



October 9, 2015





Agenda

- ❑ Innovation Pipeline
- ❑ Case Studies
- ❑ Our Case
- ❑ Conclusion





Key: Build Innovation Pipeline

Deliver Knowledge to Market

Discover

Inputs

Critical mass of science talent, research funding, facilities

Outputs

Publications, innovation feedstock (IP), pre-competitive links to industry

Develop

Inputs

Contract R&D, commercialization services, seed funds, deal generation

Outputs

Commercial revenue, innovations packages & early stage start-ups

Deploy

Inputs

Incubation, venture investment, cluster groups, tech parks, **manufacturing**

Outputs

Enterprise survival, business expansion, industry attraction & aggregation



Biomedical Cluster

CASE STUDIES





Salt Lake City Biomedical Cluster

□ A Productive Spin-off Generator

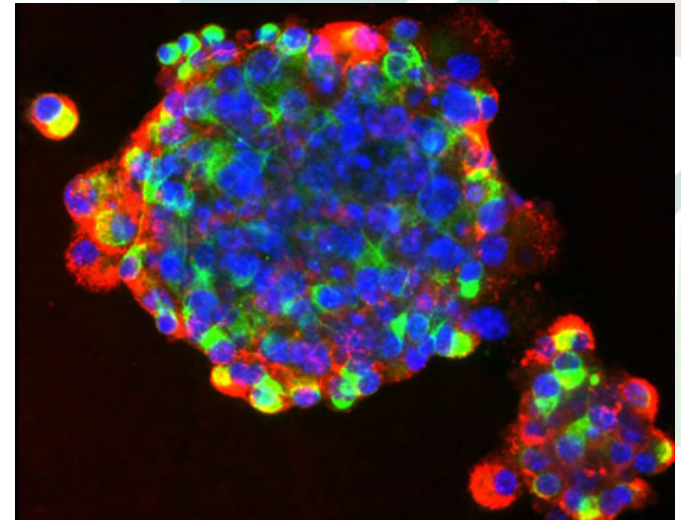
- University of Utah is #1 in the country at spinning-off companies based on its research despite lower average research funding (~\$273m compared to \$288 US average)

□ With Development Capacity

- Medical research labs and testing facilities employ around 5,000 in the region

□ Producing Specialized Output

- 3.6 times more specialized employment in the biomedical devices industry than US average





Key to Salt Lake City's Success

University of Utah acts as anchor institution driving innovation pipeline on campus and in tech park:

Strong science to
precompetitive research

Systematic tech
transfer to virtual
incubation thru
TCO Accelerator

Active
incubation to
commercial
investment



Memphis Biomedical Cluster

- Major Regional Employer
 - 70,000 employed in biosciences industry
- A Leader in Devices
 - Top 10 producer of biomedical devices
 - Grown 50%+ since 1999
- Specialized in Orthopedics
 - 2nd largest US orthopedic device manufacturer
 - Globally recognized in orthopedics and spinal implants





Key to Memphis's Success

Leverage strength in target areas to grow innovation and recruit companies

- Develop and build on a specific area of expertise
 - Concerted focus on two specific areas – orthopedics and spinal implants – has aligned research at universities, hospitals, and research organizations and attracts federal funding and private companies
- Create an industry pipeline around target areas
 - Strong network formed around orthopedics and spinal implants creates efficiencies in commercialization process and attracting companies for licensing and investment
- Aggressively market Memphis to recruit industry
 - Chamber of Commerce focused on growing the biomedical industry, providing information and services to attract firms to Memphis



Denver-Boulder Biomedical Cluster

- ❑ Solid Regional Employment
 - 14,460+ bioscience employees at 510 bioscience companies in the Denver-Aurora-Boulder region
- ❑ Small Community, High Specialization
 - Boulder has employment LQ of ~5 in BOTH biomedical devices and pharmaceuticals subsectors
- ❑ Good Recent Growth
 - Employment in medical devices and diagnostics grew 9.8% from 2005-2010
- ❑ Strong Retention of Spin-offs
 - 77 of 94 companies spun-out of University of Colorado (CU) since 1994 still operate in state



Aerial View from the Southwest
Aurora Research Building - University of Colorado at Boulder

