

The Value of Biotechnology

Biologics & Biosimilars Forum

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About BIO

Founded: 1993

Non-Profit Trade Association

CEO: James C. Greenwood

Chairman: Rachel King, CEO & Co-Founder,
GlycoMimetics, Inc.

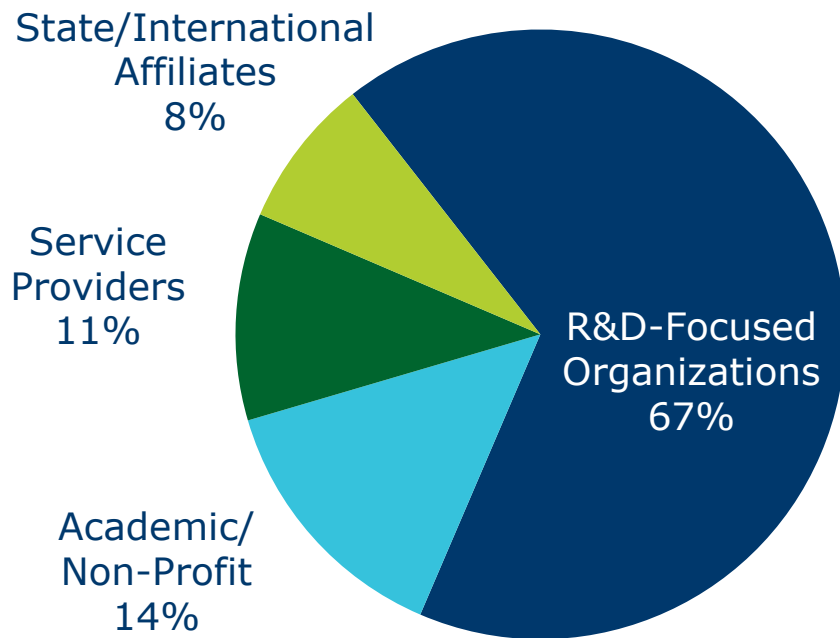
Staff: ~160

Members: ~1,000

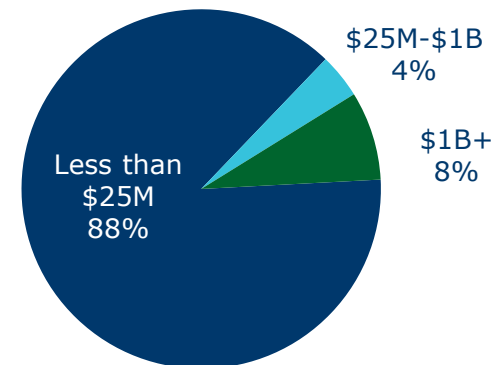
BIO Membership

June 2014

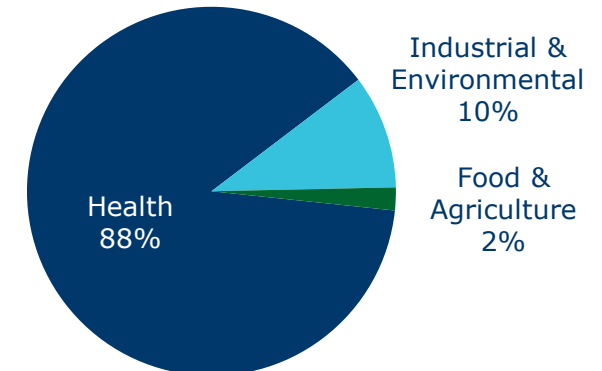
Approximately 1,000 members



R&D Company Revenues



R&D Company Focus



Presentation Outline

- Measuring the Value of the Biotechnology to:
 - Patients
 - Populations
 - Economies
- How Different Countries Value Biotechnology
- How Biotech Values Different Countries
- Sustaining the Value of Biotechnology

