



SAN DIEGO INNOVATION REPORT /2016





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CEO EXECUTIVE SUMMARY

GREG MCKEE



Photo by: Melissa Jacobs

Since 2005, CONNECT has monitored and measured the growth of the innovation economy in the San Diego region. I'm proud to present the San Diego community with the 2016 Innovation Report - another banner year for San Diego.

Over the past few years we've seen several key trends emerging in San Diego's innovation economy. To that point, we analyzed the last four years of reports and have found the following trends of interest:

The innovation sector is gaining a strong foothold in San Diego's economy. The innovation economy has grown to \$55 billion dollars, which represents a quarter of San Diego's GDP.

There is faster and more robust growth of innovation startups. In 2016 477 new innovation startups were created - the most startups created in a one year period since CONNECT started tracking their growth. Since 2013 San Diego created, on average, 440 startups each year.

Between 2005 and 2012 San Diego created, on average, 302 startups a year. That's an average increase of 100 more startups per year for the last four years.

Software startups are seeing huge growth year over year. 280 new software startups were created in San Diego in 2016, building on 2015 and 2014, which created 255 and 248 software startups, respectively.

San Diego is number one for life sciences startup creation. San Diego was the number one county in California for creation of new life sciences startups in 2016 for the second year in a row with 95.

Venture funding to early stage companies continues trending up. San Diego early stage companies received more than \$700 million in 50 VC investment deals in 2016 - a historic high-water mark. This was up 120 percent from 2015.

There is steady job growth in the innovation sector. Employment in San Diego's innovation economy has grown steadily since 2011 from 136,000 jobs to over 150,000 in 2016. With an average salary of over \$110,000, innovation economy jobs pay, on average, 2.1 times the average job in San Diego.

Research in San Diego is big business. San Diego's research institutions have a \$4.6 billion economic impact and are the core of the region's \$14.4 billion scientific R&D cluster.

CONNECT is dedicated to the success of the tech and life sciences companies for the growth and good of the San Diego region. Over the past year CONNECT has continued to strengthen and refine our flagship program - the Springboard Accelerator Program - worked to match innovation companies with the capital and talent they need to grow, and expanded the offerings of programming for growing innovation companies.

We're committed to helping San Diego entrepreneurs create the next ten \$1 billion dollar innovation companies in our region. The CONNECT Innovation Report provides hard evidence that the work we do with our entrepreneurs, research institutes, mentors, investors, and partners has tangible outcomes that grow the San Diego economy in an impactful way. We're proud to take a leading role in growing San Diego's future.

Greg McKee
Chief Executive Officer, CONNECT

REPORT HIGHLIGHTS

ECONOMIC IMPACT – \$55 BILLION, 400,500 JOBS

The innovation economy accounted for more than **\$55 billion**, or 25 percent, of San Diego's economic activity (Gross Domestic Product)

San Diego's research institutions have a **\$4.6 billion** economic impact and are at the center of the region's **\$14.4 billion** scientific R&D cluster

2.7X job multiplier effect impact of innovation economy employment on overall San Diego region employment

San Diego's innovation economy impacts more than **400,500** jobs in the region

- More than **30 percent** of private sector jobs

- More than **40 percent** of the region's total labor income

GROWTH

477 NEW INNOVATION STARTUPS IN 2016

280 NEW SOFTWARE COMPANIES CREATED

95 NEW LIFE SCIENCES COMPANIES CREATED

63 NEW COMMUNICATIONS, COMPUTER & ELECTRONICS COMPANIES CREATED

21 NEW AEROSPACE, NAVIGATION & MARITIME TECH COMPANIES CREATED

12 NEW RECREATIONAL GOODS MANUFACTURING COMPANIES CREATED

6 NEW ENVIRONMENTAL TECHNOLOGY COMPANIES CREATED

SAN DIEGO INNOVATION STARTUPS CREATED 1,729 NEW JOBS IN 2016

Top Sectors

898 NEW SOFTWARE JOBS CREATED

358 NEW LIFE SCIENCES JOBS CREATED

348 NEW COMMUNICATIONS, COMPUTER & ELECTRONICS JOBS CREATED

62 NEW AEROSPACE, NAVIGATION & MARITIME TECH JOBS CREATED



REPORT HIGHLIGHTS

INNOVATION COMPANIES, JOBS, AND WAGES

The average innovation sector job paid **2.1X More** than the average job in San Diego in 2016

- Innovation economy avg. annual salary: **\$110,700**

- Rest of economy avg. annual salary: **\$51,500**

6,630 COMPANIES

6 percent of total number of companies in San Diego County

150,660 EMPLOYEES

11 percent of total employment in San Diego County

\$16 BILLION PAYROLL

28 percent of total payroll in San Diego County

CAPITAL FUNDING – \$6.7 BILLION AND M&A – \$10.6 BILLION

Venture Capital Funding

\$1.5 BILLION in venture capital was invested in **118 deals** in San Diego in 2016. Investment in early stage San Diego companies surged 120 percent to more than **\$700 million** in 2016

Angel & Other Non-VC Capital Funding

\$134 MILLION in angel and other non-VC backed funding was invested in **137 deals** in San Diego in 2016

Equity Capital Markets (IPOs and FPOs)

\$154 MILLION was raised by **3** San Diego companies in **initial public equity offerings (IPOs)** in 2016

\$4.9 BILLION was raised by **33** San Diego companies in **41 follow-on public equity offerings (FPOs)** in 2016

Mergers & Acquisitions (M&A)

\$10.6 BILLION in **157 M&A deals** in technology and life sciences sectors were closed in 2016 where the merger or acquisition target, buyer, or seller was a San Diego company

GRANTS – \$1.5 BILLION

\$925 MILLION in **NIH** grants funding to San Diego companies and institutions in 2016

\$235 MILLION in **NSF** grants funding to San Diego companies and institutions in 2016

\$123 MILLION in **Department of Energy** grants funding to San Diego companies and institutions in 2016

\$102 MILLION in **Department of Defense** grants funding to San Diego companies and institutions in 2016

\$55 MILLION in **SBIR-STTR** grants funding to San Diego companies and institutions in 2016

\$34 MILLION in **NASA** and **NOAA** grant funding to San Diego companies and institutions in 2016

INTELLECTUAL PROPERTY – 6,252 PATENTS ISSUED

#1 ranked county in Southern California for patents granted and patent applications published

6,794 patent applications published in 2016, second ranked county in California after Santa Clara County

6,252 patents issued in 2016, second ranked county in California after Santa Clara County

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The Innovation Economy Accounts for More Than \$55 Billion, or More Than 25 Percent of San Diego's Total Economic Activity

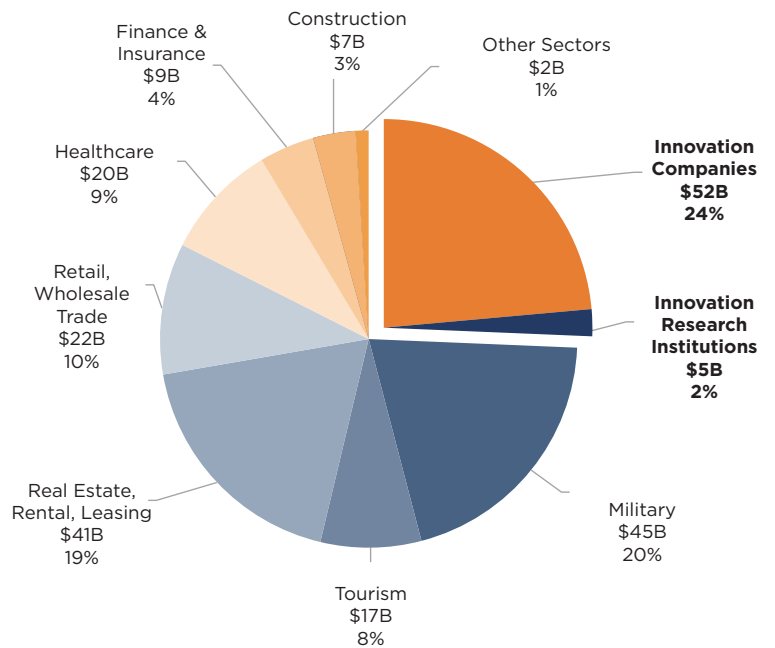
SAN DIEGO INNOVATION ECONOMY – ECONOMIC IMPACT

San Diego's innovation economy companies directly generate more than \$60 billion in sales, employ more than 150,000 workers, and provide \$18 billion in payrolls annually.

The direct economic contribution to San Diego's economy is more than \$28 billion, accounting for more than 13 percent of the regional economy or gross domestic product (GDP), estimated to be \$220 billion. Including indirect and induced impacts results in a \$57 billion impact, or 26 percent of San Diego's estimated GDP.

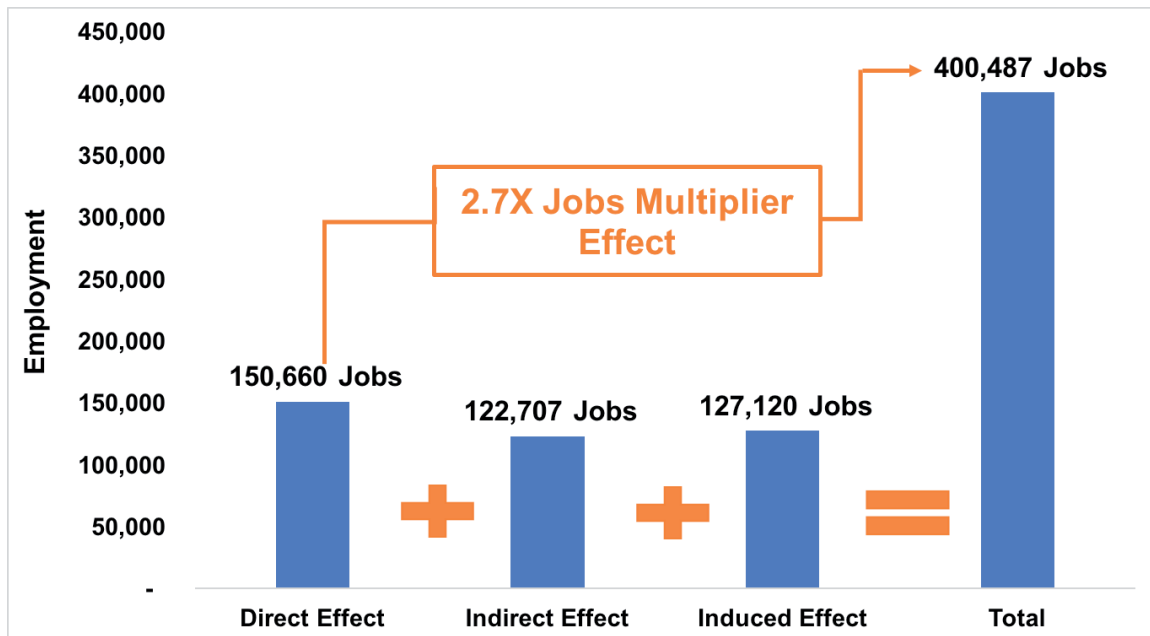
Including indirect and induced jobs impact, the multiplier effect on jobs is 2.7 - this means for every technology job, another 2.7 jobs are dependent or created.

San Diego Gross Domestic Product (GDP) By Sector \$220 Billion



EMPLOYMENT GENERATED FROM TECHNOLOGY INNOVATION BUSINESS IS EQUIVALENT TO MORE THAN 400,500 JOBS, OR 30% OF ALL CIVILIAN JOBS AND MORE THAN 40% OF THE REGION'S TOTAL LABOR INCOME.

Economic Impact of Innovation Economy - 400,500 Jobs



Source: National University System Institute for Policy Research, based on IMPLAN econometric model for San Diego County; SANDAG; San Diego Tourism Authority Annual Report; San Diego Military Advisory Council (SDMAC); San Diego EDC Research Institution Report (2015); CONNECT



STARTUP SPOTLIGHT

FEATURED LOCAL, EARLY-STAGE INNOVATION COMPANIES



Suman Kanuganti
Co-Founder & CEO



Rebecca Cofinas
Founder & CEO



Larry Blair
CEO

aira.io

Founded 2015
Information Communication Technologies

Aira leverages the ubiquity of mobile communications together with a confluence of technologies (such as smart glasses, geolocation, and sensors), in addition to professionally trained human agents, to provide instant access to information for people with vision loss. Aira users, just by tapping a button on the Aira app, connect within seconds to a network of distributed, trained agents who help blind people gain immediate and unprecedented access to information and assistance in real time. Thus, Aira is focusing on solving an age-old problem facing those with vision loss: securing greater access to information instantly, anywhere and anytime to further enhance their mobility and independence in daily life - helping them to further explore their world like never before.

aristamd.com

Founded 2013
Software, Digital Media, Mobile Apps

AristaMD, innovative provider of the cloud-based Smart Care Platform for primary care physicians and specialists, transforms the delivery of care by empowering primary care physicians (PCPs) with evidence-based clinical work-up checklists, eConsults, an expert national panel of specialists and usability insights to optimize care collaboration and specialty referral triage while ensuring fully documented care transitions. Leveraging proven clinical guidelines developed at UC, San Francisco (UCSF), the physician-designed solution enables greater patient access to efficient, specialty care via the PCP with eConsult. Designed to seamlessly integrate into clinical workflows, the scalable platform allows payers and providers to quickly and cost-effectively launch specialist eConsults using their own specialists or those provided by AristaMD's board-certified panel of specialists. Committed to driving better health outcomes, AristaMD partners with healthcare stakeholders to ensure success transitioning to value-based care.

buildfire.com

Founded 2014
Software, Digital Media, Mobile Apps

BuildFire's Mobile App Platform empowers anyone to easily build stunning mobile apps for their audience with ready-to-go themes and intuitive point-and-click interface. These are powerful apps, yet no coding skills are required. The open-architecture SDK/APIs enable even the most demanding apps to deliver enterprise-class integrations. BuildFire's Enterprise App Platform enables creative professionals to design flexible communication and engaging mobile applications without the constraints of costly, rigid or fixed function apps. Today, a business has two choices: use a DIY app builder that offers simple functions or get a developer to build a custom app specific to their needs. The BuildFire Platform enables both capabilities and bridges the gap - the simplicity of DIY and the flexibility to add custom functionality. The benefits are huge in time savings, flexibility, risk, and life cycle costs.

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SAN DIEGO TECHNOLOGY & LIFE SCIENCES STARTUPS HIT NEW HIGH IN 2016

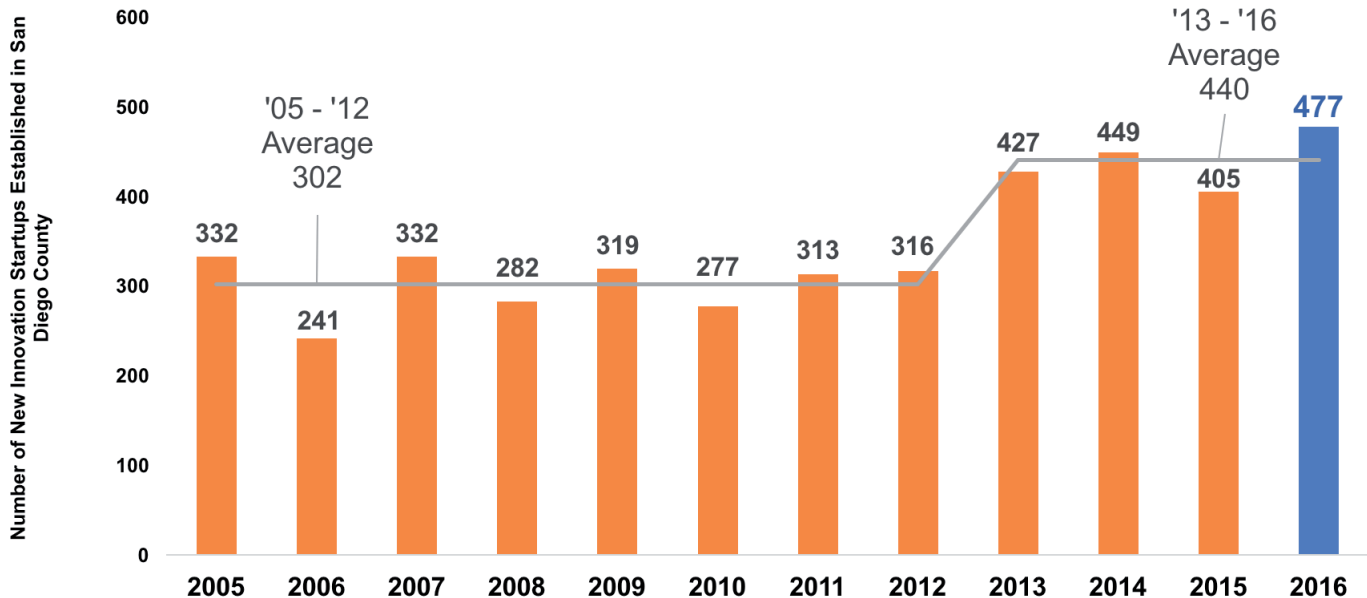
477

New innovation startup companies were created in 2016 in San Diego - continuing the four-year trend of more than 400 new innovation companies created a year in the San Diego region.

2016 was also a high watermark for innovative startup creation in San Diego - the number of companies established in 2016 was up almost 20 percent from the 405 startups established in 2015.

The average number of innovation startups established between 2005 and 2012 was slightly more than 300 per year. The average number of innovation startups jumped to 440 per year for the period 2013 through 2016, driven by an increase in new software companies.

New Innovation Startups Established in San Diego County



~4,200 new tech and life sciences companies have been created in San Diego during the period '05 - '16

Source: Dun and Bradstreet Hoovers; InfoUSA; CONNECT; National University System Institute for Policy Research, commissioned by CONNECT

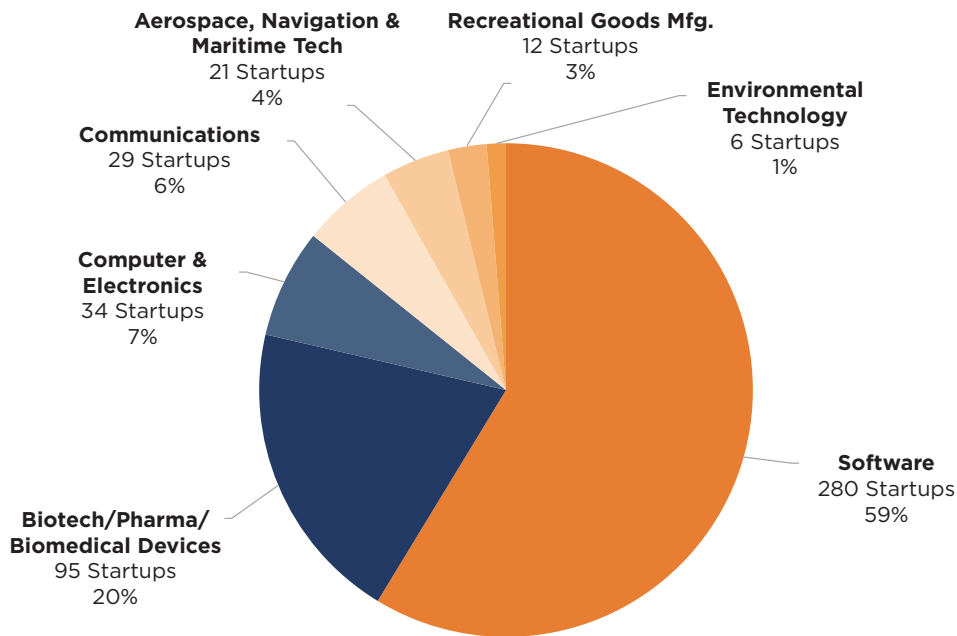
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INNOVATION ECONOMY – NEW STARTUP CREATION IN 2016

Software startups made up almost 60 percent of San Diego County's new innovation startup companies established in 2016 with 280 new software companies created, ranking 5th in California. Life sciences startups established in 2016 totaled 95 companies – a historical high for San Diego County. San Diego ranked 1st in California in the number of life sciences startups established in 2016 and 2015. Life sciences startups created more than 350 new jobs in 2016.

