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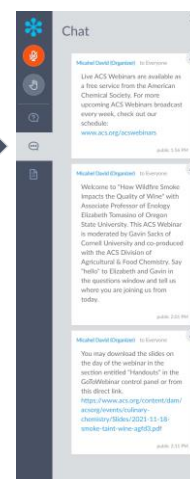
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2

2



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4



A science podcast by the American Chemical Society about things small in size but BIG in impact.



Sam Jones, PhD
Science Writer & Exec Producer



Deboki Chakravarti, PhD
Science Writer & Co-Host

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6

A Career Planning Tool For Chemical Scientists



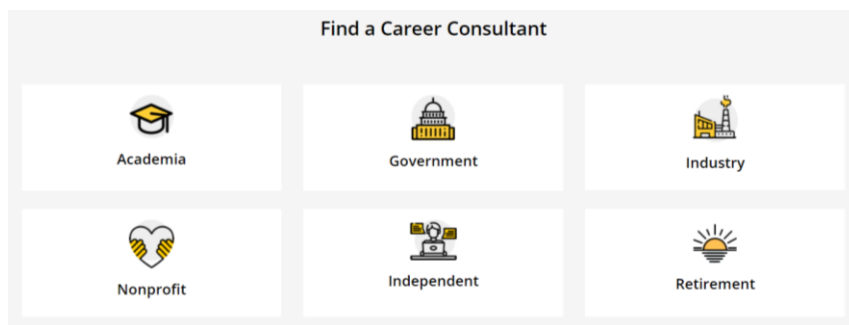
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7

7

Career Consultant Directory

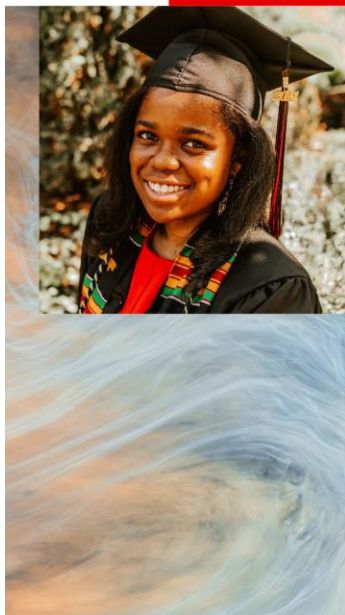


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8

8



ACS Scholar Adunoluwa Obisesan

BS, Massachusetts Institute of Technology, June 2021
(Chemical-biological Engineering, Computer Science & Molecular Biology)

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11

11

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12

12

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13

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14

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15

15



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16

16



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questions window!

17

17



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Starting a Company: The Role of Technology Transfer



MARC SEDAM, MBA

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2015 ACS President and Adjunct
Professor of Chemistry,
University of Cincinnati

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18

18



Technology Opportunities and Ventures

STARTING A COMPANY: THE ROLE OF UNIVERSITY TECHNOLOGY TRANSFER

Marc Sedam
Vice President



19



Background

- TTO leader at NYU, UNH, UNC-Chapel Hill
- Investment advisor
 - NYU internal venture fund
 - Ferocity Capital
- Former Chair, AUTM
- COO, Qualyst
 - UNC-Chapel Hill spinout



