Advances in Biotech Innovation

AMIIF – Semana de Innovacion
Mexico City
March 30, 2017

Biotechnology Innovation Organization

What is BIO

- World's Largest Biotechnology Organization
  - About 1000 members, from start ups to large MNCs
  - **Most** are small companies
  - Members from 35 countries
  - Host BIO International Convention annually – c. 16,000 participants. June 19-22, San Diego

- Covers all three sectors or biotech: Biopharma, Agriculture, industrial/environmental. Common elements:
  - All three use same technologies
  - All involved in addressing some of the most important issues confronting mankind

BIO's Mission

- **Serve as Voice of Global Innovative Biotech Sector**

  Define and advance policies best practices that promote global biotech innovation (regulatory, IP, financial)

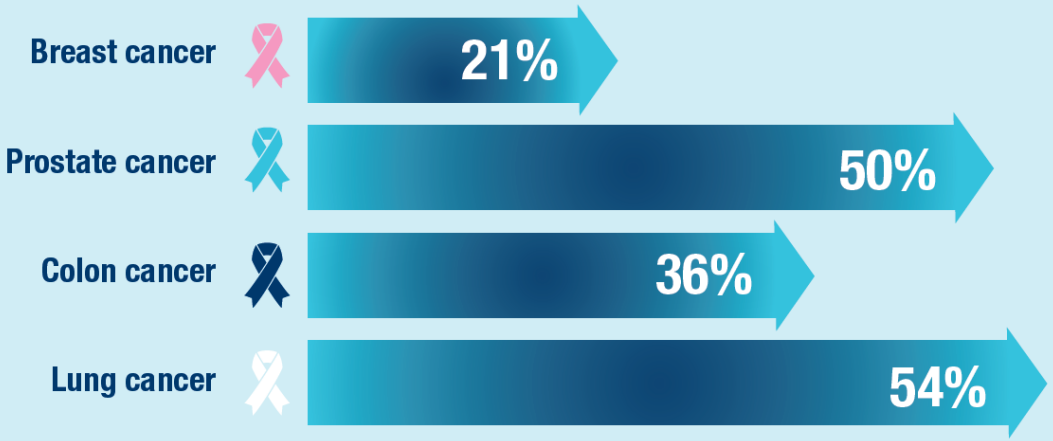
  - Promote partnerships among parties engaged in biotech research and commercialization (the biotech "ecosystem")

Impact: Innovation Saves Lives

www.bio.org/innovation

5-year survival rates increases

Survival is increasing dramatically for many forms of cancer: since 1975, 5-year survival rates went up **21%** for breast cancer; **50%** for prostate cancer; **36%** for colon cancer; **54%** for lung cancer.[3]



Innovative medicines save millions of lives every year and are transforming how we treat and cure disease.

HIV/AIDS death rates have **decreased**

85%

… since 1995

Heart disease death rates have **decreased**

30%

… from 2001 to 2011

Cancer death rates have **decreased**

22%

… since 1991

Economic Benefits of Innovation

- In the United States, the Congressional Budget Office (CBO) credits each $1 of additional spending on medicines with $.20 reduction in other healthcare expenses.

REDUCING CANCER DEATH RATES BY

10%

WOULD SAVE CURRENT AND FUTURE GENERATIONS APPROXIMATELY

$4.4 TRILLION DOLLARS[6]

Gains in cancer survival are worth nearly **$2 trillion**, with a majority of that savings going to patients, families and our economy as a whole.[5]

Biotech on the Horizon: What's in the Pipeline?

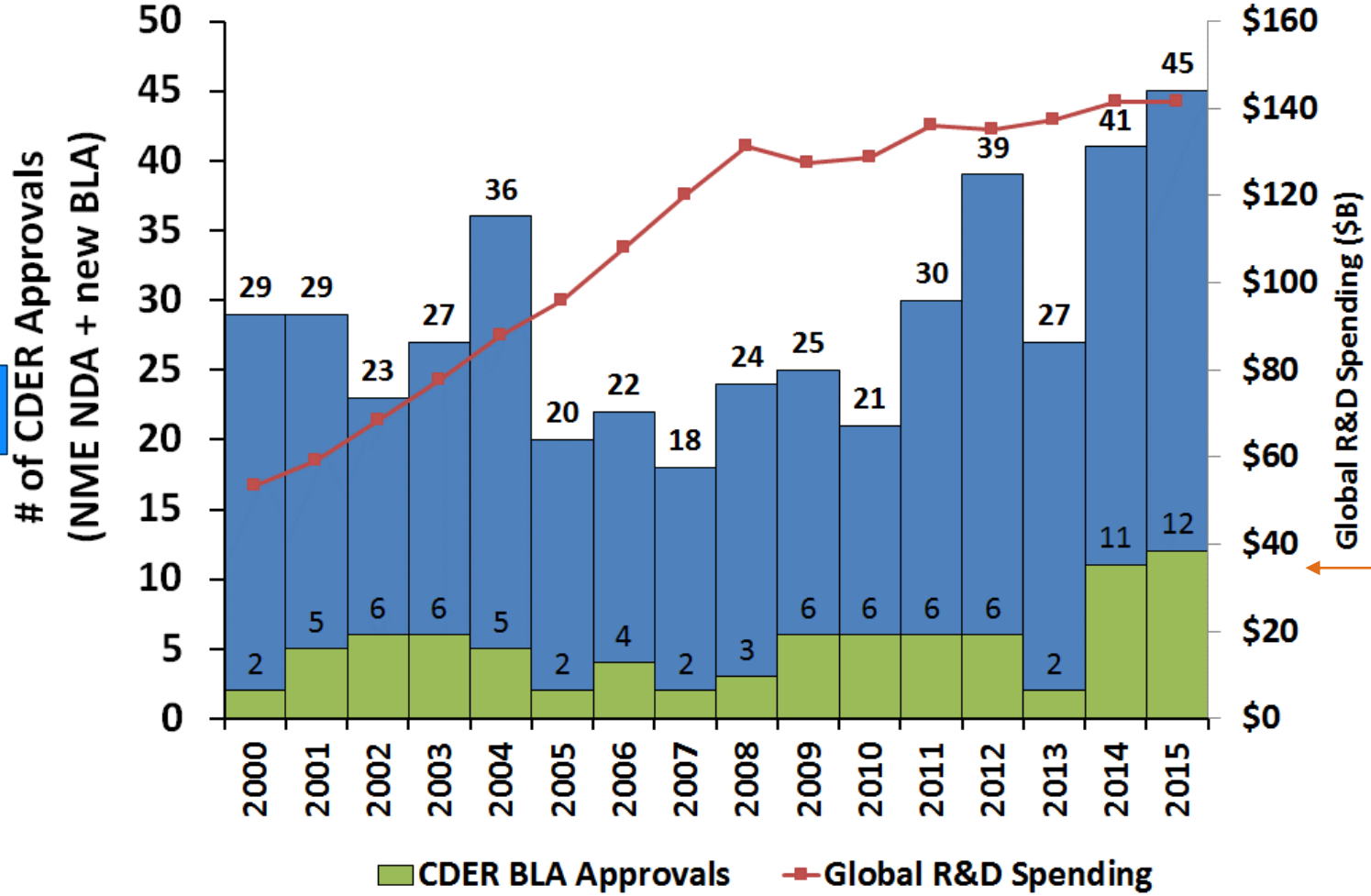
Selected Diseases	Medicines in Development*
Cancers	1,813
Cardiovascular disorders	599
Diabetes	475
HIV/AIDS	159
Immunological disorders	1,120
Infectious diseases	1,256
Mental health disorders	511
Neurological disorders	1,329

