

About SoCalBio



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



SoCalBio
Southern California
Biomedical Council

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**

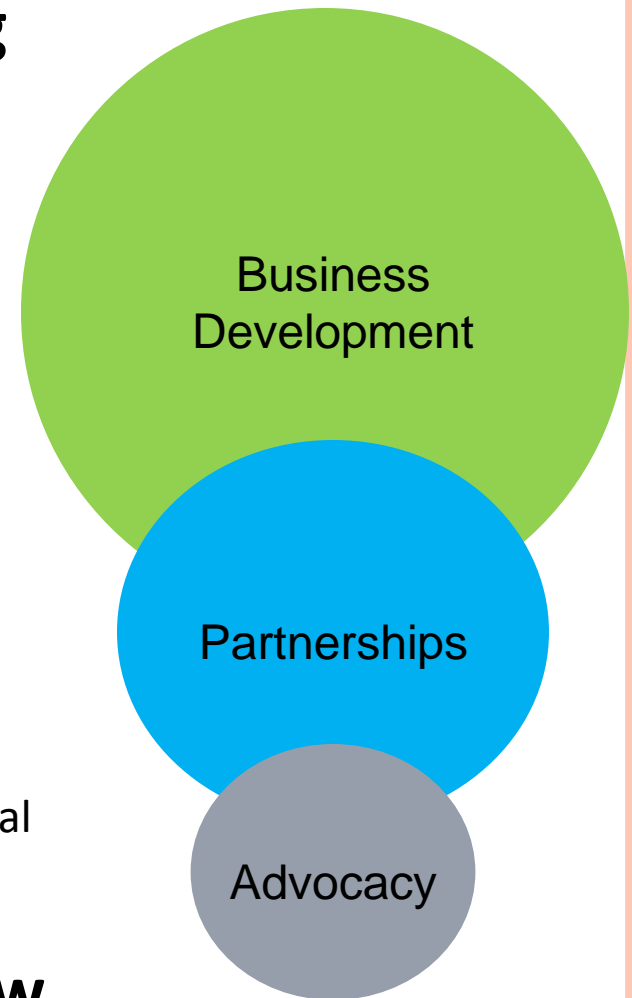
www.socalbio.org



SoCALBIO HELPS BIOSCIENCE COMPANIES

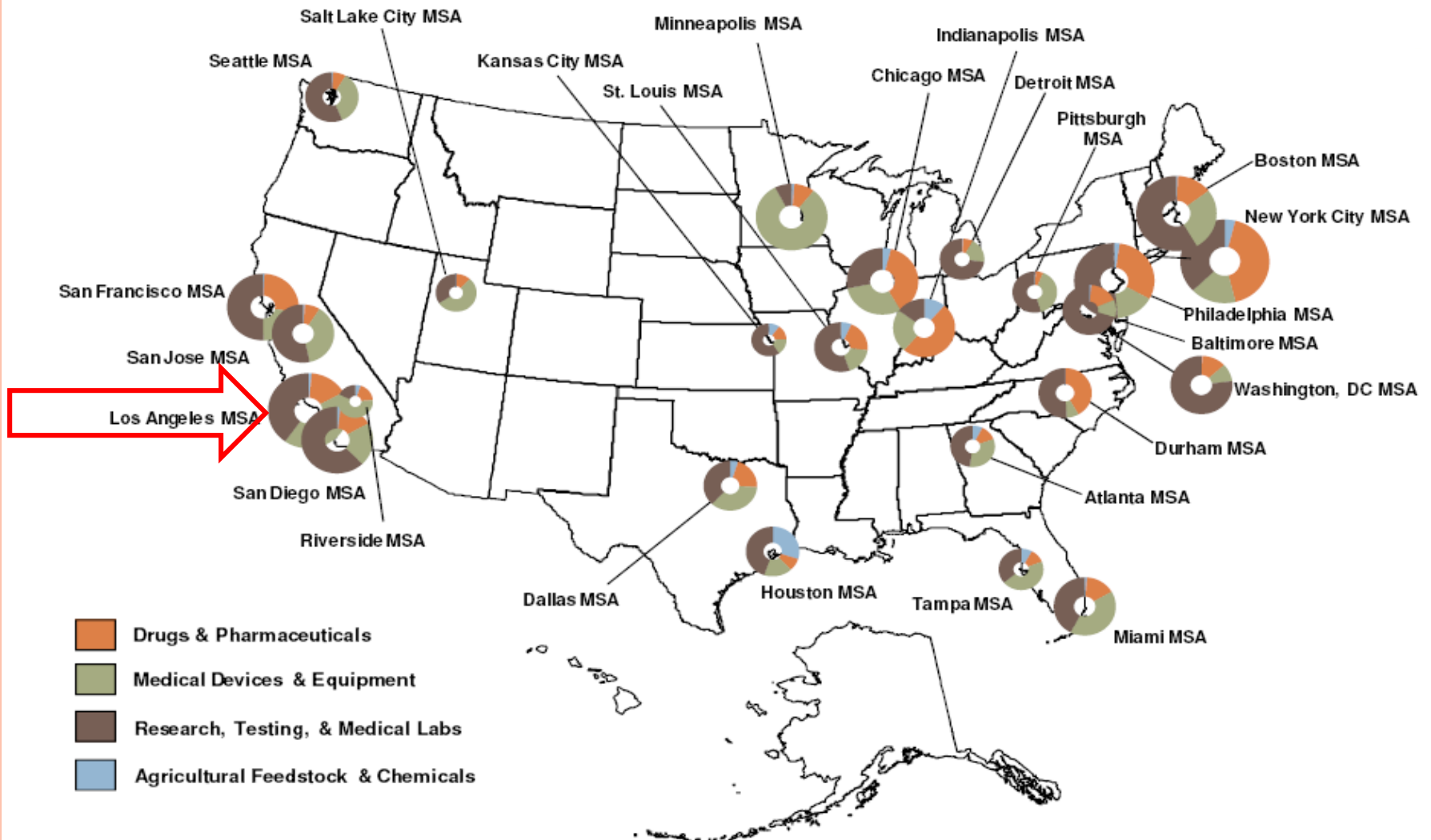
○ Through Collective Action Focusing on:

