

# Risk Aware Research - An International Perspective

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*"I'll be happy to give you innovative thinking. What are the guidelines?"*

# The Rise of Venture Capital

- Closed Innovation - going or gone

- In-house
- Vertical integration
- Fueled by monopoly profits



GlaxoWellcome

XEROX.



- Open Innovation - ubiquitous

- Leverage IP developed elsewhere
- Partner with universities, research labs, frenemies
- Fueled by venture capital



# Why has this happened?

Without monopoly, research sponsor can't guarantee exclusive ROI

# Spin-offs



- Good

- HP (1939)



- Fred Terman - 1st industrial park

- Trimble Navigation (from HP - 1978)

- Google (Stanford - 1998)



- Not so Good

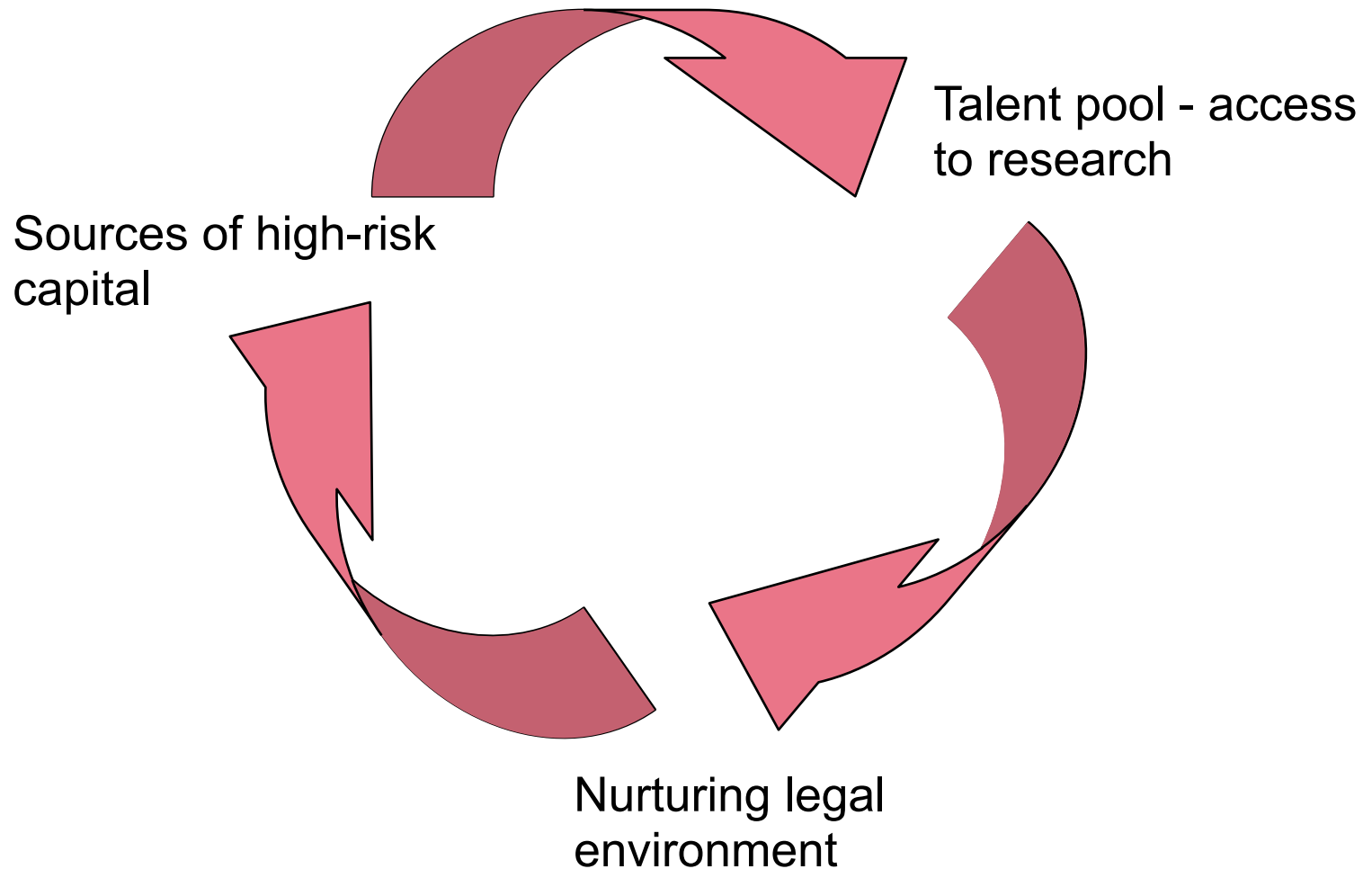
- Mosaic browser (1994)