Adis R&D Insight Database. Accessed March 2016.

New Drug Approvals (US FDA/CDER)

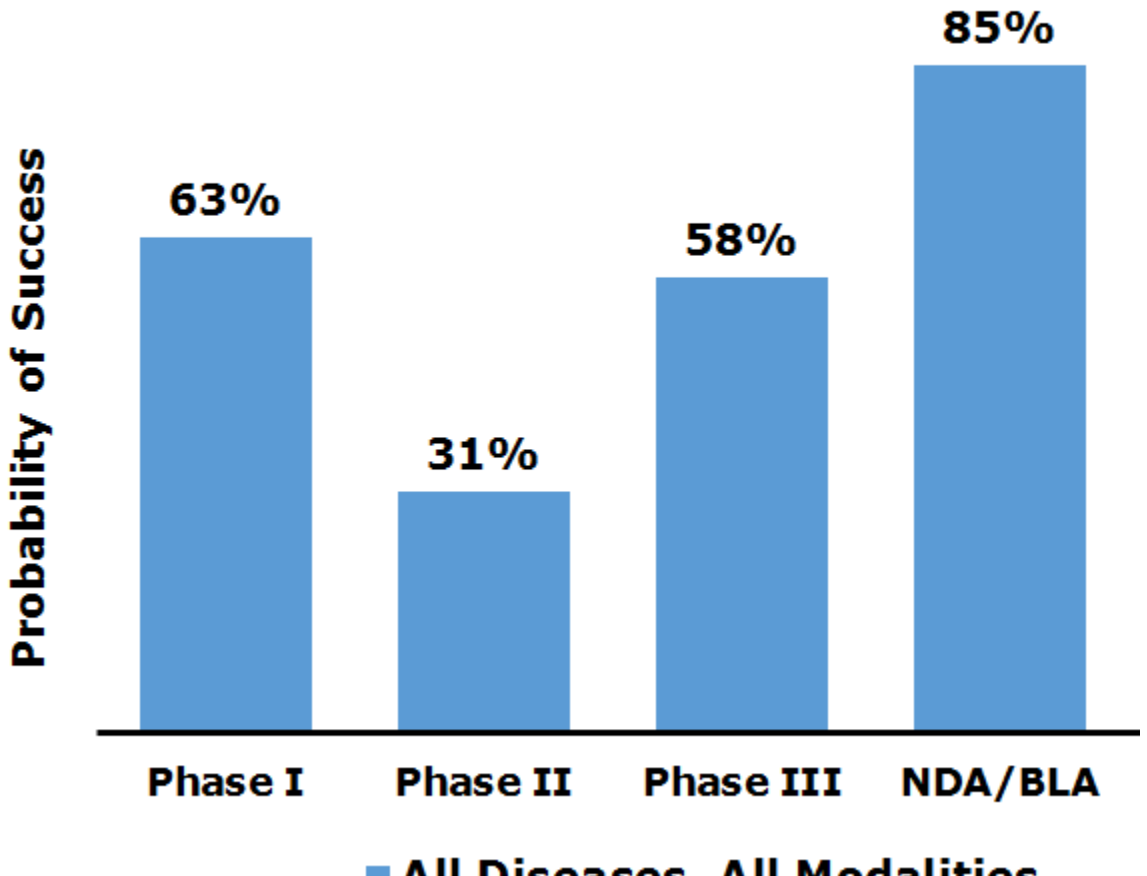
Small Molecule

Biologic

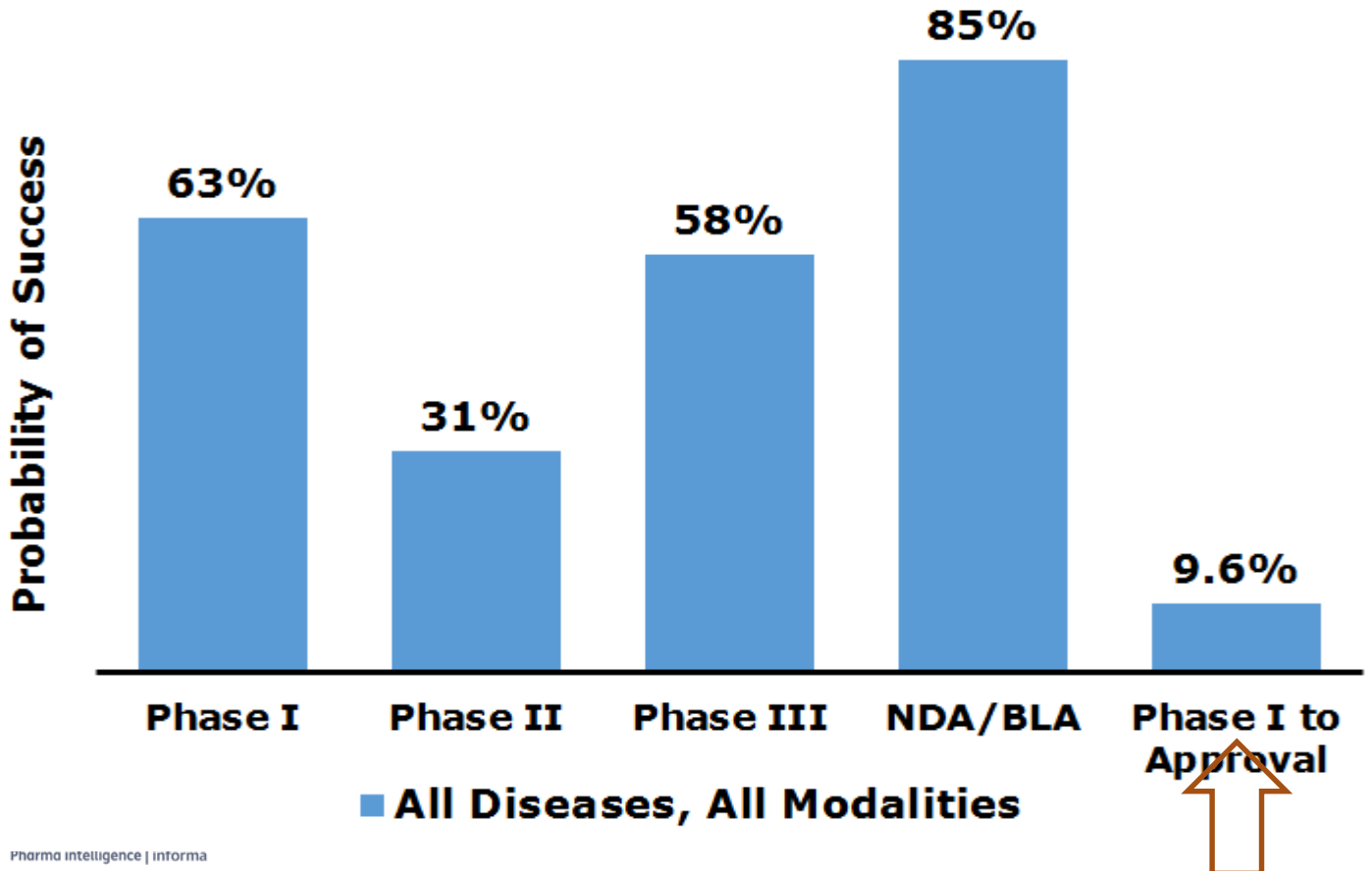


