New Perspectives on Managing University Intellectual Property and Intellectual Capital

New Modes of Capitalization and Catalysis to Move University Scientific and Technological Research to Commercial Success

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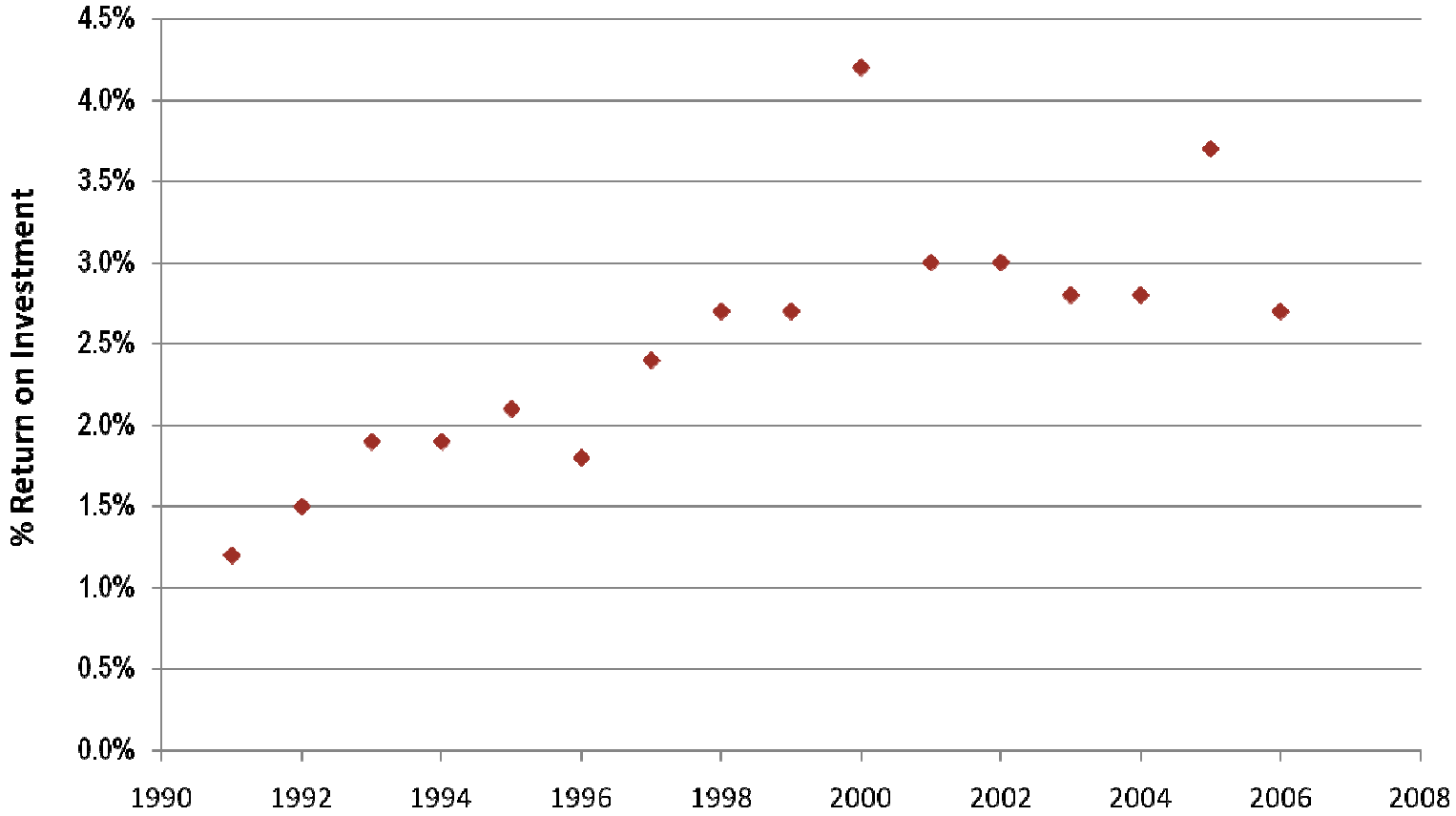
August 29, 2008

ALFRED E. MANN
FOUNDATION FOR BIOMEDICAL ENGINEERING

US Universities: Net Licensing Income as a % of Total Sponsored Research

Average ROI from 1991-2006 = 2.5%



Returns

- ROI: Return on Investment
- ROI: Return on Innovation
- Return to the Inventor
- Return to the University
- Return to the Research-subsidizing Taxpayer
- Return to the Patient

The Commercialization of Compelling Ideas is Critical!

- **Innovation fuels the entrepreneurial enterprise and both are keys to a thriving economy**
- **As a world, we are failing to develop and commercialize the majority of promising research**
- **Discoveries that could lead to new medical devices, therapeutic drugs, and other life-saving or life-enhancing technologies are languishing within the walls of our universities… or the university IP resides in the hands of small companies with inadequate capital for development**

Impediments to Successful Commercialization of Innovation

- **Commercialization output from universities has failed to keep pace with research-dollar input**
- **Interest by faculty to develop research with commercial potential lags behind their desire to perform the search for new knowledge**
- **Commercial potential of basic research and consequent IP is under-developed… with the university, the inventor, and the public provider of research dollars not receiving the potential benefit of their investments**
- **Handoff of IP to industry can get bogged down in negotiations, bureaucratic overload, and unrealistic university expectations of returns (UIDP, IP vs. IC).**

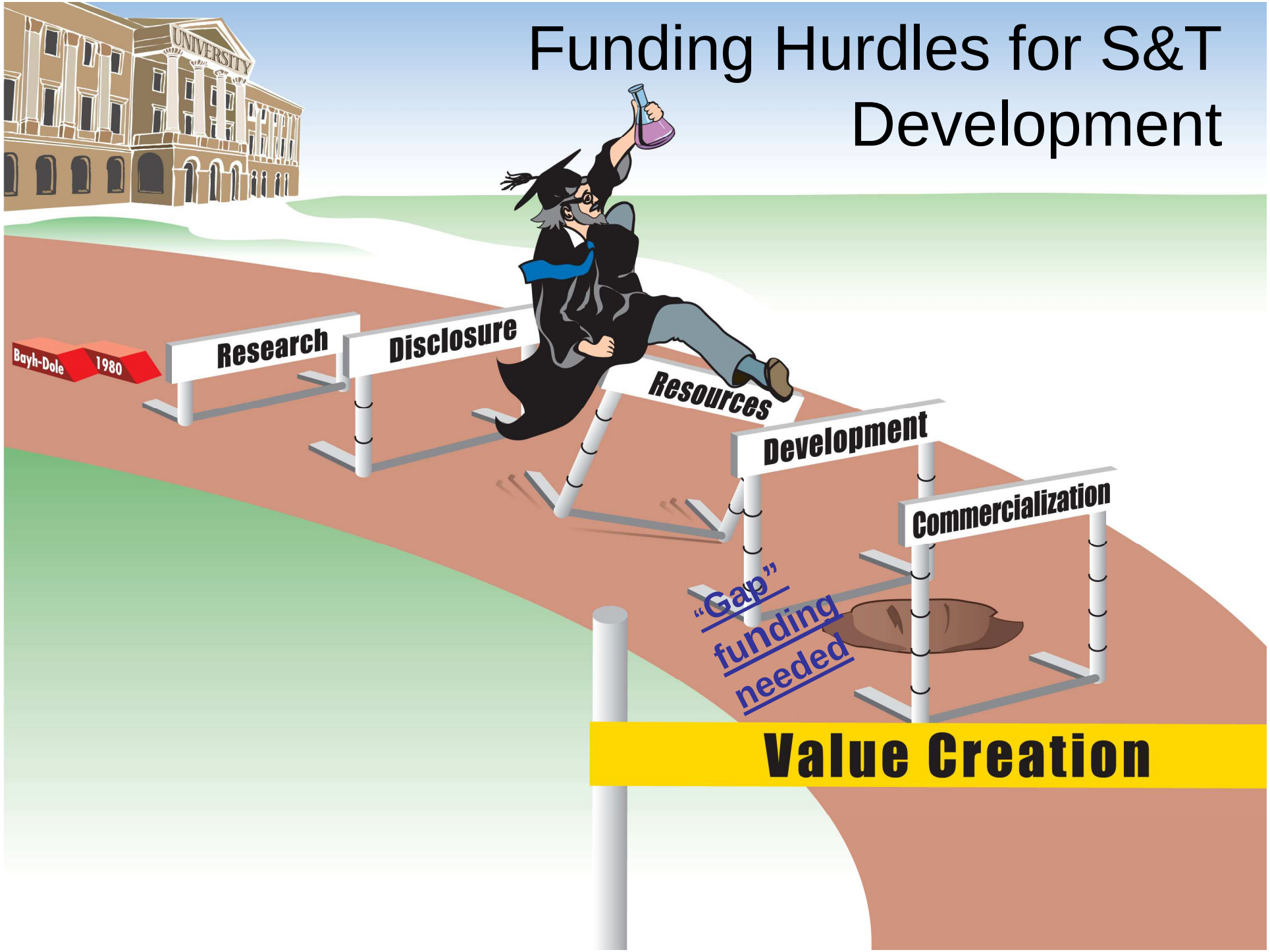
Differences Between Academia and Industry

	Academia	Industry
Main focus	Generating and disseminating **new knowledge**	Commercialization of ideas for **profit**
Resources	**Limited** resources	Often **substantial** resources available
Financial motivation	**Money not the critical** incentive for performance	**Money important** incentive to boost performance
Pace of research	Outcomes driven by desire for **high quality research**	**Time to market** is critical and permeates most every decision
Career achievement	Tenure based on publications not entrepreneurship	Value of research outcome often based mostly on **revenue** generated
Information exchange	Free exchange of ideas	**Intellectual property** becomes corporate asset