- **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**

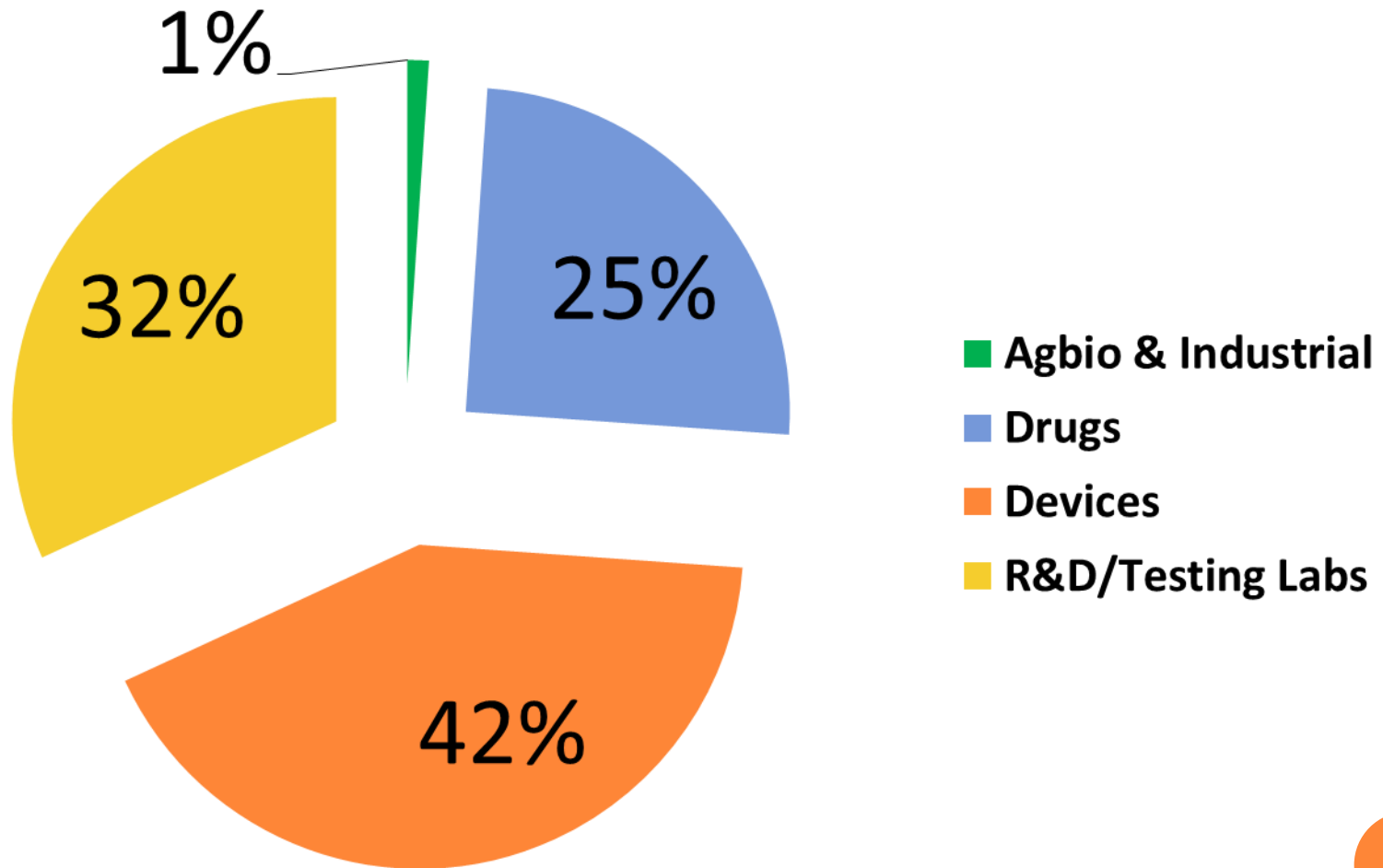
SoCalBio Serves A Well Established Life-Science Industry IN THE LOS ANGELES/ORANGE COUNTY REGION



