Technology Transfer:
What it is, why it matters to you

Presenters:
Joan Herbers, PhD
Janna Tom
AWIS’s Bold Agenda

Advocate for positive system transformation

- Show how gender equity aligns with goals for workforce development

Help all women in STEM achieve success

- Encourage professional development

Maximize our impact

- Enhance institutional and corporate engagement
AWIS and Its Members

Innovation Ecosystem
Today’s Presenters

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Department of Evolution, Ecology & Organismal Biology
Ohio State University
Past President, Association for Women in Science

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University of California, Office of the President
Webinar Objectives

By the end, understand:

• What tech transfer is
• How to get the support you need to disclose technology or find out if you have an idea worth disclosing
• Why it matters to you
What is Technology Transfer?

• Among universities and other institutions, process of transferring
  • Skills
  • Knowledge
  • Technologies
  • Methods of manufacturing
• Goal: ensure that scientific and technological developments are accessible to a wider range of users who can then further develop and exploit the technology into new products, processes, etc.
Why AWIS? Why tech transfer?

AWIS is at the nexus of science and technology and women’s interest.

Women patent at a lower rate than men, and at lower rates than would be expected based on pools of available participants.

However, several studies have shown that startups with more females in top executive positions are more successful.

Objective: examine why that disparity exists, identify what we can do about it.
Case 1: Bias with a B.S.

Identical CVs given to Primary Investigators for a lab manager position, randomly assigned a man or woman’s name

Asked to rate competence, whether they would hire them, and whether they were worth mentoring, as well as what compensation they would offer

“When presented with identical applicants who differed only by their gender, science faculty members evaluated the male student as superior, were more likely to hire him, paid him more money, and offered him more career mentoring.” - Corinne A. Moss-Racusin, Ph.D.
Case 2: IPOs worth less if a woman’s in charge

IPO’s financial and industry information identical, researchers only varied the gender distribution of the bogus company’s top management team: first names and photos were changed (from Matthew to Martha Evans)

Surveyed second-year MBA students for IPO worth and CEO compensation

“Despite identical personal qualifications and firm financials, female founders/CEOs were perceived as less capable than their male counterparts, and IPOs led by female founders/CEOs were considered less attractive investments.”

-Lyda Bigelow, Ph.D., M.B.A.
Case 3: Women less likely to be encouraged to patent

Using an identical invention disclosure, randomly assigned a male or female name and picture

Surveyed technology licensing officers: “If the inventor wanted to start a company to commercialize this technology, how much would you try to dissuade the inventor?”

“Even though the only difference between the two groups of invention disclosures was that one came from an inventor with a female name and picture and the other from an inventor with a male name and picture, the licensing officers were significantly more likely to report that they would dissuade the female inventor from starting a company.”-Scott Shane, Ph.D.
Why Don’t Women Patent As Much?

Professions with highest number of patents: industrial and mechanical engineering → areas where women are particularly underrepresented

More likely to license their technology than start up a company → the chicken or the egg dilemma

Not because their research isn’t in high enough impact area → women’s papers are more frequently cited with higher journal impact factors
Janna Tom: University Technology Transfer

- Innovation Ecosystem
- University Technology Transfer
- The “Valley of Death”
- University-Industry Partnerships
- Public Benefit
Universities - One Part of the Innovation Ecosystem

Innovation Ecosystem

- University Research
- University Teaching
- University TT
- Service/Support Providers
- Research Funding
- Entrepreneurial Activity
- Capital Providers
- Company Innovation
- Government Policy/framework
- Local ‘Culture’
- Regional Devmt Agencies

AWIS
ASSOCIATION FOR WOMEN IN SCIENCE
YOUR NETWORK, YOUR RESOURCE, YOUR VOICE
Innovation is a Process

Universities-One Piece of the Puzzle

Generation of an idea
Further knowledge and understanding, i.e. “closing the gap”
Market demand for a product
Industry partner to develop/commercialize a product
Investor(s) to finance development
Appropriate infrastructure (e.g. Bayh-Dole Act, support systems)
Incentives (e.g. strong, predictable IP protection, exclusive or nonexclusive license)
Capability to develop and manufacture
University Technology Transfer Mechanisms

Publications
Research collaborations
Trained students entering the workforce
Sharing research materials
Licensing technologies to commercial partners
Some Objectives of University Technology Licensing Programs

Facilitate introduction of new technology for public benefit

Advancement of science and technology

Support research partnerships with industry

Faculty incentives

Create broad economic impact

Return to University for investment in continued research
General Licensing Process

DISCLOSURE

EVALUATION
Patentability Assessment
Commercial Potential
Licensing Strategy
  - Exclusive/Non-Exclusive
  - Field of Use
  - Territorial

LICENSE AGREEMENT NEGOTIATION
License Grant
Field of Use
Diligence Provisions
Fair Consideration
Prosecution Reimbursement
Reporting Obligations

