About SoCalBio

“Serving Southern California’s Medical Device, Biotech and Digital Health Communities”
ABOUT SOCALBIO

Non-Profit Trade Association

Two Decades Serving the Bioscience Community in Greater Los Angeles

400 Member Companies & Organizations

Biotech + Dx + Devices + Digital Health + Allied Service Providers

www.socalbio.org
SO CAL BIO HELPS BIOSCIENCE COMPANIES

Through Collective Action Focusing on:

- **Mobilizing Resources Effectively**
  - Saving money through a group purchasing program
  - Accessing finance capital
  - Talent development
  - Finding facilities
  - Meeting company regulatory burden
  - Tapping international markets

- **Fostering Synergistic Cluster Building**
  - Partnerships
  - Networking

- **Advocacy & Building Social Support**
  - Putting Industry needs on the priority list of local governments

Because of SoCalBio the industry now perceived as an important pillar of regional economic growth
**SOCALBIO SERVES A WELL ESTABLISHED LIFE-SCIENCE INDUSTRY IN THE LOS ANGELES/ORANGE COUNTY REGION**
Greater Los Angeles is home to more than 1000 bioscience firms employing nearly 90,000 people.

SoCalBio will publish a report soon to update the industry’s stats and measure its vital signs.
Los Angeles Bioscience Employment by Industry Sub-Segment

- Agbio & Industrial: 1%
- Drugs: 25%
- Devices: 42%
- R&D/Testing Labs: 32%
TRENDS

- Greater Los Angeles is MedTech powerhouse and will continue to be a bee-hive of medical device innovation
- Biotech as an emerging industry segment
- Convergence of digital health and the biosciences is a healthy development
- Expect faster growth of certain sub-regions
- The Janus face of mergers and acquisitions
- Going global is not an option. It is a necessity ... even for our emerging firms
Greater Los Angeles is Medtech Powerhouse and will continue to be a bee-hive of medical device innovation.
The Bay Area is the Leading Cluster in Producing De Novo Devices

De Novo Devices by Leading States

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<th>State</th>
<th>Establishments</th>
<th>De Novo Devices</th>
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<tr>
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Northern CA
- Establishments: 34
- De Novo Devices: 38

Southern CA
- Establishments: 18
- De Novo Devices: 24

Northern California De Novo Devices by County

- Santa Clara: 16
- San Mateo: 13
- San Francisco: 1
- Alameda: 6
- Sonoma: 2

Southern California De Novo Devices by County

- San Diego: 14
- Orange County: 9
- Santa Barbara: 1

9
EXAMPLES OF PIONEERING DEVICES MADE IN LOS ANGELES

- Everest & Jennings’ Modern Wheelchair
- Beckman’s Electronic pH Meter
- Edwards Labs’ Heart Valve
- Pacesetter’s Rechargeable Pacemaker
- Swan-Ganz Catheter
- Iolab’s IOL with Haptic loops
- The First FDA-Approved Surgical Robot
- The First FDA-Approved Bionic Eye
Patient Monitoring

Refractive Surgery

Breast Implants

Cochlear Implants

Heart Valves

Stents

Notable Device Leaders

Insulin pumps

Medtronic

For People with Diabetes

Bionic Eye

Second Sight

Electrophysiology

Biosense Webster.

Pain Modulation

Boston Scientific

Neuromodulation

Asthma Inhalers


Dental Implants

Abbott Vascular

Pain Modulation

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Asthma Inhalers


Dental Implants

Abbott Vascular

11
2) Biotech as an Emerging Industry Segment: Benefiting from Improved Tech Transfer Practices

- Tech transfer historically has been externally oriented with more emphasis on licensing than technology development
  - Greater LA Institutions generated many breakthrough inventions that fueled industry growth
    - Case study: Cabilly patents out of the City of Hope
  - Little local impact (proof that having good research institutions does not guarantee local industry growth)

- This is changing as we see increasing attention to having local impact (SoCalBio’s main area of activity):
  - Dedicated tech development organizations
  - More incubators and accelerators established
  - Number of spin-offs increasing
  - Seed funding on the rise
  - Industry support (more CMOs, CROs, service providers, etc.)
  - Build-up of positive externalities

- Case study: UCLA’s transformation
  - The Xtandi deal represents a continuation of the historical trend
  - Kythera Biopharma’s Kite’s success: a sign of the new transformation

- Challenge: business parks to anchor the new firms
**BIOTECH IN LA**

- Greater Los Angeles is home to an emerging biotech “cluster” including **300+ companies**.

