The Role of Universities in Innovation

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Chancellor
Outline

- The Research University
  - APLU
  - AAU
- The Mission
  - Economic Development
- Bayh-Dole
  - IP and Tech Transfer
- The Future
  - The need for Reform
Association of Public Land-Grant Universities APLU

- 218 members, including the land-grant and largest public research universities in every state
- Educate the dominant share of nation’s undergraduates in science, math and engineering
- Conduct nearly two-thirds of all academic research; more than $34 billion annually
The Mission of the Public Research University

....It has become multifaceted as it addresses the needs of a new, more global, less isolated and more vulnerable society. It is to:

- Provide access to high-quality education
- Help the public improve quality of life
- Create new knowledge and drive innovation
- Engage the community in translating this intellectual wealth to economic prosperity
How Universities Participate in Economic Development

Focus on solving critical social problems:
- Health Care.....Poverty.....Energy and Sustainability.....Climate Change

Innovate and Educate:
- Formulate new questions
- Seek solutions that span multiple disciplines
- Create new knowledge
- Translate knowledge into products and services
- Educate tomorrow’s leaders
How do we translate knowledge into products and services?

**Old Model: Passive Participation**
- Consulting
- Applied Research

**New Model: Semi – Active Participation**
- Research Collaborations
- Licensing

**New Model: Fully Active Participation**
- Start-ups
- Research Parks and Incubators
The Continuum of Innovation

- Basic Research
- Translational Research
- Startups
- Valley of Death
- Companies

Public 100% → Licensing → Private 100%
Importance of Translational Research in Innovation

- Translating knowledge into products and services is an integral part of the Innovation Process.

- Taking ideas to the marketplace leads to economic growth and increase of wealth.
Existing Disciplinary Structures vis-à-vis Translational Research

- Present academic disciplines reflect an **outdated understanding of social needs and priorities**

- The social needs and pressures that drive scholarship and scientific **inquiry require new fields of study and new methodologies for translating knowledge**

- The problems facing our society drive **student interest in new fields that are problem focused rather than discipline focused**
Importance of Intellectual Property, cont.

- IP protection creates an incentive to invent and create, “To promote the Progress of Science and the useful Arts..” – U.S. Constitution

- Utility of IP as a public good requires balancing tension between encouraging creation of IP by granting a property right vs. development and public availability by sharing/selling the right to others
Importance of Intellectual Property

- **Core university mission** is to create and disseminate knowledge through research, teaching and engagement.
- **Access to cutting edge knowledge** is critical to completing this mission.
- **Assigning ownership** changes new knowledge to Intellectual Property and wealth.
25 years ago federally sponsored research was considered a public good that should be published to be in the public domain.

Bayh-Dole Act of 1980 made it possible for Universities to own intellectual property generated from public funds and gave Universities responsibility for ensuring intellectual property was developed for public good.
Technology Commercialization

- This change drove the development of more sophisticated Offices of Technology Management- spawned new ideas about how Universities should play in advancing economy

- UC decentralization of tech transfer services from UCOP to campuses over past decade
University Participation in Economic Development: Challenges

Creates tension in and among traditional intellectual communities:

- issues arising during promotion and/or tenure
- difficulties in assigning IP
- issues of access or ownership
- difficulties in technology transfer
- impact of bureaucratic processes on entrepreneurship
- issues of conflict and commitment
The Role of Industry-University Relations and Collaborations in Higher Education

Universities are important to Industry:

- Workforce Development
- Discovery and Innovation
- Translational Research

Industry is important to Universities:

- Supports Education
- Provides support for Basic Research
- Helps define immediate problems
Partnerships with Corporations Create Tension

The inherent misalignment between industry and university missions introduce barriers in exploring and establishing partnerships:

<table>
<thead>
<tr>
<th>Universities</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>scholarship and discovery</td>
<td>products and services</td>
</tr>
<tr>
<td>education</td>
<td>training</td>
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<tr>
<td>open source and shared ownership</td>
<td>exclusivity</td>
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The rigidity of the educational infrastructure in Universities is at odds with the need for flexible and entrepreneurial structures demanded by translational research.
Universities are Committed to Supporting Economic Development

- They value and depend on successful collaborations and partnerships with industry.
- They try to meet the needs of industrial partners.
- The tension during technology transition not as a barrier but as an opportunities for new thinking and new approaches.
Respect and Trust: Key Ingredients to Good Partnerships

Examples of Successful Partnerships:

- IBM – University of Illinois Partnership on Petascale Computing
- BP – UC Berkeley and University of Illinois on Biofuels
- Rolls Royce – Purdue University Technology Center on Propulsion
- GM – University of Michigan: Automotive Research Center
- Chevron – UC Davis on Biofuels
Next Steps: New Innovation Ecosystem
Suggestions for Moving Forward

- Develop a **National Framework** for Translational Research
- Create **Design-Build** Innovation Centers
- Understand the **Innovation Ecosystem** and Develop Sustainable Business Model
- Consider **Quasi-Open** Innovation Models
- Expand **Public-Private Collaborations** to Fund Translational Research