BIOSCIENCE FIRMS IN GREATER LOS ANGELES



LOS ANGELES BIOSCIENCE EMPLOYMENT BY INDUSTRY SUB-SEGMENT



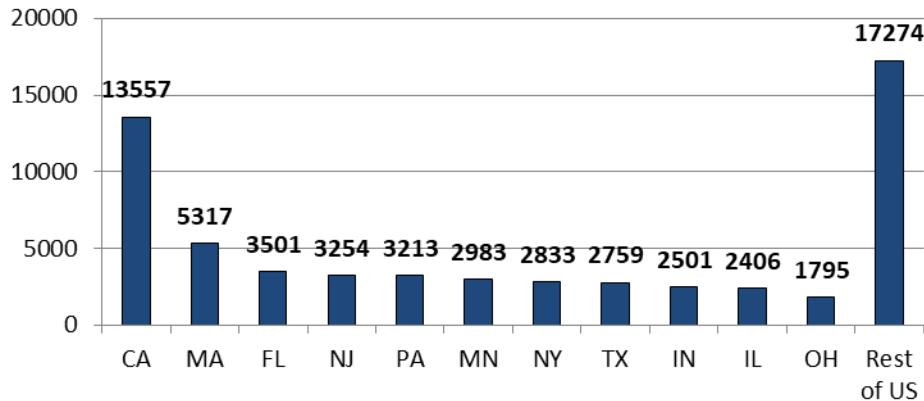
TRENDS

- **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**

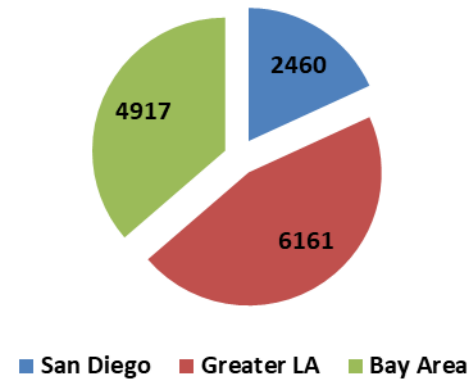


(1) GREATER LOS ANGELES IS MEDTECH POWERHOUSE AND WILL CONTINUE TO BE A BEE-HIVE OF MEDICAL DEVICE INNOVATION

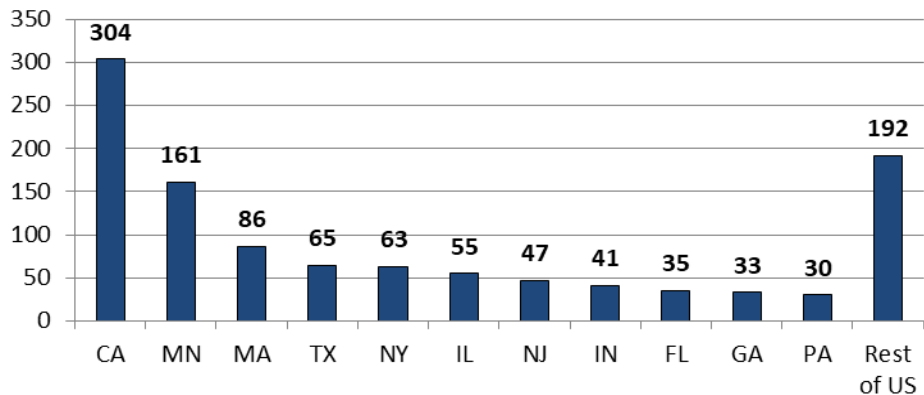
510k Decisions by the State Location of Cleared Company