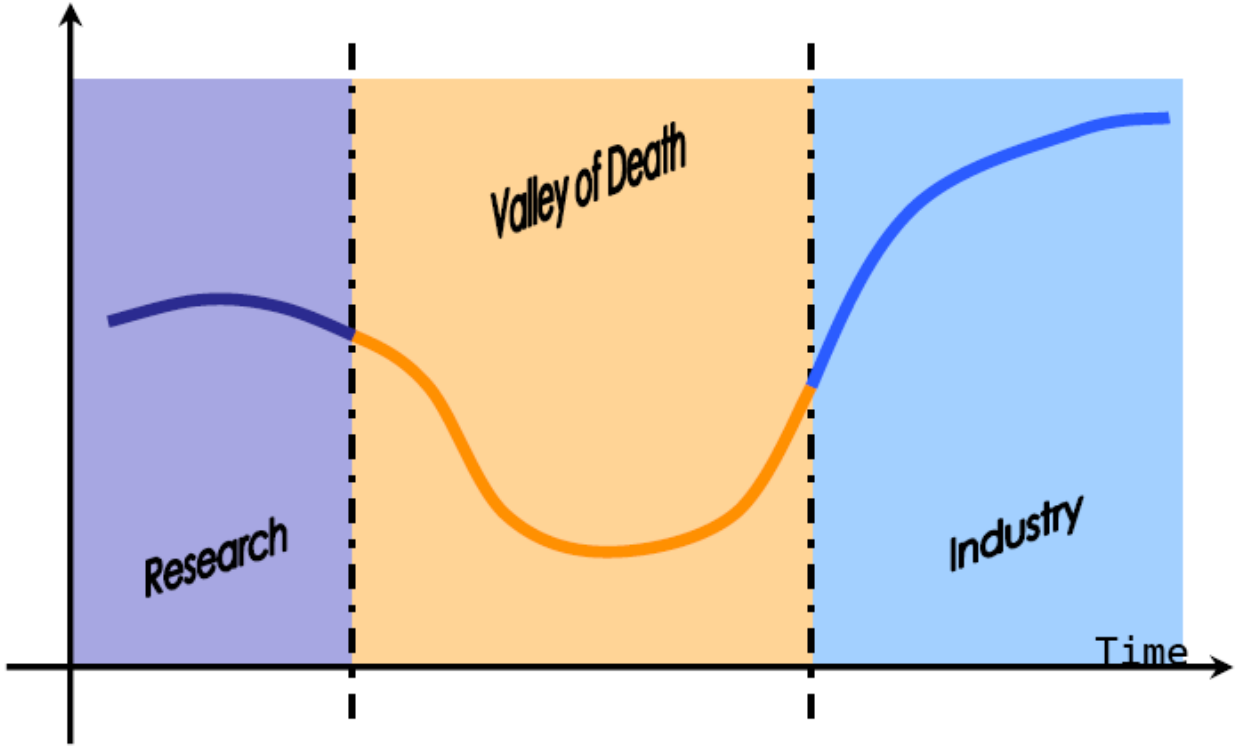
Major Differences Between Academia and Industry

Industry	Academia
Secrecy	Publish or perish
Development work	Curiosity-driven
Supervision	Academic freedom
Must show return on investment	Long-term
Risk taking	Avoids commercial risks

Funding Hurdles for S&T Development



The Valley of Death



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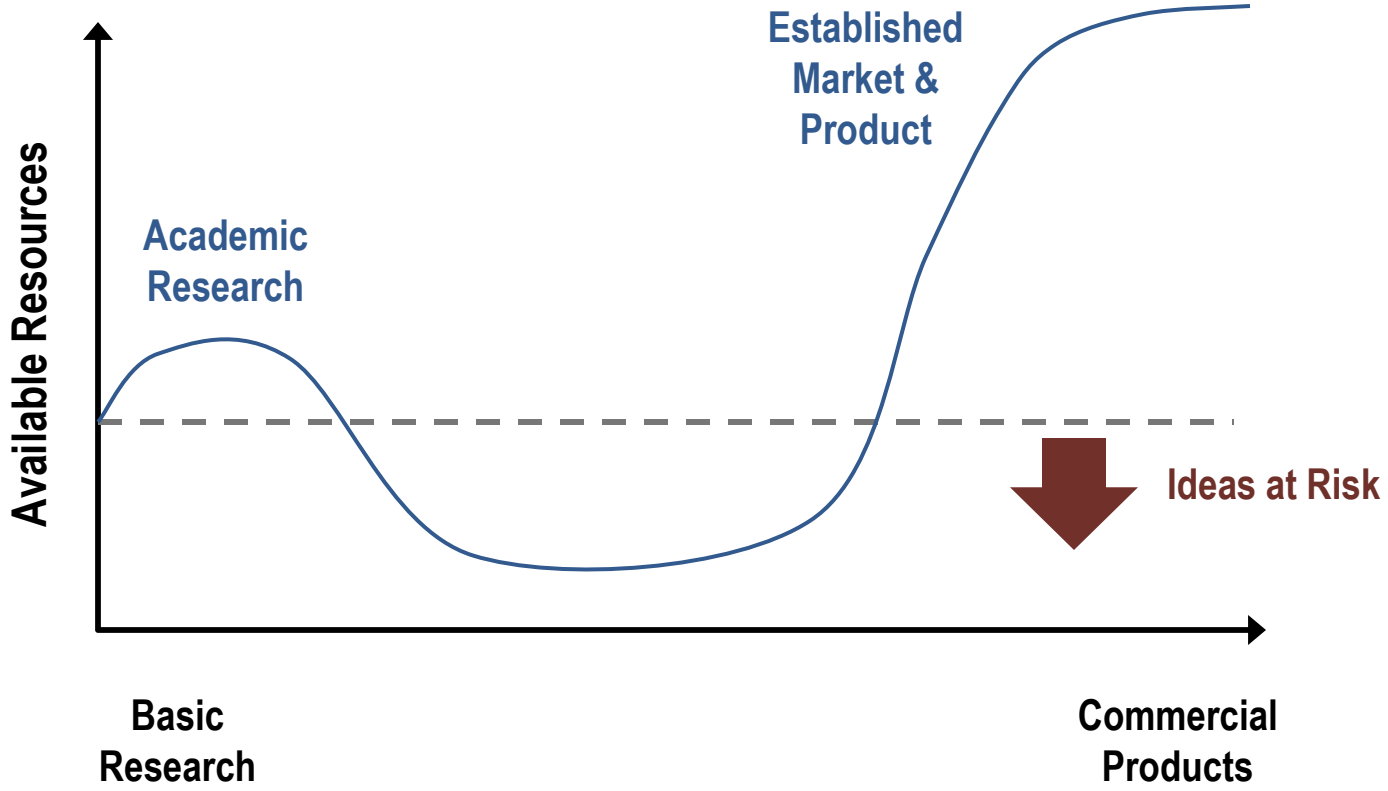
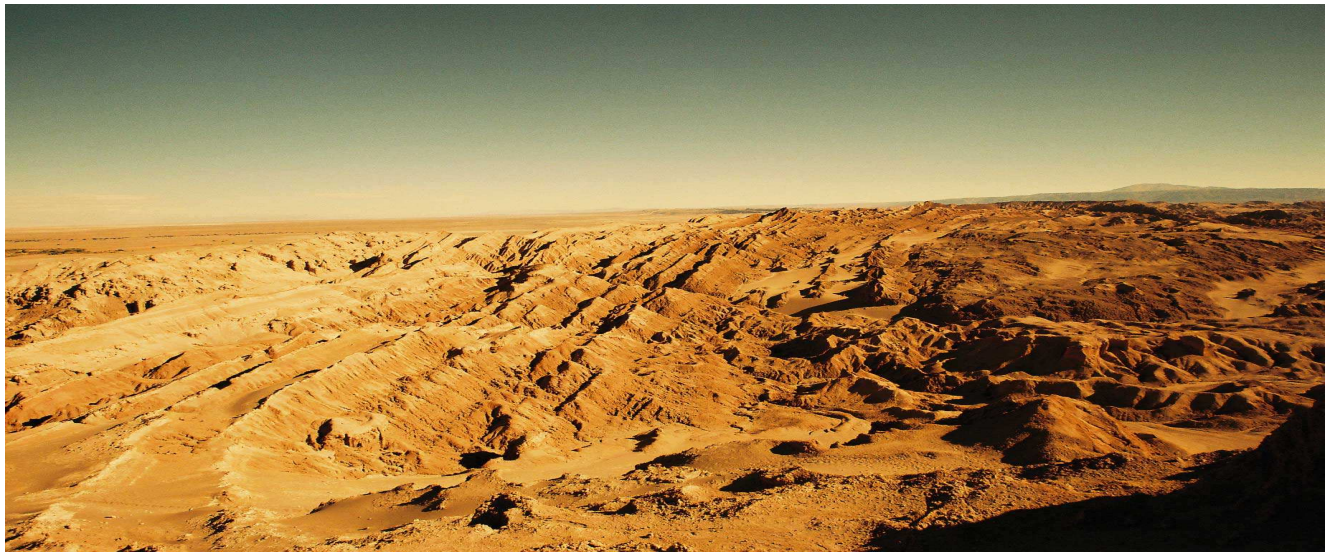
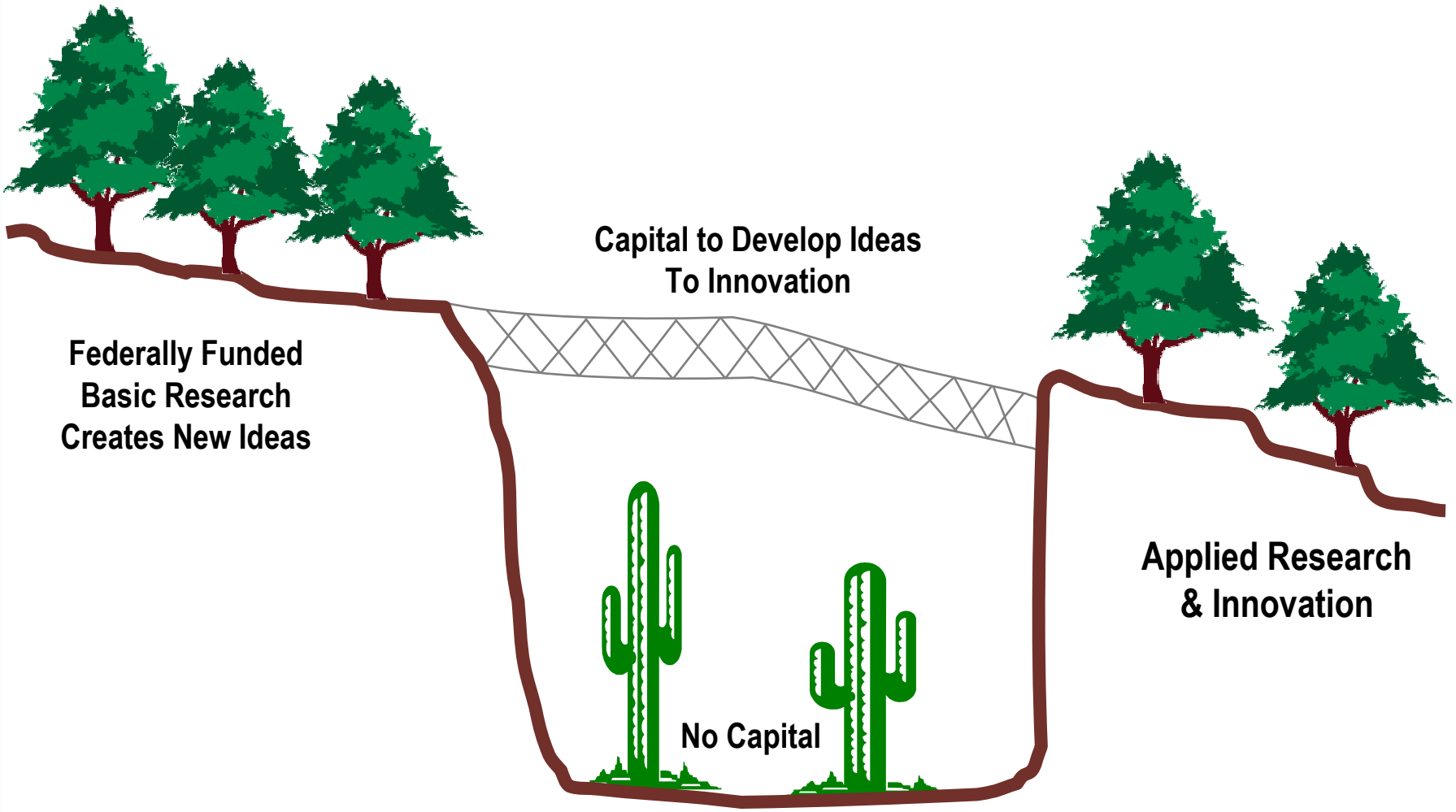


