How Clean Tech Entrepreneurs Can Leverage UC Berkeley Technology Commercializing Opportunities

CTO Matching Event
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Michael Cohen
UC Berkeley
Office of IP & Industry Research Alliances
mcohen@berkeley.edu
510-643-7201
Agenda: ~15 Min Presentation, Then Q&A

- Last year’s CTO matching event: Tech, Team, Training
- This year:
  - Overview of 4 Pathways for Commercializing Univ Tech
  - Advice for Tapping into the Commercialization Pathways
  - Q & A, and also any feedback on improving opportunities

- FY08 facts about UC Berkeley start-ups & green tech:
  - Established IP rights agreements with 27 corps including 14 start-ups
  - Of the 14 start-ups, 50% were focused on green tech or sustainability
Commercialization: *Pathway Framework*

- How do university innovations get commercialized?
- What catalyzed the commercialization?
- How is UC Berkeley involved in the process?
- Researched dozens of spin-outs
- Spin-out profiles formed 4 clusters
- Here’s useful (but simplified) framework…
Commercializing: 4 Pathways for Univ Tech

**Pull**
The extent that companies drive the transition from research to product

**Push**
The extent that universities drive the transition from research to product

- **High**
  - **Milked**: Systematically out of research by corporate collaborators
  - **Mined**: Opportunistically by entrepreneurs (e.g. MBA students) that periodically scour campus
  - **Morphed**: Organically out of research by team member(s)
  - **Marketed**: Methodically to industry by campus (e.g. PI, PR, IPMO, etc)

- **Low**
Commercialization: **Morphed**, Mined, Milked, Marketed

- **Examples:** Amyris, Calimetrics, CaliSolar, CellASIC, Chiron, Excellin, Fluxion Biosystems, GoodGuide (TaoIt), Harmonic Devices, Inktomi, Integrated Diag, IntelliOne, Kalinex, Lumiphore, Mercator Med (EndoBionics), MicroClimates (Aptility), MicroFluiDX, OnWafer, ON Diagnostics, PhotoSwitch Bioscience, Redwood Bioscience, SiClocks, TheraFuse, Urban Scan, Verimetra Med, Wireless Industrial Tech, Dust Networks, Iris AO, SiTime

- **Drivers:**
  - Great Research
  - Entrepreneurial culture & eco-system

- **IP:**
  - Some obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP

Organically out of research by team member(s)
Commercialization: *Morphed, Mined, Milked, Marketed*

- **Examples (that licensed IP):**
  - Analog Devices, *Ecoprene* (XL Tech), Google, Honeywell, Intel, Berkeley Bionics (first morphed then milked)

- **Drivers:**
  - Great sponsored research with optimized terms (i.e. 1st access, NERF, open source, etc)
  - Off-campus corporate labs (i.e. BWRC, Intel, Cadence, Yahoo, Starkey, etc)

- **IP:**
  - Some jointly own IP
  - Some obtain a license to legally use IP or thwart competitors
  - Some ignore or abscond with IP

- **Milked**
  - Systematically out of research by corporate research sponsor
Commercialization: *Morphed, Mined, Milked, Marketed*

- **Examples**: Arkal Medical, Cisco, ClimateCooler, FuelFX, Luminus Devices, Honeywell, Microchip Biotech, Renovis, Silicon Basis, Solexel, Vitesse, 3M

- **Drivers**:
  - Great Research
  - Marketing (i.e. IP Licensing offices, University PR programs, Faculty pubs & ppts, Patent pubs, etc)

- **IP**:
  - Most obtain exclusive license to stay legal, improve BP, attract investment, or thwart competitors
  - Some ignore IP or abscond with IP

- **Comments**: Didn’t get *morphed, milked* or *mined* because tech or market too nascent when invented
Commercialization: *Morphed, Mined, Milked, Marketed*

- **Examples:** Adura Tech, Aurora Biofuels, CommandCAD, Euclid Media, MediFuel, NanoRay, nanoPrint
- **Drivers:**
  - Great Research
  - MBAs, Biz plan comp, OTL mrktg
- **IP:**
  - Many obtain exclusive license to improve biz plan & attract investors
  - Some ignore or abscond with IP
- **Comments:**
  - Pathway with highest growth rate
  - MBAs are the campus’ s EIRs
Tapping Pathways: Your Role

- Founder or Early Employee

- Founders
  - Mine for start-up opportunities (in addition to providing ongoing value)
  - Founding is more challenging, but offers more control of the start-up

- Early employees
  - help already-established start-ups grow & succeed
  - Early employee still ground-floor opportunity, but requires less initiative
Tapping Pathways: Resources

- **Founder** of team & spin-out based on university innovation
  - Available IP: IPIRA.berkeley.edu “Available Technology”
  - Research Interests: Research.Chance.berkeley.edu ‘Faculty Research’
  - New Discoveries: CITRIS-UC.org/research/energy_and_environment
  - Nanotech club, biotech club, etc: search www.berkeley.edu
  - LBL EETD noon-time seminars EETD-Seminar@dante.lbl.gov

- **Early employee** of start-ups recently spun-out of research
  - Berkeley Energy & Resources Collaborative BERC.berkeley.edu
  - Bears Breaking Barriers, Big Ideas marketplace: BigIdeas.berkeley.edu
  - Haas Lester Center forums Entrepreneurship.Berkeley.edu
Partial List of Start-ups:

This is a list of the over 100 start-ups that have leveraged UC Berkeley intellectual property rights (i.e., patentable inventions and copyrightable software) since about the mid 1990s. These start-ups have used UC Berkeley's intellectual property (IP) rights to strengthen their business plans and thereby improve their prospects for obtaining the venture capital or other funding needed to pursue the commercialization of Berkeley innovations.