$30B NIH

Clinical Phase Success Rates

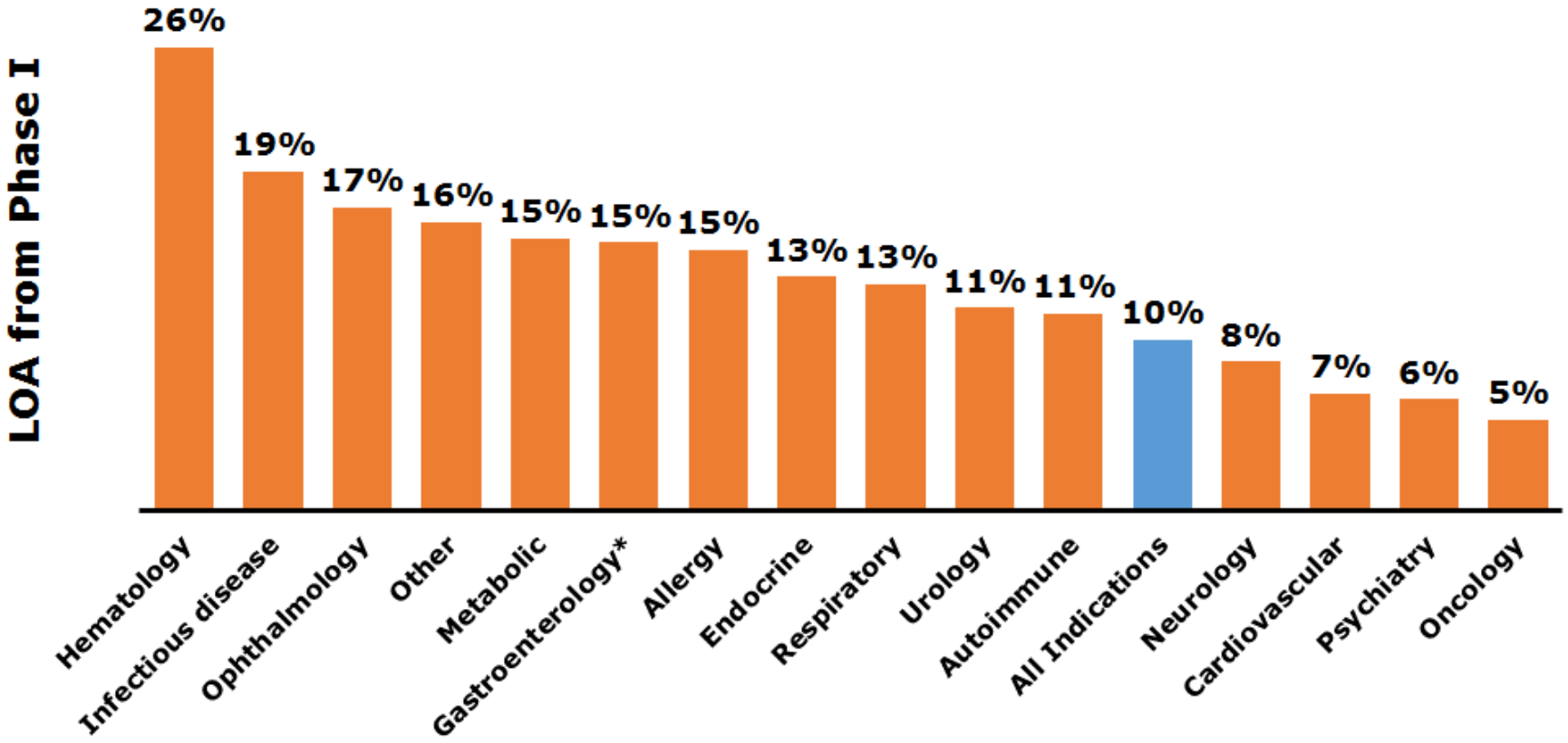


Phase Success Rates & Likelihood of Approval from Phase I



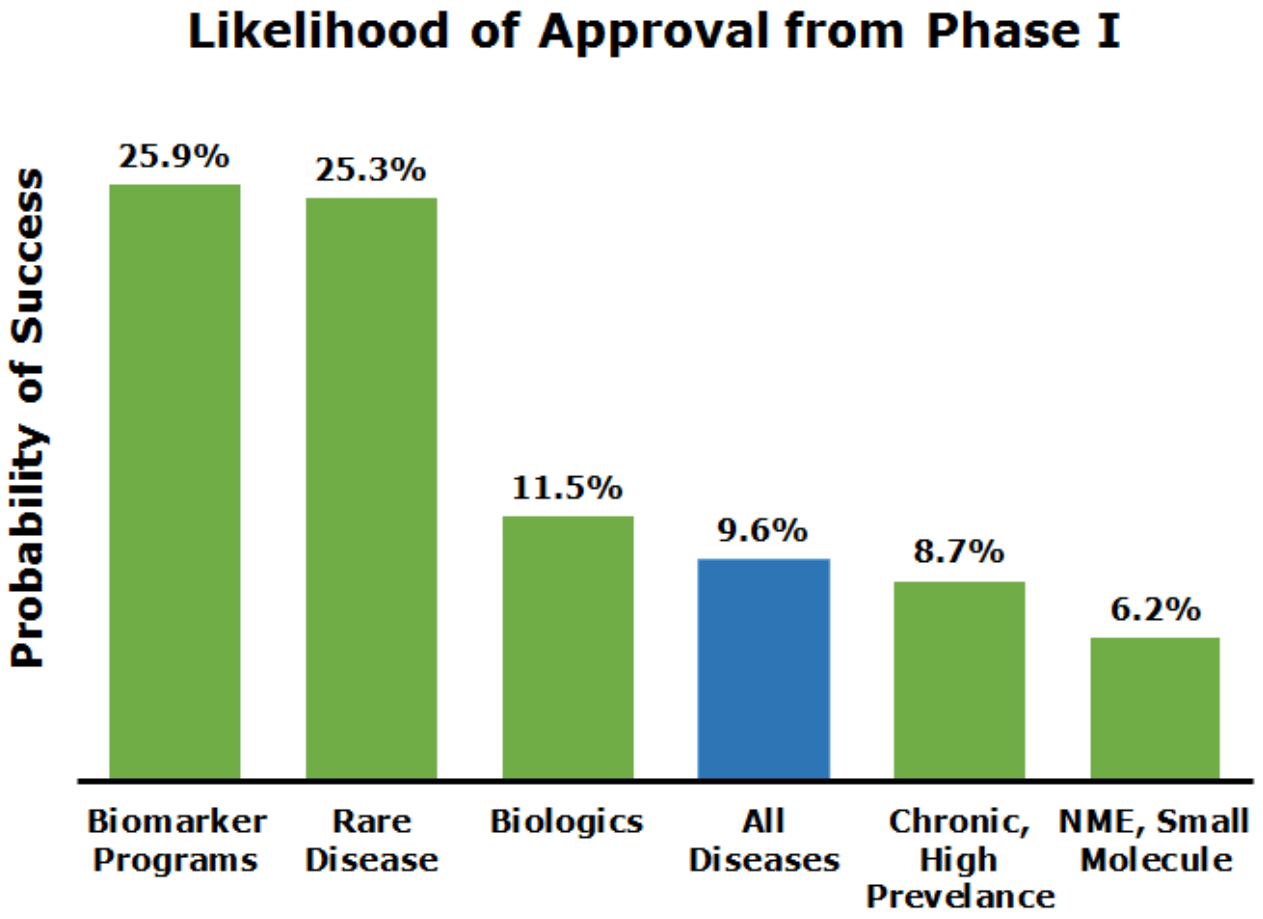