SAN DIEGO COUNTY RANKED
#1
IN CA FOR LIFE SCIENCES STARTUPS IN 2016

San Diego Innovation Startups Established in 2016 by Industry Sector

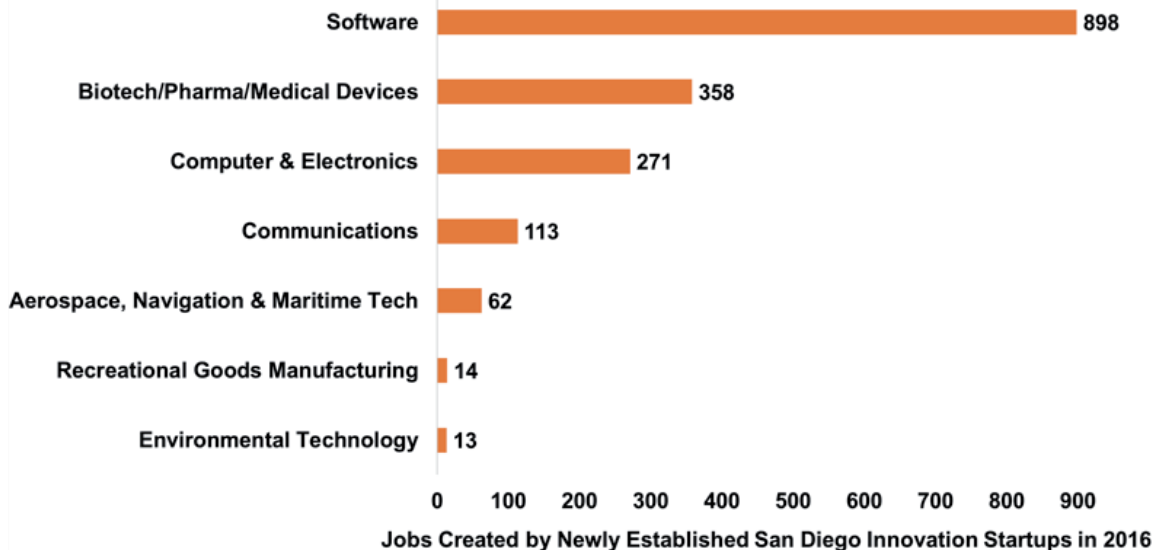


1,729
NEW INNOVATION
ECONOMY JOBS
CREATED IN 2016

477
NEW SAN DIEGO
INNOVATION STARTUPS
ESTABLISHED IN 2016

SOFTWARE STARTUPS
CREATED ALMOST
900
NEW JOBS

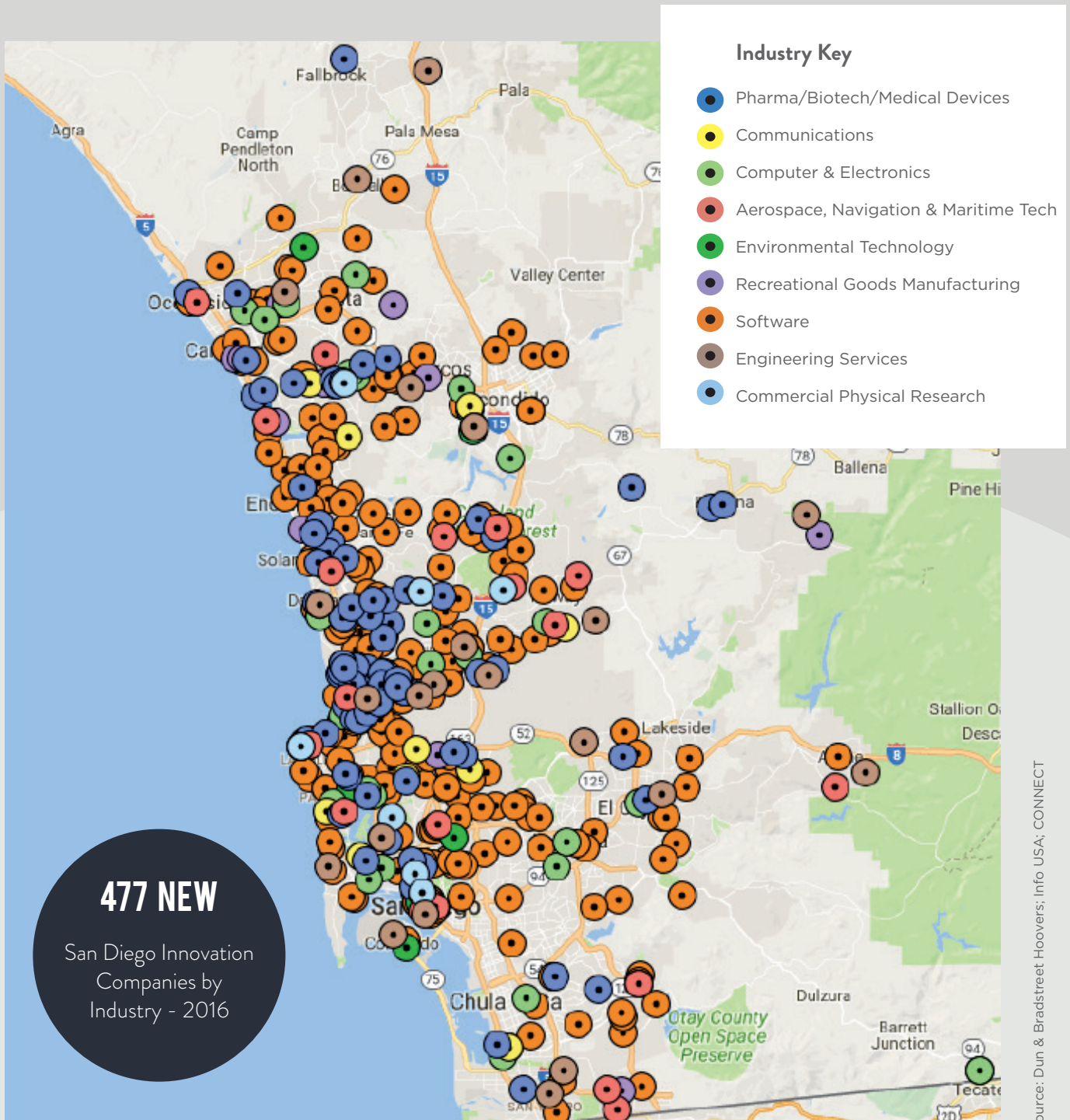
San Diego Innovation Startup Jobs Created by Industry Sector in 2016



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GEOGRAPHY: WHERE THE SAN DIEGO STARTUPS ARE LOCATED

Software startups (in orange) were widely spread throughout San Diego County in 2016. The next largest industry cluster includes life sciences startups (in blue), which were concentrated in the La Jolla and Sorrento Valley areas and along the Interstate-5 corridor up to Carlsbad.



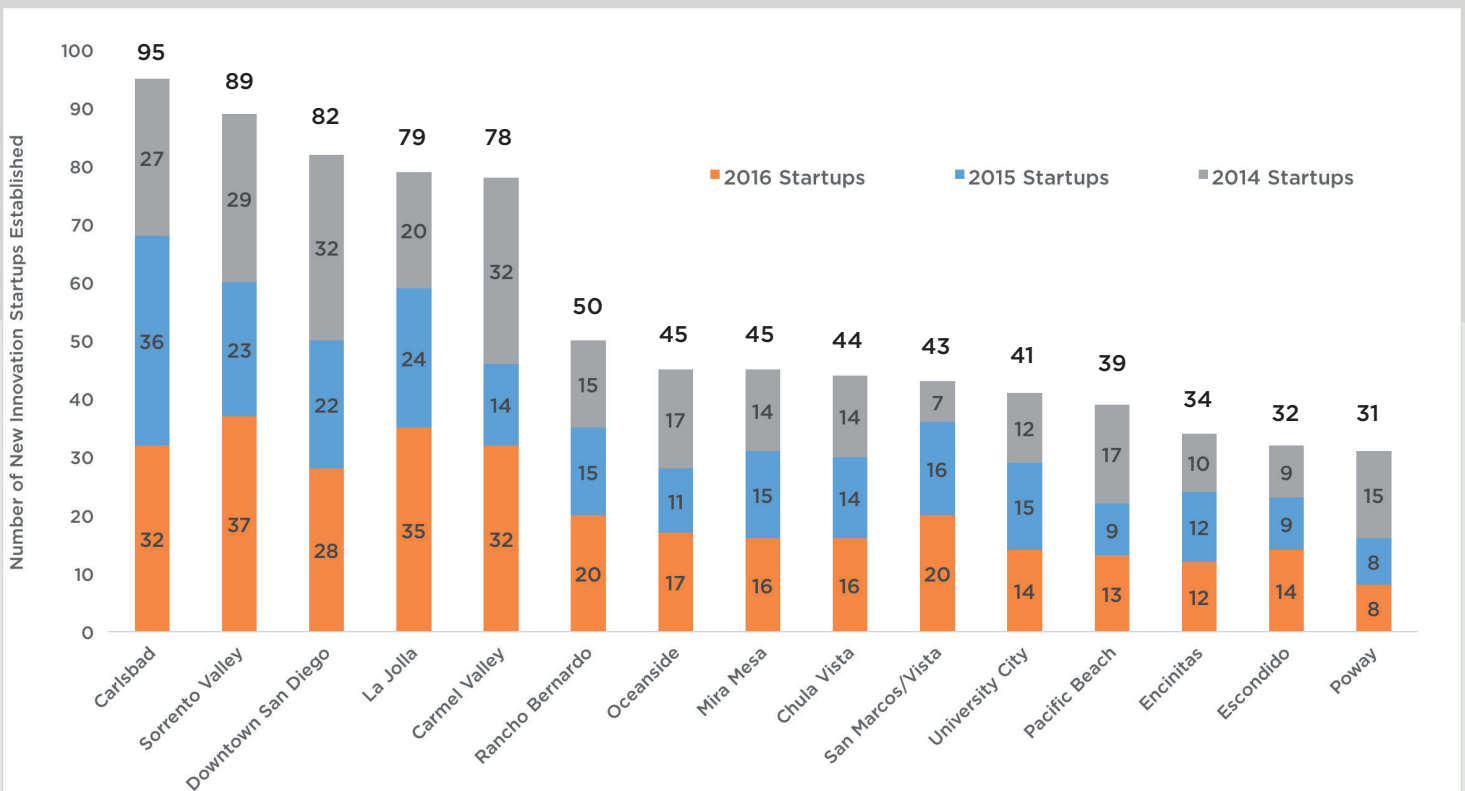
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GEOGRAPHY: WHERE THE SAN DIEGO STARTUPS ARE LOCATED

Top 15 Hotspots in San Diego for Innovation Startup Creation in 2014 - 2016

Carlsbad, Sorrento Valley, Downtown, La Jolla, and Carmel Valley were the hotspots for new innovation company startup creation over the past three years.

Sorrento Valley took the top spot in 2016 with 37 new startups, followed closely by La Jolla with 35 startups. Carlsbad and Carmel Valley both had 32 new innovation startups in 2016, and Downtown San Diego area saw 28 new innovation startups established. Rancho Bernardo had 20 startups in 2016 as did the San Marcos/Vista area.



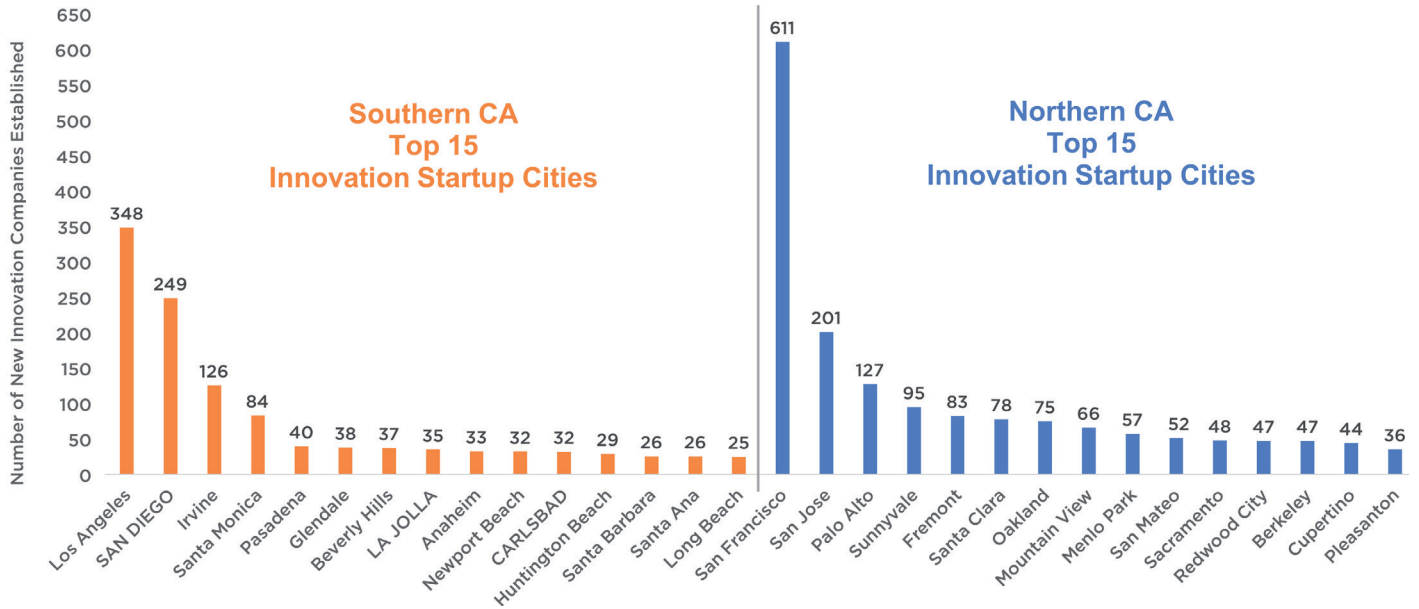
Source: Dun and Bradstreet Hoovers; InfoUSA; CONNECT

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CALIFORNIA TECHNOLOGY & LIFE SCIENCES STARTUPS

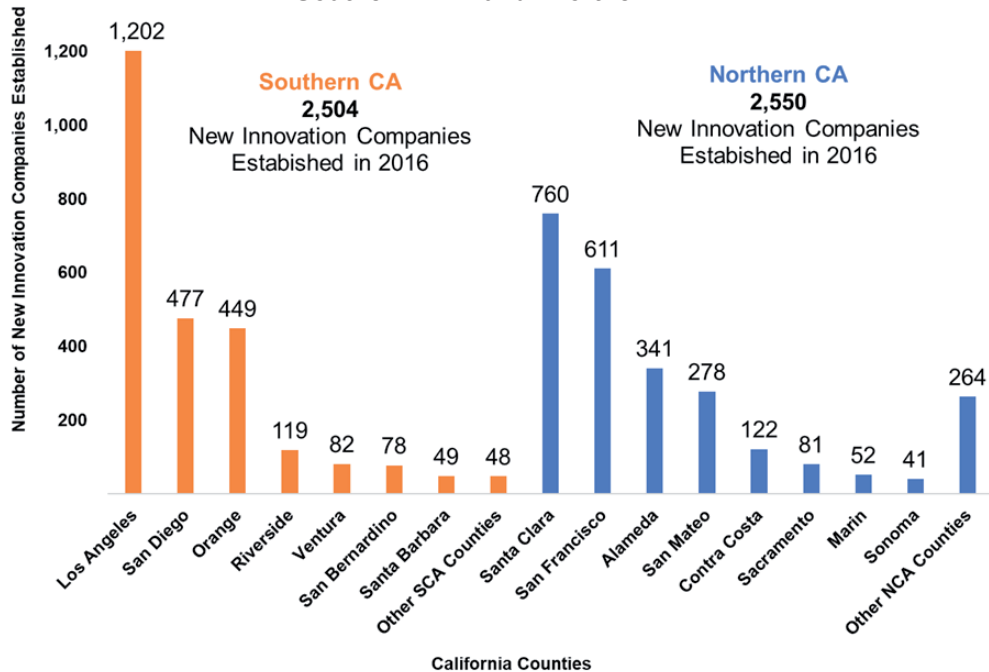
The City of San Francisco was the #1 Startup City in 2016 Followed by the Cities of Los Angeles and San Diego

California New Innovation Companies Established in 2016 by City



Innovation Startup Creation - Southern and Northern California Regions Were Equally Matched in 2016 - 5,000+ New Innovation Companies

New Innovation Startups by California County in 2016
Southern CA and Northern CA



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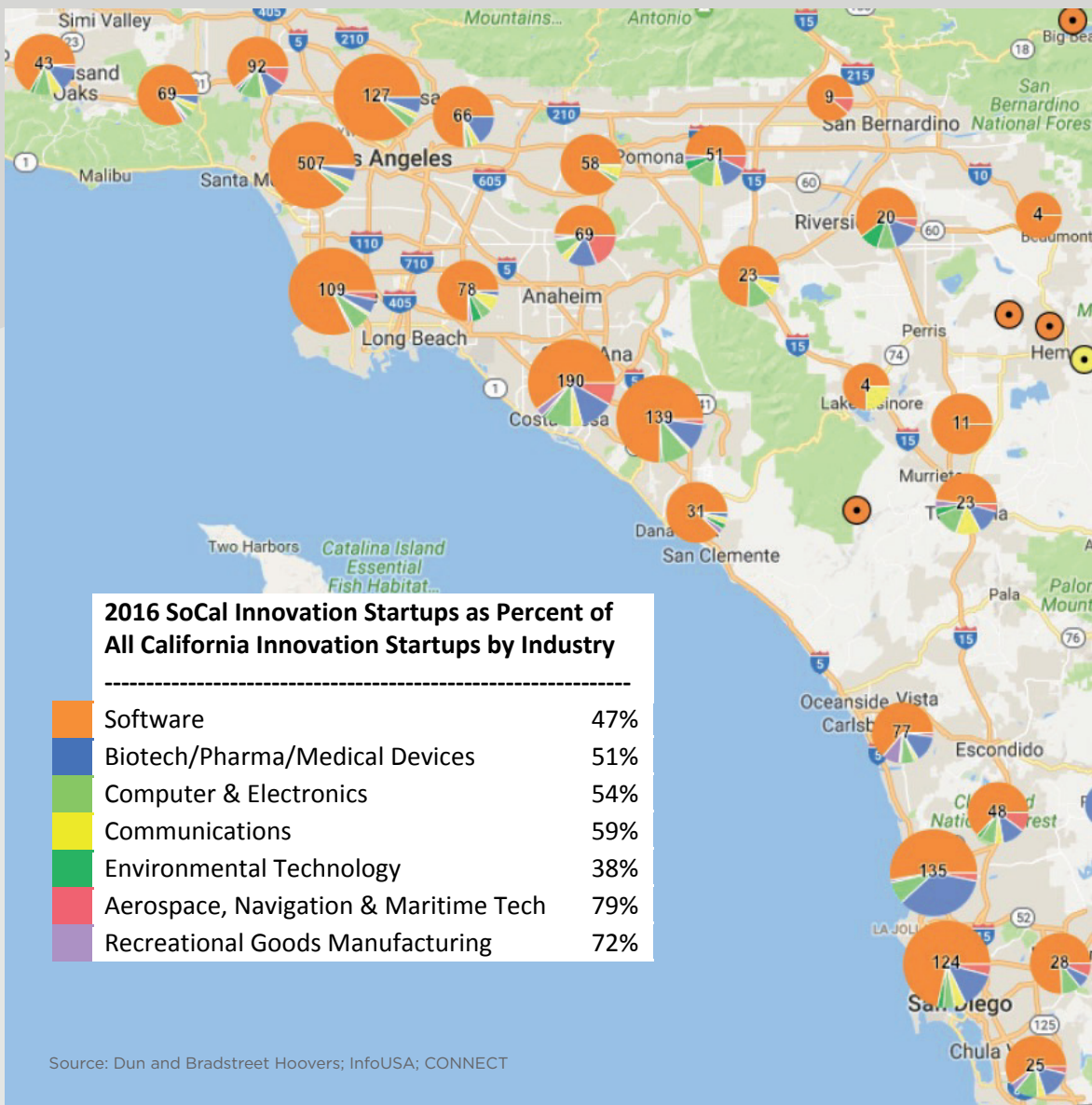
SOUTHERN CALIFORNIA TECHNOLOGY & LIFE SCIENCES STARTUPS

Southern California created slightly less than half (47 percent) of all software startups established statewide in 2016.