Note that this list does not include the numerous start-ups that have commercialized UC Berkeley innovations but did not leverage any UC Berkeley IP rights (because the innovations don't have associated IP rights).

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<tr>
<th>Acacia Biosciences</th>
<th>DNA Sciences</th>
<th>Lumiphore</th>
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<td>Silicon Basis</td>
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<td>Fluxion Biosciences</td>
<td>MicroReactor Systems</td>
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<td>Fuel FX</td>
<td>Mimesyn</td>
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<td>Berkeley Madonna</td>
<td>Genocea Biosciences</td>
<td>Modulus Video</td>
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<td>Berkeley Microinstruments</td>
<td>Goodguide</td>
<td>Molecular Dynamics</td>
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<td>Harmonic Devices</td>
<td>MOR Innovations</td>
<td>Solidus Biosciences</td>
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<td>Heath Interactive</td>
<td>NanoNerve</td>
<td>SpectruMedix</td>
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<td>Bioscale</td>
<td>HFTA</td>
<td>NanoRay</td>
<td>Stressmark Biosciences</td>
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<td>Nanosys</td>
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<td>NanoVasc</td>
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<td>Iris Micromedical</td>
<td>ON Diagnostics</td>
<td>Two Blades (Foundation)</td>
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<td>Kalinex</td>
<td>Photoswitch Biosciences</td>
<td>Wireless Industrial Tech</td>
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<td>KineMed</td>
<td>Preference Metrics</td>
<td>Xenometrix</td>
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<td>Leucadia Technologies</td>
<td>Protiveris</td>
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<td>Librarria</td>
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<td>Discera</td>
<td>Light Stage</td>
<td>Quadrant Imaging</td>
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Comm Pathways & How to Tap

- Key points
  - 4M pathways: morphed, mined, milked, marketed
  - Founder or Early Employee
  - University resources

- Q&A

- [http://IPIRA.berkeley.edu](http://IPIRA.berkeley.edu)

- Michael Cohen; mcohen@berkeley.edu
Leveraging IP: Segmenting Innovations

Potential **Return** on Investment

*Note that some technologies can be applied to multiple markets that each have their own risk/return profile*

High                   Low

Low                   High

**Commercialized UC Berkeley Innovations**

**Orphaned UC Berkeley Innovations**

Risk of Investment Required to Try to Commercialize Technology
Licenses: *Primary Motivations (3R²)*

**Potential Return on Investment**

- **High Return**
  - License to REWARD RESEARCHERS
    - Can motivate researchers to continue innovating
    - Exclusive or non-exclusive with or without field-of-use demarcations
  - License to REMOVE RESTRAINTS
    - Non-exclusive, royalty free
    - Public domain
    - Open software
  - License to RAISE RETURNS
    - Improve biz plan & attract investment
    - Power to exclude competitors
    - Freedom to operate without infringement

- **Low Return**

**Risk of Investment Required to Try to Commercialize Technology**

- **High Risk**
- **Low Risk**
Licensing:  *Common Steps*

- **Objectives:** commercialize IP broadly, quickly, beneficially
- **Challenges**
  - Manage uncertainty & risk of commercial success
  - Understand & reconcile different perspectives (corps, inventors, univ)
- **Approach**
  - Entrepreneurial (flexible, creative)
  - Principled (win-win)
  - Transparent (no conflicts of interests)
- **Process:** *Incremental*
Licensing: Managing Risk

Risks decrease as technology is developed into products
Licensing: \( \text{Commitment} = f(\text{Risk}) \)

Partner Commitment

Commitment incrementally increases as risk decreases

Common Steps

- Issue Fee (& equity)
- Earned Royalties
- Min Annual Royalties
- Indemnification
  - + below

- Annual Fee
- Diligence Terms
  - + below

- Confidential Agreement
  - + below

- Comm Plan
- Patent Costs
  - + below

- Annual Fee
- Diligence Terms

Market IP
- Evaluate Opportunity
- Letter Agreement
- Option Agreement
- License Agreement

UC Berkeley Innovation Commercialization
Licensing: Complexity

- Relationship Complexity

- Complexity incrementally increases as commitments increase & risks decrease

- Market IP
- Evaluate Opportunity
- Letter Agreement
- Option Agreement
- License Agreement

- Common Steps (simplified)

- 1-Page Doc
- 2-Page Doc
- 3-6 Month Term
- 10-Page Doc
- 1-2 Year Term
- If no extraordinary issues, then can be completed in 30-60 days
- 30-Page Doc
- Patent Life is Term
- If no extraordinary issues, then can be completed in 30-90 days

If no extraordinary issues, then can be completed within 30 days
Research: Integrating Research & IP

**University:**
- Typically give time-limited exclusive access…
- To establish a LOI, option or license

**Ours:**
- Each owns undividable interest in IP rights
- You can license UC interest to get exclusive
- Otherwise UC is free to license

**IP Owned by UC**
From SR

**IP Owned by Corp X**
From SR

**IP Jointly Owned by Corp X & UC**
From SR

**IP Owned by Corp X**