Thank You

- **Brad Halvorsen**, Executive Vice President, Flinn Foundation
- Investment data is from **Pitchbook**
- University information from **Tech Transfer Offices**
- **Nancy Johnson**, RN, PhD, University of Arizona Global MD
- **Andy Lombard**, President & CEO, Arizona Venture Development Corporation (AVC)
- **Doug Hockstad**, Associate Vice President, Tech Launch Arizona
- **Joann MacMaster**, CEO, Desert Angels,
- **Bob DeLean**, CEO, Arizona Tech Investors (ATI)
- **Joan Koerber-Walker**, President & CEO, Arizona Bioindustry Association, Inc.
- **Nicole Barraza**, Senior Director, Governance & Policy, Southern Arizona Leadership Council, SALC
- **Iris Mora**, Practice Administrator, Airzona Eye Consultants
Today’s Agenda

1. BIOSCIENCES INDUSTRY OVERVIEW
2. WORKFORCE
3. INVESTMENT – R&D Funding
4. INVESTMENT – Risk Capital
Today’s Agenda

1. BIOSCIENCES INDUSTRY OVERVIEW
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4. INVESTMENT – Risk Capital
Defining the Biosciences Industry

• Agricultural Feedstock & Industrial Biosciences
• Bioscience-Related Distribution
• Drugs, Pharmaceuticals & Diagnostics
• Medical Devices & Equipment
• Research, Testing & Medical Labs
• Hospitals
Defining the Biosciences Industry

- Agricultural Feedstock & Industrial Biosciences
- Bioscience-Related Distribution
- Drugs, Pharmaceuticals & Diagnostics
- Medical Devices & Equipment
- Research, Testing & Medical Labs
- Hospitals
Composition of Bioscience Industry Jobs, 2020

Primarily Hospital

133,000 Total AZ Biosciences Jobs

- Hospitals: 74%
- Non-Hospital Biosciences: 26%

Source: Emsi (Datarun 2022.1); TEConomy Partners analysis
Composition of Bioscience Industry Jobs, 2020
*R&D, Distribution, Device/Equipment*

133,000 Total AZ Biosciences Jobs

- Hospitals 74%
- Non-Hospital Biosciences 26%

34,000 AZ Non-Hospital Biosciences Jobs

- Research, Testing, & Medical Laboratories 26%
- Drugs & Pharmaceuticals 11%
- Medical Devices & Equipment 28%
- Bioscience-related Distribution 33%
- Agricultural Feedstock & Industrial Biosciences 2%

Source: Emsi (Datarun 2022.1); TEConomy Partners analysis
Regional Bioscience Industry Strengths

- Medical Devices & Equipment
- Hospitals
Regional Bioscience Industry Strengths

Flagstaff MSA
- Medical Devices & Equipment
- Hospitals

Phoenix-Mesa-Scottsdale MSA
- Research, Testing & Medical Labs
- Bioscience-Related Distribution
- Drugs & Pharmaceuticals
- Medical Devices & Equipment
- Hospitals

Tucson MSA
Regional Bioscience Industry Strengths

- Medical Devices & Equipment
- Hospitals

Flagstaff MSA
- Research, Testing & Medical Labs
- Bioscience-Related Distribution
- Hospitals
- Drugs & Pharmaceuticals
- Medical Devices & Equipment

Phoenix-Mesa-Scottsdale MSA
- Research, Testing & Medical Labs
- Hospitals
- Medical Devices & Equipment

Tucson MSA
Today's Agenda

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AZ & U.S. Bioscience Industry Employment

AZ Biosciences Employment Growth 40% Faster than Overall US Employment

Source: Emsi (Datarun 2022.1); TEConomy Partners analysis
AZ Private Sector Employment Trends

AZ Biosciences Job Growth 40% Higher than Private Sector

Source: Emsi (Datarun 2022.1); TEConomy Partners analysis
Healthcare Employment Data Snapshots

JOBS

<table>
<thead>
<tr>
<th>Year</th>
<th>Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>73,000</td>
</tr>
<tr>
<td>2020</td>
<td>133,000</td>
</tr>
</tbody>
</table>

1.8X increase from 2002-2020

WAGE GROWTH

+9.4%

2018-2020 saw solid wage growth for Arizona bio workers—though the total private sector grew faster.

JOBS

+5.4%

From 2018-2020, Arizona bioscience jobs kept growing, even through the COVID-19 economic shock.