Pharma Intelligence | Informa

Likelihood of Approval from Phase I By Disease



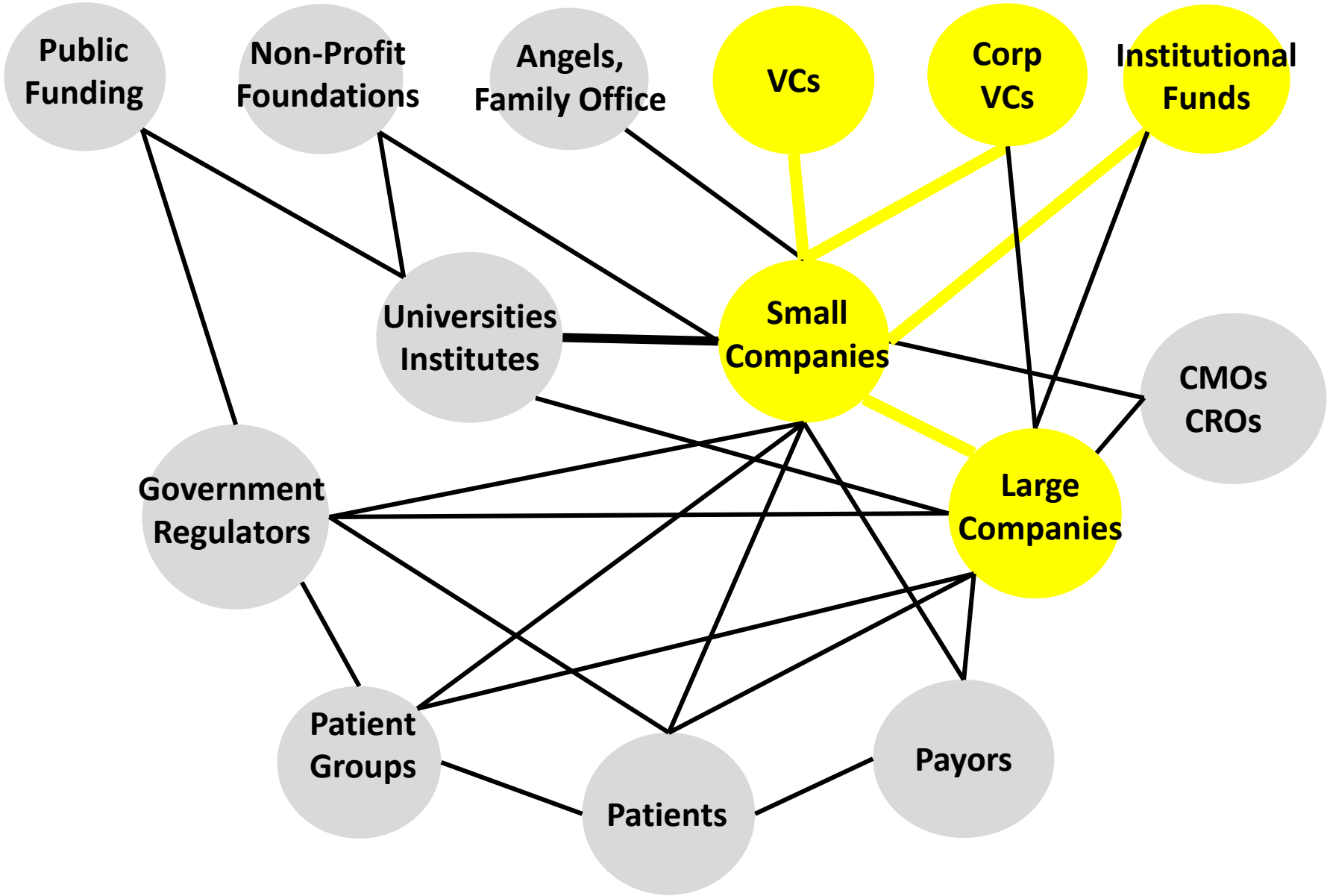
*includes IBS, but not IBD (in autoimmune)