- Mathematica (1983)



- Never-seen spin-offs from tech giants

# Turning R into D





# Legal environment critical

- California
  - Non-compete agreements not enforceable
- HP
  - Reasonable licensing terms to Trimble
- Fairchild Semiconductor
  - The traitorous 8



# How not to do it

- Tech giants late 90's
- Incubate “spin-offs” from internal research
- Crush the budding entrepreneur
  - Over-value parent's IP
  - Too much parent control
  - Insist on reward cap: that's “our” research asset

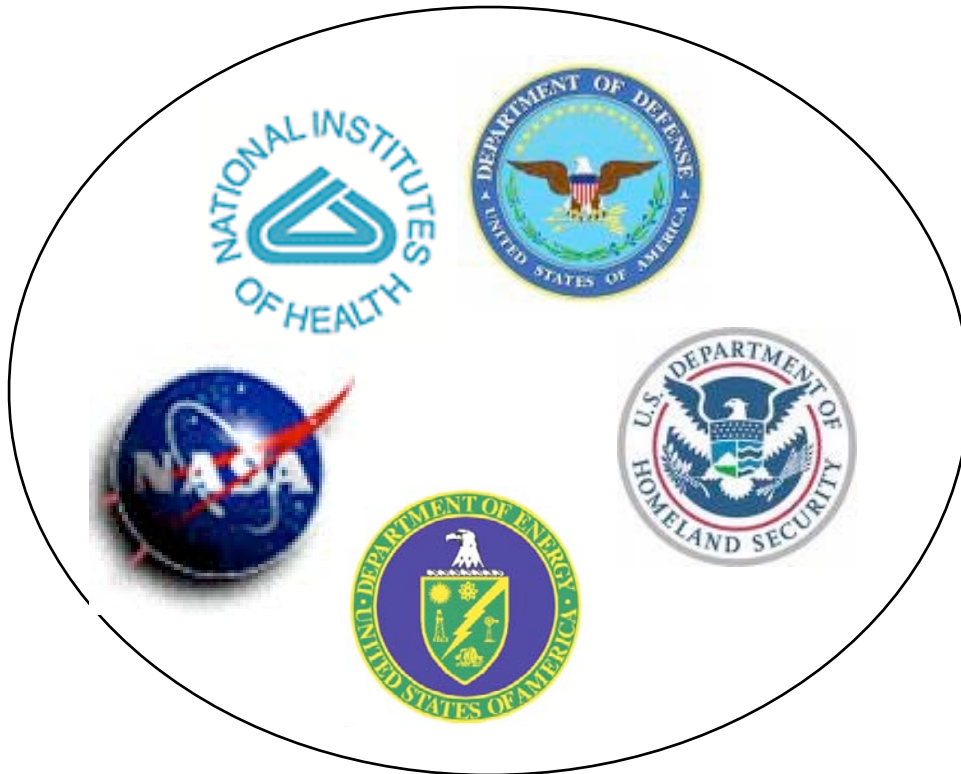
# Risk vs Reward

- Need to enable large upside
- Risk tolerance
  - Differences in temperament between researcher and developer
- Skill sets
  - Ditto
- Robust eco-system vs top-down planning