Source: NIH RePORT database, and TEConomy Partners calculations
Arizona Population Overview, 2022

By The Numbers

- **7.4 million** – 14th most populous state
- Arizona population **grew 41%** since 2000, compared to 18% US growth
- People 65 and older: Largest population increase

Arizona Counties

- **13 of 15** Arizona counties grew in population
- Largest increases in Maricopa, Pima, and Pinal counties

Population Demands

- **All 15 counties** are documented Health Professional Shortage Areas (HPSAs) and Medically Underserved Areas (MUAs)
- Primary Care: Only **40%** of demand met

Source: Nancy Johnson, RN, PhD, University of Arizona Global MD
Arizona Shortage of Healthcare Workers, 2022

<table>
<thead>
<tr>
<th>Provider Type</th>
<th>IN ARIZONA PER 100,000</th>
<th>IN U.S. PER 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Care Physicians</td>
<td>80</td>
<td>95</td>
</tr>
<tr>
<td>Total Physicians</td>
<td>252</td>
<td>287</td>
</tr>
<tr>
<td>Physician Assistant</td>
<td>47</td>
<td>48</td>
</tr>
<tr>
<td>Registered Nurses</td>
<td>1,400</td>
<td>1,550</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>59</td>
<td>67</td>
</tr>
<tr>
<td>Nurse Practitioners</td>
<td>48</td>
<td>52</td>
</tr>
<tr>
<td>Direct Care Workers</td>
<td>103</td>
<td>107</td>
</tr>
</tbody>
</table>

Source: Nancy Johnson, RN, PhD, University of Arizona Global MD
Arizona Shortage of Healthcare Workers

Healthcare workforce needs +48.3% growth

Arizona needs to train workers for healthcare jobs at growth rate more than twice the rate of overall employment (23.8%) in the coming decade

Source: Nancy Johnson, RN, PhD, University of Arizona Global MD
AZ Education System Programs Striving to Meet Needs

1. Universities
   - Undergraduate and post-graduate programs

2. Community Colleges

3. Career & Technical Education Districts
   - 14 CTED High Schools
Arizona Legislative Success: $150M

HB 2691
Gov. Doug Ducey signed a bill in June investing nearly $150 million over three years to address Arizona’s dire nursing shortage.

Nursing
• Create or expand funding for accelerated programs

Behavioral Health
• Create or expand funding for programs, increase nursing faculty, pay for capital expenses and students services

Health Provider Preceptors
• For nursing, medicine or behavioral for health professions students, funding provided

Source: Nicole Barraza, Senior Director, Governance & Policy, Southern Arizona Leadership Council, SALC
Other Arizona Legislative Success

**Physician assistants; supervision; collaboration (HB2042)**
- Modernizes physician assistant (PAs) practice laws
- Allows a PA to bill and receive direct payment for the professional services provided by the PA.
- Effective January 1, 2024

**Graduate medical education; residency programs (HB2753), $5M**
- Covers costs to expand/support the number of primary care residency programs at qualifying community health centers and rural health clinics.

**On-call OB / GYN health services (HB2563), $7.5M, 3 yr**
- Maintain service availability in low-volume delivery areas and rural communities for the unreimbursed cost necessary to maintain the availability of these services.

Source: Nicole Barraza, Senior Director, Governance & Policy, Southern Arizona Leadership Council, SALC
Arizona Health Innovation Trust Fund (AHIT), $200M, SB1084

$200M appropriation to capitalize AHIT Fund to provide:

- **Entrepreneurial education, mentoring and support** to persons in the health innovation and health care delivery sectors
- **Workforce development programs** to support the **talent requirements** of employers in health innovation and health care delivery
- Programs that support the development and commercialization of health innovation by **Arizona businesses with less than 100 employees**.

Anticipate bill will be reintroduced next year – **need your support**!

Source: Nicole Barraza, Senior Director, Governance & Policy, Southern Arizona Leadership Council, SALC
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AZ & U.S. Academic Bioscience R&D

Source: NSF Academic S&E R&D Expenditures; TEConomy Partners analysis

AZ Academic Bioscience Growth 4% Slower than US R&D
AZ Bioscience University R&D Snapshot

UNIVERSITY R&D

2.3X increase from 2002–2020

$273M

$623M

+3.6%

Bio R&D has never been greater at Arizona’s universities, though it lagged the national growth rate from 2018 to 2020.

R&D Progress Examples

- ASU opens Health Futures building on Mayo campus
- University of Arizona College of Veterinary Medicine opens in Oro Valley
- Legislature passes TRIF extension

Source: NSF Academic S&E R&D Expenditures; TEConomy Partners analysis
AZ & U.S. NIH Funding Growth

AZ Academic Bioscience Growth 11% Faster than US NIH growth

Source: NIH RePORT database, and TEConomy Partners calculations
AZ NIH Funding Snapshot

**TRIF EXPENDITURES**

- $23.7M in 2002
- $112.3M in 2021

4.7X increase from 2002-2021

**NIH FUNDING**

- $133M in 2002
- $297M in 2021

2.2X increase from 2002-2021

Source: NIH RePORT database, and TEConomy Partners calculations
AZ NIH $297M Funding Distribution: FY 2021

Source: NIH RePORT database, and TEConomy Partners calculations
Innovation Ecosystem Drives the Bio Industry

- Research & Development
- Technology Commercialization
- Venture Development
- Existing Business Promotion
- New Business Attraction
- New Enterprise Development

Growing Biosciences Industry

Biosciences Workforce R&D Funding Risk Capital
Today’s Agenda

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4. INVESTMENT – Risk Capital
# U.S. Bioscience Risk Capital Investments by Stage, 2016-2019