Flying Over the Valley of Death: Accelerating from Discovery to Project



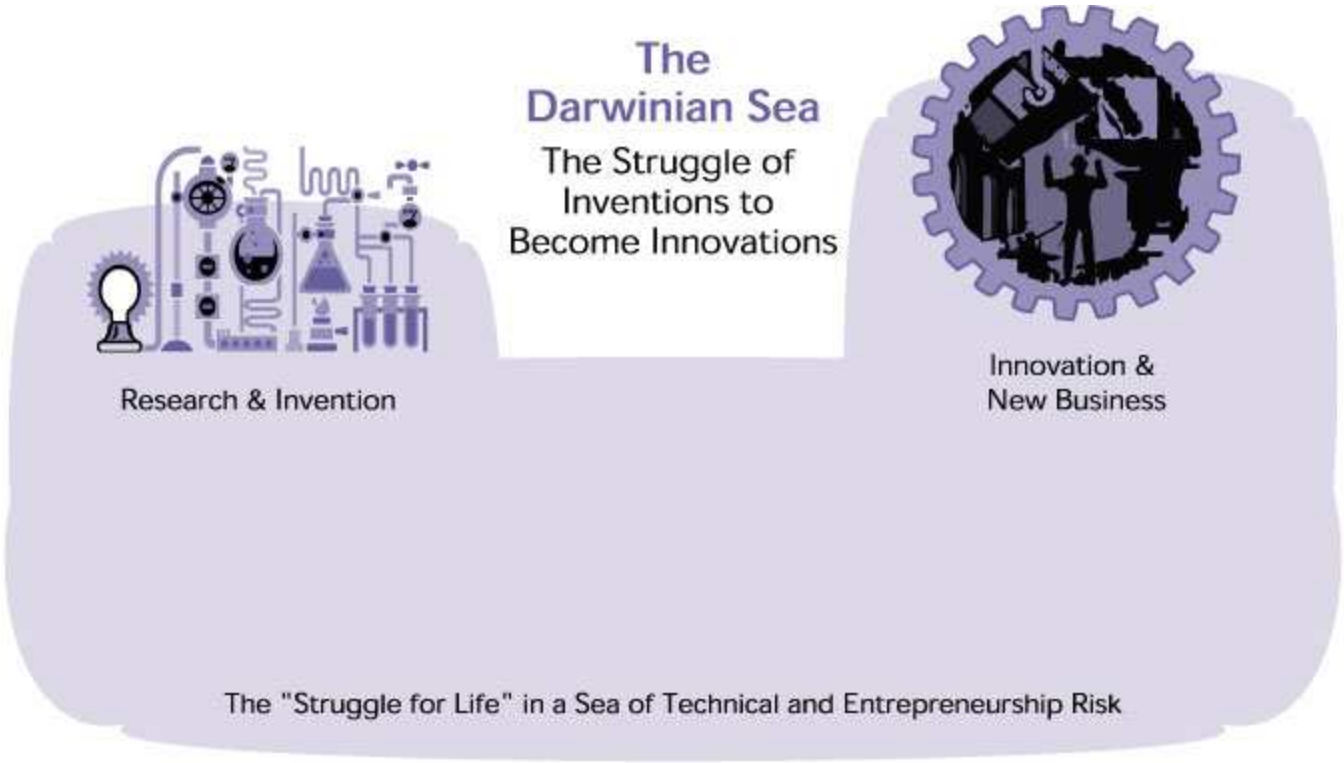
Meeting of the Government-University Industry Research Roundtable
Feb. 12-13, 2008
2101 Constitution Ave
The Lecture Room
Washington, DC