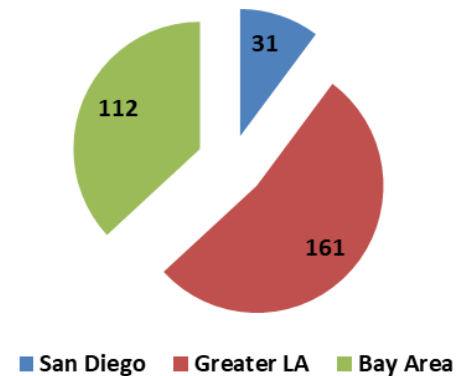
510k Decisions by California Bioscience Cluster



PMA Decisions By State Location of Approved Company

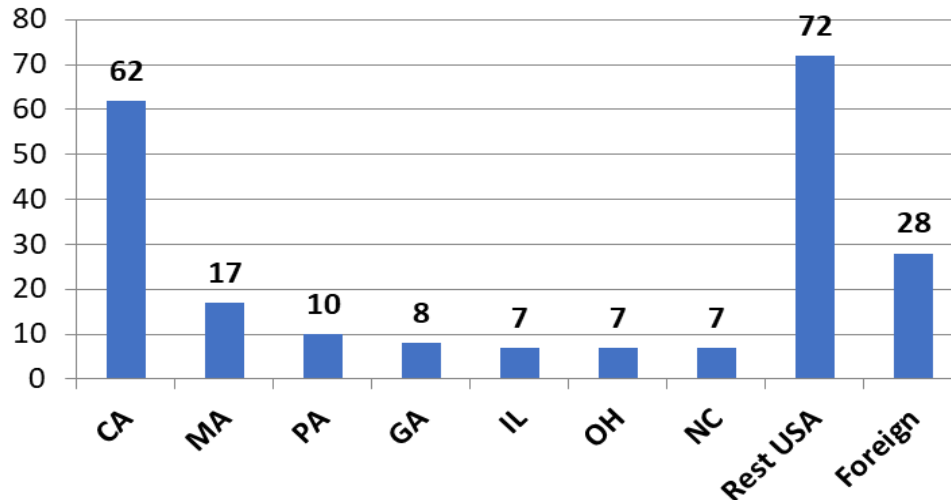


PMA Decisions by California Bioscience Cluster



THE BAY AREA IS THE LEADING CLUSTER IN PRODUCING DE NOVO DEVICES

De Novo Devices by Leading States



Northern CA

Establishments

34

De Novo Devices

38

Southern CA

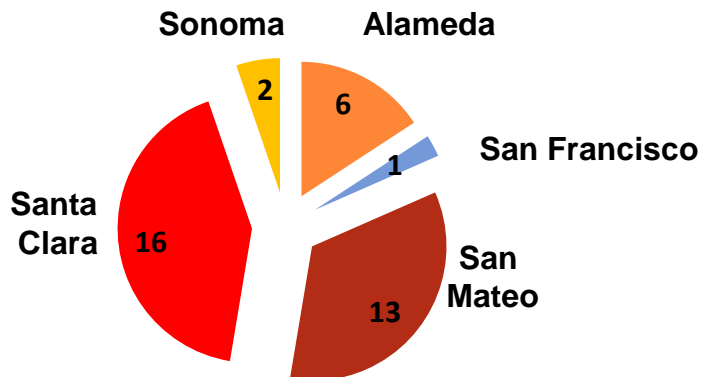
Establishments

18

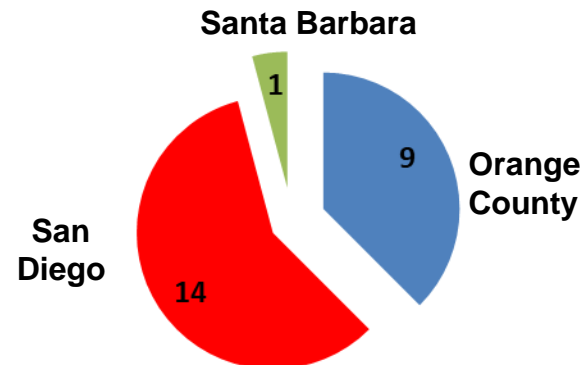
De Novo Devices

24

Northern California De Novo Devices by County



Southern California De Novo Devices by County



EXAMPLES OF PIONEERING DEVICES MADE IN LOS ANGELES



Everest & Jennings' Modern Wheelchair



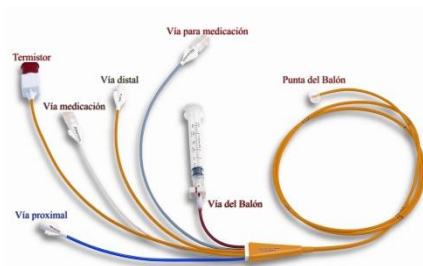
Beckman's Electronic pH Meter



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



Stents

Insulin pumps



For People with Diabetes

Bionic Eye



Second Sight

Electrophysiology



Biosense Webster
PART OF THE Johnson & Johnson FAMILY OF COMPANIES

Pain Modulation

Boston
Scientific
Neuromodulation

Asthma Inhalers

3M Science.
Applied to Life.™