Life sciences (51 percent), computer & electronics (54 percent) and communications tech startups (59 percent) in Southern California accounted for more than half the total number of startups for those sectors statewide in 2016.

Southern California accounted for almost 80 percent of aerospace, navigation and maritime tech startups in 2016 and more than 70 percent of recreational goods manufacturing startups.

Southern California Innovation Startups by Industry - 2016



Source: Dun and Bradstreet Hoovers; InfoUSA; CONNECT

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SAN DIEGO INNOVATION ECONOMY – CLUSTER BREAKDOWN

In 2016 San Diego’s innovation economy included approximately 6,630 companies and provided 150,660 jobs. San Diego’s innovation economy is comprised of knowledge-based sectors on the leading-edge of research, innovation, and development of the technologies. These sectors are defined by businesses* involved in the development and production of technical equipment, communications, and/or advanced technology services. The specific technology sectors encompass:

- Research and development in physical, engineering, and life sciences
- Biomedical products (medical devices)
- Biotechnology and pharmaceuticals
- Communications (telecommunications)
- Computers and electronics
- Aerospace, navigation & maritime tech
- Environmental technology
- Recreational goods manufacturing
- Software

2016 San Diego’s Innovation Economy Represented

6,630 COMPANIES

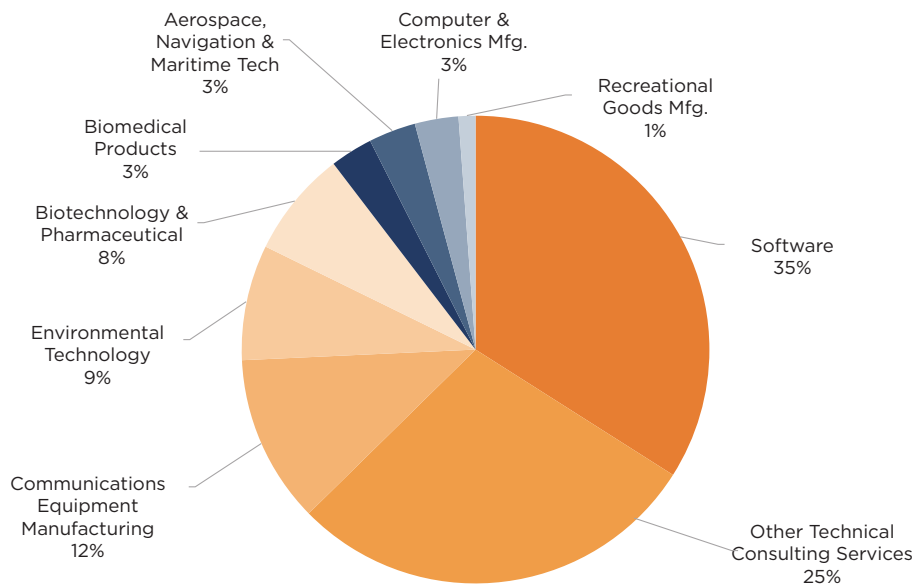
6 percent of total number of companies in San Diego County

150,660 EMPLOYEES

11 percent of total employment in San Diego County

\$16 BILLION PAYROLL

28 percent of total payroll in San Diego County



*Although public and private academic and research institutions are not included in the figures, the region’s largest research institution, UC San Diego, has an enormous impact on San Diego’s innovation economy:

- \$32.4 billion total estimated annual sales of active UCSD-related companies in San Diego County, including those utilizing licensed technology
- Second largest employer in San Diego County - 29,290 employees in 2015**
- More than 650 companies launched by and/or utilizing technology produced by UC San Diego faculty, staff and alumni, including many San Diego biotech and technology firms

Source: CONNECT, based upon California Employment Development Department, Quarterly Census of Employment and Wages (QCEW); UC Regents; San Diego EDC; **San Diego Business Journal Book of Lists 2016; CONNECT



STARTUP SPOTLIGHT

FEATURED LOCAL, EARLY-STAGE INNOVATION COMPANIES



Jeff Herman
Co-Founder & CEO

fabric8labs.com

Founded 2015
Cleantech

Fabric8Labs is a San Diego based company developing the world's first non-thermal metal 3D printing process. Fabric8Labs' patent-pending 3D electroplating process eliminates the need for expensive high-power lasers, vacuum chambers, or metal powders, all while delivering exceptional print quality, surface finish, and print speed.



Matt Ellis
Founder & CEO

measurabl.com

Founded 2013
Cleantech

Measurabl is sustainability solved by software. More than 20,000 properties - representing 3.9B square feet across 35 countries - use Measurabl to measure, manage, and improve their energy and sustainability performance, making Measurabl the world's fastest growing enterprise energy and sustainability software. Measurabl gives companies the ability to automatically collect utility data, report on sustainability performance, and identify energy and water efficiency opportunities while simplifying reports to global sustainability benchmarks like GRESB and CDP. The scalability has helped Measurabl emerge as the global clearinghouse for corporate non-financial data, empowering companies and their stakeholders to act and invest sustainably.

Behind the software, Measurabl is a team that cares about solving the problems of this generation, where technology plays a central role in an overarching solution to a sustainable world.



Clay Melugin
Co-Founder & CEO

waterpigeon.com

Founded 2016
Bluetech

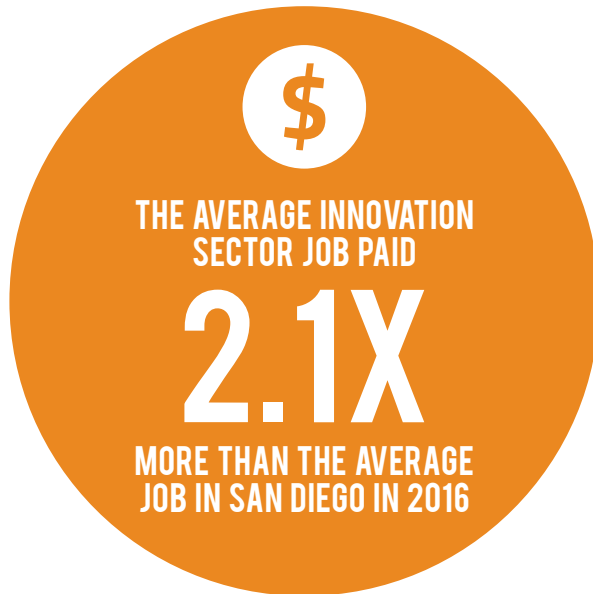
Water Pigeon is a fast, simple, secure, automated water metering and analytics solution designed for water utilities. Water Pigeon's optical solution delivers a fully automated metering infrastructure (AMI) solution for water utilities that installs 10x faster at half the capital cost of competing solutions.

Eliminating water meter replacement and installation of private wireless networks enables utilities to deploy quickly and enable data driven decision on operations.

Water Pigeon is currently pilot testing with several water utilities in Southern California.

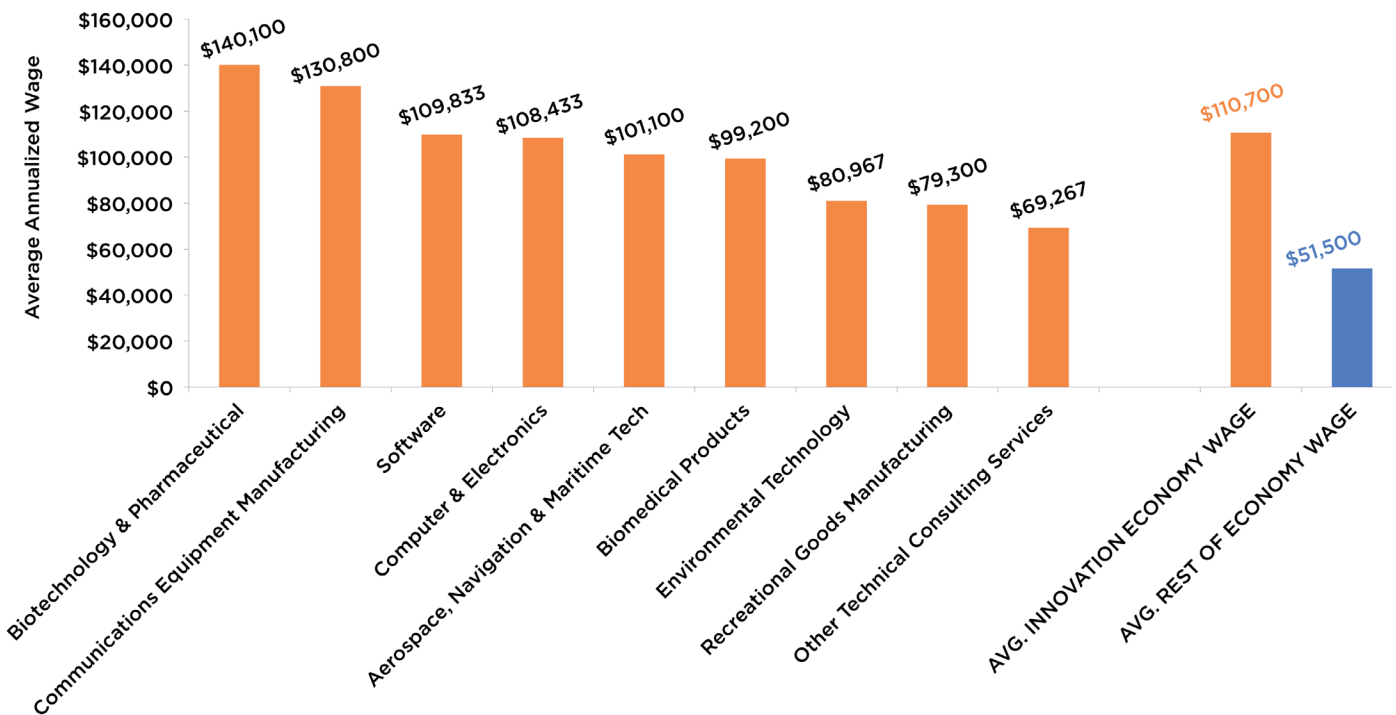
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SAN DIEGO INNOVATION ECONOMY – SECTOR BREAKDOWN



San Diego Innovation Economy Annualized Wages - 2016

Biotech and pharma jobs had the highest average annualized wage in San Diego in 2016



Source: CONNECT, based upon California Employment Development Department, Quarterly Census of Employment and Wages (QCEW). Technology sectors based upon NAICS codes defined, in part, by SANDAG Cluster Analysis and CONNECT innovation sector definitions adjusted by National University System Institute for Policy Research and CONNECT.

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INNOVATION ECONOMY EMPLOYMENT BREAKDOWN

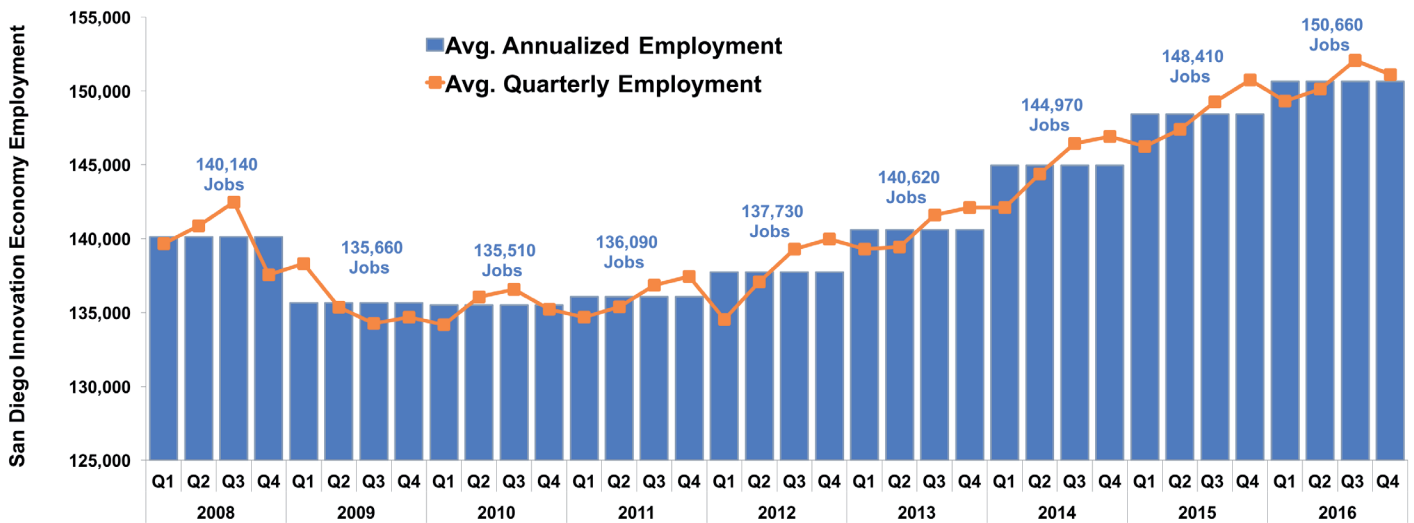
San Diego Innovation Economy Grows to Historical High in 2016

San Diego's innovation economy provided nearly 150,660 high-paying jobs in 2016 – a historical high. San Diego's innovation economy continued to show steady growth in 2016 adding more than 10,510 jobs on average since 2008.

The number of innovation economy jobs grew slightly in 2016 as compared to 2015. Job growth was up more than 11 percent from 135,510 employed in San Diego's innovation sectors in 2010 during the economic downturn.

San Diego Innovation Economy Employment: 2016 - 150,660 Jobs

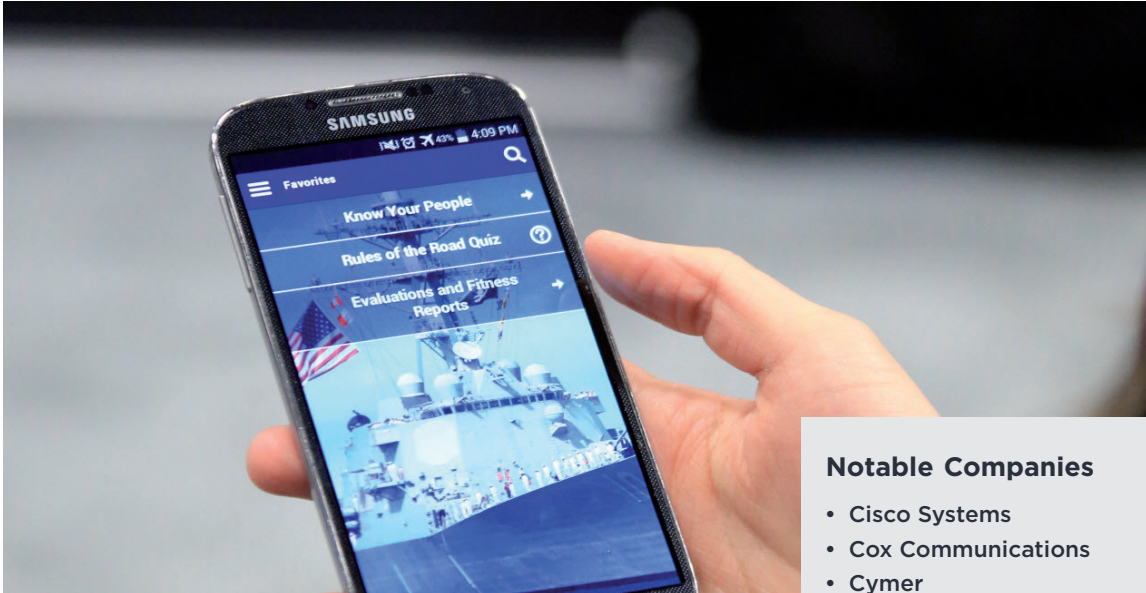
Number of innovation economy jobs hits historical high in 2016



Source: CONNECT, based upon California Employment Development Department, Quarterly Census of Employment and Wages (QCEW). Technology sectors based upon NAICS codes defined, in part, by SANDAG Cluster Analysis and CONNECT innovation sector definitions adjusted by National University System Institute for Policy Research and CONNECT.

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SAN DIEGO INNOVATION ECONOMY PRIMARY INDUSTRY SECTOR HIGHLIGHTS



San Diego's largest cluster in the innovation economy is the ICT cluster, which is made up of software, telecommunications, computer & electronics manufacturing, cybersecurity and informatics. These sectors touch nearly all aspects of the region's economy.

In 2016, the **ICT sectors** accounted for:

- **60 percent of San Diego's innovation economy companies**
- **47 percent of San Diego's innovation economy employees**
- **37 percent of San Diego's innovation economy total wages**

70,000 High-Paying Jobs

The cluster accounted for about 3,400 companies and 71,000 employees in 2016.

The average annual wage of the communications equipment manufacturing sector was \$130,800, followed by the computer & electronics sector at \$108,430 and software sector at \$109,830.

The software development sector is a significant contributor to the overall economic impact of San Diego's economy - more than 100,000 jobs in the San Diego region depend on the area's software industry. A recent study produced by the San Diego Regional Economic Development Corporation estimates the software development sector to contribute \$12.2 billion in economic impact.

In the San Diego EDC study, San Diego ranked 7th among U.S. metros based on concentration of software developers, employee retention, computer science degrees per capita, computer/math degree attainment among the 25+ population, job/wage growth, average adjusted wages, and venture capital dollars invested per capita. San Diego ranks ahead of Austin, New York City, and Portland, Oregon, among others, according to the report. San Jose was ranked 1st, followed by Seattle, San Francisco, Boston, and Raleigh.

Notable Companies

- Cisco Systems
- Cox Communications
- Cymer
- ESET North America
- Intuit
- Kyocera
- Mitchell International
- Mitek Systems Inc.
- Qualcomm
- ScaleMatrix
- ServiceNOW
- SONY
- Teradata
- Underground Elephant
- ViaSat

GROWTH

SAN DIEGO INNOVATION ECONOMY PRIMARY INDUSTRY SECTOR HIGHLIGHTS



In 2016, the **biotechnology, pharmaceuticals, and biomedical devices** sectors accounted for:

- **27 percent of San Diego's innovation economy companies**
- **17 percent of San Diego's innovation economy employees**
- **20 percent of San Diego's innovation economy total wages**

50,000 High-Paying Jobs

When related industries such as bio-renewables (e.g., biofuels), research and development/education labs (e.g., research institutes), and support jobs are included, the life sciences sector represents more than 50,000 high-paying jobs.

The average annual wage of the biotech/pharma sector was the highest in the region at \$140,100. Average annual wage of biomedical devices was \$99,200.

San Diego's life sciences sector generates \$33.6 billion in economic output and adds \$19.4 billion to the local gross product.

With 1,200 unique life sciences establishments, San Diego County's life sciences industry provides nearly 50,000 jobs and supports 133,000 jobs in the county, for a total countywide impact of more than 183,000 jobs.

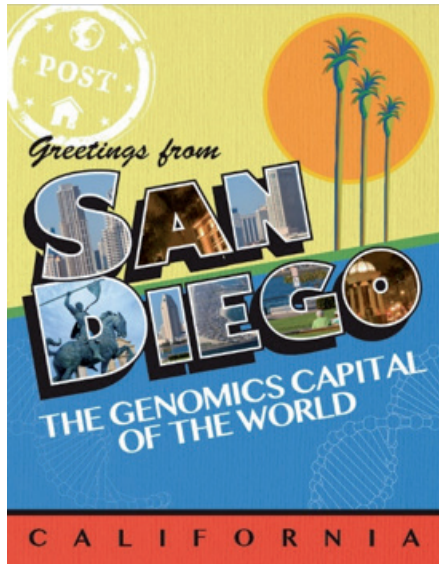
Life sciences establishments brought over \$925 million in NIH grants to San Diego during the 2016 fiscal year.

San Diego's life sciences sector enjoys a strong competitive advantage compared to other regions of the country. One way of assessing regional competitive advantage is by "location quotient". Location quotients, determined by the Bureau of Labor Statistics, compare regional industry employment levels to the U.S. overall. A figure greater than 1.2 indicates a competitive advantage. San Diego's level well exceeds that with a location quotient of 1.98, and has increased from 1.81 in 2011.

San Diego has one of the largest and most diverse contract research organization (CRO) sectors in the world with more than 85 CROs. Contract research organizations provide support to the pharmaceutical, biotechnology, and medical device industries in the form of research services outsourced on a contract basis to speed discovery and clinical development.