The Valley of Death

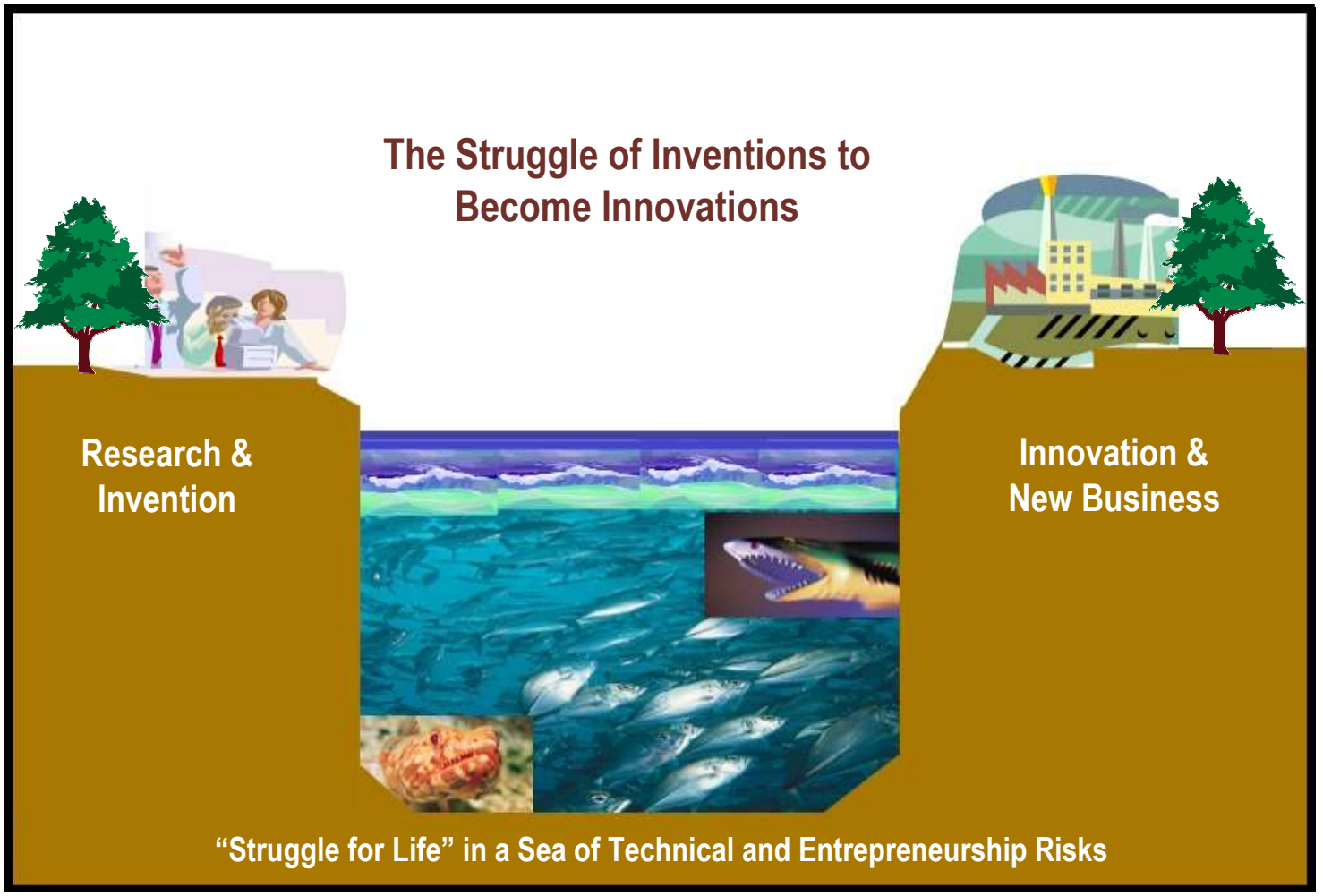


Source: Charles W. Wessner, Ph.D., *The National Academies*

The Darwinian Sea



Branscomb's Darwinian Sea



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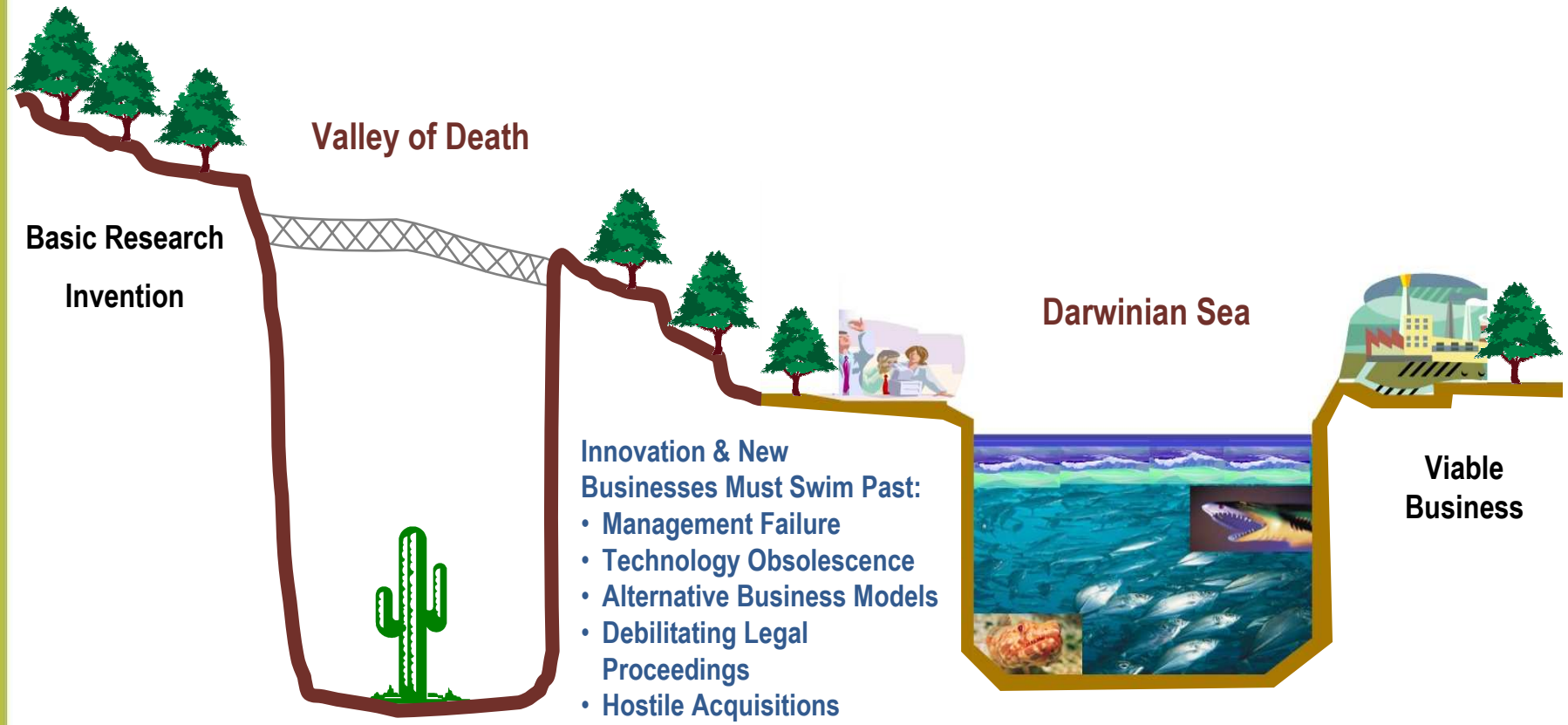
Small Firms Actually Face Many Hurdles

Crossing the Valley of Death and the Darwinian Sea only to Arrive in the Jungle of Prosperity



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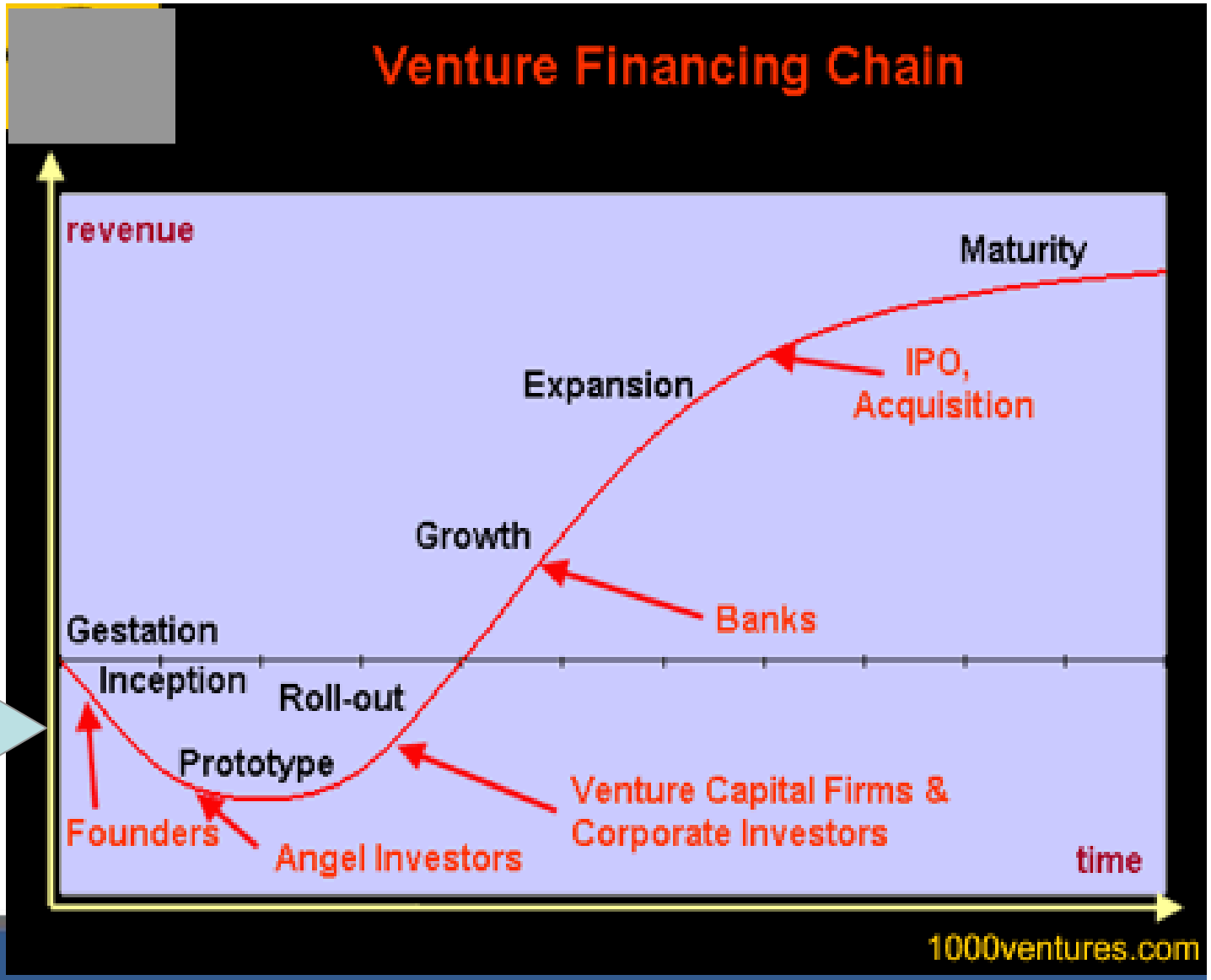
Life Science Technologies Funding Life Cycle