The Value of Biotechnology to: Patients

■ Increase life expectancy

1986-2000

New therapies account for 40% of the increase in life expectancy

40%

2000-2009

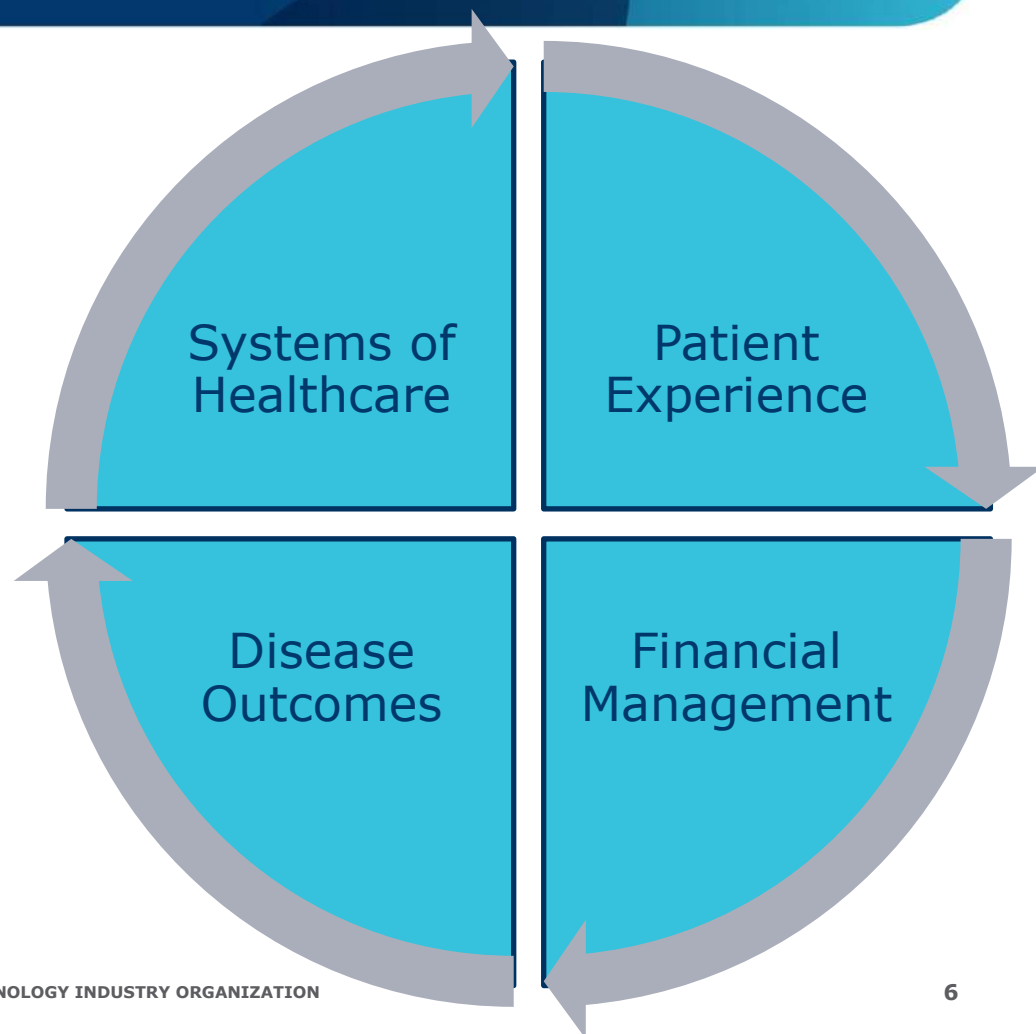
New therapies account for 73% of the increase in life expectancy

73%

- Increased quality of life
- Ability to enter back into routine, daily life
- Caregiver relief
- Benefits unique to individual circumstances:
 - Participate in family milestones,
 - Survive long enough for the next treatment advancement

The Value of Biotechnology to: Patients CONT'D

Defining “Value” to Individual Patients:
A discussion with common terms, not a checklist.



The Value of Biotechnology to: Populations

- Cancer: Over 53 million life-years saved since 1990, in large part due to medical innovation, which includes innovative biologics
 - 4.59 life years saved per minute results in \$429, 145 in economic value added per minute^[1]
- Biotech aims to be truly innovative: 70% of the 5,400 treatments making their way through the pipeline have the potential to be first-in-class^[2]
- Biotech pipelines aim to target unmet medical need^[3]

Therapeutic Area	Pipeline Projects (2013)
Cancer (all)	3,070
Neurology	610
Cardiovascular	450
Diabetes	281

[1] Value of Innovation. 2015. *Lives Saved Clock*, available at: <http://valueofinnovation.org/life-years-saved-clock/>.

[2] PhRMA. 2014. *The Global Impact of Innovative Medicines*, available at: <http://www.phrma.org/catalyst/the-global-impact-of-innovative-medicines#sthash.kmpUgwrZ.dpuf>.

[3] PhRMA. 2013. *The Biopharmaceutical Pipeline*.

