Industry Partnerships at the University of Cincinnati: Their Role in Research, Innovation, Entrepreneurship and Commercialization

William S. Ball, M.D.
Interim Vice-President for Research
University of Cincinnati
• Research at UC by the numbers
  ▪ Putting Industry Research in perspective

• Industry Research Partnerships: Reinventing our future
  ▪ Why we should view industry partnerships as important?

• A cultural exchange: Integrating industry partnerships with our mission as a university
  ▪ Overcoming/addressing our own issues
  ▪ What makes for a good industry partner?
  ▪ The relationship of industry partnerships to innovation, entrepreneurship and commercialization at UC

• Creating the right interface for students, faculty and industry
  ▪ UC Accelerator for Commercialization, UCRI
  ▪ Synergy of student education with industry partnerships
10-Year Research Funding
UC and Affiliates

The American Recovery and Reinvestment Act (ARRA) portion for the above figures is:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2009</td>
<td>$2.2 million</td>
</tr>
<tr>
<td>FY2010</td>
<td>$65.5 million</td>
</tr>
<tr>
<td>FY2011</td>
<td>$47.9 million</td>
</tr>
</tbody>
</table>

* Affiliates include: Children’s Hospital Medical Center, Cincinnati Department of Veterans Affairs Medical Center, Shriners Hospitals for Children - Cincinnati, University of Cincinnati Physicians clinical trials.
10-Year Research Funding

UC alone

2011 … $251,228,315
2010 … $284,820,135
2009 … $238,375,939
2008 … $214,635,140
2007 … $204,892,792
2006 … $197,830,254
2005 … $210,816,314
2004 … $188,321,799
2003 … $197,108,302
2002 … $163,147,186
In Fiscal Year 2010 and 2011 federal funding from the American Recovery and Reinvestment Act (ARRA) accounted for a significant portion of the increase in research funding.
2011 Research Awards by Source

FY 2011 Research Awards by Funding Source
*Not including affiliates
Based on a total of $251,228,315

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Amount</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>$208,507,901</td>
<td>83.00%</td>
</tr>
<tr>
<td>NIH</td>
<td>$100,949,904</td>
<td>40.18%</td>
</tr>
<tr>
<td>NSF</td>
<td>$9,884,423</td>
<td>3.93%</td>
</tr>
<tr>
<td>DoD</td>
<td>$16,797,087</td>
<td>6.69%</td>
</tr>
<tr>
<td>D. of Edu.</td>
<td>$52,003,506</td>
<td>20.70%</td>
</tr>
<tr>
<td>Other Fed.</td>
<td>$28,87,981</td>
<td>11.49%</td>
</tr>
<tr>
<td>Industry 2011</td>
<td>$18,953,838</td>
<td>7.54%</td>
</tr>
<tr>
<td>Local Government</td>
<td>$390,457</td>
<td>0.15%</td>
</tr>
<tr>
<td>State of Ohio</td>
<td>$10,899,267</td>
<td>4.34%</td>
</tr>
<tr>
<td>Other, Nonprofit</td>
<td>$12,476,852</td>
<td>4.97%</td>
</tr>
</tbody>
</table>

Industry 2010          | $15,233,890        | 5.35%      |

- Federal funding remains our primary source for funding
- There is clearly room for growth in industry research; Target 20%
2011 Research Awards by Units

- **Medicine**: 53.10%
- **Other**: 19.09%
- **Nursing**: 0.70%
- **Pharmacy**: 1.08%
- **VP Presearch**: 0.70%
- **Acad. Planning**: 0.96%
- **Allied Health Sciences**: 1.17%
- **A&S**: 4.99%
- **Edu (CECH)**: 6.16%
- **DAAP**: 0.35%
- **CEAS**: 11.70%

*Other* includes: Business, Clermont, General Education, Graduate School, Hoxworth Blood Center, and Student Affairs.
# Technology Transfer Activity

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invention Disclosures</td>
<td>117</td>
<td>106</td>
<td>82</td>
</tr>
<tr>
<td>Royalty Income</td>
<td>?</td>
<td>$515,281</td>
<td>$480,602</td>
</tr>
<tr>
<td>Patent Applications</td>
<td>70</td>
<td>70</td>
<td>50</td>
</tr>
<tr>
<td>Patents Issued</td>
<td>20</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Start-Up Activity</td>
<td>6</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

Within a major university, tech transfer may represent only a portion of the overall intellectual property.
Industry Research Partnerships

Why should they be important to UC?