August 26, 2010

HDH AMERICAN SERN



Key to Denver/Boulder's success

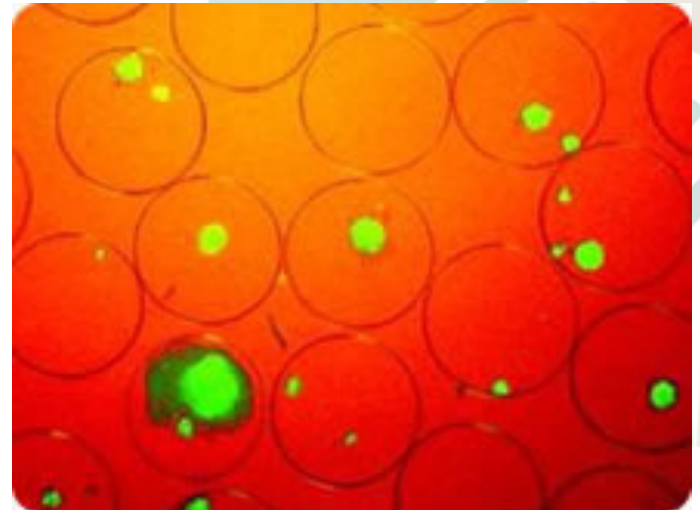
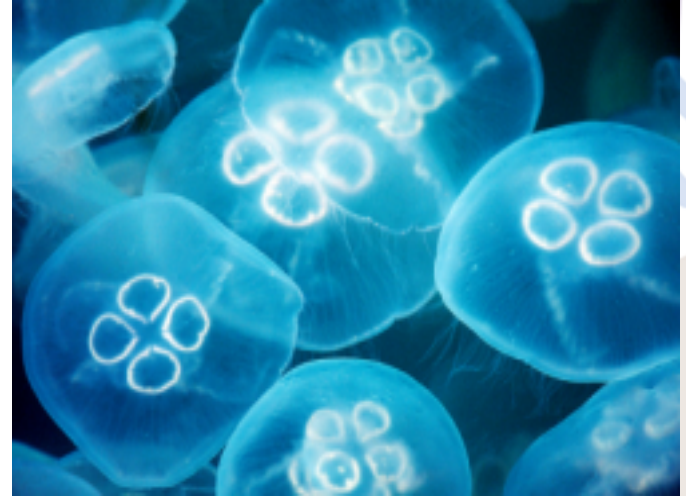
Fitzsimons Life Sciences District

- ❑ Repurposed military facility for biomedical industry
 - Collaborative between the state, local governments, military and \$1.5 billion Anschutz Medical Campus has over 40 technology companies and 3 hospitals located on campus with room to grow
- ❑ Centrally located facility = Regional hub
 - Built on a former military medical center as a result of a shared vision by the City of Aurora and CU, the FLSD bridges the Denver and Boulder regions geographically, expanding the potential growth engine
- ❑ Spans the entire innovation pipeline
 - Discover, Development, deployment via Fitzsimons BioBusiness Partners FBBp was created to help convert the substantial ongoing public investment in the Fitzsimons Life Science District into a sustainable life sciences cluster



San Diego Biomedical Cluster

- Major employer
 - Over 27,000 people – ~20% of total – employed in the region's biomedical industry
- Specialized across the board
 - 3.5 times the US average employment concentration in biomedical research, labs & testing
- Science is the Catalyst
 - Federal research grants to local research institutes and tech firms totaled ~\$1.4 billion in 2010
- Forming & attracting a major nexus of firms
 - > 400 biomedical companies in the San Diego MSA
- Leveraging Tijuana, Mexico
 - Largest biomedical device manufacturing cluster in Mexico





Key to San Diego's success

CONNECT fuels development and deployment

- Started by UCSD, CONNECT has grown into an independent regional cluster engine
 - Establish a "culture of collaboration" between industry, capital sources, professional service providers & research organizations.
- Broad network spans the innovation pipeline
 - Widely emulated, distinct model for growing a cluster through Innovation Acceleration for Business Creation
- Efficient vehicle links inventors with investors
 - Leverages connections with Silicon Valley investors interested in funding biomedicine



OUR CASE....



PDN TRANSFORMATION ...
in education, research & life sciences



TTUHSC El Paso 2006 - present

- \$180 million of capital investments



Medical Sciences Building



Clinics



Medical Education Building



Nursing School & Simulation Labs



Upcoming Research Building



UMC & Children's 2005 - present

- \$425 million of capital investments



UMC Hospital Expansion & Renovation

New Children's Hospital Tower



Outpatient Destination Centers



UTEP 2009 – present

- ❑ \$270 million of capital investments



Biological Sciences



Chemistry & Computer Sciences



Engineering
+ Bio-Engineering
Annex



College of Health Sciences Nursing School



Upcoming Interdisciplinary
Research



New Mexico State University

- ❑ \$200 million in annual research
- ❑ Arrowhead Innovation Center
- ❑ **2014:** Burrell College of Osteopathic Medicine will be built on the NMSU Campus – sharing services
 - \$60 million facility





William Beaumont Army Medical Center @ Ft. Bliss – *coming summer 2018*

- ❑ \$1 billion replacement hospital
- ❑ 1.13M sf
- ❑ 6 buildings
 - Hospital
 - East Clinic
 - West Clinic
 - Admin
 - CIB
 - CUP





The Hospitals of Providence

- ❑ Over \$550 million of capital investment over a 10 year period
 - New Northwest Hospital with TTUHSC
 - New Sierra East Hospital + New Tower
 - Renovation of Sierra
 - Renovation of Providence
 - 2 Off-Campus Emergency Departments
 - Urgent Care Centers and Imaging Centers
 - Horizon City Expansion





