Catalyzing an Innovation-Entrepreneurship Ecosystem:
The Faculty Perspective

The SuperGs

April 7, 2017
The Challenge

• Characteristics of a strong innovation ecosystem
• Opportunities for catalyzing innovation – entrepreneurship
• Recommendations for fostering and sustaining a strong entrepreneurial ecosystem
• Unique role for the CCTSI
Perspectives

- Patti Davies, PhD, CSU
  - Associate Dean, Health & Human Sciences
- Eric Lavonas, MD, Denver Health
  - Emergency Medicine, Medical Toxicology
- Cecilia Low Wang, MD, CU-AMC, CPC
  - Endocrinology/Diabetes, Clinical Trials
- Pam Peterson, MD, MSPH, Denver Health
  - Cardiology, Outcomes Research
- Elaine Scallan, PhD, CSPH
  - Food Safety, Public Health Training
- Lisa Schilling, MD, MSPH, CU-AMC
  - Co-Director, Data Science to Patient Value Initiative
- Eric Schmidt, MD, CU-AMC & Denver Health
  - Critical Care Medicine
All NIH research grants awarded, 2004-2013

Bayh-Dole Act was designed to facilitate the commercialization of federally funded research by encouraging cooperation and collaboration among government, industry, and academia.

Accordingly, the Bayh-Dole Act provided a uniform policy concerning the ownership of federally funded research. Under this law, universities and other non-profit organizations are allowed the option of retaining ownership of inventions made under the auspices of federal funding. Under the provisions of the Bayh-Dole Act, universities are also permitted to seek commercialization through exclusive licensing agreements with the private sector.

In addition to these rights, universities and other non-profits also incurred certain obligations under the Bayh-Dole Act. These obligations pertain to inventions conceived or developed under federal grants and include requirements of timely disclosure, election of title, and patent filing.
Who Owns Academic Products of Value?

University of Colorado Denver

Fiscal Policy

Title: Distribution of Technology Transfer Income
Effective Date: January 14, 2004
Replaces: N/A

Applies: Anschutz Medical Campus

A. Introduction

The net receipts from technology transfer will be distributed 25% to the discoverer(s), 25% to the University to support the discoverer's research, 25% to the University and 25% to the campus Chancellor. The CU Policy provides that the Chancellor establish the individual campus policy for any allocation of the 25% designated for the campus. This policy addresses the way in which the 25% allocated the campus Chancellor will be handled for the University of Colorado Denver (UCD). It is the responsibility of the CU System Technology Transfer Office to work with the UCD Budget Office to make distributions of Chancellor’s portion of intellectual property income consistent with this policy. This policy applies to the distribution of the UCD Chancellor’s portion of net receipts from intellectual property. In this policy, "net receipts" means all financial consideration received by the University or its agent from the transfer, license, development, or commercial exploitation of the intellectual property, less all unreimbursed legal expenses.

B. Policy
Who Owns Academic Products of Value?

- 25% to the discoverer(s)
- 25% to the University  
  - “To support the discoverer’s research”
- 25% to the campus Chancellor
- 25% to the University
Who Owns Academic Products of Value?

- 35% to the discoverer(s)
- 10% to the Department or College
- 15% to the University VP of Research
- 40% to the CSU Research Foundation
## Hypothetical $2M Discovery

<table>
<thead>
<tr>
<th>School</th>
<th>Discoverer</th>
<th>Lab</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UT - Southwestern</td>
<td>$1,000,000</td>
<td>$250,000</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Syracuse</td>
<td>$850,000</td>
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<td>$850,000</td>
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<tr>
<td><strong>Colorado State</strong></td>
<td><strong>$700,000</strong></td>
<td></td>
<td><strong>$700,000</strong></td>
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<tr>
<td>Tufts</td>
<td>$720,000</td>
<td></td>
<td>$720,000</td>
</tr>
<tr>
<td>Hopkins</td>
<td>$700,000</td>
<td>$300,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Ohio State</td>
<td>$678,025</td>
<td></td>
<td>$678,025</td>
</tr>
<tr>
<td>Harvard</td>
<td>$595,000</td>
<td>$255,000</td>
<td>$850,000</td>
</tr>
<tr>
<td>Michigan</td>
<td>$580,000</td>
<td>$414,000</td>
<td>$994,000</td>
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<tr>
<td>USC (Stevens)</td>
<td>$566,000</td>
<td></td>
<td>$566,000</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td><strong>$500,000</strong></td>
<td><strong>$500,000</strong></td>
<td><strong>$1,000,000</strong></td>
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Gross licensing income from life sciences - 2014

FY 2015. 202 of 308 institutions surveyed
169 universities, 31 teaching hospitals and research institutions, 1 third-party technology investments firm, 1 national laboratory
Gross licensing income: $2.5 billion
Local Landscape

**CU**: as of July 2015
- 126 active companies created based on CU IP

**CU–Anschutz**: since 2002
- >1900 patent applications filed
- 53 companies formed

**CSU**: 2015
- Researchers filed 92 invention disclosures
- 49 patents issued
- 43 agreements to license technologies
The challenge

We could be doing better.