• UC has a sufficient and rich repository of intellectual property as a major research university
• We are entering a phase of declining research dollars
• Our greatest source of funding is and likely will remain Federal dollars
• We have not leveraged industry funding in keeping with Industry dollars
• We have only a marginal record of bringing product to market by ourselves
Why should they be important to UC?

UC

- Enhanced research opportunities/funding for faculty and students
- Can be an important driver of innovation, entrepreneurship and commercialization at UC
- Enhancing job opportunities for students
- Support of community economic development

Industry

- Maintaining a competitive edge
  - Increased outsourcing of research by industry, especially by small to medium sized companies where the greatest growth is to be expected in any economic recovery
  - An increasing dependence on basic science
- Access to and input into workforce development
What makes for a good partnership?

• Mutual understanding of mission and culture
• Intellectual property rules clearly defined and negotiable
  ▪ Broad definition/recognition
  ▪ Internal Pipeline: renewable, adequate volume, reasonable flow
  ▪ Mutually agreeable policies
• Good communication – UC Research Catalog
• Mutual community goals
• UC:
  ▪ Integrated faculty/disciplines
  ▪ Integrated university culture
  ▪ Adequate resources
  ▪ Reasonable speed of business
  ▪ Workforce development
  ▪ Opportunity for industry to be more involved
Accelerating the Development of an Innovation Economy in the Cincinnati Region

University of Cincinnati
Board of Trustees

Discussion document
December 15, 2011

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Executive summary

- The Cincinnati region has a good starting point to drive innovation and entrepreneurship, but needs more scale and collaboration to compete with other regions:
  - **Several areas on a good trajectory** (e.g., research funding attracted by local institutions, seed capital investing)
  - **Other areas lack sufficient capabilities or resources** (e.g., technology transfer, mentoring, entrepreneurs-in-residence, local venture capital, etc.)
  - **Some roles are generally not covered by any existing organization** (e.g., strategic roadmapping and execution, etc.)

- **UC is a critical component of the region and can play an important role in the success of the ecosystem.** UC can draw on lessons learned from other universities in the following areas:
  - Translating its research funding into increased commercialization
  - Multiplying the number of entrepreneurial connections by modifying policies and programs for professors, students and staff

- **UC will need to invest in top talent, commit resources and change aspects of its culture to be successful.** A more detailed roadmap is needed to guide this effort.
What makes for a good partnership?

• Mutual understanding of mission and culture
• Intellectual property rules clearly defined and negotiable
  ▪ Broad definition/recognition
  ▪ Internal Pipeline: renewable, adequate volume, reasonable flow
  ▪ Mutually agreeable policies
• Good communication – UC Research Catalog
• Mutual community goals

• UC:
  ▪ Integrated faculty/disciplines
  ▪ Integrated university culture
  ▪ Adequate resources
  ▪ Reasonable speed of business
  ▪ Workforce development
  ▪ Opportunity for industry to be more involved
• **Challenges at UC**
  - Expanding opportunities to enhance partnerships
    - UCRI
    - Reassessing how we value industry partnerships
    - Intellectual property: What it means, etc.
  - Diversifying our Research Portfolio – Federal and Industry
  - Answering the question: “What is the role for commercialization and entrepreneurship at UC?”
  - Building lasting industry relationships in an environment of shifting leadership.
  - Regulatory/Compliance adjustments
The National Council of Entrepreneurial Tech Transfer (NCET2)
Association of Public Land-grant Universities (APLU)
Association of American Universities (AAU)

Present

"President Obama’s Initiative on University Research Commercialization:
How Universities Plan To Respond"

Webinar Series

Sponsored by:
The National Venture Capital Association (NVCA), the National Association of Seed and Venture Funds (NASVF) and the University-Industry Demonstration Partnership (UIDP) representing the venture capitalists (VCs), angel investors and Global 1000 private funders of research commercialization

Please forward this important announcement on where universities are headed in research commercialization to your friends and colleagues

Upcoming Webinars:

November 17, 1:00 pm - 1:30 pm ET
Dr. William Ball
VP for Research, University of Cincinnati

Dr. Patrick O’Shea
VP for Research, University of Maryland

November 22, 1:00 pm - 1:30 pm ET
Dr. Sharron Quisenberry
VP of Research and Economic Development
Iowa State University

Dr. Todd Sherer
Director of Technology Transfer, Emory University
University of Cincinnati Rethinks Commercialization

• UC, like many universities, is now taking a new look at how commercialization fits within a university’s charge, and the impact we can have within the community.

• Commercialization for a university is clearly not a get rich quick scheme, with emphasis on rich and quick.

• Universities must take advantage of commercializing the full range of its intellectual property rather than just a focus on technology transfer.