Sources: CONNECT Innovation Report; San Diego EDC; Biocom 2017 Economic Impact Report.

San Diego is a Powerhouse for Genomics Research and Development



SAN DIEGO'S GENOMICS INDUSTRY HAS \$5.6B ANNUAL ECONOMIC IMPACT

San Diego is widely considered to be a global leader in the genomics field with more than 115 genomics companies. Genomics experts work to determine complete DNA sequences and perform genetic mapping to help understand disease. Technologies in the industry include DNA sequencing, informatics, and genome analysis.

- A recent study by the San Diego Regional EDC found that venture capital firms invested more than \$290 million in San Diego genomics companies in 2016. This was more than 20 percent of the \$1.3 billion invested nationwide in 2016 in genomics deals. Human Longevity's \$220 million Series B round raise accounted for 75 percent of the total VC investment in San Diego in 2016.
- Gene sequencing leader Illumina effectively reduced the cost of individual gene sequencing from \$100 million to \$1,000 over the course of a single decade. During the 2017 J.P. Morgan annual healthcare conference, the company projected a cost of as little as \$100.
- In 2016, The Scripps Research Institute was awarded a \$120 million grant for a genomics-related study involving one million or more patients - the largest study of its kind to date.
- San Diego doesn't just specialize in the human genome. Liquid yeast manufacturer White Labs recently partnered with Illumina and Synthetic Genomics to sequence and assemble the full genome of nearly 100 of the beverage producer's yeast strains.

Notable Companies

- Agena Bioscience
- Ajinomoto Althea Inc.
- CareFusion, a BD Company
- Edico Genome
- Eli Lilly
- Genentech
- Halozyme Therapeutics
- Hologic
- Human Longevity Inc.
- Isis Pharmaceuticals
- Illumina
- Johnson & Johnson
- Nuvasive Inc.
- Pathway Genomics
- Pfizer
- Philips Healthcare
- Quidel Corp.
- Regulus Therapeutics
- ResMed
- Sequenom
- Thermo Fisher Scientific



edico  genome



Sources: CONNECT Innovation Report; San Diego EDC report - "Cracking the Code: The Economic Impact of San Diego's Genomics Industry", June 2017; Biocom 2017 Economic Impact Report; Xconomy

GROWTH

SAN DIEGO INNOVATION ECONOMY PRIMARY INDUSTRY SECTOR HIGHLIGHTS



28,000 High-Paying Jobs

The aerospace, navigation & maritime technologies cluster employs more than 28,000 people in the San Diego region and more than 220 firms. The average annual wage in 2016 was \$101,100 making it one of San Diego's highest paying sectors. The cluster attracts more than \$8 billion in procurement contracts from the Department of Defense.

The aerospace cluster is an integral part of San Diego's defense and innovation economies, and several large aerospace, aircraft, and R&D companies make the region an aerospace hub. San Diego's naval and marine bases rely on technologies developed by companies in the cluster.

San Diego's defense cluster continues to play a critical role in the region's innovation and military economy and the United States' national security priorities. San Diego is home to the largest concentration of military assets in the world and the largest federal military workforce in the country.

When considering the overall ripple effects of the defense cluster in San Diego, about 20 percent of San Diego's gross regional product (GRP) is the result of defense-related spending. Jobs supported because of defense spending include uniformed military, federal government employees, and defense contractors, as well as employees in healthcare, engineering, construction, hospitality, and tourism.

As the region's defense cluster catalyzes and inspires local entrepreneurs, emerging industries like unmanned systems and cybersecurity are burgeoning in San Diego and expanding into international markets. Local expertise in these fields provides strategic advantages for product development, job growth, and the commercialization of defense technology.

- In fiscal year 2016, \$8.6 billion in procurement contracts was projected to flow into San Diego.
- In fiscal year 2016, direct spending by the Department of Defense in compensation for the more than 134,000 active duty and civilians, support for veteran services, and defense contracts was an estimated \$23.3 billion.
- San Diego County receives more defense spending than any other county in the U.S. except for Fairfax County, Virginia.

Notable Companies

- BAE Systems
- Booz Allen Hamilton
- Cubic Corporation
- General Atomics
- General Dynamics NASSCO
- Kratos Defense & Security Solutions
- Leidos
- Lockheed Martin
- Northrop Grumman
- Ocean Aero
- Orca Marine
- Orbital ATK Systems
- Poseidon Resources
- SNC Space Systems
- Space Micro
- Teledyne SeaBotix
- UTC Aerospace Systems
- ViaSat

Sources: CONNECT Innovation Report; San Diego EDC; San Diego Military Advisory Council, "San Diego Military Economic Impact Study", 2016; U.S. Department of Defense

GROWTH

SAN DIEGO INNOVATION ECONOMY PRIMARY INDUSTRY SECTOR HIGHLIGHTS



Notable Companies

- Assure Controls
- Black & Veatch
- Cellana
- EDF Renewable Energy
- Kyocera Solar
- NRG Energy
- OneRoof Solar
- San Diego Gas & Electric
- Sapphire Energy
- Solar Turbines
- Synthetic Genomics
- Sullivan Solar Power

25,000 High-Paying Jobs

San Diego is the most concentrated major metropolitan area in the U.S. for cleantech employment with 25,000 cleantech jobs. San Diego has some of the most innovative cleantech research and development companies in the world, and is home to more than 800 cleantech companies.

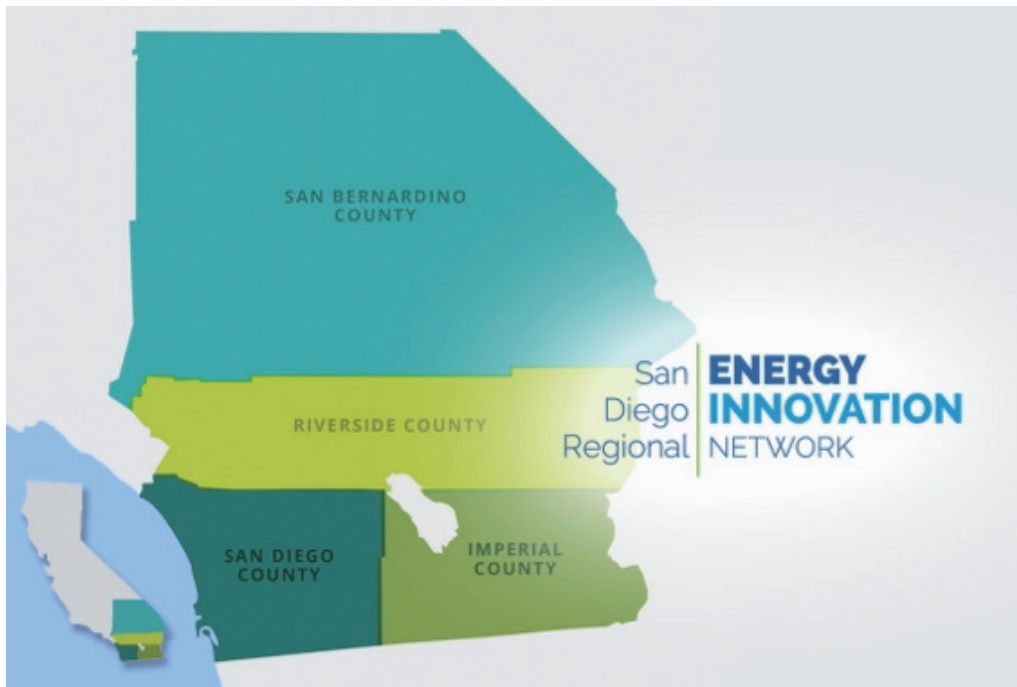
In 2016, the region ranked number 3 in the nation for cleantech leadership. Continued growth in markets such as solar, wind, energy efficiency, storage, and electric vehicles has elevated San Diego as a leader in the climate action and smart cities movements.

- San Diego employs 1.9X as many people in cleantech as the national average
- San Diego ranks #2 in the nation in solar installations, with more than 93,000 rooftop systems in the region
- Smart Cities Summit named San Diego's Smart City Solutions one of the world's top 10 smart city projects
- San Diego Gas & Electric became the first California utility to reach the net energy metering cap in 2016

In addition, the cleantech cluster is supported by world-class research institutions such as UC San Diego, San Diego State University, and University of San Diego that help seed and support innovation in sustainability technologies. In addition to solar power, San Diego's cleantech industry includes wind and water energy, bio-renewables, clean transportation, and energy storage technologies.

Source: San Diego EDC; Cleantech San Diego; CONNECT,

New State-Funded Regional Energy Innovation Network Established in 2016



In 2016, The San Diego Regional Energy Innovation Network (SDREIN) was established. The SDREIN is a program for entrepreneurs who are developing solutions to help address the region's energy priorities.

The program is funded by a five-year, \$5 million grant from the California Energy Commission and extends its offerings to the energy innovation industry in San Diego, Imperial, Riverside, and San Bernardino counties.

The SDREIN provides entrepreneurs with access to the facilities and services of several regional partner organizations and connection with industry to help accelerate the commercialization of their energy technologies:

- Energy Efficiency (envelope, lighting, HVAC, plugload, pumps)
- Renewable Energy (hydro, wind, solar, geothermal, wave)
- Energy Storage (mechanical, electrochemical, electrical, thermal)
- Smart Metering/Smart Grid (hardware, software, data analytics, microgrids)
- Transportation (electric vehicles, hybrids, infrastructure, software platforms)
- Energy Services (energy planning, analysis, management)

PARTNER ORGANIZATIONS

Cleantech San Diego Center for Sustainable Energy CONNECT
Imperial Valley EDC Inland Empire Economic Partnership San Diego State University
San Diego Venture Group UC San Diego University of San Diego

SUPPORTING ORGANIZATIONS

Flow Rocket Fund Cybertech Tech Coast Angels EvoNexus

RELATED FUNDING PROGRAMS

CaISEED California Clean Energy Fund (CalCEF) California Energy Commission

Source: SDREIN



STARTUP SPOTLIGHT

FEATURED LOCAL, EARLY-STAGE INNOVATION COMPANIES



Michael J. Kamdar, CEO

molecularassemblies.com

Founded 2013
Life Sciences Tools
& Diagnostics

Molecular Assemblies, Inc. is developing an enzymatic, platform-independent DNA synthesis technology capable of powering the next generation of DNA-based products. Inspired by nature, the company's proprietary DNA synthesis method is designed to produce long, high quality, sequence-specific DNA reliably, affordably and sustainably. Unconstrained by scale, format or platform, Molecular Assemblies' enzymatic synthesis process will enable the reading and writing of DNA for synthetic biology, personalized therapeutics, precision diagnostics, and CRISPR/Cas9 as well as for emerging applications in data information storage, nanotechnology, bio-based electronics, and more. With a highly-experienced executive and scientific team and an expansive intellectual property portfolio, Molecular Assemblies has attracted investments from Agilent Technologies, Cavendish Impact Capital Fund, Eleven Two Capital, Keshif Ventures, Genomics Investment Syndicate, Newport Holdings, LP, and Alexandria Venture Investments.



Pieter van Rooyen
Founder & CEO

edicogenome.com

Founded 2013
Life Sciences Tools
& Diagnostics

The use of next-generation sequencing is growing at an unprecedented pace, creating a need for easy to implement infrastructure that enables rapid, accurate, and cost-effective processing and storage of this big data. Edico Genome has created an end-to-end platform solution for analysis of next-generation sequencing data, DRAGEN™, which speeds whole genome data analysis from hours to minutes while maintaining high accuracy and reducing costs. Top clinicians and researchers are utilizing the platform to achieve faster diagnoses for critically ill newborns, cancer patients and expecting parents waiting on prenatal tests, and faster results for scientists and drug developers.



Kevin Harris, CEO

curemetrix.com

Founded 2014
Life Sciences Tools
& Diagnostics

CureMetrix has developed a "Diagnostic-as-a-Service" platform for medical imaging based on deep learning. Their first target is the early and accurate detection of breast cancer in mammograms. CureMetrix's goals are to 1) significantly reduce false positives and the associated unnecessary procedures that cost the US healthcare system \$4B annually; and 2) significantly reduce false negatives by helping doctors see what they might be missing and find cancers sooner thus saving lives and money by reducing the cost to treat. The company can work with hospitals and doctors to create quantified, objective assessments of their historical performance, help improve their performance, and measure those improvements over time. While breast cancer in mammograms is their first target, the CureMetrix platform is extensible to all modalities, parts of the anatomy, and diseases.

CAPITAL

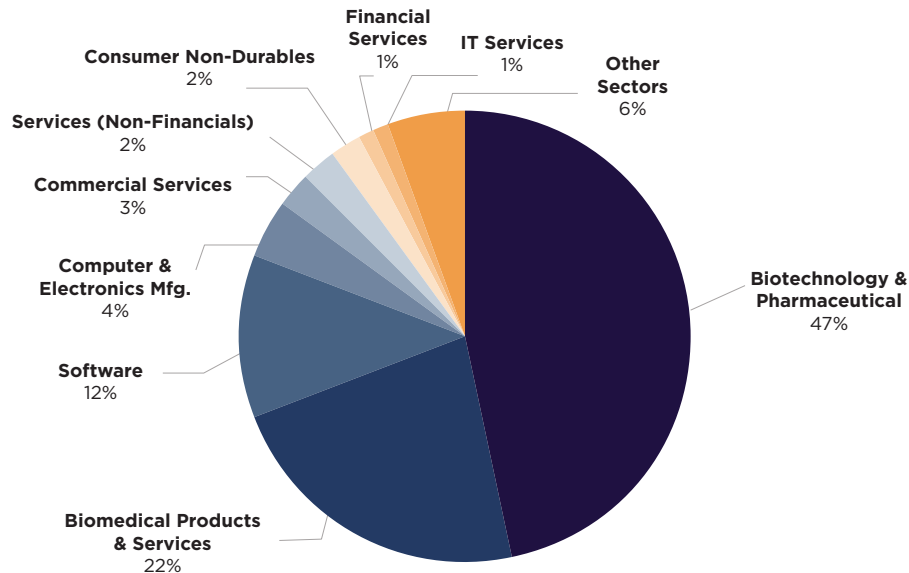
VENTURE CAPITAL FUNDING IN SAN DIEGO – \$1.5 BILLION IN 2016

Venture capital funding to companies in San Diego County totaled more than \$1.5 billion invested in 118 deals in 2016 according to deal data sourced from PitchBook and analyzed by CONNECT.

Life sciences companies received 70 percent of the total VC funding in San Diego in 2016. Biotechnology companies accounted for the largest share of venture investment in San Diego in 2016 with more than 47 percent of the VC funding totaling \$720 million invested in 30 deals. The medical devices sector accounted for an additional 23 percent with \$344 million invested in 23 deals.

The software sector saw a decline in VC investment in 2016 with \$180 million invested in 23 deals – down 25 percent from 2015 when \$240 million was invested in 28 software deals. 2015 was the biggest year for VC funding to San Diego software companies since 2007 when more than \$330 million was invested in 37 deals. The computer and electronics sector was the next largest in terms of VC investment in 2016 with five deals totaling \$65 million.

San Diego VC Investment by Industry 2016 - \$1.5 Billion



Top 10 San Diego Companies Receiving Venture Capital Funding in 2016

COMPANY	DEAL SIZE	INDUSTRY
Human Longevity	\$220M	Pharmaceuticals and Biotechnology
Acutus Medical	\$75M	Healthcare Devices and Supplies
Ostendo Technologies	\$64M	Electronics
eFFECTOR Therapeutics	\$56M	Pharmaceuticals and Biotechnology
Aspyrian Therapeutics	\$55M	Pharmaceuticals and Biotechnology
Samumed	\$50M	Pharmaceuticals and Biotechnology
Amplix	\$49M	Pharmaceuticals and Biotechnology
Zavante Therapeutics	\$46M	Pharmaceuticals and Biotechnology
BioAtla	\$45M	Pharmaceuticals and Biotechnology
Astute Medical	\$43M	Healthcare Devices and Supplies

Note: investment value rounded to nearest \$million Source: PitchBook; CONNECT

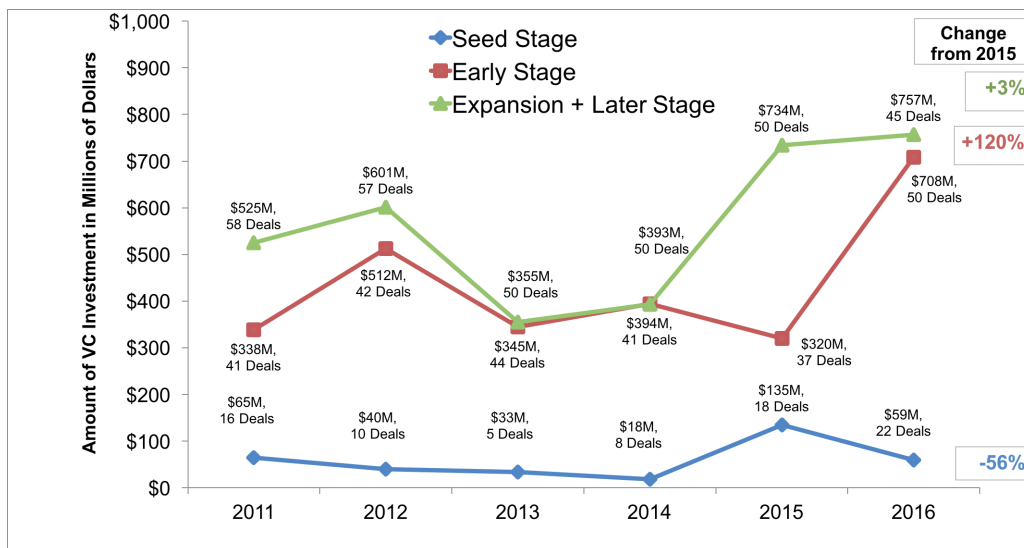
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VENTURE CAPITAL FUNDING IN SAN DIEGO BY STAGE OF DEVELOPMENT – SURGE IN EARLY STAGE INVESTMENT IN 2016

San Diego early stage companies received more than \$700 million in 50 VC investment deals in 2016 - a historical high-water mark - up 120 percent from 2015 when early stage companies raised \$320 million in 37 deals.

Seed stage deal activity was up in terms of number of deals - 22 deals in 2016 compared to 18 deals in 2015 - although the total amount invested was down 56 percent - \$59 million in 2016 compared to 135 million in 2015.

San Diego VC Investment by Stage of Company Development



Source: PricewaterhouseCoopers MoneyTree™ Report; National Venture Capital Association; data provided by Thomson Reuters

Expansion and later stage deal activity in San Diego were on par with 2015 - 45 deals in 2016 compared to 50 deals the previous year. Total VC investment for expansion and later companies was up slightly - \$757 million in 2016 compared to \$734 million in 2015.

The stage of development classifications are as follows:

1 SEED STAGE

The initial stage. The company has a concept or product under development, but is probably not fully operational. Usually in existence less than 18 months.

2 EARLY STAGE

The company has a product or service in testing or pilot production. In some cases, the product may be commercially available. May or may not be generating revenues. Usually in business less than three years.

3 EXPANSION STAGE + LATER STAGE

Product or service is in production and commercially available. The company demonstrates significant revenue growth, but may or may not be showing a profit. Usually in business more than three years. May include spin-offs of operating divisions of existing private companies and established private companies.

Source: PitchBook; CONNECT

CAPITAL

VENTURE CAPITAL INVESTMENT



SEED STAGE



Raised \$20 Million Series 1 Seed Funding
Pre-Money Valuation \$25 Million

MDRejuvena

Randy Kriech, President & CEO
David Hale, Co-Founder & Executive Chairman

A seed stage developer of skincare products that protect skin from photo-damage, removes rough or scaly patches, pigmentation, age spots and maintains skin health, the company raised \$20 million of seed funding from SigmaBleyzer, Wicklow Capital, and other undisclosed investors on December 19, 2016, putting the pre-money valuation at \$25 million.