Our team’s approach:
- Environmental scan
- Interviews with leaders in entrepreneurship
- Survey of faculty about entrepreneurship
## Innovations in Entrepreneurial Ecosystems

<table>
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<tr>
<th>Institution</th>
<th>Features</th>
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<tr>
<td>MIT</td>
<td>● Concise policies, inflexible by design - not bogged down in costly negotiations</td>
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<td>● Culture - everybody does it, model success</td>
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<tr>
<td>U North Carolina</td>
<td>● Focus on high payoff technology and entrepreneurial faculty,</td>
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<tr>
<td></td>
<td>● Negotiation/contracting toolkits,</td>
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<td></td>
<td>● Faculty mentorship,</td>
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<td></td>
<td>● Pilot various academic-industry models of collaboration</td>
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<tr>
<td>U Minnesota</td>
<td>● Faculty entrepreneurship leaves - up to 1 yr</td>
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<td></td>
<td>● Different licensing models - pay to try it out, sponsored research for exclusive IP rights</td>
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<tr>
<td>U Utah</td>
<td>● Focus on spin-off/start-up over licensing - averages over 20 startups/yr</td>
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<td>● Applied research focus</td>
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<td>● Entrepreneurship training across the ecosystem</td>
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<td>● Dedicated center for student innovation &amp; entrepreneurship</td>
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Interviews with Entrepreneurship Leaders

Who we spoke with:
- David Charron, Haas School of Business, UC Berkeley
- Philip Payne, Director, Institute for Informatics, WU
- Elaine Morrato, Program Director, I-Corps @ CCTSI
- Kimberly Muller, Director of Technology Transfer, CU AMC
- Faculty entrepreneurs and innovators at CU and elsewhere

What we heard:
- Create “culture” of entrepreneurship
  - With the institution
  - Among faculty
- Support innovators, entrepreneurs
  - Reduce institutional barriers (e.g., promotion)
  - Provide needed resources and university systems
  - Connect faculty with mentors
• 100 faculty surveyed
  ○ 32% response rate

SURVEY PARTICIPANTS: "JOBS"
- Faculty: basic science
- Faculty: applied science
- Faculty: clinician
- Post-doctoral fellow
WHAT WOULD INSPIRE YOU TO DEVELOP AN INNOVATIVE IDEA?

- Innovation will uncover new sources of funding, protected time 38%
- Encouragement by role models 4%
- Opportunity to develop leadership, infrastructure 10%
- Inner motivations/personal satisfaction 10%
- Promise of diversifying my academic endeavors 7%
- Innovation aligns well with clinical mission/research goals 31%

WHAT BARRIERS DISCOURAGE YOU FROM INNOVATING?

- No ideas on what to do 6%
- No funding or time 31%
- Concern for conflicts of interest 6%
- Impenetrable University bureaucracy 39%
- No incentive/ too many institutional disincentives 18%
Engage faculty by promoting gains and minimizing pains

**GAINS:**
- Clinical/research interests
- Personal satisfaction
- Funding

**PAINS:**
- University bureaucracy
- Lack of incentives
- Career risk

Value Proposition Analysis
Actionable challenges to entrepreneurship

Risky and knowledge about the process is not innate
   Need: create a culture of innovation and invest in training

Not aligned with what is important to faculty
   Need: change incentives

Pathway feels impenetrable
   Need: clarify guidelines, invest in infrastructure
Solutions to Creating a Culture for Innovation-Entrepreneurship
"Behind one door is tenure - behind the other is flipping burgers at McDonald's."

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Recommendations

- Time
  - FTE “buy-down”, sabbaticals
- Education/training
- Rapid feedback on ideas
  - Repository of ideas and potential investors
- Incentivize
  - Incorporate into promotion-tenure structure
  - Time (opportunity costs for not doing other valued activities)
- Clarify the pathway through existing infrastructure and advertise
- Update faculty policy
Acknowledgments

- CCTSI – LIteS program
  - Judith Albino, PhD
  - Susan Johnson, PhD
  - Galit Mankin, MSW
- Elaine Morrato, PhD
- CCTSI Grant: NIH/NCATS Colorado CTSA Grant Number UL1 TR001082-04
Current Resources

CU Innovations - UCHealth & Children’s Hospital Colorado (???? need details)

CU Tech Innovation

CCTSI - I-Corps - team of 2-3 people, 3-week short-course of NSF long-course, 30 potential customers with whom you discuss your team’s idea, develop the value proposition and a business hypothesis

CCTSI - Innovation & Entrepreneurship Core

CSU – Team Science training and evaluation; CSU Ventures; Hackathons; Biomedical Engineering interdisciplinary program; Catalyst Innovation Internal grants (200K across 2 years)
CCTSI Innovation Ecosystem

Accelerating
- Launch
- AMC Accelerator
- Pitch Competitions
- Incubating
- Vetting

Opportunity Identification
- Idea Generation and Team Formation

Fundamentals
- Entrepreneurial Education Curriculum and Culture

Dept Bioengineering Pitch Night
CU Innovations Fellows
BEST (www.nihbest.org)
Jake Jabs Center for Bioentrepreneurship

CU Innovations
Children’s Hospital Colorado
UCHealth
PRIME Health Challenge
Jake Jabs Business Plan Competition
CID4 501c3
CU Innovations EIR

Nat’l I-Corps (@NSF, SBIR)
I-Corps@CCTSI (@NCATS)
NSF I-Corps Site@CSU?

Adapted from E Morrato
Recommendations

- **Time**
  - Create time for innovation-entrepreneurship
  - E.g. “buy out” time, allow sabbaticals

- **2. Education**
  - for faculty regarding innovation-entrepreneurship

- **3. Environment**
  - incentivize innovation-entrepreneurship
  - Incorporate into promotion-tenure structure
  - Update faculty policy