HCA Developments

- ❑ Free Standing Emergency Departments
- ❑ Urgent Care Clinics
- ❑ Hybrid OR
- ❑ Surgical Robots





Private Hospital Industry Growth

- Mentis Neuro Rehab Hospital – west side
 - \$3 million investment

- Juarez Private Hospitals
 - Star Medica
 - Los Angeles

- Launch of a biomedical cluster in Juarez
 - Medical Tourism
 - Biomedical Device Manufacturing





2008: 140 Acre MCA Campus

2011: 440 Acre MCA Campus

.... And 13 acre purchase for
“Tech Park” development





City Economic Development Incentive Policy “Impact Fund”

- ❑ Policy approved = June 14, 2011
- ❑ Contract with MCA = February 7, 2015
- ❑ Strategic Objective
 - Dedicate 75% of the annual fund to assist the MCA Foundation to create a **life sciences campus** in the City of El Paso.
 - ~\$2.7 million per year to the MCA
 - 18 years
 - Approximately **\$60 million over 18 years**





Construction In Progress

opens May 2016





Cardwell Collaborative





Juarez Maquiladora Industry

- ❑ 50 years of operations
- ❑ 350+ maquiladoras in Juarez
- ❑ 300,000+ employed in maquilas in Juarez
- ❑ Advantages to manufacturing in Juarez
 - Low labor costs
 - Trainable workforce
 - Proximity to U.S. market and distribution centers
 - Cooperative, predominantly nonunion workforce
 - Access to experienced legal and customs services
 - Fine quality of life for U.S. managers living in El Paso
 - Sophisticated transportation infrastructure
 - Experienced Mexican technicians and supervisors
 - Educational institutions providing qualified graduates for industry
 - World-class production facilities





Juarez Biomedical Manufacturing





Seisa Group – Juarez, MX

- Vertical integration of biomedical manufacturing
- R&D and product development
- Local ownership, control, decision making
 - Local scientific talent
 - Local facilities
 - Cost-efficiencies
 - Manufacturing experience and “know-how”
 - R&D, product development “know-how”



Paso del Norte Region – BioCluster

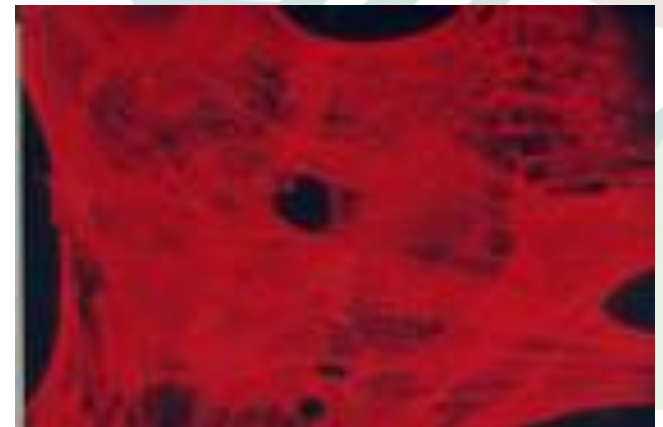
CHALLENGES, GOALS...





The Challenge

- ❑ **Bad News: Competition**
 - There are over 25 MSA's with existing, growing biomedical clusters
- ❑ **Good News: Growth is fundamental**
 - Biomedical industry will expand and diversify
- ❑ **Reality: Entering biomedicine is difficult**
 - Creating distinctive input advantage is key to success
- ❑ **Opportunity: Paso del Norte can stand out**
 - Take advantage of the laws, culture and capabilities of 2 countries & 3 states





Key to Paso del Norte Region's Biomedical Cluster Success

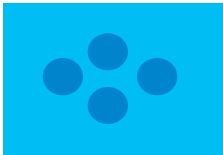
- ❑ **DISCOVER: Emerging Research & Development Capacity (facilities, talent)**
 - 6+ Institutions of Higher Education
 - 3 Medical Schools
- ❑ **DEVELOP: Growing Innovation Community**
 - MCA Foundation & Cardwell Collaborative
 - Arrowhead at NMSU
 - HUB of Human Innovation
 - Tech Hub Juarez
- ❑ **DEPLOY: High-Quality, Cost-Effective Intelligent Manufacturing and Support**
 - 50 years of manufacturing evolution in El Paso/Juarez
 - Transition to advanced/intelligent manufacturing + product development





Conclusion_

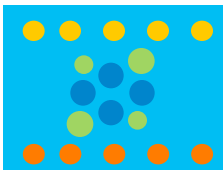
El Paso - Juarez symbiotic relationship
will result in a strong and unique
Biomedical Cluster:



Research



Commercialization



Manufacturing



THANK YOU!!