The Value of Biotechnology to: Economies

■ All Forms of Biotech

- Global Revenue: US \$289 billion
- Global Growth Rate: 10.8% (2009-2014)
- Global Employment (direct): 556,000
- Estimated number of companies: 10,838

■ Health-specific[1]

- Health-related biotechnology represents 600 companies with over 170,000 employees that generate \$90b USD of revenue annually.
- More than \$160b USD were spent on biopharmaceuticals in 2011
- Increases in biopharmaceutical utilization can decrease overall spending on healthcare

■ Agriculture-specific[1]

- 175.2m ha of genetically modified crops worldwide

The Value of Biotechnology to: Economies CONT'D

■ 1989:

- 150 public biotech companies in US
- 700 private biotech companies in US
- Essentially a U.S. industry

■ Today:

- 300 public biotech companies in US
- 2500 private biotech companies in US
- **Approx. 7500** biotech companies *outside* US

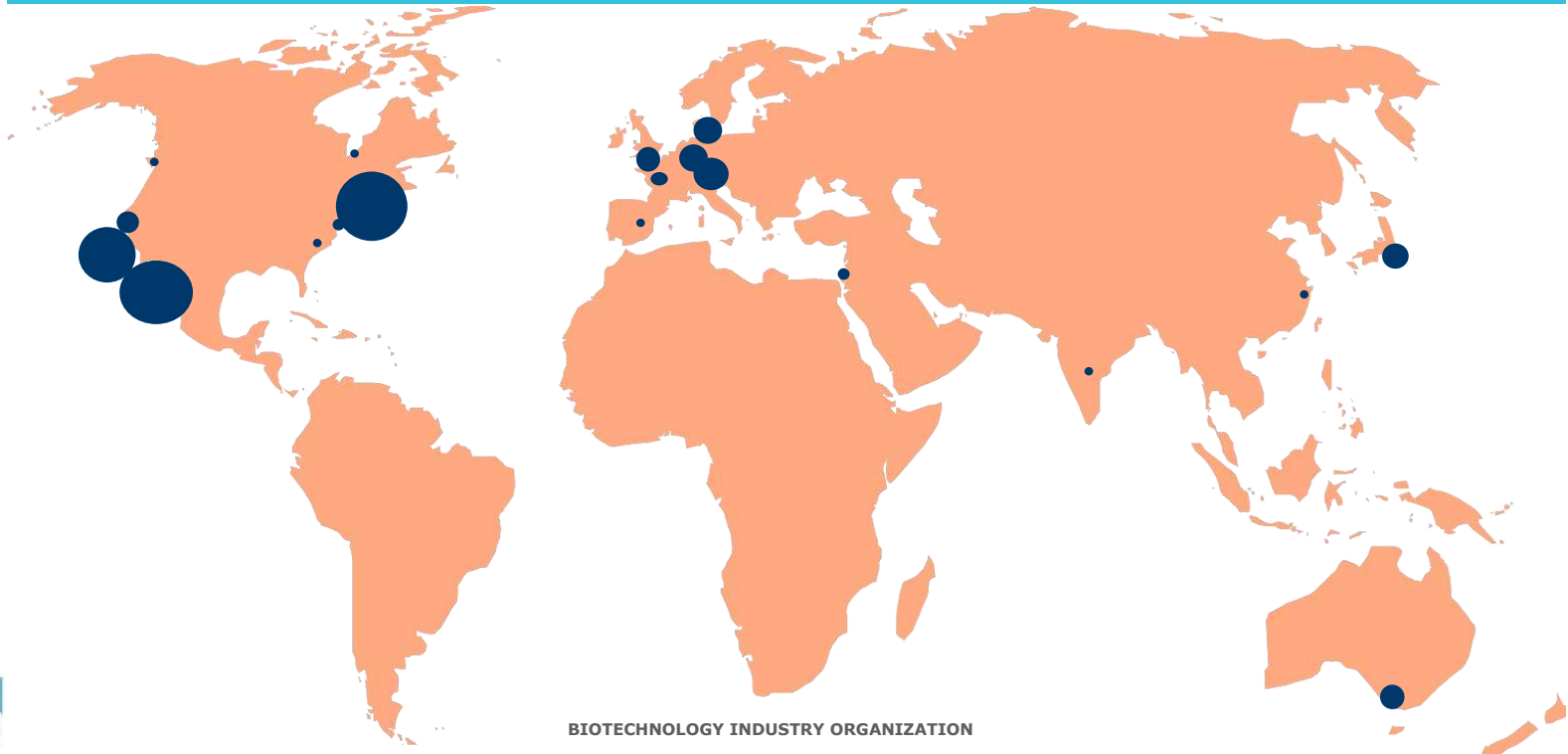
How Different Countries Value Biotechnology

- Canada: National *Biotechnology Strategy* that creates a policy framework to integrate social, ethical, health, economic, environmental, and regulatory considerations, as well as addressing public information and participation.
- China: Over the next 3 years, the government will invest 850b RMB to reform the Basic Medical Security System, and 6b for supporting technological platforms for all stages of development (including clinical trials).