## Table: U.S. Bioscience Risk Capital Investments by Stage, 2016-2019

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number of Deals</th>
<th>Number of Companies</th>
<th>Total VC Investments ($ Millions)</th>
<th>Average Investment Per Deal ($ Millions)</th>
<th>Average Investment Per Company ($ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Seed</td>
<td>2,782</td>
<td>2,039</td>
<td>$155</td>
<td>$0.06</td>
<td>$0.08</td>
</tr>
<tr>
<td>Angel</td>
<td>1,847</td>
<td>1,465</td>
<td>$3,025</td>
<td>$1.64</td>
<td>$2.06</td>
</tr>
<tr>
<td>Seed</td>
<td>1,465</td>
<td>1,231</td>
<td>$3,287</td>
<td>$2.24</td>
<td>$2.67</td>
</tr>
<tr>
<td>Early Stage</td>
<td>3,150</td>
<td>2,350</td>
<td>$44,797</td>
<td>$14.22</td>
<td>$19.06</td>
</tr>
<tr>
<td>Later Stage</td>
<td>2,312</td>
<td>1,555</td>
<td>$51,465</td>
<td>$22.26</td>
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<td>11,556</td>
<td>6,660</td>
<td>$102,728</td>
<td>$8.89</td>
<td>$15.42</td>
</tr>
</tbody>
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Source: TEConomy Partners analysis of PitchBook Data, Inc.
Share of VC Investment by Bio-Related Industry, 2018-2021

**Arizona Strengths**

- Medical Devices
- Bioscience IT/Digital
- Clinics/Outpatient Services
- Drug Discovery

**United States**

- Biopharmaceuticals, 50%
- Medical Devices, 13%
- Bioscience IT/Digital Health, 29%
- Healthcare Services, 5%
- Other Healthcare, 3%

**Arizona**

- Biopharma, 16%
- Medical Devices, 27%
- Bioscience IT/Digital Health, 25%
- Healthcare Services, 25%
- Other Healthcare, 7%

Source: PitchBook Data with TEConomy Partners Calculations
AZ & U.S. Bio Venture Capital Investment

$240 million
VC funding for bio firms in Arizona saw a record high in 2021, though nationally it surged even faster.

Source: PitchBook Data with TEconomy Partners Calculations
US VC Deal Activity Trends, 2020 – 2Q 2023

- **Deal Value (Billions)**
  - 2020: $171.7
  - 2021: $347.5
  - 2022: $246.5
  - 2023*: $85.6

- **Deal Count**
  - 2020: 13,577
  - 2021: 18,990
  - 2022: 17,504
  - 2023*: 6,514

Source: PitchBook Data
AZ & U.S. RISK Capital Deals by Stage, 2018-2021

Source: PitchBook Data with TEconomy Partners Calculations
## Arizona Angel Funding Resources, 2020-2022

<table>
<thead>
<tr>
<th>Criterium</th>
<th>Desert Angels Tucson</th>
<th>AZ Tech Investors (ATI) Phoenix</th>
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<tr>
<td><strong>Ranking</strong></td>
<td>#1 Southwest Region</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>#5 Nation (# investments)</td>
<td></td>
</tr>
<tr>
<td><strong>Investment</strong></td>
<td>$12.8 Million</td>
<td>$6.5 Million</td>
</tr>
<tr>
<td><strong>Number of Deals</strong></td>
<td>24 New Companies</td>
<td>32 New Companies</td>
</tr>
<tr>
<td></td>
<td>40 Follow-on Investment</td>
<td>32 Follow-on Investment</td>
</tr>
<tr>
<td><strong>% Bioscience</strong></td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>Number of Members</strong></td>
<td>100</td>
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AZ & U.S. RISK Capital Deals by Stage, 2018-2021

Source: PitchBook Data with TEconomy Partners Calculations
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Source: TEConomy Partners analysis of PitchBook Data, Inc.
Thriving in a Desert Economy

Tentatively Scheduled:
Friday, March 22, 2024
Phoenix Bioscience Core
Summary of Bioscience Industry Metrics of Success

<table>
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<th>Metrics</th>
<th>AZ Growth Since 2018</th>
<th>AZ Growth Relative to U.S.</th>
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<tbody>
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<td>Bio Industry Job Growth</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Bio Average Wages</td>
<td>↑</td>
<td>↓</td>
</tr>
<tr>
<td>Academic Bio R&amp;D Expenditures</td>
<td>↑</td>
<td>↓</td>
</tr>
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<td>NIH Funding</td>
<td>↑</td>
<td>↑</td>
</tr>
<tr>
<td>Bio Risk Capital</td>
<td>↑</td>
<td>↓</td>
</tr>
</tbody>
</table>
Call to Action

Workforce

- **Support** Arizona Health Innovation Trust Fund (AHIT), $200M, SB1084
- **Support** 14 CTED High Schools via the $400 Public School Tax Credit

Investment

*(Risk Capital)*

- **Attend** Flinn Foundation’s Arizona Bioscience Conference
BIO SCIENCES IN ARIZONA

ARIZONA BIOSCIENCE OVERVIEW

Nannon Roosa, PMP, FACMPE, CPA

August 29, 2023