# Government Research

Mission Driven - \$\$\$

Discipline Driven - \$

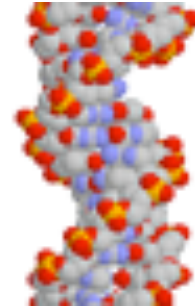


Targeted  
Applied  
Risk-averse

Unfettered  
Basic  
Risk-oriented

# US Biosciences Funding Gap

- Physical science windfalls for biology
  - Protein X-ray crystallography
  - NMR
  - CT Scans
- Often unexpected and long-term benefit
- Decline in deep innovation closes off these opportunities

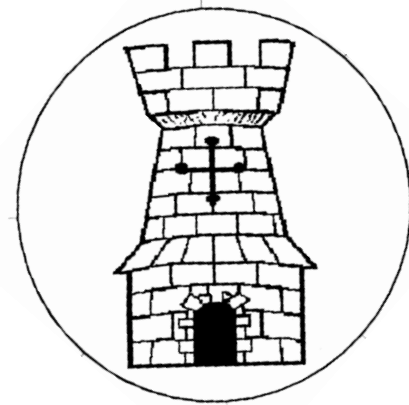


*Discovery and innovation are to some extent taking place in spite of, rather than because of, the current policies and practices of major biomedical funding agencies.*

Tom Cech, 2005  
Chemistry Nobel Laureate



- Completely overhaul NIH peer review
- Set up NIH-wide funding to support deep innovation
- Bridging the Gap coalition
  - *“bring back the ivory tower”*



# Deep Innovation Funding

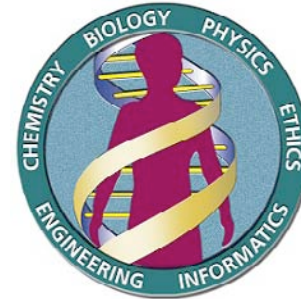
- Pool of set-aside Deep Innovation funds
  - Outgrowth of Pioneer Program
- Short proposals: 5-8 pages
- Independent, arms length review
- Focus on people, not ROI
- Ranking, not scoring
- Broad range of \$\$ and timescales



- Internet - targeted, but not incremental
- Grand Challenges



# Big vs Small



- Driven by Presidential Initiative
- Steak and Sizzle
- Scale preempts cannibalization
- More \$\$\$ raises all boats

# Thanks to

- Prof Ken Dill, UC San Francisco, Pharmaceutical Chemistry
- Peter Norvig, Google Research Director, former head, Computational Sciences, NASA Ames
- Bill Coughran, EVP Google Engineering, former VP, Computing Sciences Research, Bell Labs
- Mark Drummond, Jeff Davitz, SRI/DARPA Program Management
- Charlie Trimble, Founder, Trimble Navigation

JUST BECAUSE AN IDEA IS  
NEW, DOESN'T NECESSARILY  
MEAN IT'S GOOD





# Commercialization Office - Success factors

- Long-term strategy
- Not expected to be profit center short-term
- Generous licencing terms
  - Costs little in \$\$ resources
  - Shortens odds of success
  - Encourages other entrepreneurs
  - Generates a cultural critical mass of “altruism”

# Tech Transfer

- Eco-system of people with different interests and skills
- Pool of results from high-risk research
- Some ideas are selected for development by “entrepreneurs”
- Darwinian selection
- One or two work out!



- HPCC: An early “risk-tolerant” portfolio - 1993
- NASA: 6 Grand Challenges
  - Astrophysics, atmospheric modeling,...
  - Knowledge Discovery in Geophysical Databases
    - Novelty risk
    - Datamining research at NASA
    - Applications in Business Intelligence, information retrieval, ....
- Round 2 - lost nerve
  - Targeted, incremental metrics (Gflps/sec)
  - No further innovation