20

Role of the TTO

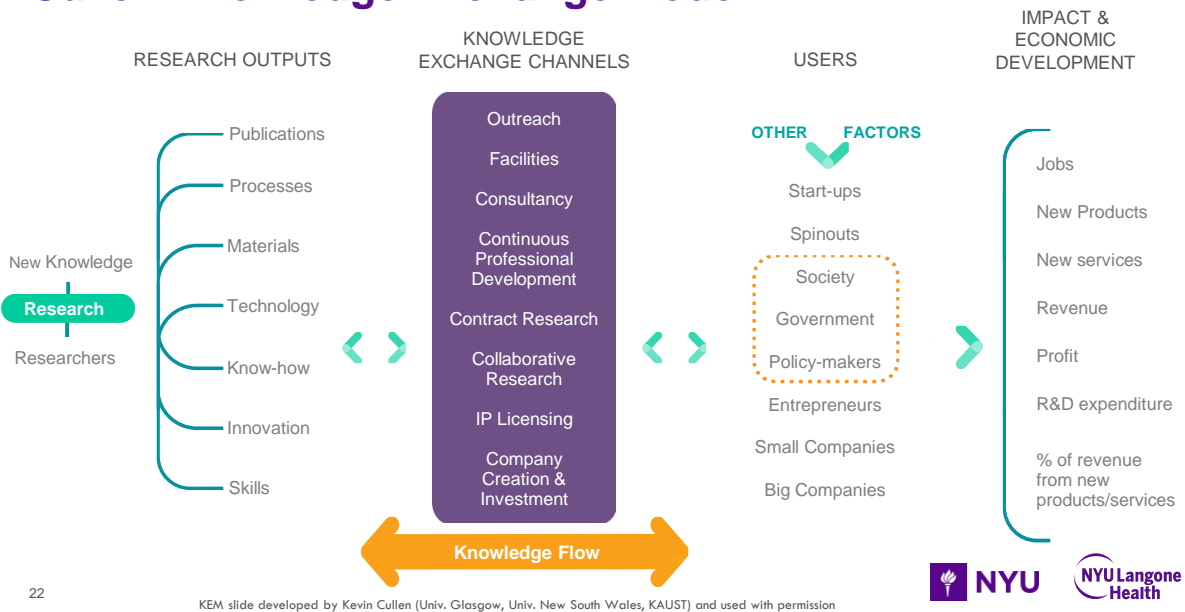
- TTOs are the stewards of institutional intellectual property (IP)
- Goal is to maximize use of the innovation while sharing in the return
 - Value/valuation is always the biggest sticking point
- Every university has different priorities and experiences will be wildly different but the themes should be the same

21 Technology Opportunities and Ventures



21

Cullen Knowledge Exchange Model



22

KEM slide developed by Kevin Cullen (Univ. Glasgow, Univ. New South Wales, KAUST) and used with permission



22

Do Universities Really Know How to Start Companies?

- Increasingly, yes!
- Most TTOs are led by experienced professionals with decades of exposure to licensing and startup formation
- Many staff of TTOs have significant industry experience
- University TTOs have made a meaningful contribution to the US economy

23 Technology Opportunities and Ventures



NYU



23



Audience Survey Question

ANSWER THE QUESTION ON THE INTERACTIVE SCREEN IN ONE MOMENT

Of the over 13,000 university startups reported by AUTM, what percentage of them are still in operation?

- Less than a quarter
- About a quarter to half
- About half to three quarters
- More than three quarters

* If your answer differs greatly from the choices above **tell us in the chat!**

24

24

From 1996 to 2017, up to...

\$1.7 trillion

contributed to U.S. gross industrial output



\$865 billion

contributed to U.S. gross domestic product



5.9 million

jobs supported



420,000+

inventions disclosed...

100,000+

U.S. patents issued...



to research institutions since 1996

6,518

Start-ups Still Operational as of FY2018



13,000+

start ups formed



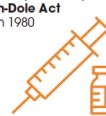
67%

of university licenses are to start-ups and small companies



200+

drugs and vaccines developed through public-private partnerships since Bayh-Dole Act enacted in 1980



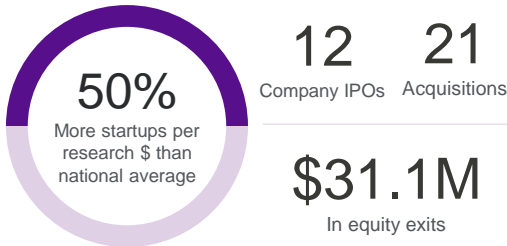
25 Technology Opportunities and Ventures