Idea

Out-license
or
Start-up



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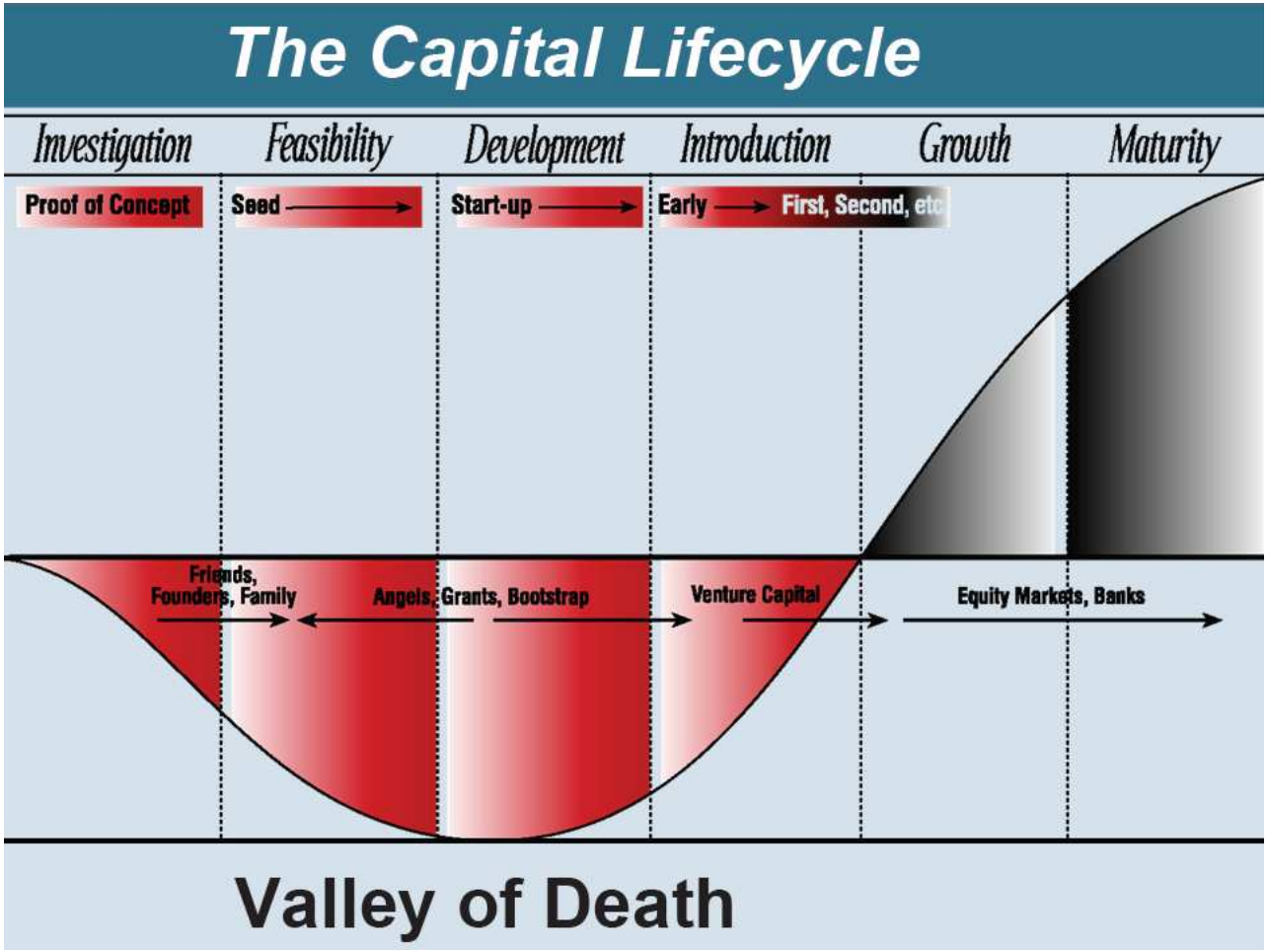
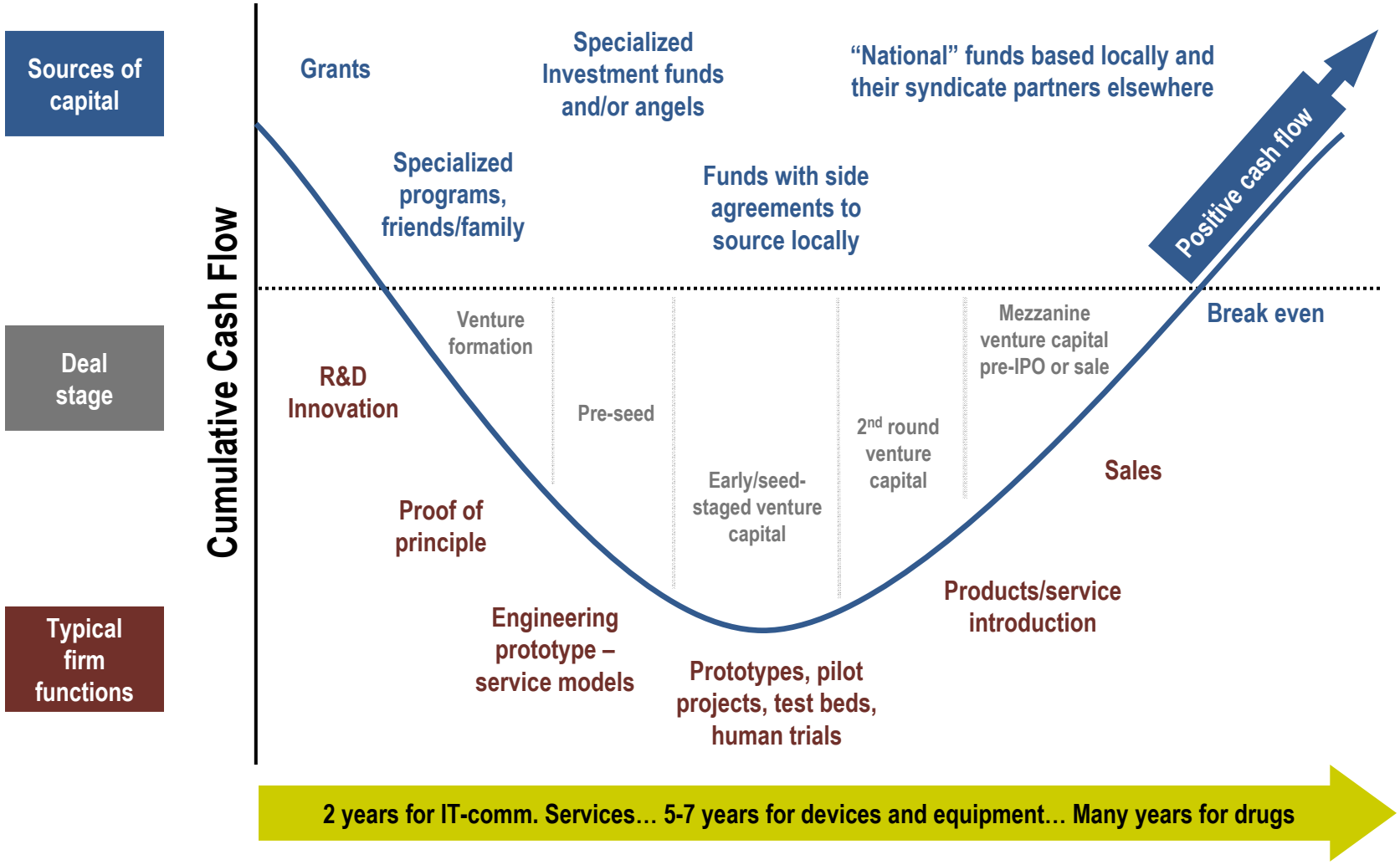
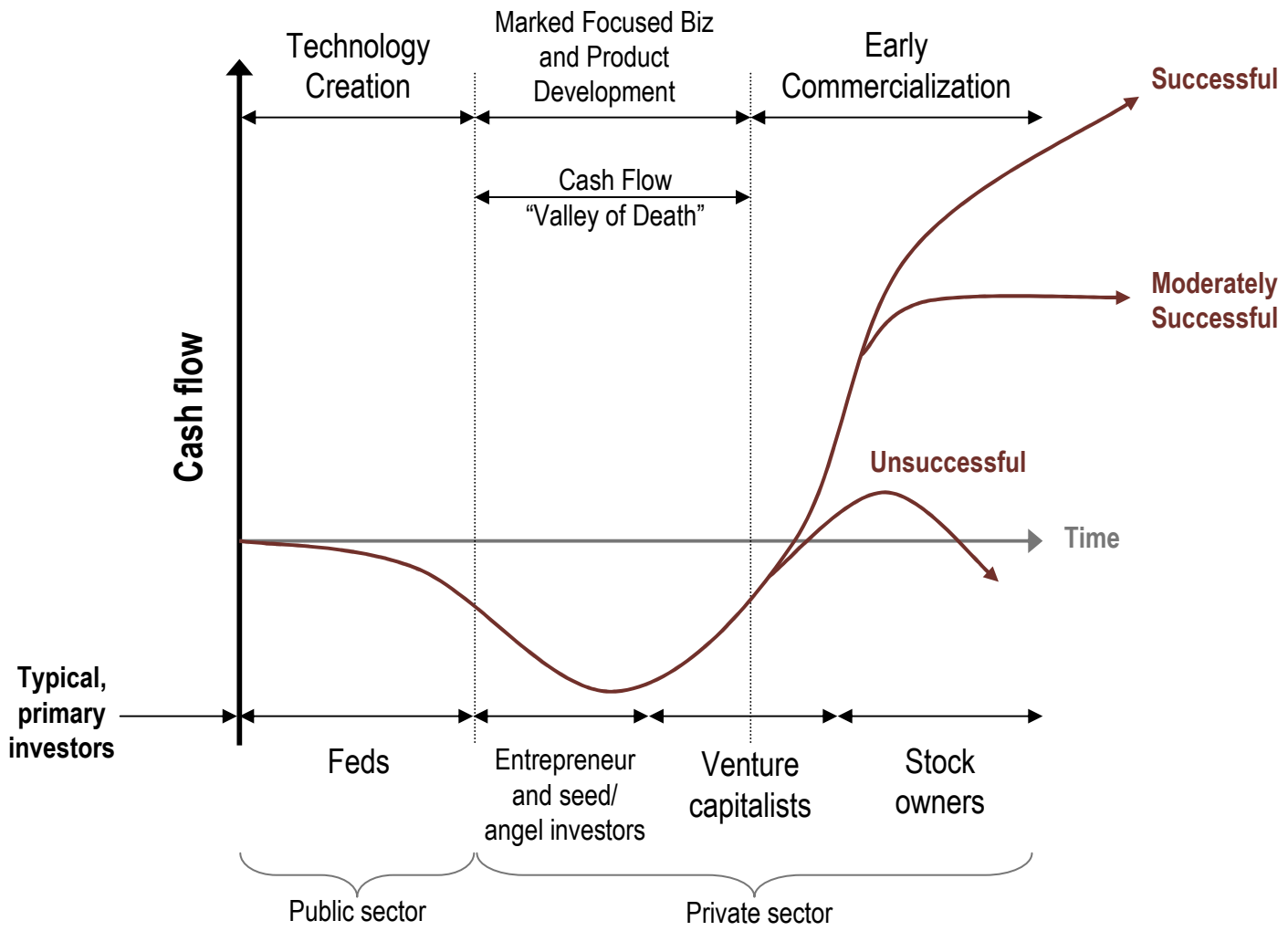
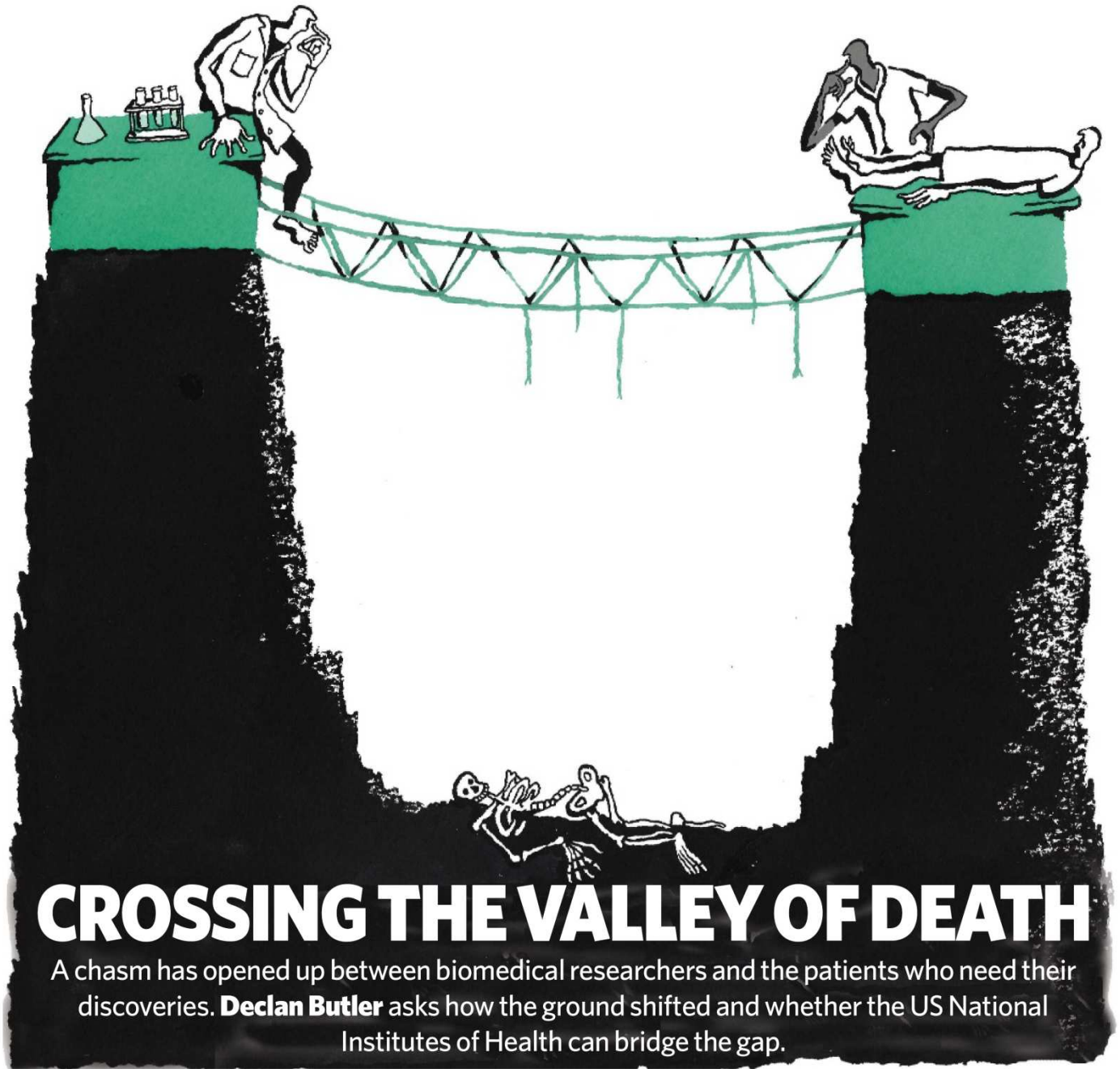


