



SAN DIEGO'S GENOMICS INDUSTRY

San Diego has provided fundamental genomic research that has galvanized scientific discovery across the globe. As we enter into an era of personalized medicine and technology, San Diego's companies, research institutes, and universities will continue to pioneer discoveries across the interdisciplinary field of genomics.

Genomics found its genesis in San Diego. San Diegan J. Craig Venter was the first to map the entire human genome in 2000 as part of a broad international science initiative. Venter's multiple companies in the space, alongside the launch of sequencing company Illumina in 1998, set the stage for San Diego to become a trailblazer in the field. Dozens of companies, alongside a robust mix of public and private institutions such as the Salk Institute and Scripps Translational Science Institute now make up the local genomics ecosystem. With an influx of conferences such as the Festival of Genomics California moving events to San Diego and Illumina being repeatedly ranked as one of MIT Technology Review's "50 Smartest Companies," the region is well poised to continue to lead in this game-changing industry.¹

HIGHLIGHTS

- » **The impact:** San Diego's genomics industry directly supports more than 10,000 jobs found across more than 115 firms. In 2016, the industry's gross regional product totaled \$5.6 billion.²
- » **Life-changing talent:** In 2016, San Diego universities graduated more genomics talent than any other U.S. metro.²
- » **Funding innovation:** Despite representing only one percent of the U.S. population, San Diego attracted nearly 22 percent of venture capital investment in the genomics industry in 2016 - a sum of \$292 million.²
- » **#1 in patent intensity:** From 2014-2016, San Diego was at the forefront of innovation, generating 371 genomics-related patents. Collectively, 28 firms in the region generated 120 genomics-related patents in 2016 alone.²

KEY COMPANIES

- | | | |
|--------------------|-------------------------|----------------------------|
| » Agena Bioscience | » Human Longevity, Inc. | » Sequenom |
| » AltheaDx | » Illumina | » Singlera Genomics |
| » Edico Genome | » Luna DNA | » Synthetic Genomics |
| » Helix | » Pathway Genomics | » Thermo Fisher Scientific |



INNOVATION



MILITARY



TOURISM



LOCAL



INTELLECT

SPOTLIGHT

Edico Genome

Edico Genome was founded in 2013 and is committed to revolutionizing genome sequencing analysis by providing unprecedented speed, scale, and accuracy with its DRAGEN™ processor - the world's first NGS reconfigurable bioinformatics processors. This processor analyzes large amounts of data, generated by NGS, rapidly, accurately, and inexpensively - overcoming a key bottleneck in the DNA sequencing workflow.



edicogenome.com

RESOURCES

Biocom

Biocom is the largest regional life sciences association in the world and represents more than 825 member companies.

biocom.org

EvoNexus

EvoNexus is the leading tech startup incubator in Southern California. Under its pro-bono model, EvoNexus startups receive mentorship, access to capital, and space in a collaborative working environment, without giving up equity or fees.

evonexus.org

San Diego Entrepreneurs Exchange

San Diego Entrepreneurs Exchange supports new companies in the life sciences and technology fields, and sponsors networking and educational events.

sdentrepreneurs.org

San Diego Biotechnology Network

San Diego Biotechnology Network was founded in 2008 with the goal of providing high quality, face-to-face networking among professionals working directly in the biotech space.

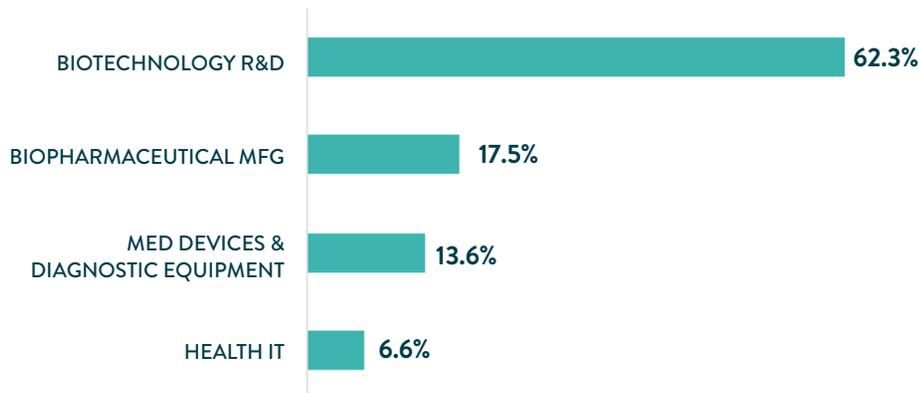
sdbn.org

BY THE NUMBERS

EMPLOYMENT NUMBERS

In 2016, an estimated **10,055** people were directly employed by the local genomics industry.² The overwhelming majority - approximately 62 percent - were employed in biotechnology research and development. Approximately 18 percent of employment was in biopharmaceutical manufacturing, 14 percent in medical devices and diagnostic equipment and the remaining seven percent in health IT. With 49,763 jobs supported by San Diego's life sciences cluster, local genomics operations represent more than 20 percent of the region's life sciences cluster.³

Genomics Employment Breakdown



ECONOMIC IMPACT

In addition to the 10,055 direct jobs in the genomics industry, an additional 12,720 jobs were supported through indirect effects resulting from additional non-industry purchases in the supply chain. Another 12,240 jobs are supported from household expenditures made by employees in the genomics industry. Genomics produces a sizeable contribution to the regional economy, totaling \$5.6 billion in gross regional product in 2016.²

**Economic Impacts
2016 Dollars**

Impact Type	Employment	Value Added (\$ Millions)	Wages (\$ Millions)
Direct	10,055	\$2,955	\$1,577
Indirect	12,720	\$1,532	\$1,033
Induced	12,240	\$1,085	\$607
Total Effect	35,015	\$5,572	\$3,217
Multiplier	3.5	1.9	2.0

Sources: Highlights: 1. MIT Technology Review, 2017, "50 Smartest Companies 2017" 2. San Diego Regional EDC, 2017, "Cracking the Code: The Economic Impact of San Diego's Genomics Industry" 3. Biocom, 2017, "2017 Biocom California Economic Impact Report Databook" 4. San Diego Regional EDC, Traded Economies Analysis with data from BLS

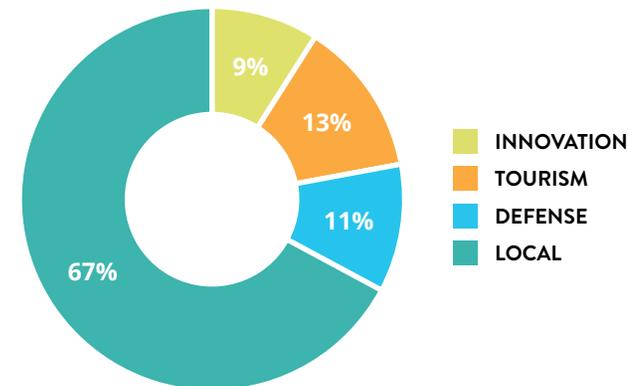
OUR ECONOMIES

The vitality of San Diego's economy is reliant upon the strength of the region's four economic drivers - innovation, military, tourism, and local.

Recognized as one of the leading high-tech hubs in the U.S., San Diego's innovation economy is anchored by established life sciences, aerospace, communications, cleantech, and software industries fueled by a collaborative culture and sophisticated support systems focused on commercializing research and growing entrepreneurial, knowledge-based companies.

Genomics is an intrinsic part of San Diego's innovation economy. As of 2016, the innovation economy was responsible for nine percent of the region's total jobs.

**Employment Comparisons
Across the San Diego Region's Economic Drivers⁴**



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