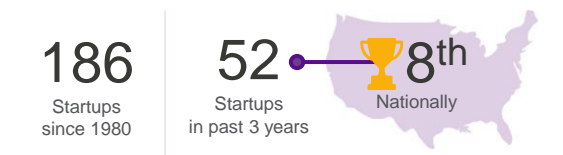
25

History of Success at New York University

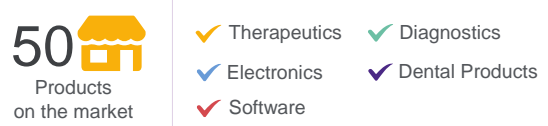
STARTUP ACTIVITY



IP PROTECTION AND LICENSING



SOCIETAL BENEFIT



26 Technology Opportunities & Ventures



26

Top 5 Reasons Universities Do Start-Ups

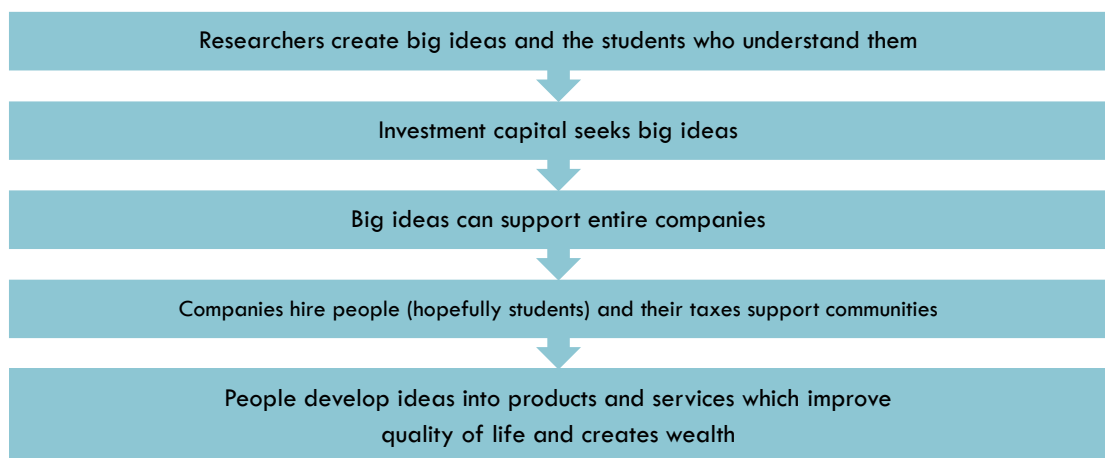
(Lou Berneman, Osage University Partners [retired])

1. Facilitate commercialization of research for the public good
2. Reward, retain, and recruit faculty and students
3. Induce closer ties to industry
4. Promote local economic growth
5. Generate income
 - This is not always last!



27

Why Does This Work So Well?



28

The University Start-Up

- Is the start-up the best way?
- Is the start-up the only way?
- Are the players capable?
 - Repeat offenders
 - Access to capital
- Is there a plan?
- A reasonable chance of success?



29

Is the Startup the Best/Only Way Forward

- University's interest is to license technology to third parties for development
- Many early-stage technologies are too far from the market to merit interest from large players
 - Federal funds pay for the *creation* of knowledge
 - Industry pays for de-risked innovations
- Startups serve as a “translational entity” to bring an idea forward and are frequently the only choice



30

Negotiating the Startup

- Role of researcher and students
- Consideration of other stakeholders
- Value of the opportunity
- License terms
- Diligence requirements
- Access to university programming/resources

Role of the Faculty in a Startup

- Ideal role for faculty is as Chair of SAB or CSO
- Faculty have many conflicts in startups which are heavily managed in universities
 - Conflict of interest
 - Holding stock in startup, receiving income, sponsored research
 - Innovator on IP means a share of university royalty income too!
 - Conflict of commitment
 - Time spent on startup is NOT time spent at the university
 - Overseeing science in the lab AND science in the startup
- Most universities will ask faculty to appoint a third-party to negotiate and many have policies prohibiting faculty taking an active role in license negotiation

Why?

- University is a unique structure where we allow our employees to create other companies and allow them to spend time on it while we pay them
- We don't want our researchers to leave the institution
- Most policies and guardrails are to protect students working with the PI

Other Stakeholders?