Research Discoveries: "Valley of Death"



The Cash Flow Valley of Death As a Function of Development Stage



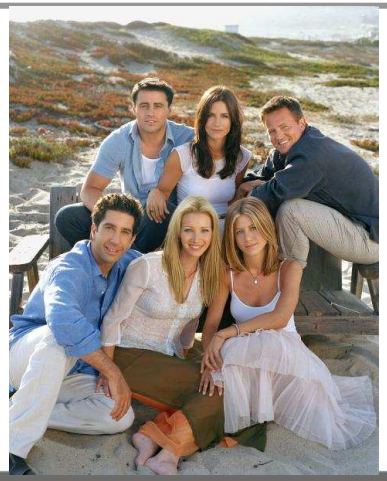


CROSSING THE VALLEY OF DEATH

A chasm has opened up between biomedical researchers and the patients who need their discoveries. **Declan Butler** asks how the ground shifted and whether the US National Institutes of Health can bridge the gap.

Traditional Sources of Venture Capital

Funding Source	Pros	Cons
Friends, Family, Founders, Fools ("Bootstrap")	Easiest to get Quick to decide Non-financial motives	Small investments Low value add
Government grants	Non-dilutive Validation of technology VCs generally favorable	Usual focus on basic studies No value add Restrictions on use



The New Venture Capital Collective

- Venture Philanthropy
- Directed Philanthropy
- Philanthrocapitalism
- Philanthroentrepreneurism
- Creative Capitalism

The New Venture Capital Collective

- New vs. Old Philanthropy
- Engaged Philanthropy
- Strategic Philanthropy
- Effective Philanthropy
- Disruptive Philanthropy

Philanthropic Potential to Fill the Gap

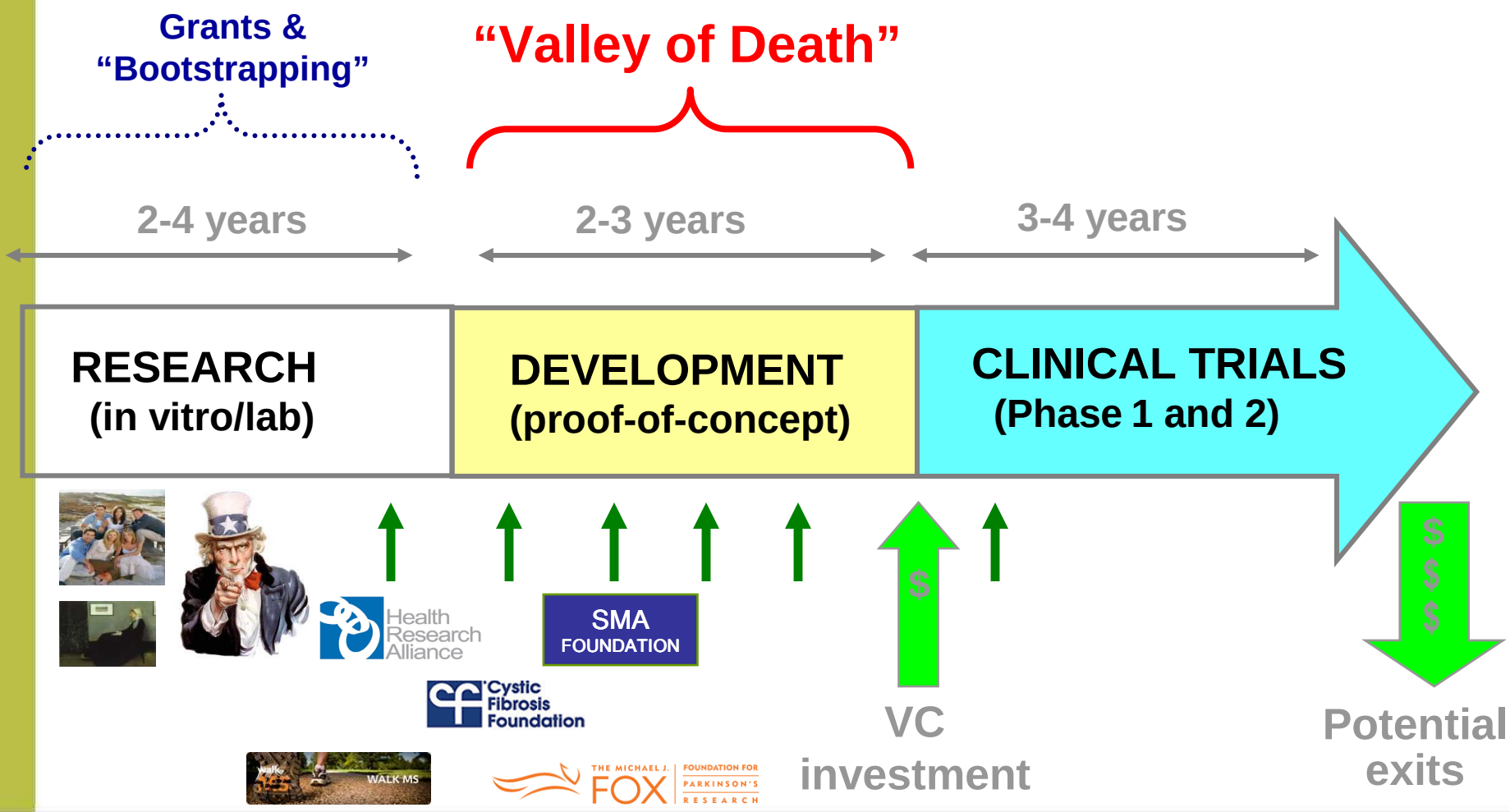
$55 Trillion in the next 40 years

Minding the Gap

Some Interesting New Models for Commercialization Enablement Driven by the New Venture Capital

- Disease-focused Foundations
- Coulter Foundation
- European Commission (EC)
- Organization for Economic Co-operation and Development (OECD) initiatives
- Italian Banking Foundations
- Philanthropreneurs: Asia and U.S.