EARLY STAGE



Raised \$220 Million Series B Funding
Pre-Money Valuation \$1.69 Billion

Human Longevity

Cynthia Collins, CEO
Craig Venter Ph.D, Co-Founder & Executive Chairman

An early stage provider of genomics and cell therapy-based diagnostic and therapeutic technology, raised \$220 million of Series B venture funding from lead investors Illumina and Celgene on April 4, 2016, putting the pre-money valuation at \$1.69 billion. GE Ventures, Draper Fisher Jurvetson, NKM Capital, and other undisclosed Series A investors also participated. The company will use funds for the growth and expansion of its line of products, including Health Nucleus, and for development of the HLI Knowledgebase. The company develops cell-based therapeutics to address age-related decline in endogenous stem cell function. It concentrates on cancer, diabetes and obesity, heart and liver diseases, and dementia.

Human Longevity raised \$80 million in Series A funding in March 2014 by Draper Fisher Jurvetson, Illumina, and Tan Sri Lim Kok Thay, putting the pre-money valuation at \$272 million. This was closely followed by additional corporate funding by Celgene in 2014. The company has raised more than \$300 million (excluding grant funding) to date.



LATER STAGE



Raised \$75 Million Series C Funding
Pre-Money Valuation \$100 Million

Acutus Medical

Randy Werneth, Co-Founder, President & CEO
Christof Scharf, MD, Co-Founder & Board Director

A later stage developer of a minimally invasive cardiac catheter for the treatment of irregular heart rhythms. The company raised \$75 million of Series C venture funding from Deerfield Management Company, Xeraya Capital, and Advent Life Sciences on March 22, 2016, putting the company's pre-money valuation at \$100 million. OrbiMed Advisors, GE Ventures, and an undisclosed strategic investor also participated. The company will use the funding to finish product development and build-out sales force in Europe.

Acutus Medical raised \$5.54 million of Series A venture funding in three tranches from Advent Life Sciences, Index Ventures, and founders of the company in 2012 with a pre-money valuation of \$4.7 million. The company raised \$48.6 million of Series B venture funding in a deal led by OrbiMed Advisors and GE Ventures in 2014, putting the pre-money valuation at \$30 million. Index Ventures, Advent Life Sciences, and other undisclosed investors also participated in the round. The company has now raised a total of nearly \$130 million in funding.

Source: PitchBook; CONNECT

CAPITAL

VENTURE CAPITAL INVESTMENT



MDRejuvena

**HUMAN
LONGEVITY,
INC.**

**ACUTUS
MEDICAL**

Top Seed Round VC Investments 2016

MDRejuvena	\$20M
Trefoil Therapeutics	\$4M
Clarify Medical	\$4M
46 Degrees	\$3M
SkySafe	\$3M
Chromis Therapeutics	\$3M
Shield AI	\$3M
LoanHero	\$3M
Molecular Assemblies	\$2M

Top Early Stage VC Investments 2016

Human Longevity	\$220M
eFFECTOR Therapeutics	\$56M
Aspyrian Therapeutics	\$55M
Zavante Therapeutics	\$46M
Metacrine	\$38M
Figtree Financing	\$30M
Singlera Genomics	\$20M
Reflexion Health	\$18M
Fortis Therapeutics	\$18M
NetraDyne	\$16M

Top Expansion + Later Stage VC Investments 2016

Acutus Medical	\$75M
Ostendo Technologies	\$64M
Samumed	\$50M
Amplix	\$49M
BioAtla	\$45M
Astute Medical	\$43M
Seismic Software	\$40M
Genalyte	\$36M
Tealium	\$35M
BioTheranostics	\$32M
Renova Therapeutics	\$30M
Classy	\$30M

Source: PitchBook; CONNECT

CAPITAL

VENTURE CAPITAL INVESTMENT – TOP COMPANIES BY VALUATION

Samumed and Human Longevity - San Diego's Venture-Backed Unicorns in 2016

Samumed, a developer of tissue-level therapeutic drugs intended to cure degenerative diseases in patients, was founded in 2008 and is valued at \$12 billion. The company raised \$50 million in 2016.

Human Longevity, Inc., a provider of genomics and cell therapy-based diagnostic and therapeutic technology designed to give everyone access to the power of data-driven health intelligence, was founded in 2013 and is valued at \$1.9 billion and has raised more than \$300 million to date.

Company	Pre-Money Valuation	Post-Money Valuation	Total Raised to Date	Year Founded	Industry	Employees
Samumed	\$11,950M	\$12,000M	\$50M	2008	Drug Discovery	120
Human Longevity	\$1,668M	\$1,888M	\$300M	2013	Genomics	146
Renova Therapeutics	\$300M	\$330M	\$47M	2009	Genomics	8
Tealium	\$270M	\$285M	\$113M	2008	Software	270
Astute Medical	\$200M	\$243M	\$180M	2007	Medical Diagnostics	77
eFFECTOR Therapeutics	\$83M	\$139M	\$112M	2013	Drug Discovery	28
Allele Biotech	\$89M	\$100M	\$18M	1999	Biotechnology	11
Epic Sciences	\$84M	\$91M	\$109M	2008	Medical Diagnostics	70
Aspyrian Therapeutics	\$32M	\$88M	\$68M	2010	Biotechnology	6
Bird Rock Bio	\$71M	\$80M	\$50M	2006	Biotechnology	9

Life Sciences

Other venture-backed San Diego life sciences companies valued at more than \$100 million include Renova Therapeutics, Astute Medical, eFFECTOR Therapeutics, and Allele Biotech.

Technology

The only tech company in the top ten valued venture-backed companies is Tealium, a provider of web analytics and digital marketing software. It was founded in 2008 and is valued at \$285 million. The company has raised more than \$110 million to date.

One That Got Away . . .

Another tech unicorn founded in San Diego was **Razer**. The company is a designer and developer of gaming hardware and wearable devices. Razer is valued at \$1.5 billion and has raised \$125 million in funding to date. The company was founded in San Diego in 2005, moved headquarters from Carlsbad to Irvine in 2015. Orange County, with its huge concentration of gaming companies and talent, was considered by management to be a better fit for the company.

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VENTURE CAPITAL INVESTMENT SAN DIEGO VC DEAL HOTSPOTS IN 2016

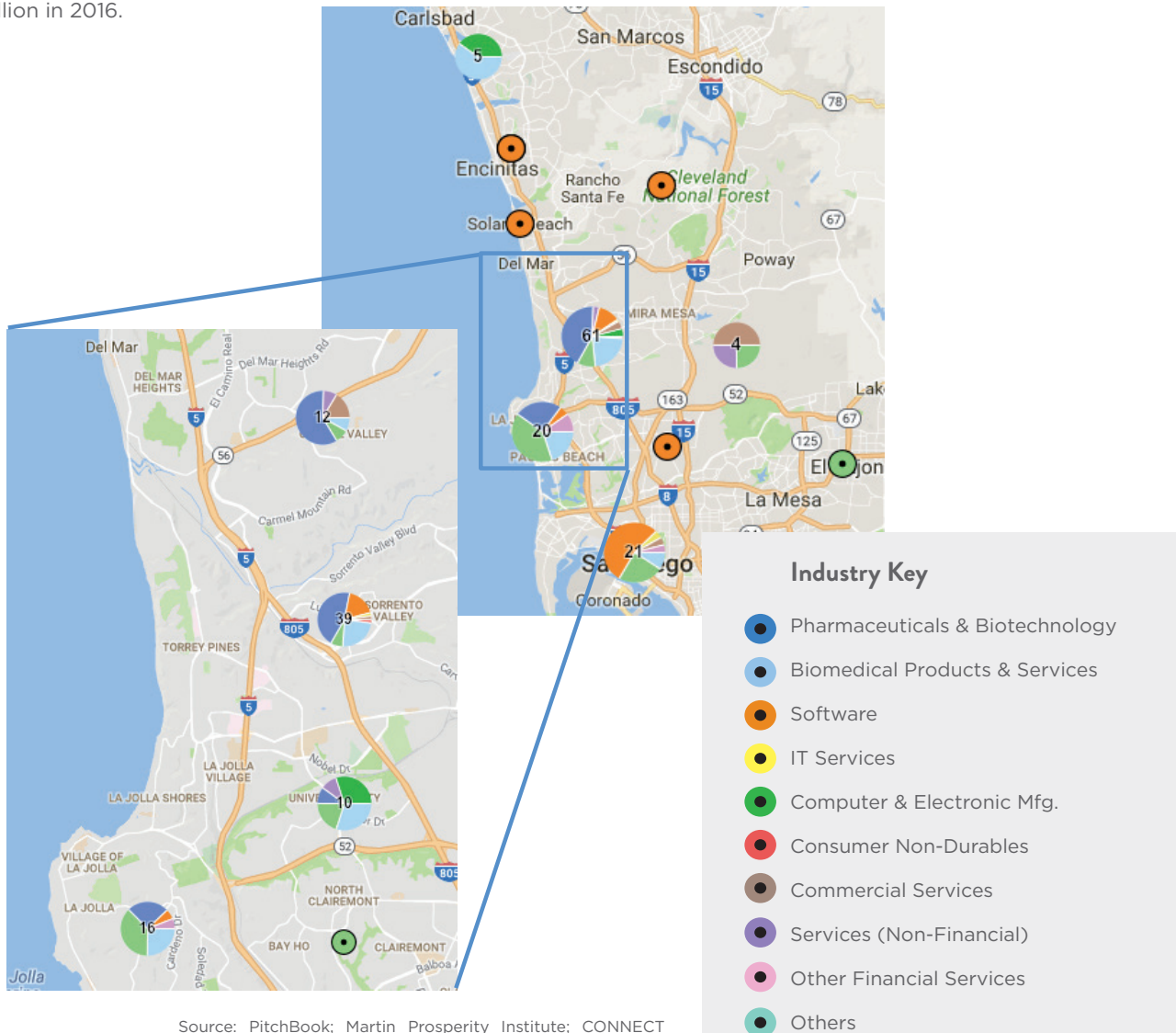
Sorrento Valley was the hotspot of VC activity in San Diego in 2016 with 39 deals totaling \$805 million - 53 percent of total San Diego VC investment in 2016. The 92121 zip code has a high concentration of venture-backed life sciences companies, and is the 5th ranked neighborhood in the U.S. for VC investment (the top four were in the Bay Area).

Carlsbad companies raised \$170 million in five deals in 2016. Downtown San Diego companies raised more than \$100 million in 21 deals - more than half were software deals.

The Torrey Mesa with its high concentration of life sciences companies has been a consistent magnet for VC funding.

In addition to Sorrento Valley, Carmel Valley companies raised \$169 million in 12 VC deals.

Sixteen La Jolla-based companies raised \$139 million and ten companies in University City raised \$35 million in 2016.

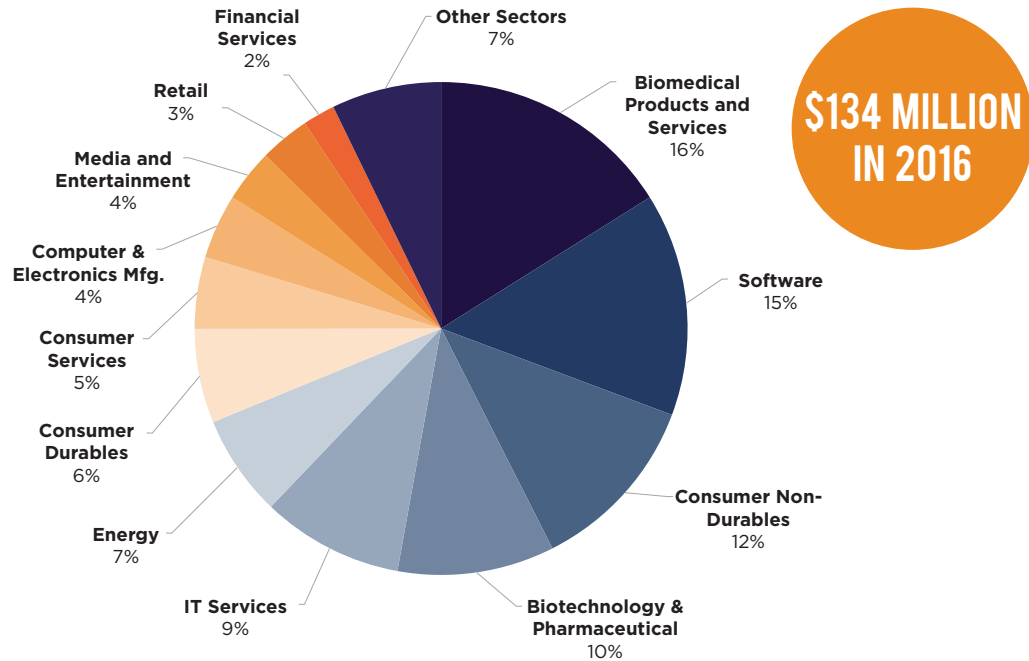


Source: PitchBook; Martin Prosperity Institute; CONNECT

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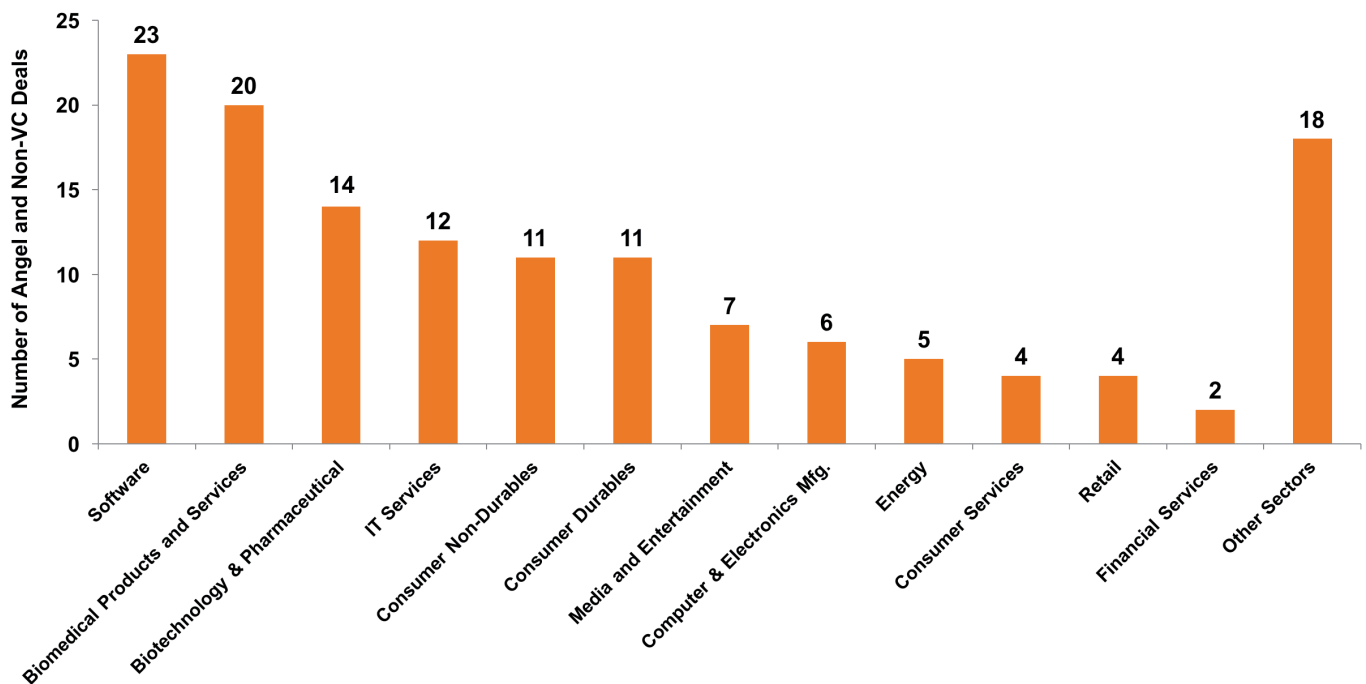
SAN DIEGO ANGEL AND OTHER NON-VENTURE CAPITAL INVESTMENT

San Diego companies raised \$134 million in 137 deals in 2016 where the investors were not institutional venture capital firms. Most of the deals had a single angel investor. Life sciences companies raised more than \$35 million in 34 deals. Software companies raised almost \$20 million in 20 deals.



**\$134 MILLION
IN 2016**

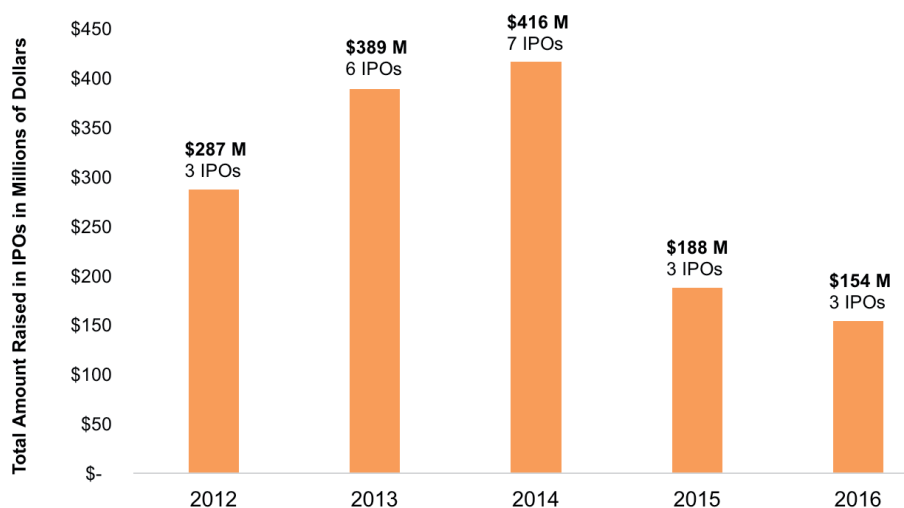
San Diego Angel & Other Non-VC Investment - 137 Deals in 2016



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INITIAL PUBLIC EQUITY OFFERINGS (IPOS)

The San Diego IPO market saw limited activity in 2016 with only three companies going public. The three companies raised \$154 million through their IPOs. This was a bit below the \$188 million raised in the three San Diego IPOs completed in 2015. In 2014 seven San Diego biotech companies went public initially raising \$416 million, which followed on \$389 million raised in six deals in 2013.



Obalon Therapeutics, Inc. (NasdaqGM:OBLN)

\$75 Million IPO

Founded 2008

Went public 10/6/2016

Developer of an encapsulated gastric balloon for weight loss. The company offers a non-surgical, reversible weight-loss option that entails a deflated gastric balloon that is swallowed and then inflated in the user's stomach. The balloon promotes feelings of fullness, enabling users to cut down on food consumption.

The company raised \$75 million in its initial public offering. Previously, the company raised \$16 million of Series E venture funding from InterWest Partners and other undisclosed investors on May 2, 2016.

Funding Round	Deal Type	Date	Amount	Raised to Date	Pre-Valuation	Post-Valuation	Stage
8.	IPO	2016	\$75.0M	\$83.7M**	\$164.3M	\$239.3M ^E	Generating Revenue/Not Profitable
7.	Later Stage VC (Series E)	2016	\$16.0M	\$83.7M			Generating Revenue/Not Profitable
6.	Later Stage VC (Series D)	2015	\$30.0M	\$67.7M	\$59.2M	\$79.2M	Generating Revenue/Not Profitable
5.	Later Stage VC (Series C1)	2013	\$5.0M	\$37.7M	\$81.8M	\$86.78M	Startup
4.	Later Stage VC (Series C1)	2012	\$5.0M	\$32.8M	\$71.8M	\$76.8M	Startup
3.	Later Stage VC (Series C)	2012	\$16.5M	\$27.8M	\$17.8M	\$34.3M	Startup
2.	Early Stage VC (Series B)	2009	\$6.5M	\$11.2M	\$6.0M	\$12.5M	Startup
1.	Early Stage VC (Series A)	2008	\$4.7M	\$4.7M	\$2.7M	\$7.4M	Startup

E - indicates estimated value. ** Includes \$10M of known debt; Does not include grant funding

Source: Pitchbook; S&P Capital IQ; Roth Capital Partners; CrunchBase Inc.; CONNECT

CAPITAL

INITIAL PUBLIC EQUITY OFFERINGS (IPOS)



Innovative Industrial Properties, Inc. (NYSE:IIPR) \$67 Million IPO
 Founded 2016 Went public 11/30/2016

Innovative Industrial Properties is a Real Estate Investment Trust (REIT) that acquires specialized industrial real estate assets that are used for growing medical-use cannabis and operated by state-licensed growers. The company acts as a source of capital to these licensed medical-use cannabis growers by acquiring and leasing back their real estate locations.