- Internal recipients of royalty income
- Graduate students/post-docs doing dissertation on founding science
- Company
- Local economy
- University administration
- Funding organizations

Uncle Sam: The Original Seed Fund

- Bayh-Dole Act (1980) allowed universities to take title to an innovation and promoting the granting of exclusive licenses
- Receipt of federal funds requires an attempt at commercialization
- Ironically, no funds have ever been provided at the Federal level to support technology transfer in universities
 - “The great unfunded mandate”
- All resources to identify, evaluate, protect, and license a technology to you are done through discretionary/budgeted institutional funds

35 Technology Opportunities and Ventures



35

Stakeholder Issues to Consider

- University owns the technology
 - Licensing to a start-up is a discretionary decision
 - Never a “sale” of the technology
- Obligation to funding agency
- Obligation to state law
- Obligation to university policies
- Obligation to *all* inventors, including **students**



36

Value of the Opportunity

University

- Research is foundation of company
- Broad IP protection
- Promising IP has high potential across multiple disciplines, leading to higher perceived value
- Must negotiate the best deal at the start
- Limited willingness to accept downstream risk

Start-Up

- Execution is future of company
- Expensive
- Clearest use case is focus, leading to lower perceived value
- Focused on a fundable deal
- Desire to share risk

37



37

License Terms

- Upfront consideration
- Royalty on sales
- Reimbursement of past IP costs and assumption of future costs
- Diligence and Milestone payments
- Sublicensing Income
- Reporting requirements

38 Technology Opportunities and Ventures



38

License Terms: Upfront Consideration

- What's it for?
 - **Upfront fees are to access the technology only**
- Equity range: 2% - 20+%
 - Average starting point is 5%
 - Antidilution is not uncommon but caps are reasonable
 - Institution may have policies on when it sells
- Cash is always acceptable but rarely available]
- Some universities can invest but happens outside of the license

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39

License Terms: Royalties

- What's it for?
 - **Royalties create a value created / value shared relationship at the time of the license.**
- Highly dependent on field of use and type of IP
 - 3-6% is a good starting point
- NCEs >> methods of manufacture
- Can be flat, sliding up, or sliding down
- Exist so long as licensed/sublicensed products are sold
- Royalties can include “know-how”

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40



Audience Survey Question

ANSWER THE QUESTION ON THE INTERACTIVE SCREEN IN ONE MOMENT

Across the history of US technology transfer, running royalties account for what percentage of all license income received:

- Less than half
- About half to three-fourths
- About three-fourths to almost all (95%)
- Almost all (Greater than 95%)

* If your answer differs greatly from the choices above **tell us in the chat!**

41

41

License Terms: IP Reimbursement

- What's it for?
 - Reimbursement of IP covers the real cost to create the asset.
- Expectation that past costs are repaid at license signing
- Assumption of all future costs post-signing
- University still owns IP and prosecution is with existing lawfirm
 - Startup has significant influence over future prosecution and strategy
 - “I’m paying double”
- University retains right to reclaim IP if company doesn't pay

42

License Terms: Diligence and Milestone Payments

- What's it for?
 - Ensures the timely development of ideas into saleable solutions.
- Diligence payments
 - Fees due after specific time has elapsed
 - Increases along with time from signature
 - Promotes active use of IP; no payment and license terminates
- Milestone payments
 - Fees due upon startup achieving agreed-upon development successes
 - Generally relates to value-creating milestones so value is shared

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43

License Terms: Sublicensing Income

- What's it for?
 - University shares in value wherever it's created.
- University shares in any payments to the startup by partners to develop/commercialize the IP
 - Generally does not include legitimate R&D expenses
 - “25% rule” is still being used

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44

License Terms: Reporting Requirements

- What's it for?
 - We want to know what's happening!
- Semi-annual or annual development reports
 - Sufficient detail to provide insight into the progress of the opportunity
- Quarterly royalty summaries

45 Technology Opportunities and Ventures



45

Other License Terms: State Laws and University Policy

- Publication delay
 - Will never agree to keep information unpublished
 - Delay sufficient to file patents on the idea (60-90 days max)
- Permission/prohibition on sponsoring research in Founder's lab
- Assumption of liability
- Governing law
- Indemnification
- Insurance requirements



46

Role of the TTO

- Try to guide you through the complexities of our rules
- Do not receive a personal share of income
- Balancing all stakeholders
- Staying true to the principle's academic freedoms of inquiry, research, and publication
 - Attempts to unduly limit these generally goes poorly

Other Ways the TTO Can Support Startup Formation?

- EIR / XIR programs
- Translational research funding
 - May lead to increased valuation
- Education / training / acceleration
 - NYU has >100 programs focused on promoting innovation or entrepreneurship
 - I-Corps training
- Co-investment
 - Captive venture funds, alumni affiliate funds
- Contacts and access to local VC community



THANK YOU



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49



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