Success by Type of Product



Bio Biomedtracker Pharma intelligence | informa AMPLION

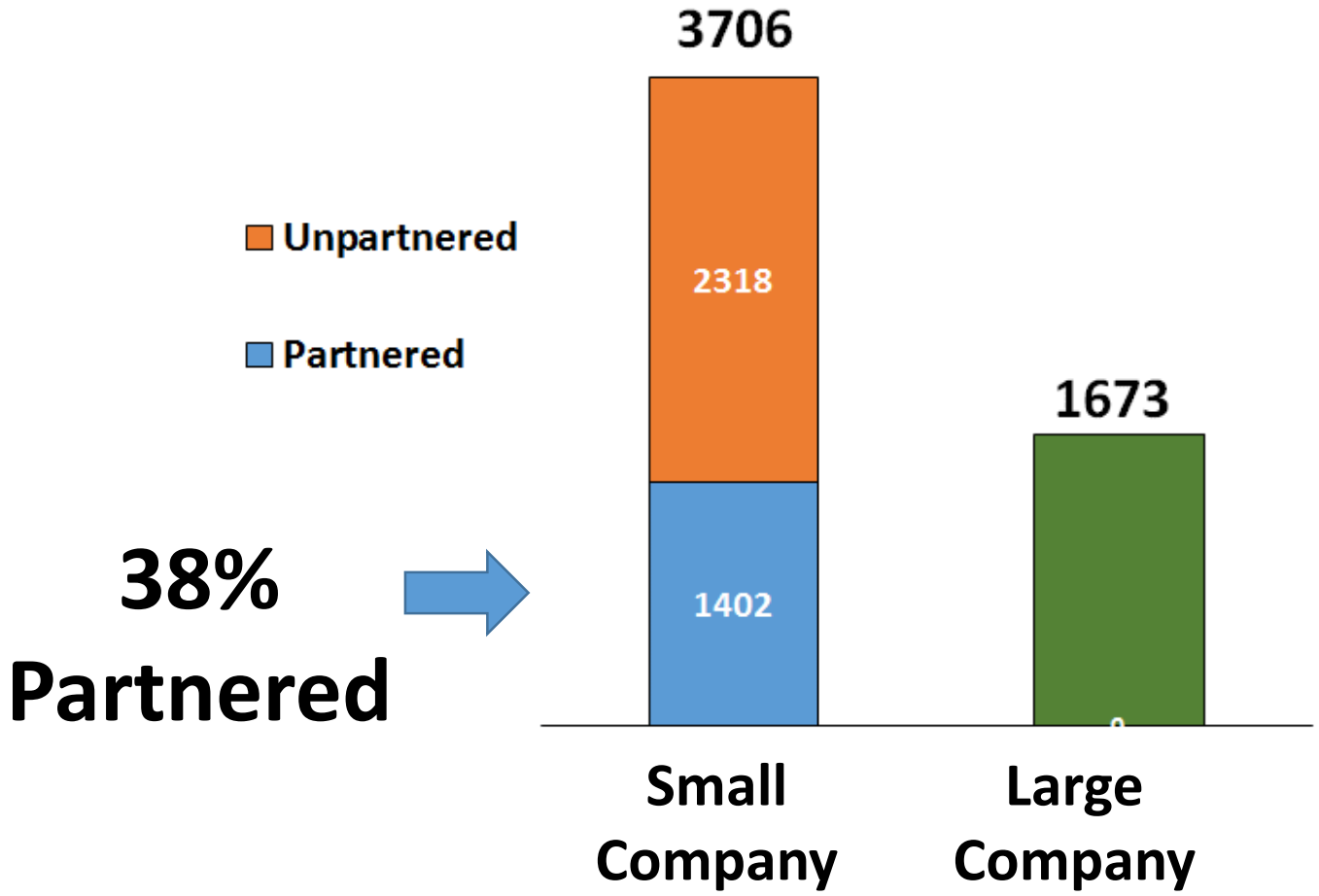
BioPharma Ecosystem



BIO Industry Analysis, January 2016

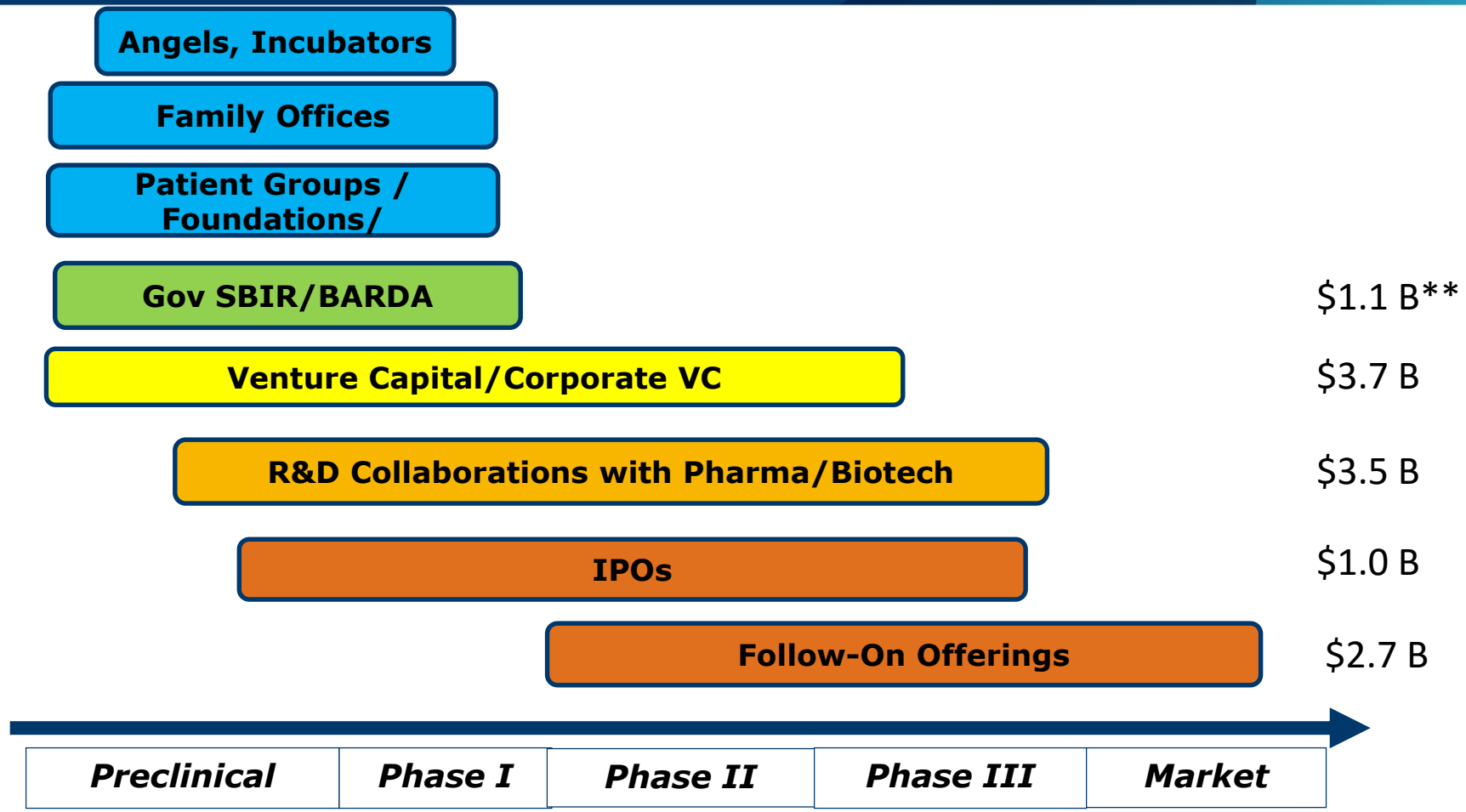
