



# SAN DIEGO'S GENOMICS INDUSTRY

San Diego is widely considered to be a global leader in the genomics field. 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.

Historically speaking, one could say that 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 The Scripps Research 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 ranked as the "World's Smartest Company" in 2014, the region is well poised to continue to lead in this game-changing industry.<sup>1</sup>

## HIGHLIGHTS

- » **Sequencing on a budget:** 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.<sup>1</sup>
- » **Studying genomics:** In 2016, The Scripps Research Institute awarded a \$120 million grant for a genomics-related study involving one million or more patients – the largest study of its kind to date.<sup>2</sup>
- » **Cheers to genomes:** 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 96 of the beverage producer's yeast strains.<sup>3</sup>

## KEY COMPANIES

- |                        |                      |
|------------------------|----------------------|
| » Agena Bioscience     | » Illumina           |
| » Edico Genome         | » Pathway Genomics   |
| » Helix                | » Sequenom           |
| » Human Longevity Inc. | » Synthetic Genomics |



INNOVATION



MILITARY



TOURISM



LOCAL



INTELLECT

## SPOTLIGHT

**Human Longevity Inc.** (HLI) was founded in 2013 and is committed to creating the world's largest and most comprehensive database of whole genome, phenotype and clinical data. HLI has raised \$300 million in venture capital to date.



## RESOURCES

### Biocom

Biocom is the largest regional life sciences association in the world and represents more than 825 member companies. [biocom.org](http://biocom.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](http://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](http://sdbn.org)

### UCSD Institute for Genomic Medicine

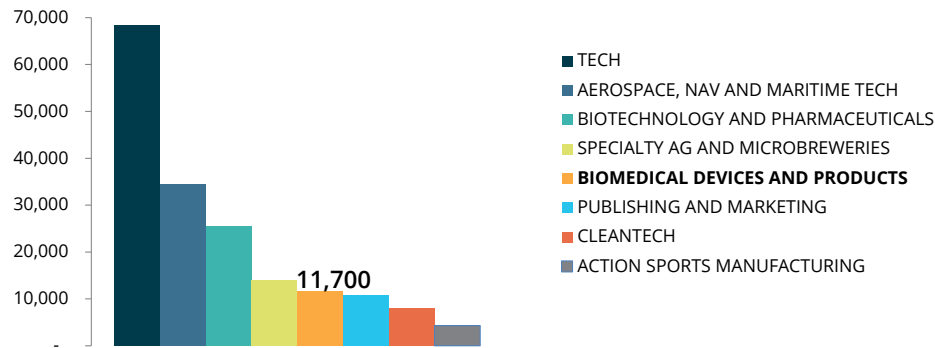
Founded by the UCSD School of Medicine and the UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences, the UCSD Institute for Genomic Medicine aims to link clinical and genomic information to facilitate personalized health care. [igm.ucsd.edu](http://igm.ucsd.edu)

## BY THE NUMBERS

### Employment Numbers

Genomics falls under the biomedical devices and products segment of San Diego's life sciences cluster. In 2014, biomedical devices and products accounted for **11,700** jobs and **305** establishments in the San Diego region. San Diego Regional EDC is working toward determining which portion of these jobs fall into the genomics industry with a subsequent report scheduled to launch in June, 2017.

Employment Comparisons  
within San Diego Region's Innovation Economy



### Employment Allocations by Key Industries in Biomedical Devices and Products

Industry	Employment	Avg Annual Pay	LQ*
Industrial Gas Manufacturing	355	\$81,200	1.93
Optical Instrument and Lens Manufacturing	432	\$71,800	1.97
Surgical and Medical Instrument Manufacturing	2390	\$92,000	2.15
Surgical Appliance and Supplies Manufacturing	1764	\$89,100	1.76
Dental Equipment and Supplies Manufacturing	762	\$76,300	5.00
Ophthalmic Goods Manufacturing	962	\$46,300	2.93
Dental Laboratories	347	\$33,300	0.78
Testing Laboratories	402	\$85,300	4.95
Res/Dev Phys, Eng, Life Sciences (ex Biotech)	4106	\$179,500	4.80
Other Electronic Equipment Repair	198	\$67,300	0.61
<b>BIOMEDICAL DEVICES AND PRODUCTS</b>	<b>11,700</b>	<b>\$115,000</b>	<b>2.50</b>

\*LQ=Location Quotient

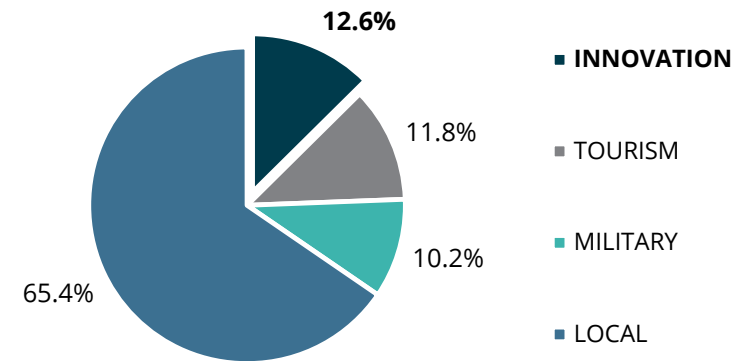
Sources: Highlights: 1. Illumina Press Release, 2017, "Illumina Introduces the NovaSeq Series - a New Architecture Designed to Usher in the \$100 Genome" 2. KPBS, 2016, "Scripps Institute Wins \$120 Million Grant From NIH" 3. The Full Pint, 2016

### 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.

Genomics is an intrinsic part of San Diego's innovation economy. As of 2014, innovation was responsible for almost 13 percent of the region's total jobs.

Employment Comparisons  
Across the San Diego Region's Economies



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