How does Biotech value different economies?

- What attracts biotech?
- Proximity to: university research, venture capital, highly-educated workforce, specialized real estate, governmental infrastructure

Leading Biotechnology Clusters



Sustaining the Value of Biotechnology

The increasing trend
toward regulatory
standards
harmonization

The need for robust
pharmacovigilance
mechanisms to support
value-based payment
models

Integrating
biotechnology products
with care systems

Trend toward
developing increasingly
personalized medicines
(e.g., gene therapy)

Sustaining the Value of Biotechnology CONT'D

Evolution of the business model for small biotech (increased reliance on tech transfer, academic partnerships, and venture capital)

Patient access to biotechnology products

Increasing attention on patient-focused drug development (especially for rare diseases)

Globalization of clinical trials



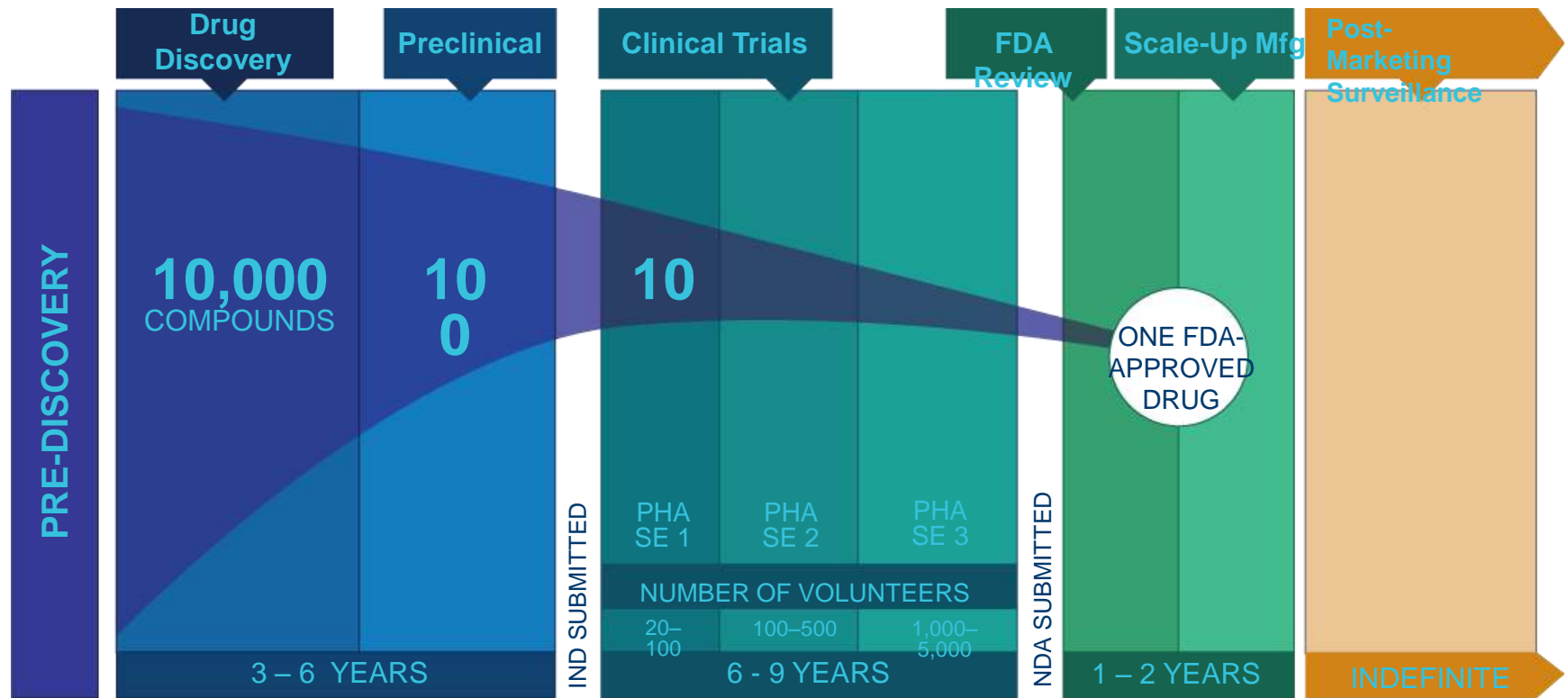
Biotechnology
Industry
Organization

Additional Slides

Business Model: Bio-pharma

Innovation is Costly and High-Risk

Drug Development Timeline



**Developing a new medicine takes
10–15 years, \$800M–\$1.2B**

Biotech Development is a Global “Ecosystem”