Venture Philanthropy from the Disease Foundations Can Fill the Gap in Financing



Disease Foundations: Accelerated Commercialization

- Accelerated Brain Cancer Cures
- Adenoid Cystic Carcinoma Research Foundation
- Alzheimer Drug Discovery Foundation
- ALS Therapy Development Foundation
- The ALS Association
- Avon Foundation
- Bill & Melinda Gates Foundation
- Children's Brain Tumor Foundation
- Children's Cause for Cancer Advocacy
- CONRAD
- Cure Huntington's Disease Initiative
- Cystic Fibrosis Foundation
- Dystonia Medical Research Foundation
- Epilepsy Therapy Development Project
- Families of SMA
- Foundation Fighting Blindness
- High Q Foundation
- Huntington's Disease Society of America
- International AIDS Vaccine Initiative
- Juvenile Diabetes Research Foundation
- Leukemia & Lymphoma Society
- Michael J. Fox Foundation for Parkinson's Research
- Multiple Myeloma Research Foundation
- Muscular Dystrophy Association
- Myelin Repair Project
- National Multiple Sclerosis Society
- PATH
- SMA Foundation
- TB Alliance

SAN DIEGO COMPANIES: $64M 2007

Selected Non-Profit Foundations Investing in Industry

Charity (Focus)	Main Forms of Investment	Selected Firms Spun Out or (Co)-Seeded
Cystic Fibrosis Foundation	Royalties; milestone-based grants	
Alzheimer's Drug Discovery Foundation (Alzheimer's disease and cognitive again)	Convertible notes; milestone-based grants	Allon Therapeutics; Zapaq
Juvenile Diabetes Research Foundation	Milestone-driven grants; equity; royalties	
Epilepsy Therapy Development Project	Equity; grants	Marine Pharmaceuticals
Leukemia & Lymphoma Society (blood cancers)	Grants	
Michael J. Fox Foundation (Parkinson's)	Grants; royalties	
Stanley Medical Research Institute (schizophrenia and bipolar disorder)	Grants; equity; royalties	
Blanchette Rockefeller Neurosciences Inst. (Alzheimer's and neurological disorders)	Equity	Neuroscience research Venture Inc.
ABC2 (brain cancer)	Grants	
ALS Therapy Development Foundation (Lou Gehrig's disease)	Grants; equity	Alsgen
Multiple Myeloma Research Foundation	Grants	
Melanoma Therapeutics Foundation	Equity; royalties	Accelerate Cnacer Therapeutics (ACT Biotech)
Families of Spinal Muscular Atrophy	Grants	

Source: ***Venture Philanthropy: The New Venture Capital?*** **Melanie Senior,** ***Start-Up*** **March 2007.**

Coulter Foundation

- IP -> commercial cycle
- Seed capital awards to link faculty to new university commercialization processes
- Biomedical engineering focus
- 9 universities
- $1,000,000/yr, 5 yrs
- 2-3 universities, $10m endowment

OECD and EC Initiatives

- **OECD: New Emerging Research Models for Healthcare Innovation**
- **European Commission:**
  - **Reports from the Committee on Research and Philanthropy**
    - **Sept 2005: "Giving More for Research in Europe: The Role of Foundations and the Non-profit Sector in Boosting R&D Investment"**
    - **Dec 2007: "Engaging Philanthropy for University Research" (note: applied and basic research)**

NOTE:

- **European Forum on Philanthropy and Research Funding is meeting December 2 in Milan.**
- **EU Meeting on Venture Philanthropy is in the planning process**

The Private Foundations of the Italian Banks and Technology Transfer

INTERNATIONAL CONFERENCE
Thursday, February 14th 2008

Exploitation of Scientific & Technological Research

Fondazione Cariplo and partners

Themes

1. The exploitation of scientific & technological research:

   International context analysis

2. An international view on financial schemes for technology transfer funding

3. Analysis of the venture capital in technology transfer in Italy

4. The new Technology Transfer Fund “TT Venture”:

   an innovative financial instrument

The Commitment

- Fondazione Cariplo
- In concert with the foundations of the 17 largest Italian banks
- TT Venture is a closed-end fund with a 12 year term. The Foundations have underwritten 50 million Euros/yr as their initial commitment to TT Venture.
- The Foundations have other investment activities and their traditional philanthropy activities. TT Venture is one of their commitments to Italian R&D, but as today it is the only one with a market approach (for profit).
- Probability of success? U.S. banks?

Philanthropreneurs and Their Foundations

- **Asia:**
  - **Cyrus Tang (China)**
  - **Terry Kuo (Taiwan)**
  - **Ryu Geun-cheol (Korea)**

- **U.S.**
  - **Gates (Buffett)**
  - **Mann**

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- **Philanthrocapitalism**
- **Philanthroentrepreneurism**
- **Creative Capitalism (http://creativecapitalismblog.com)**

IN HIS WORDS | BILL GATES

How to Fix Capitalism

In these tough times, it's easy to forget that during the past century, the world has gotten better. But billions have not been able to benefit from capitalism's miracle. Here's how to help them

BY BILL GATES

creative	+ capitalism
cre·a·tive *adj.* 1. marked by the ability or power to create 2. having the quality of something imaginative	cap·i·tal·ism *n.* 1. an economic system marked by private ownership, in which a free market distributes goods

creative capitalist →

Alfred E. Mann Foundation for Biomedical Engineering

Accelerating the Movement of University IP Towards the Commercial Marketplace

The Alfred Mann Institutes

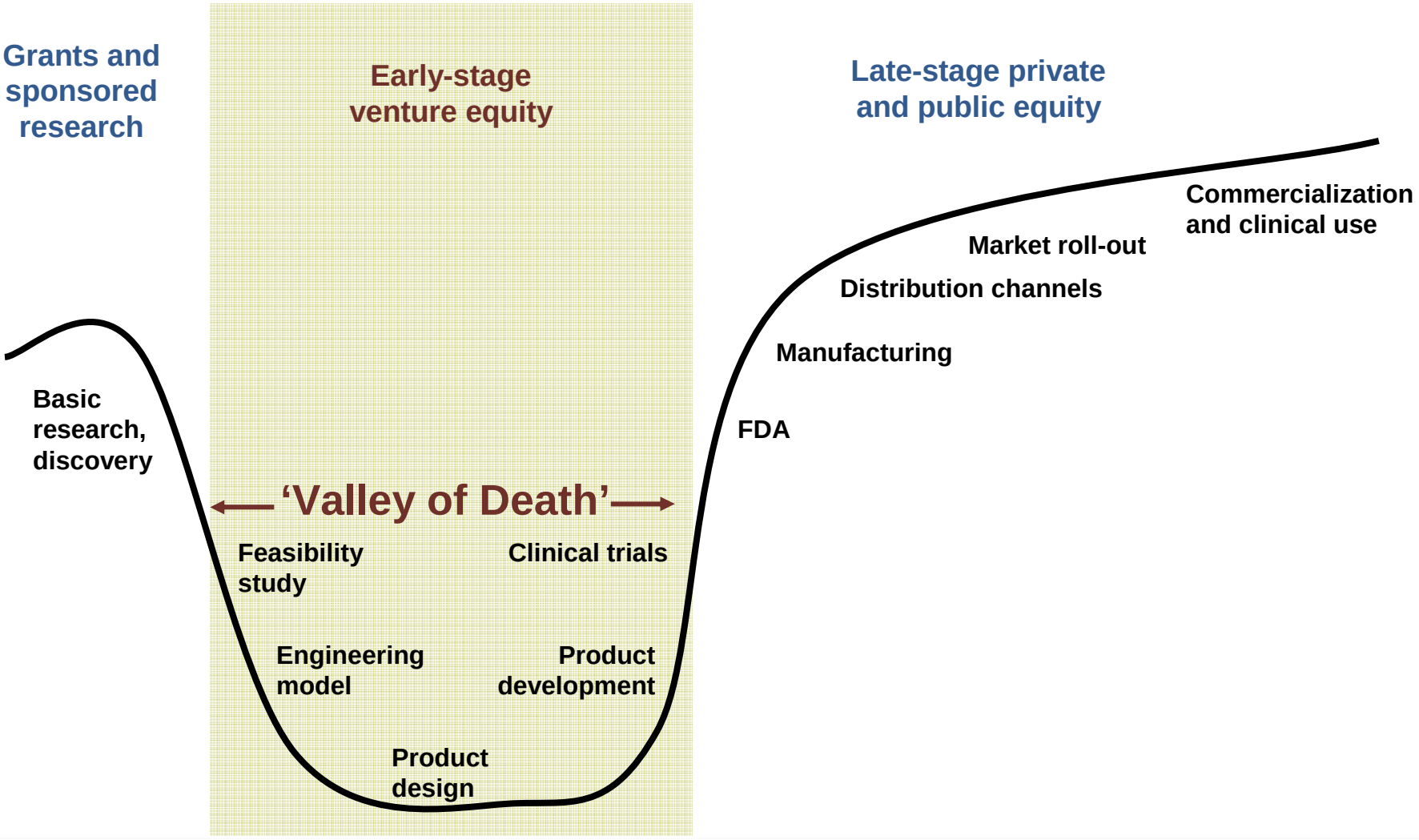
Alfred Mann's vision:

To enhance the flow of university biomedical research of into the stream of commercialization by speeding the transfer of technology.