Global BioPharma Pipeline

- 5,393 clinical programs
- 70% from small companies

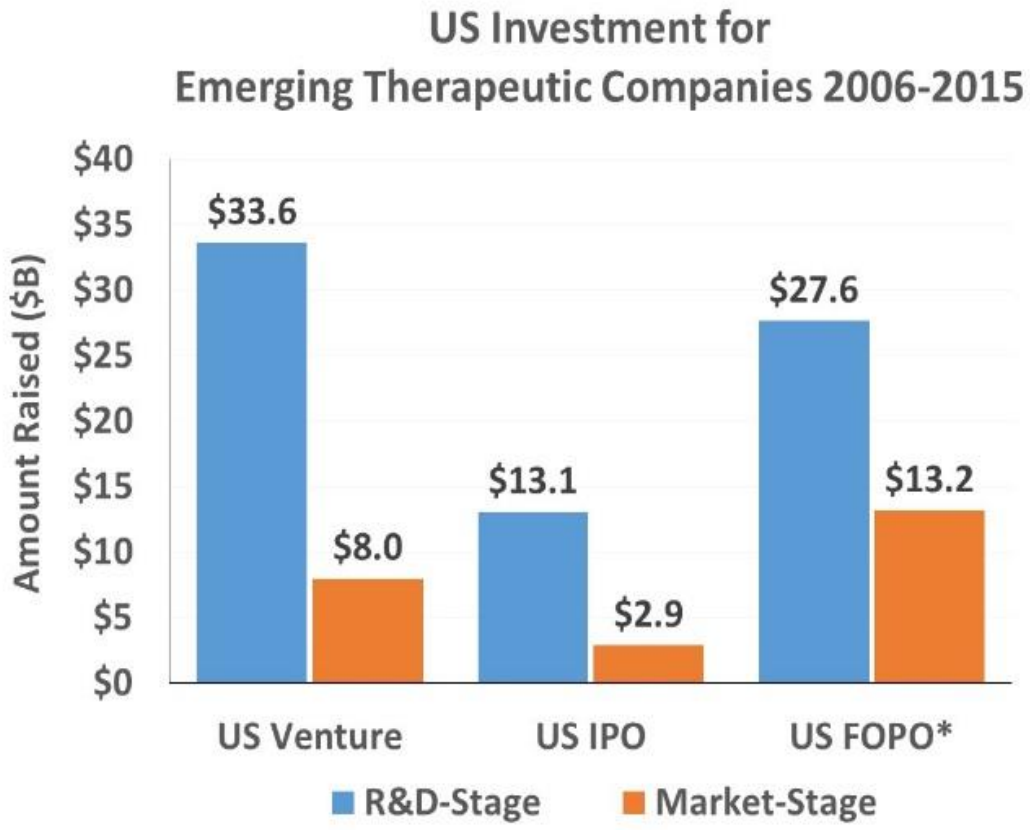


Source: BIO Industry Analysis, BioMedTracker, June 2016

Financing Innovation



