIH funding, transparent FDA regulatory processes, value-driven coverage and payment policies and robust intellectual property protection will help ensure California continues its longstanding biomedical leadership. State policies that foster higher education and STEM funding, coupled with a better tax, regulatory and lawsuit climate need to be addressed for California's biomedical ecosystem to thrive.

# Fostering a Better Business Environment

While California pioneered the modern biomedical industry, past performance is no guarantee of future success. In particular, the state must find innovative ways to become more business-friendly or risk losing its leadership position.

Fortunately, steps are being taken to improve the business climate. Recently, legislation championed by Governor Jerry Brown to reduce duplicative state biomedical facility inspections has become law. In addition, the governor's economic development package included several business-friendly sales tax exemptions. These are positive steps, but more can be done.

#### Report Authors

David L. Gollaher, Ph.D. President and CEO California Healthcare Institute

Peter Claude Partner, Pharma & Life Sciences Advisory PwC

#### **Project Team**

Erica Hiar California Healthcare Institute

Todd Gillenwater California Healthcare Institute

Art Karacsony

Ousmane Caba PwC

#### Writing

Josh Baxt Baxt Communications

Graphics and Design Paul Horn

Cover Illustration
Jim Nuttle

#### **Economic Analysis**

Kristen Soderberg

Jack Rodgers PwC

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#### About California Healthcare Institute

CHI represents more than 275 leading biotechnology, medical device, diagnostics, and pharmaceutical companies, and public and private academic biomedical research organizations. CHIs mission is to advance responsible public policies that foster medical innovation and promote scientific discovery.

CHI's website is www.chi.org. Follow us on Twitter @calhealthcare, Facebook, LinkedIn and YouTube.

See methodology and more at: www.chi.org/2014biomedreport



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CHI • HEADQUARTERS 888 Prospect St., Suite 220 • La Jolla, CA 92037 858.551.6677 • Fax 858.551.6688

CHI • SACRAMENTO 1201 K St., Suite 1840 • Sacramento, CA 95814 916.233.3497 • Fax 916.233.3498

CHI • WASHINGTON, D.C. 1608 Rhode Island Ave. NW, Second Floor • Washington, D.C. 20036 202.974.6313 • Fax 202.974.6330