- **Amgen**, the biggest biotech company in the world, is located just outside the western edge of the County in Thousand Oaks

- Past successes:
  - **Diagnostic Products Corporation** (sold to Siemens in 2006 for nearly $2 billion)
  - **Cougar Biotechnology** (sold to J&J in 2009 for nearly 1 billion)
  - **Abraxis Biosciences** (sold to Celgene in 2010 for $4 billion)
  - **One Lambda** (sold to Thermo Fisher in 2012 for nearly $1 billion)
RECENT SUCCESSES

- **MannKind** (which got FDA approval for inhaled insulin in 2014)
- **Kythera Biopharma** (which won FDA approval for its double-chin drug Kybella in 2015. Company was acquired by Allergan for $2 billion).
- **Kite Pharma** (Received FDA approval of its CAR T-Cell in October 2017 after Gilead Sciences made its $12 billion acquisition offer in August 2017).
- **Puma Biotechnology** (Won FDA approval for Neratinib, its breast cancer drug, in July 2017).
- **Emmaus Lifesciences** (Got FDA nod for Endari that targets sickle cell disease in July 2017).
THE OVERWHELMING MAJORITY IS IN THE PRE-PRODUCT PHASE

- Notable companies:
  - ArmagenTech, C3Jian, Claremont Bio, DxTerity Diagnostics, Epeius Biotech, Molecular GPS, Nanthealth, Nantcell, Nantbiosciences, Synedgen, Trethera, Xencor.

- More than **half of the region’s biotech firms** is made up of early-stage ventures housed in various incubators:
  - The future of biotech in Los Angeles rests **in part** on the success of these incubators in nurturing startups and help them move to the next level.

- Improvement in local funding of early-stage ventures is key for fast growth:
  - Emergence of new funds such as Kairos Ventures and Westlake Biopartners is a sign of healthy progress of the region’s innovation system.
MOONSHOT POTENTIAL IN THESE TECHNOLOGY DEVELOPMENT AREAS

- **Immunotherapy and Precision Medicine**
  - Amgen (Thousand Oaks)
  - Atara Biotherapeutics (Westlake Village)
  - Kite Pharma (Santa Monica)
  - Xencor (Monrovia)

- **Nucleic Acid Drugs**
  - Arrowhead Pharmaceuticals (Pasadena)

- **Molecular Diagnostics:**
  - DxTerity Diagnostics (Dominguez Hills)

- **Medicinal Cannabis:**
  - MedMen (Culver City)
  - Cure Pharmaceuticals (Oxnard)
  - Vitality Biopharma (Century City)
(3) **CONVERGENCE OF DIGITAL HEALTH AND THE BIOSCIENCES IS A HEALTHY DEVELOPMENT**

- Infusing new energy and shaping competitiveness:
  - Use of AI in Imaging
  - Biosensors and medical wearables
  - Computer/human interface
  - Remote monitoring

- Key players to watch:
  - Embodied Inc. (Pasadena): Computer/human interface
  - InTouch Health (Santa Barbara): Telemedicine
  - VoxelCloud (Los Angeles): AI for clinical support systems
  - Neural Analytics (Los Angeles): Smart, non-invasive brain monitoring
  - Masimo (Irvine): Remote patient monitoring
  - Medtronic (Northridge): Diabetes management
  - Abbott (Sylmar): Atrial fibrillation
Expect faster growth of certain sub-regions

- **Tustin-Irvine-Lake Forest area** will continue to be the backbone of the region’s MedTech cluster:
  - **Key players:** Edwards Lifesciences, Masimo, J&J Vision, Allergan, Alcon Vision, Biosense Webster, Endologix, TherOx

- Expect fast growth of the **101 corridor** from Calabasas to Camarillo:
  - **40+ biotech/biopharma companies**, including Amgen, Atara Biotherapeutics, Sienna Biopharmaceuticals, and Integrity Bio.
  - Westlake Biopartners’ $320 million fund + talent + Amgen assets + support services (CROs, drug formulation, regulatory, etc.) + space availability = **explosive biotech growth prospects**

- Keep an eye on **Santa Clarita** as an emerging MedTech hub:
  - **Key players:** Boston Scientific Neuromodulation, Advanced Bionics, Avita Medical
  - **Core Competence:** implatables, bio-sensors, drug delivery, and bio-electric medicine
  - The role of the Alfred Mann Foundation as an innovation catalyst and cluster anchor
  - Plans in place for developing the Mann BioPark

- The **Inland Empire** positioning itself to be the “**Silicon Valley of Medical Cannabis**”
(5) The Janus Face of Mergers and Acquisitions

- Greater LA is an M&A bee hive
  - Higher than average M&As and lower than average IPOs
  - Preferred exit among locals, particularly, device entrepreneurs
  - Investors contribute to it through the build-and-play models of deal structuring

- Pros (case studies: Celgene’s acquisition of Abraxis Biosciences, Medtronic’s acquisition of MiniMed, and Gilead’s acquisition of Kite Pharma)
  - Value statement
  - Infusion of capital
  - Spinoffs

- Cons (J&J’s acquisition of Cougar Biotech):
  - Weakening of cluster anchoring
  - Loss of business and employment as a result of restructuring
    - Look at what happened to Kythera Biopharmaceuticals
  - Loss of experienced entrepreneurs.

42 pharma and biotech acquisitions during the last 30 years totaling more than $117 billion in value
(6) **Going Global Is Not and Option; It Is a Necessity ... Even for Our Emerging Firms**

- Cutting cost of doing business, particularly for virtual companies
- Tapping patient populations for clinical work
- Tapping talent, IP & money
- Taking advantage of expanding global healthcare market
- Acknowledging special relations with

![Graph showing Global Spending on healthcare doubled during the last 24 years](image1)

![Graph showing The healthcare market in Asia grew by a factor of 8](image2)
Thank You

Southern California Biomedical Council (SoCalBio)

Your Success Is Our Business

www.socalbio.org

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