US Investment into Biotech 2006-2015



Source: Factset, BIO Industry Analysis, October 2016

New Company Formation by Country

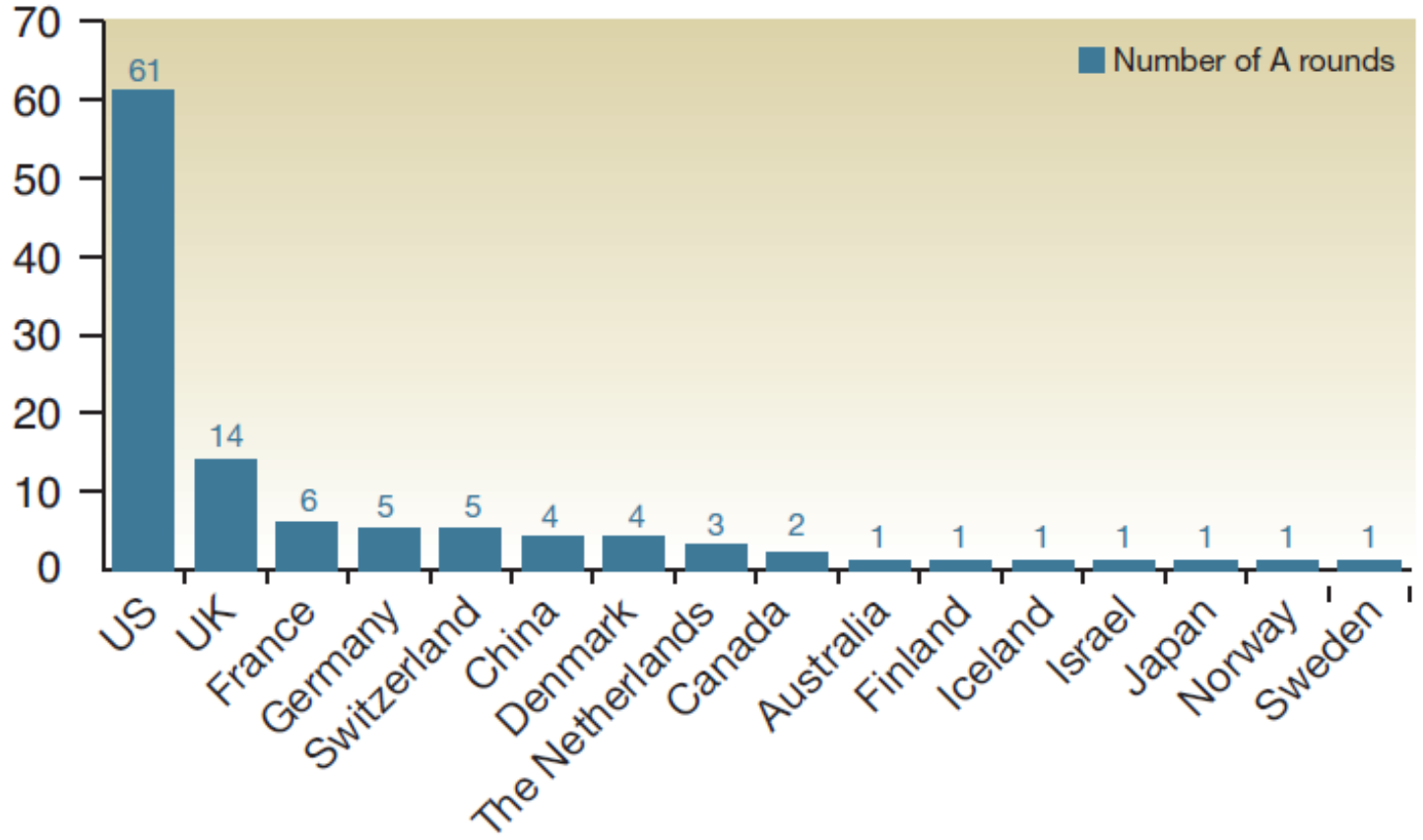
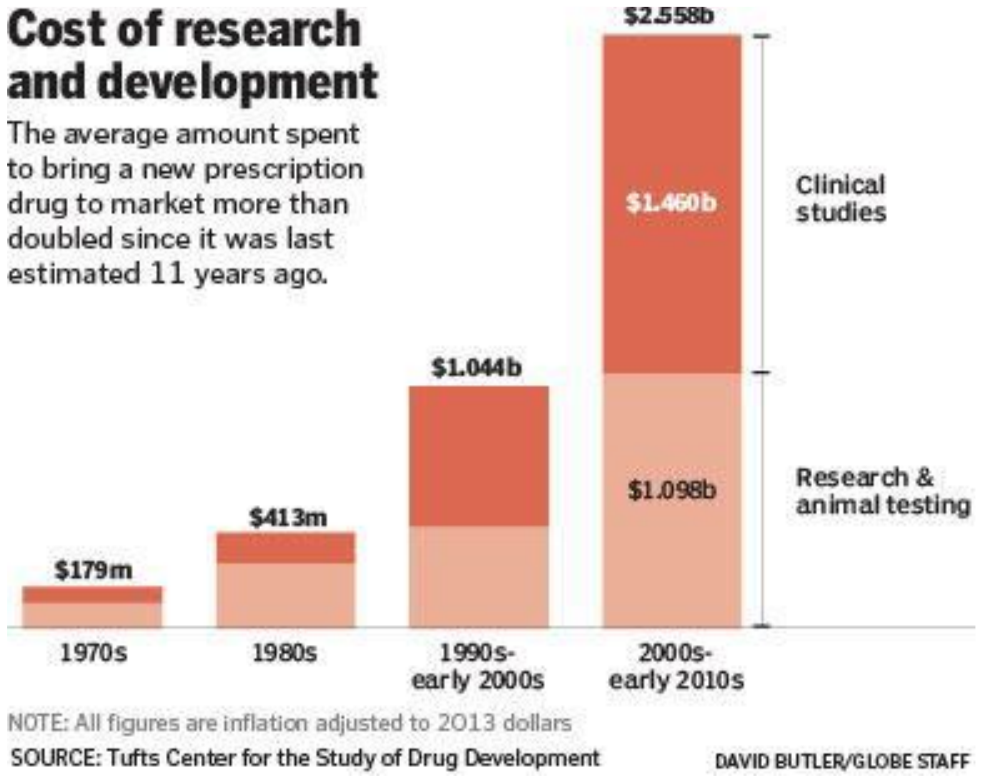