• If not to financially enhance the university, then why the effort on commercialization?
  - It allows for innovation to grow and thrive within a university for faculty, students and staff.
  - It provides for good stewardship in support of community growth and development
  - Jobs for our students
University of Cincinnati
Accelerator for Commercialization

Dorothy H. Air, PhD
Associate Vice President for Entrepreneurial Affairs and Technology Commercialization

William S. Ball, MD
Interim Vice President for Research
Technology Commercialization Accelerator Goals

• **Short Term Goal:**
  - To establish a Technology Commercialization Accelerator on a pilot basis as a platform for attracting new financial resources and generating commercialization success

• **Long Term Goal:**
  - To establish a permanent Technology Commercialization Accelerator as a vehicle for establishing UC as technology commercialization leader, generating new revenue streams through increased start-up company, licensing and industry activity and attracting additional external funding revenue streams

• **Collaboration EB5, UC and State of Ohio**

• **Structured as a two year pilot project**

• **Focus initially on engineering and biosciences**

• **Initial funding - $750,000 with $500,000 pending from Third Frontier**

• **Location in Innovation development on Short Vine**
UCRI

- 501c(3)
- Pilot funded by UC BOT $5M/5 years
- Will be available to all colleges and affiliates
- Board of Directors – 9 initial (4+5) with expansion to 11
- CEO – Search to begin in 2012
- Transition Team currently in place to begin operations
- Industry sponsored research
- Allow for commercialization of all IP not just TT – Centers
- Initial business and legal operations will be purchased services with eventual independent UCRI operations with continued growth
- Overhead to remain in UCRI or at discretion of Dean as long as it is used to advance research
- Allows for integration of education with research
UCRI

- Faculty
  - Enhanced opportunity to partner with industry
  - Compensation mechanism not in conflict with state/federal guidelines
  - Enhanced funding of projects
- Students
  - Enhanced career development
- UC
  - Shift of risk
  - Enhanced funding for research by faculty and students
  - Diversifies portfolio
- Industry
  - Enhanced access to the university
  - Enhanced IP environment
  - Enhanced speed of business
  - Enhanced workforce opportunity
  - Leadership which bridges culture
UCRI: GE-ARC Partnership with CEAS

- The GE-ARC, if located at the GE Aviation facility in Evendale, Ohio. The overall purpose of GE-ARC is to create a structure that will align laboratory innovation with commercial applications. By combining the combustion testing and feedback from the advanced emissions testing, we will be able to have continuous improvement in all aspects of design, manufacturing and evaluation thus creating transformative and creative concepts that will expand the current knowledge base.

- The technical focus of the Center will concentrate on three areas:
  - Advanced Low-Emissions Combustion,
  - Ceramic Matrix Composites and
  - Aircraft Total Thermal Management.

- GE-ARC is now in partnership with CEAS-Aerospace as a UCRI project
One Stop Structure

Co-op:
  - Engineering, Applied Science
  - Design, Architecture, Business

Internships & Service Learning:
  - All UC Colleges

1,500 Companies/6,000 placements/$43 M Earnings
Since its official formation in June of 2007 the LWC has completed **26** projects, involved **30+** UC faculty and advisors and almost **400** students.

<table>
<thead>
<tr>
<th>Company</th>
<th>Projects</th>
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<tbody>
<tr>
<td><strong>P&amp;G</strong></td>
<td>Crest &amp; Oral-B Winter, 2011 Brush and Paste Solutions</td>
</tr>
<tr>
<td><strong>Fixodent</strong></td>
<td>Fixodent Fall, 2009 Improving the lives of denture users</td>
</tr>
<tr>
<td><strong>UC Simulation Center</strong></td>
<td>Summer, 2009 Virtual packaging simulation</td>
</tr>
<tr>
<td><strong>Tide</strong></td>
<td>Spring, 2008 Value of Compaction</td>
</tr>
<tr>
<td><strong>Progresso</strong></td>
<td>Spring, 2009 Investigated new soup opportunities</td>
</tr>
<tr>
<td><strong>Green Giant</strong></td>
<td>Spring, 2008 Explored new opportunity markets</td>
</tr>
<tr>
<td><strong>LG</strong></td>
<td>Spring &amp; Fall, 2009 Created innovative concepts for the home appliance market</td>
</tr>
</tbody>
</table>
Students and faculty works in the P&G computational environment and are an integral member of the P&G R&D team

High research impact on product development
Medical Device Innovation & Entrepreneurship Program

• 4 Colleges participate
• 2-10 provisional patents filed annually
• 3 National Awards
• 2 start-up companies
• Supported by industry