IDENTIFY and CONTACT POTENTIAL LICENSEES

BUSINESS PLAN

EXECUTE LICENSE

PRODUCT DEVELOPMENT

TRANSFER TO MARKET
University-Industry Relations
Various Interactions

- Knowledge exchange
- Exchange of personnel
- Sharing research materials
- R&D collaborations
- Sponsored research or clinical trials
- Research consortia

- Gifts/Donations from industry
- Trained students entering the workforce
- Faculty consulting
- Cooperative Extension
- Licensing pre-existing technology
- Networking forums
University-Industry Relationship

Curiosity-Driven Basic Research  Applied Research  Technology Development  Commercialization

From Basic Research to Products on Shelves
Early Stage Technologies and the “Valley of Death”

University technologies often are early stage discoveries that need:

• Years of further development in order to interest an industry partner for commercialization
• Significant investment to develop a commercial product

→ Gap Funding Issue: Spanning the “Valley of Death”
A System of Gaps

**Pre-Inc**
- Early Business Formation
- **Funding Range:** $125-300K

**Research**
- Applied Research
  - (No Gov. Funding)
- Grants, Gifts
  - (No Direct Repayment)
- **Funding Range:** $25-200K

**POC/Prototype**
- Evaluate Commercial Potential
- **Funding Range:** Average of $50K

**Post-Inc**
- Business Formation
- ROI
- **Funding Range:** $50-700K, Angel
University-Industry Partnerships

Sponsored/Collaborative Research => Licensing Arrangement

Advance research more quickly

Produce more valuable and relevant inventions

Move technologies to market more quickly
Identifying Partners Upfront to Expedite Translational Research and Clinical/Regulatory Approvals

- Instead of a “relay race,” a single donor (Gates Foundation) makes one grant to fund basic research, translational research, clinical & regulatory activities
- No uncertainty in finding the next partner or in future contract terms and no gaps (time, expertise, additional transactions) between stages
- Berkeley’s start up company, Amyris Biotech, can refine & scale up the technology
- The Institute for One World Health (iOWH) is the world’s first nonprofit pharmaceutical company and has expertise in clinical trials, FDA regulatory approvals. Mission: cure infectious diseases in developing world

Courtesy of C. Mimura, UCB
University Technology Transfer for the Public Benefit

Results of basic research fuel the next generation of ideas and products

Transferring university research results to a commercial partner leads to new and improved products useful to the general public

Innovation must overcome many hurdles, including the Valley of Death

University technology transfer leads to creation of small businesses and jobs
Why does it matter to you?

No matter what stage in your career you are at, you should at least be considering the potential value of your ideas for commercialization.

Given the current fiscal crisis, cuts for university research budgets are likely to take funding levels back to what they were at the start of the last decade.

America Invents Act: patent system change from first to invent, to first to file

- Implications for posters and talks at meetings → other people will be able to steal your ideas more easily and legally
- Best to file a provisional patent before sharing anything
Grad students, Post Docs

You may have an idea that is related to your work, or totally unrelated to it.

Other students and postdocs who started companies or licensed technology often did so because they had a mentor who already had experience in that space.

If you don’t have a mentor with an entrepreneurial bent, you may not be considering options.

Great time to develop skill sets to make you more marketable after you finish your training (ie. business, science writing).

With budget cuts as well as education reforms (tenure, MOOCs, etc.), there will be fewer academic positions.
Assistant, Associate Professors

Some universities count patents toward tenure, does yours?

Just because you don’t currently have an idea doesn’t mean at some other point you won’t

Partnerships with industry might provide an alternative funding source if the worst cuts go through the federal budget

Consulting: contract law may changing due to the Stanford v. Roche case
Full Professors

You may not be interested in this space, but your students and post docs might be.

At many schools, entire departments get a return on the revenue generated from their faculty’s commercial endeavors:

- Consulting opportunities
- Science Advisory Boards
Retirees

US Patent and Trademark Office fast tracks patent applications for those over 65

Consulting, Science Advisory Boards, etc. are another way to keep a hand in things
Broadening Engagement Opportunities

- UCLA: Business of Science Center
- NSF: I-Corps program
- Stanford: StartX
- MIT: only hires tech managers who have had experience in industry and academia
- Online classes by Steve Blanks from Stanford
- Pizza and patents receptions
- Entrepreneurship for Engineers
- Town hall style meetings
Title VII

What is Title VII?

- Title VII of the Civil Rights Act of 1964 is a federal law that prohibits discrimination in employment on the basis of sex, race, color, national origin, and religion. Title VII applies to any employer with 15 or more employees in both the public and private sector including federal, state and local governments, public and private colleges and universities, labor organizations, and training programs.

How does it apply to me?

- Discriminatory practices
- Sexual harassment
- Pregnancy, childbirth, and related medical leave
- Employment decisions based on stereotypes and assumptions regarding the abilities, traits, or the performance of an individual on the basis of sex
Questions?