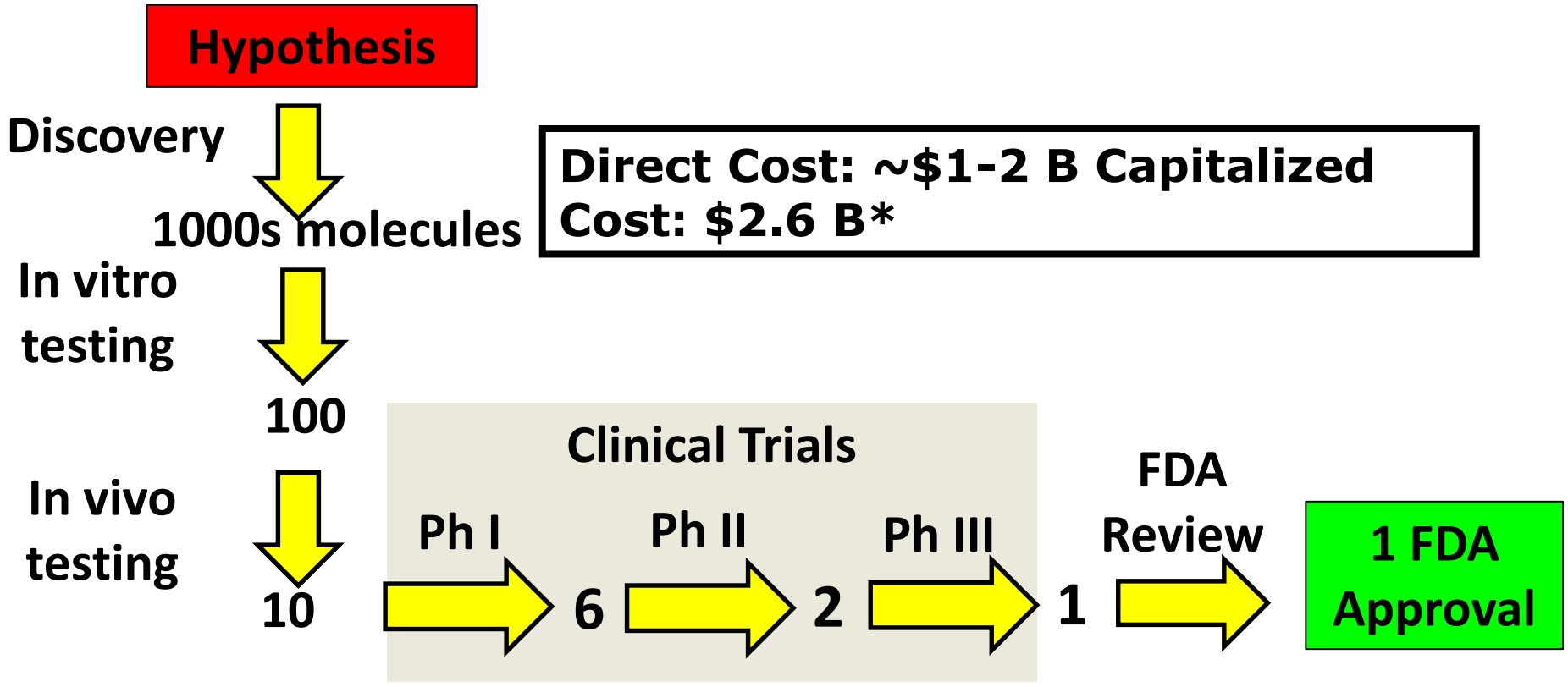
Figure 1 Number of startups by country in 2014. Source: BCIQ: BioCentury Online Intelligence.

Source: Nature Biotechnology, Vol 33, No 1, Jan 2015

Cost of Innovation



Cost of Innovation

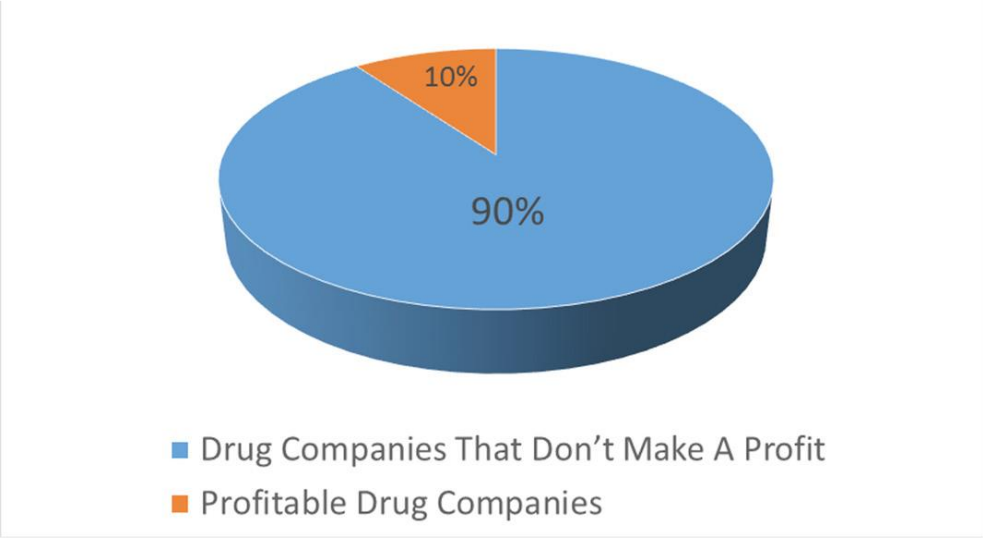


*Tufts 2014, BIO Industry Analysis, January 2016

Cost of Innovation

- Vast majority of the companies working on biotech innovations are small, pre-revenue enterprises that do not earn a profit.

- Only 2 of every 10 drugs on the market ever earn back enough money to match the costs of R&D and regulatory approval process before their patent expires



Some Key Questions

- Can drug development be done more efficiently, i.e., faster, less costly and higher success rates?
  - Will require researchers, industry and governments working together to solve
- How will societies ensure that the incentives for innovation are sufficient? Can societies take a longer term view (the business model is long term) of the benefits
- Can the "start-up culture" – of spreading risk among many small developers – be replicated globally
  - Indeed, can the ecosystem of innovation become more globalized – what policies will it take to advance that goal

Thank you

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