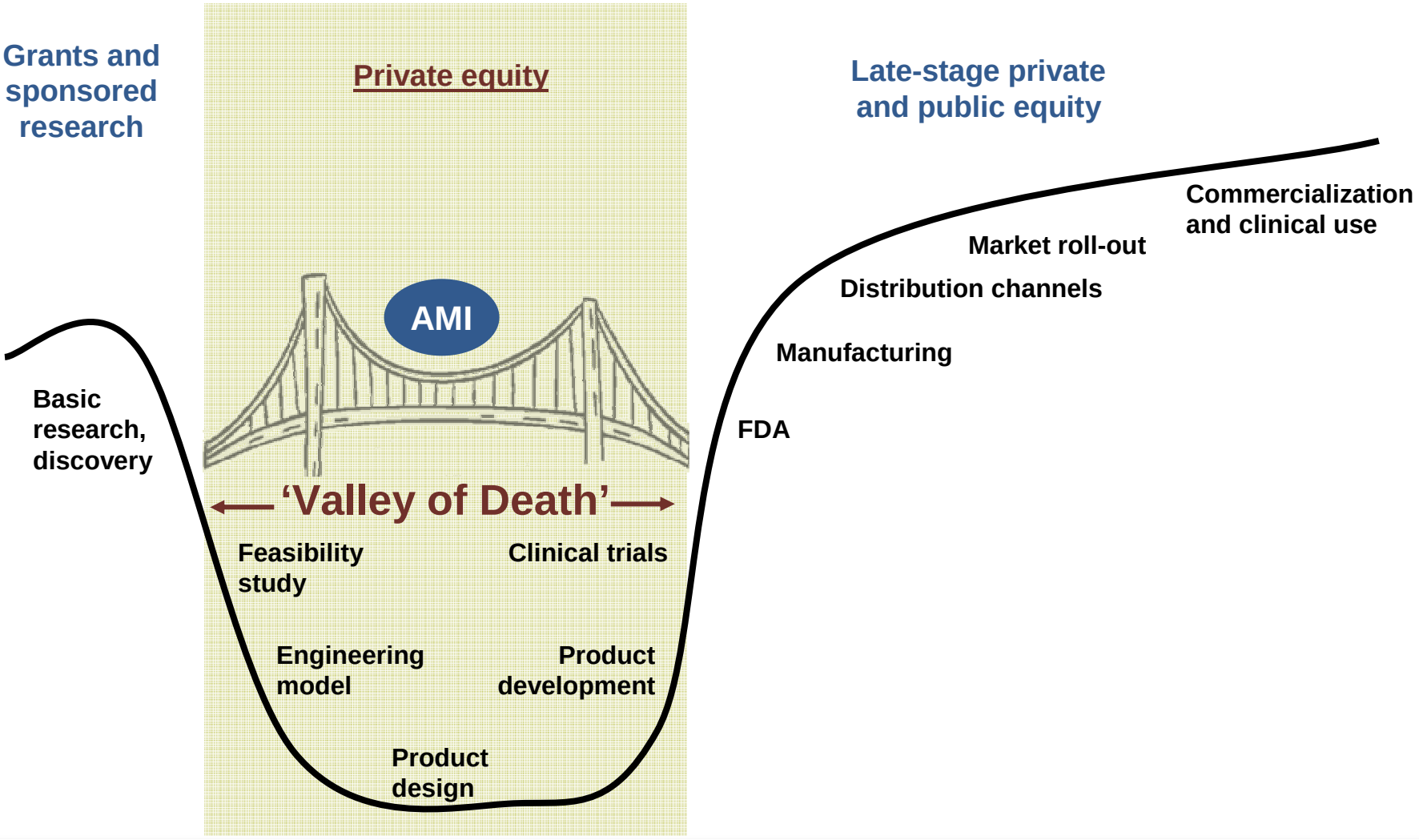
Alfred Mann's plan:

To create 12-15 Institutes for Biomedical Development at elite universities and to provide the financial and business resources to guide the commercialization of promising research…with funding of $150 m to $200 m each. The Alfred Mann Institute at USC is the first of these, followed by the Technion University, followed by Purdue, followed by…..

The Execution Gap: Death or Dearth of Capital?



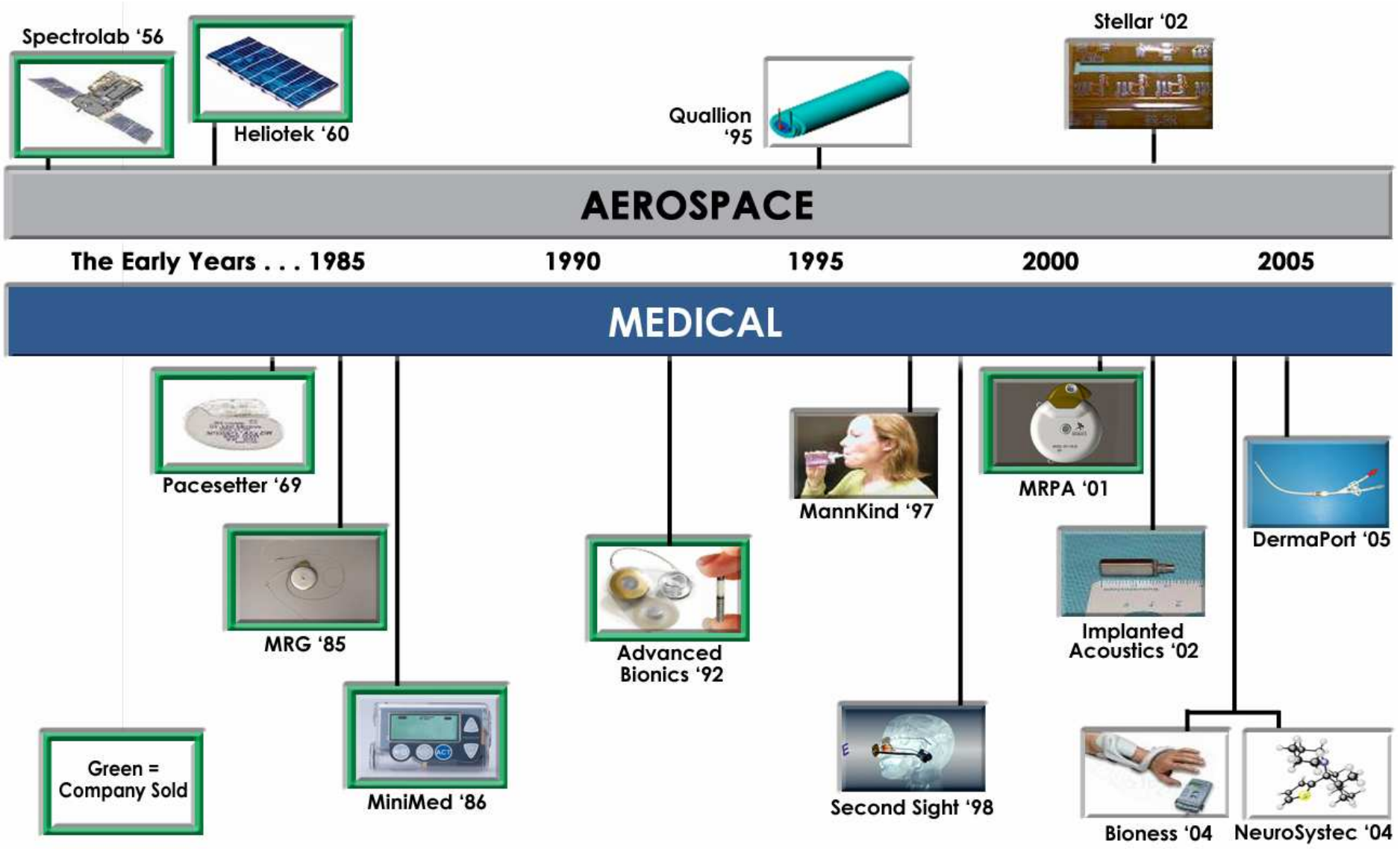
Alfred E. Mann Institutes: A Bridge Across the Funding Gap



Who is Philanthropreneur Alfred E. Mann?

- Alfred E. Mann is an 82 year old serial entrepreneur living in Los Angeles
- He has founded 17 successful biomedical and aerospace companies.
- He has taken two companies public and has sold seven of the companies, earning more than $10 billion dollars.
- 8th most prominent U.S. philanthropist
- 3rd largest U.S. supporter of research outside the U.S.
- Mr. Mann desires to use the vast bulk of his acquired wealth to benefit mankind and has established the Alfred E. Mann Foundation for Biomedical Engineering to manage the distribution of these monies.

Timeline of Alfred E. Mann Companies



What is an AMI?

Alfred E. Mann Institute

A university-based Institute that expedites the development of biomedical technologies to improve human health for later stage private industry transfers.

- **A significant number of universities will be selected to establish an Alfred E. Mann Institute on their campus.**
- **The AMIs are university co-governed**
- **Projects will be selected and funded by undiluteable capital to develop medical devices, pharmaceuticals, and biologics**
- **Substantial value for universities and inventors, and most importantly, the patient, will be created**
- **After value enhancing development, the AMI manages licensing, sale, spinout negotiation at meaningfully higher rates**
- **Philanthropic operations extend into perpetuity under the university umbrella**

What is Next for TT on Steroids?

- 12-15 more Institutes after 8-10 years? How many cycles?
- Mann peer activities?
- International activities?
- Specialized smaller scale projects for colleges or departments or organizations?
- Larger scale projects?
  - Regional AMI's
  - NIH
  - Federal labs
  - AMI Consortium
  - Regional accelerator funds
  - Mann Foundation Development Corporation

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