One of the first medical cannabis companies to list on the New York Stock Exchange, Innovative Industrial Properties executive chairman Alan Gold previously took REITs BioMed Realty Trust and Alexandria Real Estate Equities Inc. public and sold BioMed to the Blackstone Group in an \$8 billion deal that closed in 2016.

The company raised \$67 million in its initial public offering, valuing the company at \$67 million.



Airgain, Inc. (NasdaqCM:AIRG) \$12 Million IPO
 Founded 2003 Went public 8/11/2016

Airgain is a wireless system innovator focused on improving the mass market's wireless connectivity experience through its patented smart antenna technology, embedded antenna designs, and modular wireless video and system products. Airgain designs, develops, and engineers its antenna products and connectivity solutions for original equipment and design manufacturers worldwide.

The company raised \$12 million in its initial public offering on August 12, 2016, valuing the company at \$57.9 million. Airgain filed for a second public offering on November 23, 2016.

Funding Round	Deal Type	Date	Amount	Raised to Date	Pre-Valuation	Post-Valuation	Stage
10.	IPO	2016	\$12.0M	\$28.4M	\$45.9M	\$57.9M ^E	Profitable
9.	Later Stage VC (Series G)	2009	\$1.9M	\$28.4M	\$33.7M	\$35.6M	Generating Revenue/Not Profitable
8.	Later Stage VC (Series G)	2008	\$2.5M	\$26.5M	\$31.2M	\$33.7M	Generating Revenue/Not Profitable
7.	Later Stage VC (Series F)	2007	\$6.2M	\$24.0M	\$25.1M	\$31.2M	Generating Revenue/Not Profitable
6.	Later Stage VC (Series E)	2006	\$4.1M	\$17.9M	\$17.3M	\$21.4M	Startup
5.	Later Stage VC (Series E)	2005	\$4.8M	\$13.8M	\$12.5M	\$17.3M	Startup
4.	Later Stage VC (Series D)	2004	\$2.0M	\$9.0M	\$4.0M	\$6.0M	Startup
3.	Later Stage VC (Series C)	2003	\$0.7M	\$7.0M	\$3.4M	\$4.1M	Startup
2.	Later Stage VC (Series B)	2003	\$5.1M	\$6.3M	\$10.0M	\$15.1M	Startup
1.	Early Stage VC (Series A)	2001	\$1.2M	\$1.2M	\$6.8M	\$8.0M	Startup

E - indicates estimated value.

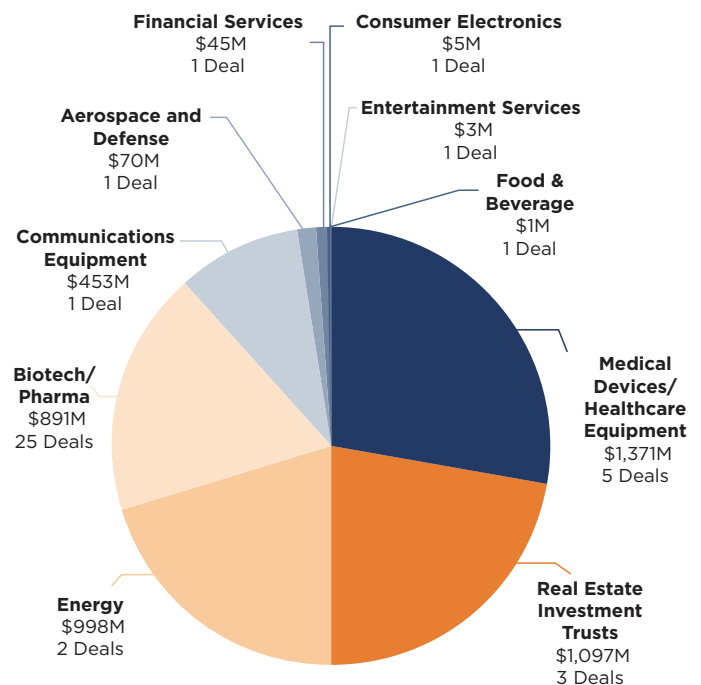
Source: PitchBook; S&P Capital IQ; Roth Capital Partners; CrunchBase Inc.; CONNECT

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FOLLOW-ON PUBLIC EQUITY OFFERINGS – \$4.9 BILLION IN ADDITIONAL FUNDING \$4.9 BILLION RAISED BY 33 SAN DIEGO COMPANIES THROUGH 41 FPOS IN 2016

Company	Industry	Total Raised
Realty Income Corporation	Real Estate Investment Trust	\$975.9M
NuVasive, Inc.	Healthcare Equipment	\$550.0M
ACADIA Pharmaceuticals Inc.	Biotech/Pharma	\$500.0M
Sempra Energy	Energy	\$499.5M
SDG&E	Energy	\$498.4M
ViaSat, Inc.	Communications Equipment	\$453.3M
AMN Healthcare, Inc.	Healthcare Equipment	\$325.0M
DJO Finance LLC	Healthcare Equipment	\$298.5M
Evolent Health, Inc.	Healthcare Equipment	\$168.8M
Retail Opportunity Investments Corp.	Real Estate Investment Trust	\$121.1M
Otonomy, Inc.	Biotech/Pharma	\$100.0M
Kratos Defense & Security Solutions, Inc.	Aerospace and Defense	\$70.0M
Ignyta, Inc.	Biotech/Pharma	\$50.0M
BofI Holding, Inc.	Financial Services	\$45.0M
Sophiris Bio, Inc.	Biotech/Pharma	\$31.0M
GenMark Diagnostics, Inc.	Healthcare Equipment	\$29.0M
Cidara Therapeutics, Inc.	Biotech/Pharma	\$25.0M
Organovo Holdings, Inc.	Biotech/Pharma	\$24.8M
Apricus Biosciences, Inc.	Biotech/Pharma	\$21.5M
Cytori Therapeutics, Inc.	Biotech/Pharma	\$19.4M
TearLab Corporation	Biotech/Pharma	\$17.3M
TRACON Pharmaceuticals, Inc.	Biotech/Pharma	\$15.1M
Biocept, Inc.	Biotech/Pharma	\$15.0M
Evoke Pharma, Inc.	Biotech/Pharma	\$14.5M
Adamis Pharmaceuticals Corporation	Biotech/Pharma	\$11.1M
Imprimis Pharmaceuticals, Inc.	Biotech/Pharma	\$10.4M
OncoSec Medical Incorporated	Biotech/Pharma	\$10.0M
AmpliPhi Biosciences Corporation	Biotech/Pharma	\$9.0M
MabVax Therapeutics Holdings, Inc.	Biotech/Pharma	\$8.6M
Mast Therapeutics, Inc.	Biotech/Pharma	\$8.0M
Turtle Beach Corporation	Consumer Electronics	\$5.0M
NTN Buzztime, Inc.	Entertainment Services	\$2.8M
Nuzee, Inc.	Food & Beverage	\$0.6M
TOTAL FOLLOW-ON PUBLIC EQUITY FINANCING		\$4,934B

This was nearly twice the amount raised in 2015 when 40 companies raised \$2.7 billion. A follow-on public equity offer (FPO) is an issuing of supplementary shares to investors by a public company that is already listed on an exchange, and has gone through the IPO process. FPOs are popular methods for companies to raise additional equity capital in the capital markets through a stock issue.



Healthcare equipment (medical devices) was the largest industry sector with almost \$1.4 billion in FPO activity led by NuVasive and AMN Healthcare.

Realty Income Corporation, a real estate investment trust, raised the largest amount in two deals totaling more than \$975 million.

Sempra Energy and SDG&E together raised nearly \$1 billion in follow-on equity offerings.

The biotechnology and pharmaceuticals sector had the most deals with 25 FPOs totaling more than \$890 million, led by Acadia Pharmaceuticals \$500 million FPO.

ViaSat was the sole FPO in the communications equipment sector totaling more than \$450 million in 2016.

Source: S&P Capital IQ; Roth Capital Partners; CrunchBase; CONNECT



STARTUP SPOTLIGHT

FEATURED LOCAL, EARLY-STAGE INNOVATION COMPANIES

comhear 

GRYPHON


Nanome Inc.



Perry Teevens
CEO



John Wu
Co-Founder & CEO



Steve McCloskey
Founder & CEO

comhear.com

Founded 2013
Software, Digital Media, Mobile Apps

Comhear is a technology company dedicated to creating the next generation of audio products for home, enterprise, and professional applications. Primary to the company is a relationship with UC San Diego (UCSD) around a series of new patented technologies that will change the way audio is experienced in the future. Most recently, the company has developed a way to present immersive audio experiences with a new audio beamforming technology, in partnership with researchers at UCSD. Its new Yarra 3DX sound bar brings cutting edge, patented digital processing to an array of phase aligned, precision engineered drivers to produce a uniquely natural way to hear sound. The company's patented MyBeam™ 360° technology also recently received the CES 2017 Innovation Award within the High-Performance Home Audio/Video category.

gryphonconnect.com

Founded 2014
Security Technologies

Gryphon is a cloud managed network security service platform for the connected home. The company is aiming to disrupt home and SMB network security using AI based intrusion detection, community drive content rating, and a real time secure messaging protocol. The average home has over a dozen connected devices and growing. With as much as 70 percent of those devices vulnerable, hackers around the world can easily intrude on one's privacy, steal one's identity, or worse, violate one's children. Fragmented solutions range from software installed on end devices to additional appliances in an already complex home network with compatibility issues. Gryphon simplifies all of that with an easy-to-use cloud-managed service platform that includes a fast, secure Wi-Fi router, a cloud service, and an intuitive app.

nanome.ai

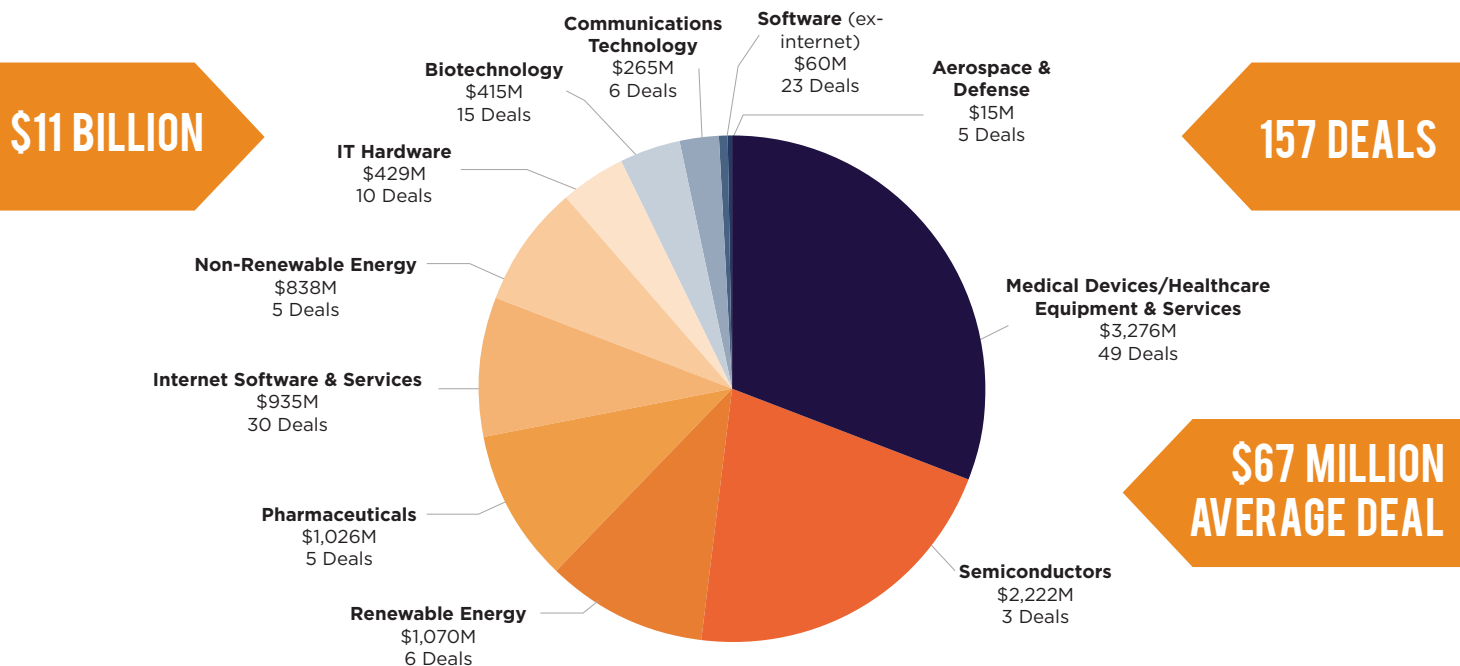
Founded 2015
Software, Digital Media, Mobile Apps

Using Nanome's software enables scientists and engineers to collaborate on the development of an intuitive Virtual Reality molecular design package capable of enhancing visualization, interaction, and collaboration for structure-based drug-design. This fully interactive application, with the ability to place teams of molecular designers within a Virtual Molecular world is used to elaborate and enhance structure-based for the design of small molecule and biologics medicines. Such a framework allows enhanced visualization and understanding of complex molecular interactions and representation with a tactile intuitive nature, allowing the design of complex three dimensional entities and interactive collaboration both locally and globally on projects. Collaborators will be able to work and understand the nature of problems interactively.

MERGERS & ACQUISITIONS

TECH & LIFE SCIENCES MERGERS & ACQUISITIONS (M&A)

\$10.6 billion in technology and life sciences M&A deals were closed in 2016 where the target, buyer or seller was a San Diego company – down 42 percent from 2015, which included the nearly \$14 billion acquisition of CareFusion by Becton, Dickinson & Company. San Diego’s innovation sector accounted for a third of the total San Diego M&A deal value and more than 80 percent of the total number of M&A deals closed in 2016.



Life sciences related sectors continued to represent the greatest M&A activity among San Diego’s innovation economy sectors:

- The medical devices sector accounted for more than 30 percent of the total number of M&A deals with 49 deals totaling \$3.3 billion.
- The pharmaceutical and biotechnology sectors together accounted for almost eight percent of the overall M&A value with 20 deals totaling \$1.4 billion.

Amongst the non-life sciences industries:

- The semiconductor sector accounted for three deals totaling \$2.2 billion.
- Renewable and non-renewable energy deals accounted for 11 deals and a total value of \$1.9 billion.
- Internet software and software-related sectors accounted for the largest number of M&A deals in San Diego with 53 deals totaling \$995 million.
- Three other M&A deals of undisclosed value included a chemical company acquisition, an electrical components company acquisition, and an IT services company acquisition.
- There were ten IT Hardware deals totaling \$429 million (includes Nervana Systems, Inc.) and six communications technology acquisitions totaling \$265 million.

Note: A single deal, the \$7.9 billion acquisition of BioMed Realty Trust by Blackstone Real Estate Advisors, was excluded from this analysis.

Source: S&P Capital IQ; Roth Capital Partners; CrunchBase; CONNECT

TOP 20 SAN DIEGO TECH & LIFE SCIENCES M&A DEALS IN 2016

(Orange highlighted and bold indicates company acquired, buyer, or seller is a San Diego company)

Company Acquired	Deal Amount	Buyers	Seller	Industry
Microsemi Storage Solutions, Inc.	\$1,921M	Microsemi Corporation	Relational Investors LLC ; Soros Fund Management, LLC; SSGA Funds Management, Inc.; T. Rowe Price Associates, Inc.; Cadian Capital Management, LLC	Semiconductors
Noble Americas Energy Solutions, LLC	\$1,048M	Calpine Corporation	Noble Americas Gas & Power Corp.	Renewable Energy
Sorrento Therapeutics, Inc., Worldwide License of Anti-PD-1 Antibody	\$978M	Les Laboratoires Servier SAS	Sorrento Therapeutics, Inc.	Pharmaceuticals
Brightree, LLC	\$800M	Resmed Corp.	Battery Ventures; C&B Capital, LP	Healthcare Equipment & Services
Imprivata, Inc.	\$521M	Thoma Bravo, LLC	Highland Capital Partners; Polaris Partners; General Catalyst Partners; RGM Capital, LLC; Tamarack Advisers, LP ; Wellington Management Company, LLP	Healthcare Equipment & Services
Lytx, Inc.	\$500M	GTCR, LLC	Insight Venture Partners; JMI Equity; Menlo Ventures; Welsh, Carson, Anderson & Stowe; Volvo Group Venture Capital; Triangle Peak Partners, LP; Delta-v Capital	Internet Software & Services
Rockies Express Pipeline, LLC	\$440M	Tallgrass Energy Partners, LP; Tallgrass Development, LP	Sempra U.S. Gas & Power, LLC	Energy
Sequenom, Inc.	\$414M	Laboratory Corporation of America Holdings	OrbiMed Advisors, LLC; Palo Alto Investors, LLC; Deutsche Bank AG, Investment Arm; John Hancock Investments; UBS O'Connor LLC; Manulife Asset Management; LB I Group Inc.; John Hancock Investment Trust II - John Hancock Small Cap Equity Fund; Visium Asset Management, LLC; John Hancock Funds II - Emerging Growth Fund; Camber Capital Management LLC; UBS Eucalyptus Management, LLC; Ramius, LLC	Healthcare Equipment & Services
NuVasive Specialized Orthopedics, Inc.	\$410M	NuVasive, Inc.	MedFocus Fund, LLC; BioStar Ventures LLC; HBM Partners Ltd.; Wexford Capital LLC	Healthcare Equipment & Services
Nervana Systems, Inc.	\$408M	Intel	Allen & Company; AME Cloud Ventures; Cisco Entrepreneurs in Residence; CME Ventures; Data Collective; Draper Fisher Jurvetson; FUEL Capital; In-Q-Tel; Lux Capital; Omidyar Network; Playground Global; SV Angel	IT Hardware, AI, Machine Learning
EnergySouth, Inc.	\$390M	Spire, Inc.	Sempra U.S. Gas & Power, LLC	Energy
Tapad, Inc.	\$360M	Telenor ASA	Battery Ventures; FirstMark Capital, LLC; WPP PLC; Firsthand Capital Management, Inc.; Avalon Ventures, LLC ; Firsthand Technology Value Fund, Inc.; Redwood Partners International, Investment Arm; G & H Partners LLP; Knight Foundation, Investment Arm; Spring Capital AS; Compound (formerly Metamorphic Ventures); SVB Silicon Valley Bank, Investment Arm; Lerer Hippeau Ventures; Grape Arbor LLC; Quotidian Ventures; Tribal Ventures; Blue Cloud Ventures; Zanadu Capital Partners, LLC	Internet Software & Services
Transcend Medical, Inc.	\$352M	Alcon Holdings, Inc.	Canaan Partners; HLM Venture Partners; Morgenthaler; Technology Partners; Versant Ventures, Inc.; Investor Growth Capital; Kaiser Permanente Ventures; Latterell Venture Partners; Split Rock Partners, LLC; Finistere Ventures, LLC ; RMI Partners	Healthcare Equipment & Services
GATR Technologies, Inc.	\$233M	Cubic Corporation	In-Q-Tel, Inc.	Communications Technology
Micronas Semiconductor Holding AG	\$221M	TDK Corporation	Brandes Investment Partners, LP ; Black Creek Investment Management, Inc.	Semiconductors
HealthFusion Holdings, Inc.	\$201M	Quality Systems, Inc.	BNY Mellon-Alcentra Mezzanine Partners	Healthcare Equipment & Services
Open Monoclonal Technology, Inc.	\$178M	Ligand Pharmaceuticals Incorporated	Essex Woodlands Health Ventures	Biotechnology
B. E. Smith, Inc.	\$160M	AMN Healthcare, Inc.	NA	Healthcare Equipment & Services
Creabilis SA	\$150M	Sienna Labs, Inc.	Kreos Capital; Sofinnova Partners; NeoMed; AbbVie Biotech Ventures, Inc.	Biotechnology
Inova Labs, Inc.	\$110M	ResMed, Inc.	Three Arch Partners; Latterell Venture Partners; Gilde Healthcare Partners B.V.	Healthcare Equipment & Services

Source: S&P Capital IQ; Roth Capital Partners; CrunchBase; CONNECT

IMPACT OF RESEARCH INSTITUTIONS ON SAN DIEGO'S ECONOMY: \$4.6 BILLION



San Diego's research institutions have a \$4.6 billion economic impact and are at the center of the region's \$14.4 billion scientific R&D cluster.