Dental Implants



Patient Monitoring



Refractive Surgery



Breast Implants



Cochlear Implants



Advanced Bionics

Heart Valves



Edwards
LIFESCIENCES

Notable Device Leaders

(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



(4) EXPECT FASTER GROWTH OF CERTAIN SUB-REGIONS

- The **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**, includingt 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

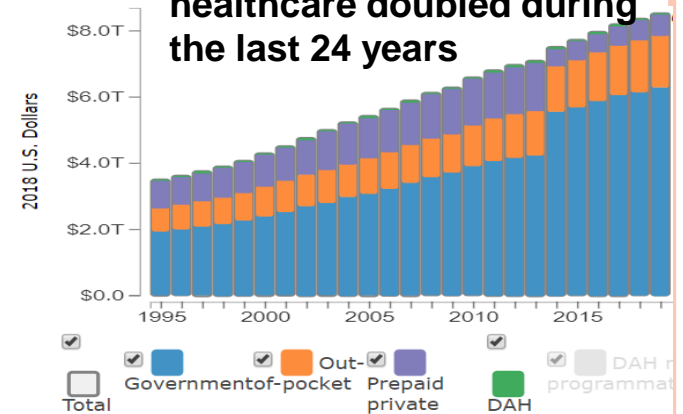


(6) GOING GLOBAL IS NOT AN OPTION; IT IS A NECESSITY ... EVEN FOR OUR EMERGING FIRMS

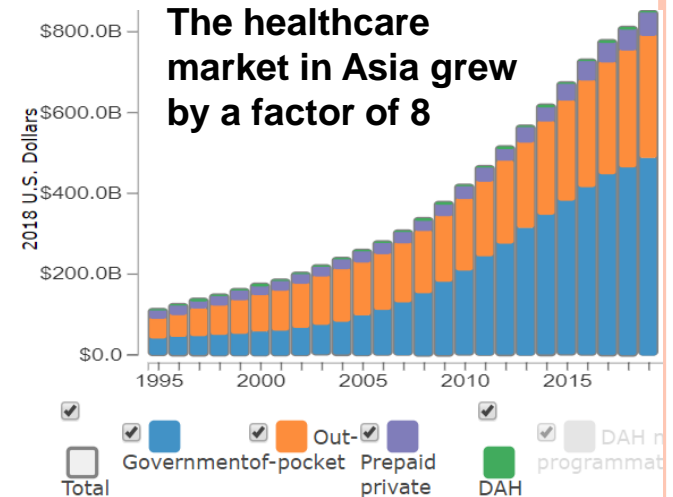
- Cutting cost of doing business, particularly for virtual companies
- Tapping patient populations for clinical work
- Tapping talent, IP & money
- Taking advantage of expanding global healthcare market
- Acknowledging special relations with

Canada 
CHINA

Global Spending on healthcare doubled during the last 24 years



The healthcare market in Asia grew by a factor of 8



Thank You



Southern California Biomedical Council (SoCalBio)

Your Success Is Our Business

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