San Diego is one of the most concentrated scientific R&D markets in the United States and a global leader in innovation. In total, scientific R&D impacts more than 100,000 local jobs and generates over \$14 billion in economic impact—a third of which stems from research institutions.

- Research institutions impact roughly 37,000 jobs and have a combined \$4.6 billion total impact on the region's GDP every year.
- All scientific R&D, including for-profit enterprises, generates \$14.4 billion annually in economic impact—roughly equal to the San Diego's visitor industry.
- \$1.8 billion in federal and philanthropic research funding flows to the region's research institutions every year.
- Independent research institutions in San Diego receive more NIH research funding and generate more patents than counterparts in any metro area of the United States.
- An estimated 111 National Academy of Science members and more than 2,600 postdocs call San Diego's research institutions home.
- San Diego has more than 41.8 million square feet of lab and R&D space—more than 3 times the total shopping mall space in the region.

THE \$4.6 BILLION ECONOMIC IMPACT OF SAN DIEGO'S RESEARCH INSTITUTIONS
EQUATES TO THAT OF:

4

SAN DIEGO
CONVENTION
CENTERS

34

SAN DIEGO
COMIC-CONS

6

AIRCRAFT
CARRIERS

33

U.S. OPEN GOLF
CHAMPIONSHIPS

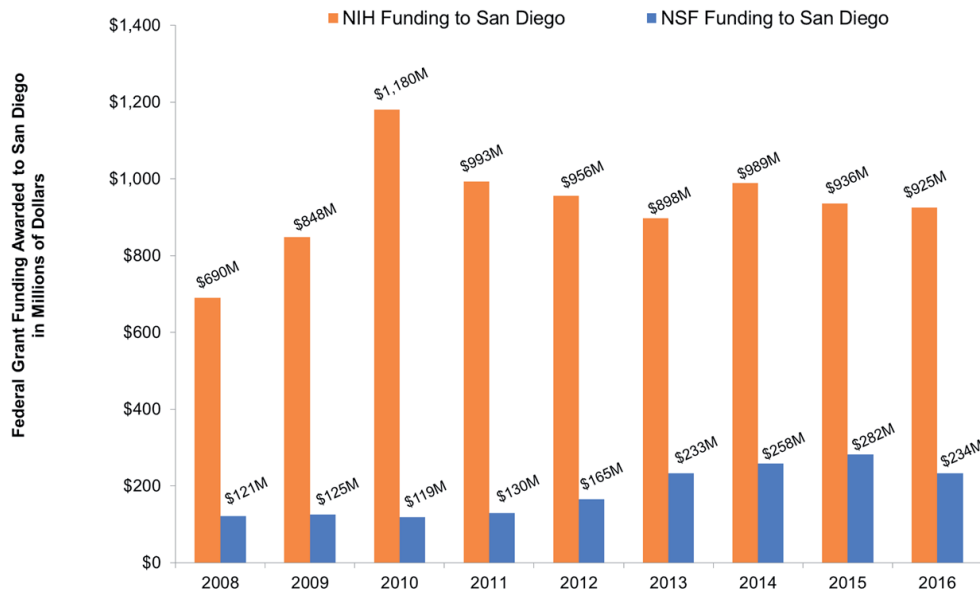
Source: San Diego Regional Economic Development Corporation, "The Economic Impact of San Diego's Research Institutions - Driving San Diego's Innovation Economy".

RESEARCH GRANTS

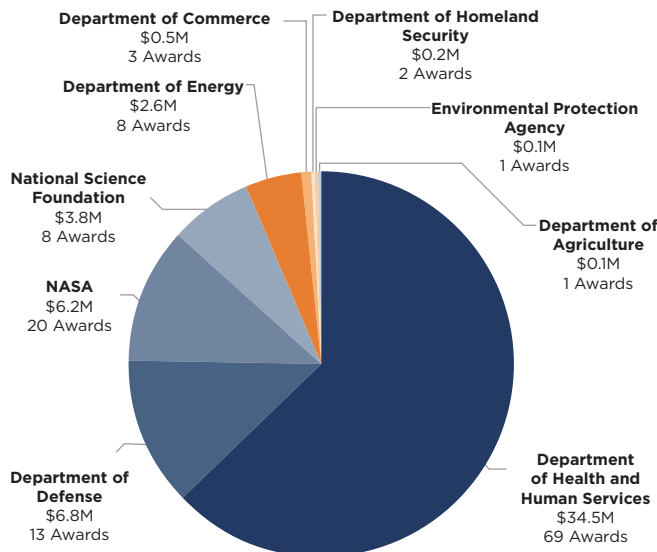
FEDERAL RESEARCH GRANTS – HIGHLIGHTS

More than \$1.2 billion in NIH, NSF and SBIR-STTR grant funding awarded to San Diego research institutions and companies in 2016:

NIH and NSF Grant Funding to San Diego Institutions and Companies: \$1.15B in 2016



2016 SBIR-STTR Grant Awards – San Diego County



Source: NIH, NSF, www.sbir.gov; CONNECT

Small Business Innovation Research-Small Business Technology Transfer (SBIR-STTR) Grant Funding to San Diego Companies and Institutions by Government Agency: \$54.9 million awarded in 2016

The Department of Health & Human Services, primarily through the NIH, awarded more than half the total SBIR-STTR grants with 69 awards totaling almost \$35 million in 2016. This was up from \$27 million through 70 awards in 2015. SBIR-STTR grants awarded by the Department of Defense totaled almost \$7 million, down significantly from the \$27 million awarded in 2015. The fall-off in DoD SBIR awards was seen nationwide.

- The SBIR program encourages small businesses to engage in Federal Research/Research and Development (R/R&D) that has the potential for commercialization.
- The STTR program encourages joint venture opportunities for small businesses and nonprofit research institutions.

RESEARCH GRANTS

FEDERAL RESEARCH GRANTS – FUNDING BY FEDERAL AGENCY

Federal agencies pump a substantial amount of grant money into the San Diego region – more than \$2.5 billion in 2016. A substantial portion of this funding - \$1.4 billion - goes to scientific research that provides a foundation for San Diego’s innovation economy. The major agencies that provide grant funding support to San Diego’s innovation economy are shown by the orange bars in the chart below.

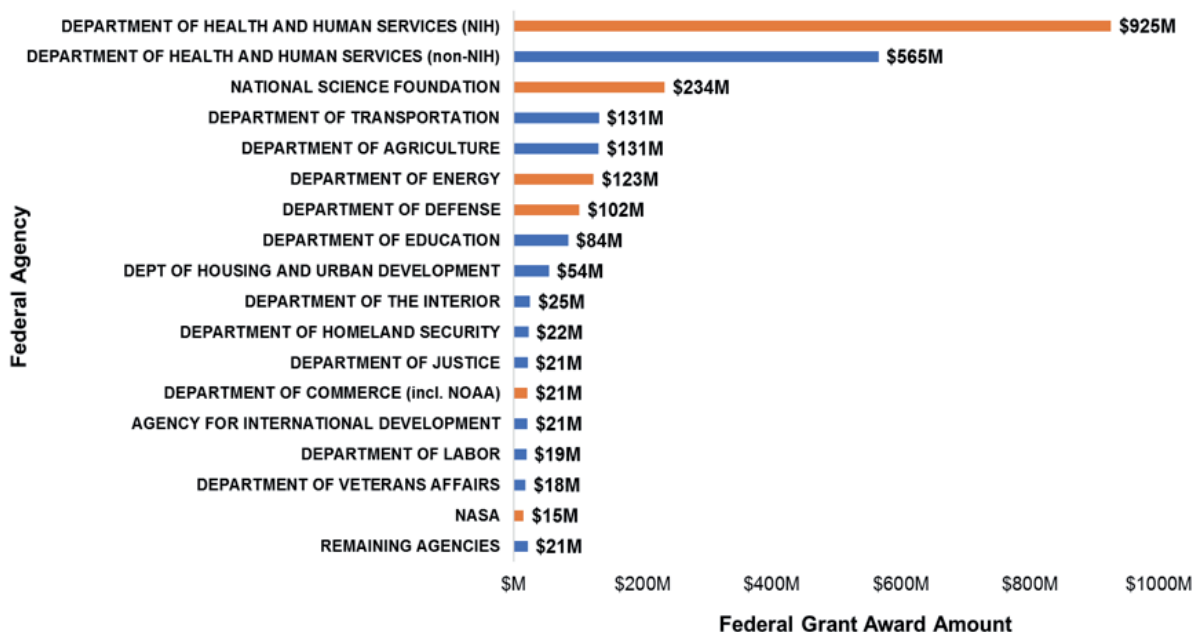
Two agencies, The Department of Health and Human Services (NIH) and the National Science Foundation (NSF) account for almost half of the federal grant funding to San Diego. Federal grant funding awarded to San Diego institutions and companies by the National Institutes of Health and the National Science Foundation totaled more than \$1.15 billion in 2016, down slightly from the \$1.2 billion awarded in 2015. NIH grant awards in 2016 totaled \$925 million. NSF grant awards totaled \$234 million and were down 17 percent compared to 2015.

The other bureaus of Department of Health and Human Services (non-NIH) awarded \$565 million in grant funding to promote the economic and social well-being of families, children, individuals, and communities, support research to improve the quality, effectiveness, accessibility, and cost effectiveness of health care, disease control, and prevention, and to enhance or develop new and existing programs intended to aid in safeguarding products intended for human or animal use.

Two other major agencies awarding grant dollars to San Diego companies and institutions include the Department of Energy and Department of Defense, which together awarded \$225 million in 2016.

San Diego companies and institutions received an additional \$19 million from the National Oceanic and Atmospheric Administration (NOAA) and \$15 million from NASA in 2016. NOAA funding to San Diego in 2016 was down 23 percent from 2015. NASA funding to San Diego was down nine percent in 2016 compared to the previous year.

Federal Grant Funding to San Diego by Federal Agency – 2016



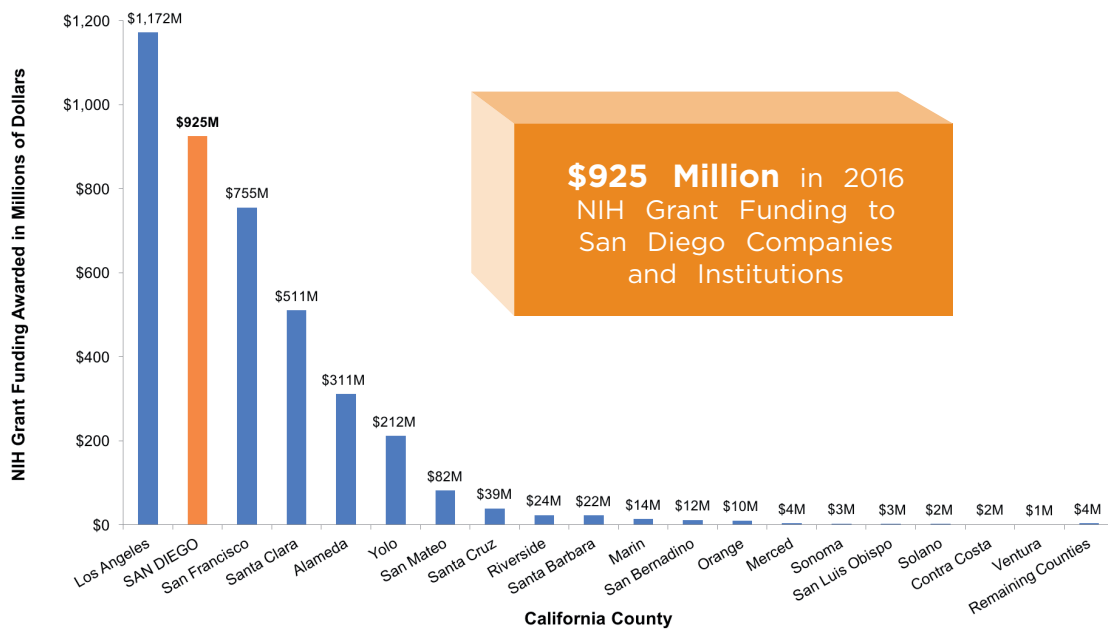
Source: www.usaspending.gov; CONNECT

RESEARCH GRANTS

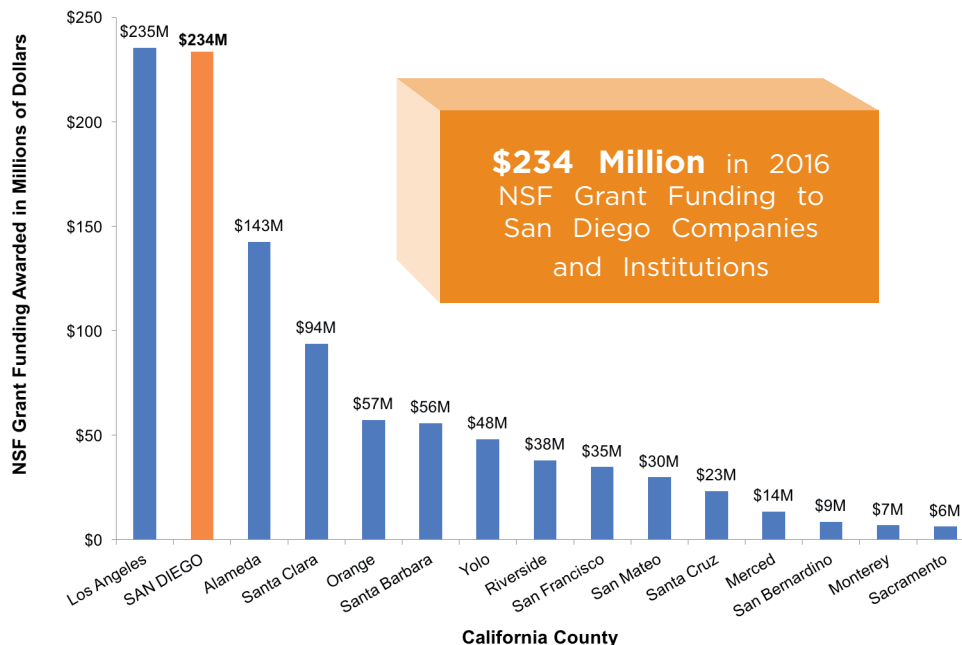
FEDERAL RESEARCH GRANTS - TOP AWARDS IN CALIFORNIA BY COUNTY

San Diego County again ranked second in California, behind Los Angeles County, for both NIH and NSF awards supporting research in 2016. This funding is critical to support foundational research that can lead to scientific breakthroughs and commercial innovation in the region.

NIH Grant Funding Awarded in 2016 by County - California



NSF Grant Funding Awarded in FY2016 by County - California



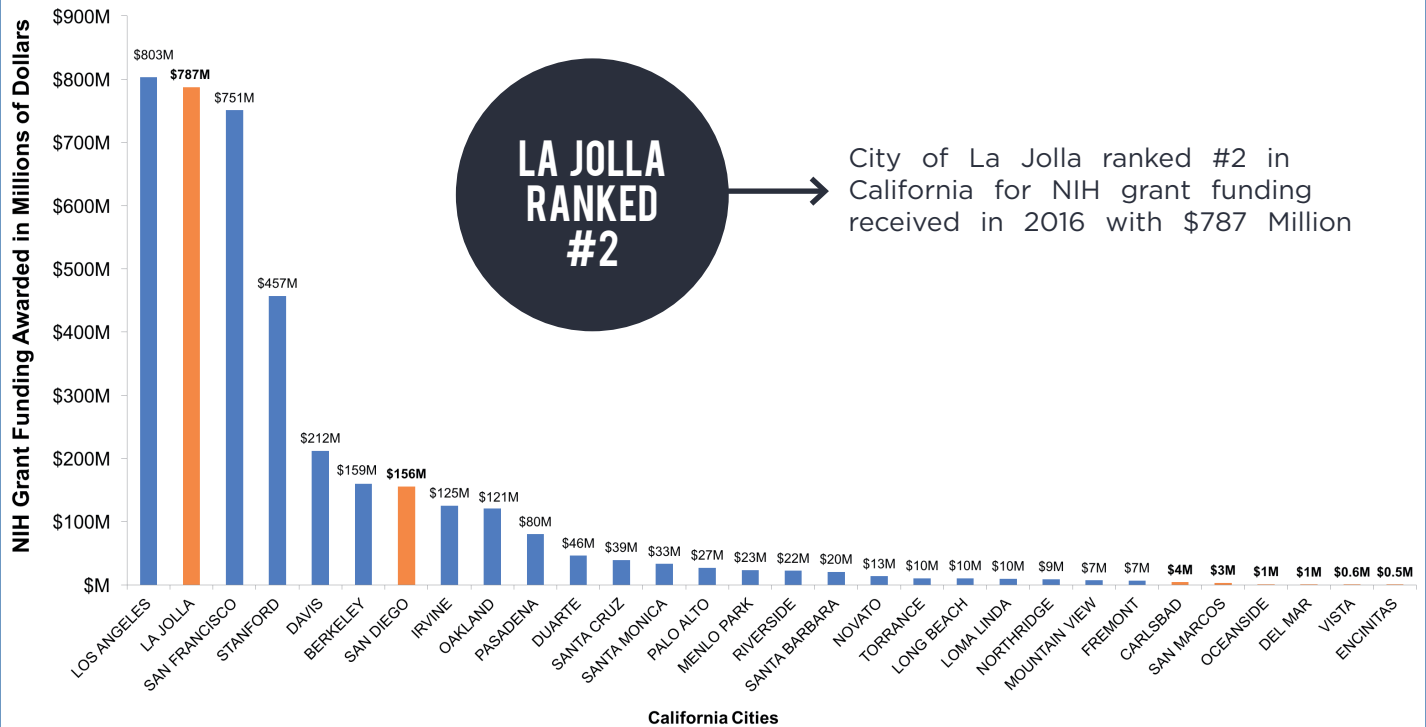
Source: NIH; NSF; CONNECT

RESEARCH GRANTS

FEDERAL RESEARCH GRANTS - TOP AWARDS IN CALIFORNIA BY CITY

La Jolla ranked second among California cities for NIH research funding in 2016 with almost \$790 million or 20 percent of the entire amount of NIH funding received in California. Los Angeles ranked first with more than \$800 million, and San Francisco ranked third with \$750 million. The City of San Diego ranked seventh with \$156 Million. Another \$11 million in NIH research grant funding was received by companies and institutions in Carlsbad, San Marcos, Oceanside, Vista and Encinitas.

NIH Grant Funding Awarded in 2016 by City - California



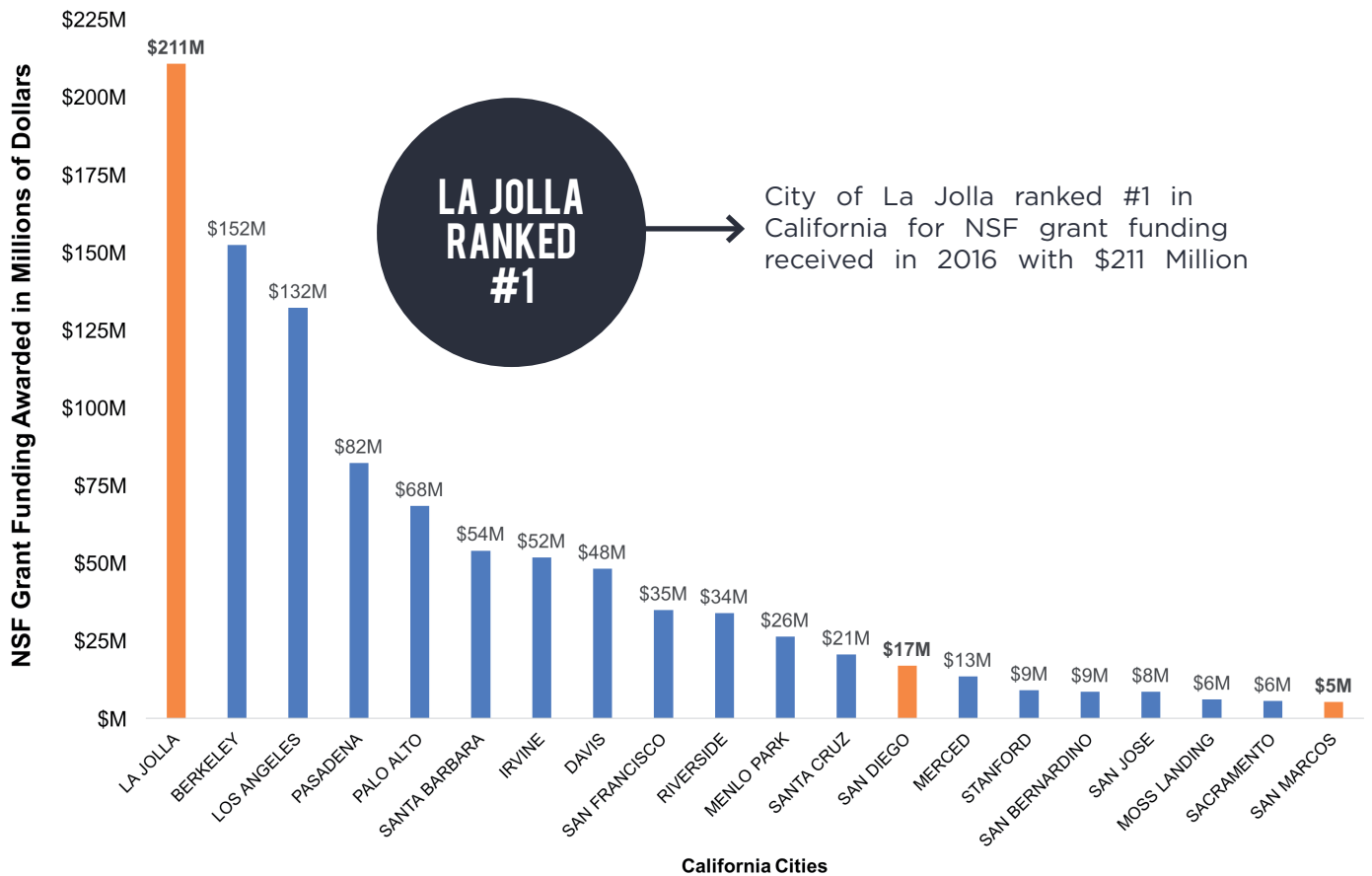
Source: NIH; CONNECT

RESEARCH GRANTS

FEDERAL RESEARCH GRANTS – NSF TOP AWARDS IN CALIFORNIA BY CITY

La Jolla ranked first among California cities for NSF research funding in 2016 with more than \$210 million, 20 percent of the entire amount of NSF funding received in California. Berkeley ranked second with more than \$150 million closely followed by Los Angeles with more than \$130 million. The City of San Diego ranked thirteenth overall with \$17 million and the City of San Marcos received \$5 million. An additional half a million dollars of NSF research grant funding was received by companies and institutions in Solana Beach, Encinitas, El Cajon, and Oceanside.

NSF Grant Funding Awarded in 2016 by City - California



Source: NSF; CONNECT

RESEARCH GRANTS

FEDERAL RESEARCH GRANTS – TOP AWARDS BY CALIFORNIA INSTITUTION

UC San Diego ranked second in California (up from third in 2015) for NIH funding in fiscal year 2016 with more than \$430 million awarded to researchers across 1,000 awards. The Scripps Research Institute in La Jolla was also among the top six California institutions awarded with \$226 million. The top institutions receiving NIH awards in 2016 are highlighted below. UC San Francisco ranked first with \$645 million and almost 1,500 awards.

NIH Grant Funding to Top California Institutions in 2016				
California Ranking	Institution	City	NIH Award Amount	Number of Awards
1	University of California, San Francisco	San Francisco	\$645.4M	1,474
2	University of California, San Diego	San Diego	\$434.0M	992
3	Stanford University	Stanford	\$427.0M	944
4	University of California, Los Angeles	Los Angeles	\$399.6M	960
5	University of Southern California	Los Angeles	\$229.9M	513
6	Scripps Research Institute	La Jolla	\$226.0M	322
7	University of California, Davis	Davis	\$199.9M	529
8	University of California, Berkeley	Berkeley	\$125.9M	338
9	University of California, Irvine	Irvine	\$120.8M	363
10	PROTOTYPES: Centers for Innovation in Health, Mental Health and Social Services	Los Angeles	\$70.3M	1
13	Sanford Burnham Prebys Medical Discovery Institute	La Jolla	\$59.9M	140
17	La Jolla Institute for Allergy & Immunology	La Jolla	\$39.1M	80
19	Salk Institute for Biological Studies	La Jolla	\$34.3M	72
23	San Diego State University	San Diego	\$27.7M	81

UC San Diego ranked second in the state (up from fifth in California in 2015) for NSF funding in 2016 with \$115 million awarded across 315 grant awards. NSF funding to UC San Diego in 2016 was up more than 60 percent over the \$71 million received by the university in 2015. UC Berkeley ranked first with almost \$140 million and 350 NSF awards.

NSF Grant Funding to Top California Institutions in 2016				
California Ranking	Institutions	City	NSF Award Amount	Number of Awards
1	University of California, Berkeley	Berkeley	\$138.7M	352
2	University of California, San Diego	San Diego	\$115.1M	315
3	California Institute of Technology	Pasadena	\$80.4M	139
4	University of California, Los Angeles	Los Angeles	\$75.6M	260
5	Stanford University	Stanford	\$74.5M	266
6	University of California, Santa Barbara	Santa Barbara	\$52.4M	168
7	University of Southern California	Irvine	\$51.0M	161
8	University of California, Irvine	Los Angeles	\$49.0M	147
9	University of California, Davis	Davis	\$46.9M	222
10	University of California, Riverside	Riverside	\$33.5M	143

Source: National Institutes of Health; National Science Foundation; CONNECT



STARTUP SPOTLIGHT

FEATURED LOCAL, EARLY-STAGE INNOVATION COMPANIES



Marc Hertz
Co-Founder & CEO

gribo.com

Founded 2009
Pharmaceutical Drugs & Therapeutics

GRI Bio, Inc. is a clinical stage biotechnology company focused on treating liver disease (NASH) and autoimmune conditions including multiple sclerosis (MS) and rheumatoid arthritis (RA). Their patented technology platform treats a variety of inflammatory diseases by regulating human lymphocytes, known as natural killer T cells. GRI's technology platform has been proven in established disease models and in published scientific journals. It has been shown to improve liver function in human patients. GRI's other development programs include a Phase II ready compound for MS and a Phase I ready compound for RA. GRI's novel approach will be more effective than existing drug candidates because they interrupt the progression of diseases earlier in the inflammatory chain, as well as at multiple points during disease progression.



Jerry Feitelson
Co-Founder & CEO

agribodytech.com

Founded 2015
AgTech

Agribody Technologies will apply a proven solution to food-sourcing problems due to ever growing population, decreasing farmland availability, and extreme weather and climate change by increasing crop yields by at least 20 percent. Their broadly patent-protected technology modifies a fundamental biological switch in crop plants that also delays onset of plant senescence while increasing resistance to diseases and sub lethal stresses such as drought, heat, cold, salt, low nutrients, and crowding. Early revenues will be generated through licensing and co-developing our patented technology to innovative seed companies, with significant royalties and revenue sharing from commercialized products expected by year five. With an experienced team, unique technology validated in greenhouse and field studies, defined benchmarks, low overhead, and a huge market, Agribody Technologies expects exceptional returns on investment.



Avneesh Agrawal
Co-Founder & CEO

netradyne.com

Founded 2015
Software, IOT

NetraDyne provides artificial intelligence-enhanced, vision-based solutions. With technology innovation centers in San Diego, CA and Bangalore, India, NetraDyne designed its first innovation, Driveri, to solve driver safety issues experienced by the commercial vehicle industry. Driveri captures every moment of the driving experience, rather than a small sample of triggered data. Through advancements in AI they are delivering the next generation of fleet safety. Using AI approaches similar to WAYMO and Mobileye, these advancements in deep-learning deliver solutions never before seen in this industry, capturing large amounts of meaningful data at a speed only a commercial driver can.

RESEARCH GRANTS

FEDERAL RESEARCH GRANTS – SBIR–STTR AWARDS BY COMPANY

Ninety small businesses in San Diego County received 125 SBIR-STTR awards totaling \$54 million in 2016. The top awarded companies are shown here.

	Company	Amount Awarded	# of Awards	City
1	ARISAN THERAPEUTICS, INC.	\$5,100,000	3	San Diego
2	SAN DIEGO COMPOSITES, INC.	\$2,828,171	6	San Diego
3	SEACOAST SCIENCE, INC.	\$1,840,114	4	Carlsbad
4	INNOFLIGHT, INC.	\$1,747,019	4	San Diego
5	NANOSD, INC.	\$1,719,249	2	San Diego
6	AMYDIS DIAGNOSTICS, INC.	\$1,647,908	1	San Diego
7	PARABILIS SPACE TECHNOLOGIES, INC.	\$1,623,845	3	San Marcos
8	RENOVA THERAPEUTICS, INC.	\$1,605,000	1	San Diego
9	VALA SCIENCES, INC.	\$1,499,999	1	San Diego
10	VIROGENICS, INC.	\$1,499,999	1	San Diego



Arisan Therapeutics, Inc. is a biotechnology company based in San Diego committed to the discovery and development of broad spectrum orally active small-molecule anti-infectives. Current programs include several antiviral and antibacterial discovery projects.



San Diego Composites, Inc. (SDC) is an aerospace company with in-house capability for design through production of hardware and systems. SDC formed in 2002 with a focus on developing next generation materials, structures, and manufacturing technologies to benefit aerospace systems.



Seacoast Science, Inc. is focused on the expanding chemical sensor and chemical detection market. The company's primary focus is on the development of gas sensors for a variety of markets including leak detection, chemical warfare agent detection, air quality monitoring, and emission gas detection.



Innoflight, Inc. specializes in electronics systems for reliable operations in extreme environments. The company's core competency is affordable and responsive satellite design and operations through the innovative implementation of modern Commercial Off the Shelf (COTS) technology in tandem with common standards and protocols. Our primary focus is to provide aerospace vehicle systems with advanced solutions while reducing development timeline and ultimately reducing cost.



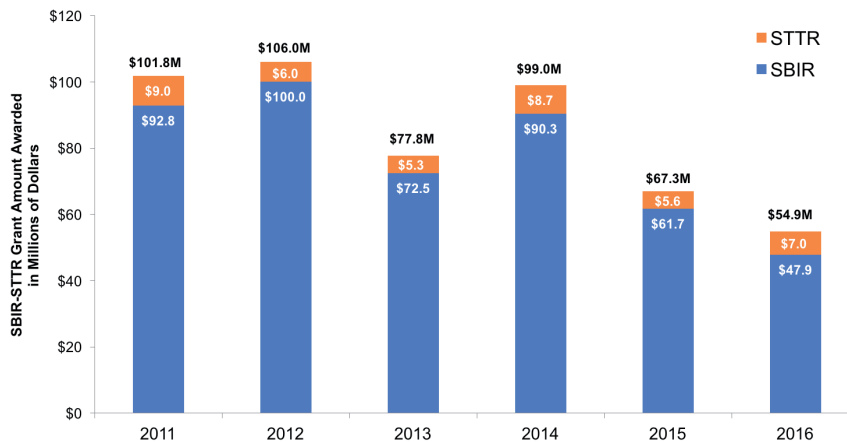
NanoSD, Inc is an energy/nanomaterials R&D company dedicated to identifying, inventing, and commercializing nanotechnologies to solve critical engineering problems in emerging and current products. NanoSD focuses on creating nanotechnology-based energy saving/generating solutions as it works at the very cutting-edge of nano research and development.

Source: www.sbir.gov; CONNECT

RESEARCH GRANTS

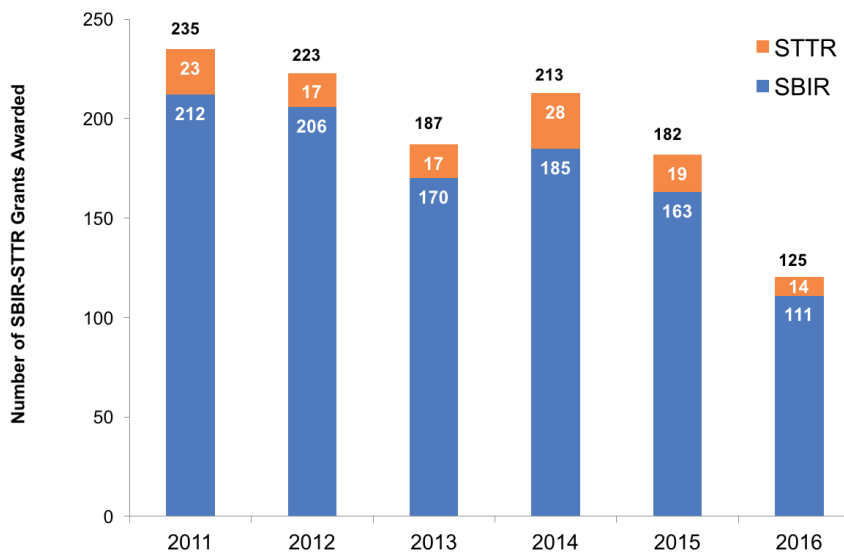
FEDERAL RESEARCH GRANTS – SBIR–STTR AWARDS

**SBIR-STTR Awards – San Diego County
Amount Awarded**



SBIR-STTR grant awards to San Diego companies and institutions dipped again in 2016 to \$54 million from \$67 million in 2015. The Department of Health & Human Services (primarily NIH) awarded more than half the total with 69 awards totaling almost \$35 million in 2016. This was up from \$27 million in 70 awards in 2015. SBIR-STTR grants awarded by the Department of Defense totaled almost \$7 million – down significantly from the \$27 million awarded in 2016. The fall-off in DoD SBIR awards was seen nationwide.

**SBIR-STTR Awards – San Diego County
Number of Awards**



The number of SBIR-STTR awarded to San Diego companies and research institutions in 2016 decreased by more than 30 percent to 125 awards compared to the 182 awards in 2015. The number of awards has fallen steadily since 2014 when 213 SBIR-STTR grants were awarded. The variance is due to the smaller number of awards made by the Department of Defense – 13 awards in 2016 compared to 65 awards in 2015.

Source: www.sbir.gov; CONNECT

PATENTS

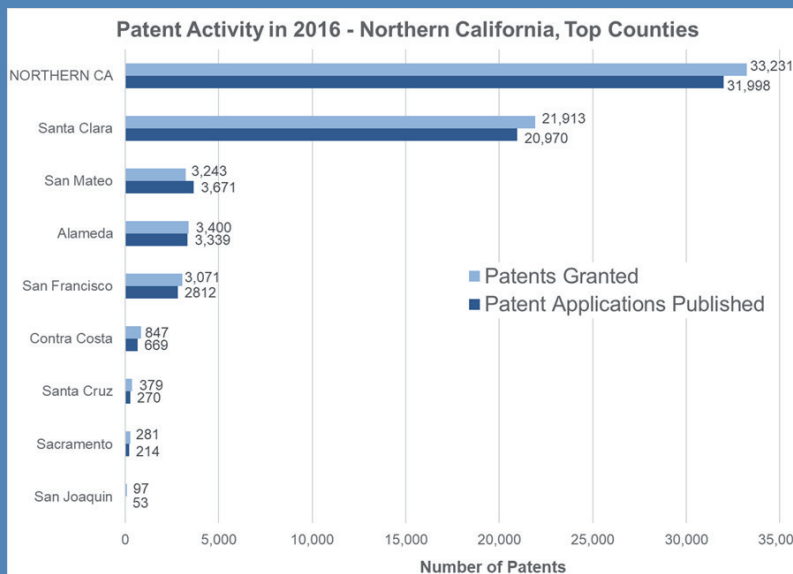
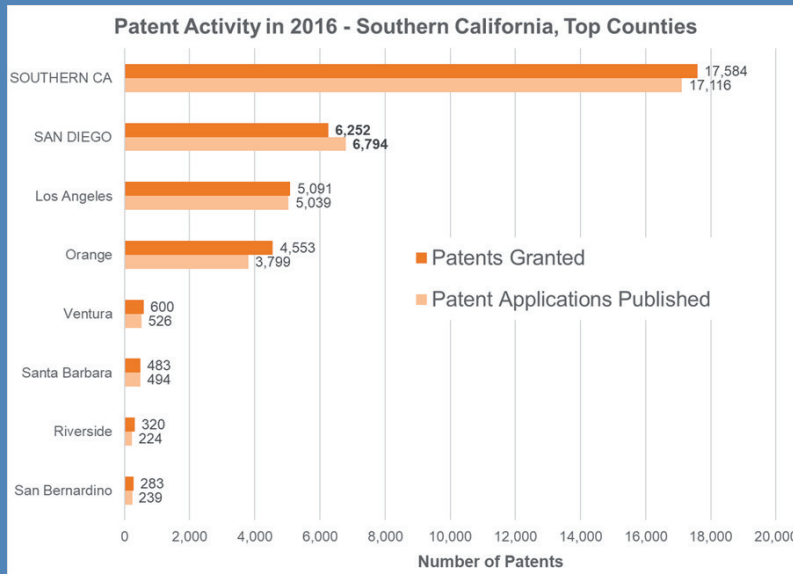
APPLICATIONS GRANTED AND PUBLISHED IN CALIFORNIA

San Diego Patent Activity Remained Solid in 2016

Patent activity is one reflection of innovation activity in the region. In 2016, 6,794 patent applications were published and 6,252 patents were granted – both numbers were down slightly from historical highs in 2014. The number of patents granted in 2016 was down 3 percent from 2015. Patent applications published were down slightly more than two percent from 2015. San Diego County is the patent leader in Southern California. Santa Clara County in Silicon Valley has the highest patent density in California, in fact the highest in the country.

In 2016 San Diego County was

- # 1** County in Southern California for patents granted and applications published
- # 2** County in California for patents granted
- # 2** County in California for new patent applications published



Source: United States Patent and Trade Office;
UC San Diego Extension; CONNECT



THANK YOU TO OUR SPONSORS AND PARTNERS

Sponsored by

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County of San Diego Community Enhancement Fund

In Partnership with

PitchBook
Roth Capital Partners
Stradling Yocca Carlson & Rauth

Thank you to the companies that significantly support San Diego's innovation economy through their support of CONNECT:

Alliance Healthcare Foundation	DeskHub	Procopio, Cory, Hargreaves & Savitch
Ardea Biosciences, a Member of the AstraZeneca Group	Ernst & Young	Qualcomm, Inc.
AT&T	JLABS, Johnson & Johnson Innovation	San Diego State University
Bank of America - Merrill Lynch	Jones Day	SDG&E, A Sempra Energy Utility
bkm OfficeWorks	J.P. Morgan Chase	Solar Turbines
California Energy Commission	Knobbe, Martens, Olson & Bear	Stradling Yocca Carlson & Rauth
Center for the Advancement of Science in Space (CASIS)	The Legler Benbough Foundation	UC San Diego, Chancellor's Office
California Manufacturing Technology Consulting (CMTC)	Lilly Research Laboratories	UC San Diego School of Extension
Cox Communications	Magda Marquet & François Ferré	U.S. Small Business Administration
Cubic Corporation	Malin Burnham	ViaSat, Inc.
Deloitte.	Marsh & McLennan Agency	Wilson Sonsini Goodrich & Rosati
Dentons	Morrison & Foerster	
	Pillsbury Winthrop Shaw Pittman	



ABOUT

The CONNECT San Diego Innovation Report provides an overview of the strength and impact of the innovation economy in San Diego. By gathering and analyzing data year over year, the report provides comparisons across innovation economy clusters and selected regions, monitors several types of capital investment in the region, and tracks the overall health of the San Diego innovation economy. This report also helps guide policymakers and trade organizations with their planning and advocacy work to foster the growth and expansion of the region's economy including, but not limited to: availability of international visas and workforce training for talent in high-growth clusters, building an attractive environment of capital investment, allocation of grant funding, reform of the patent system, and zoning. The report also underscores San Diego as a world leader in innovation with world-class research, leadership, and management talent.

Online

www.connect.org/innovation-reports

Contact

For additional information or inquiries about the 2016 San Diego Innovation report please email info@connect.org or call 858.964.1300



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San Diego, CA 92121