For scientific and technical research to be of direct use to society, the research process doesn’t stop with completion of a study, publication of a paper, or graduation of students. When discoveries have inventive characteristics, the appropriate way to protect the research-based intellectual property (IP) asset is through patents. Research dissemination then continues by facilitating movement of the IP asset into businesses. To convey this IP into the public sphere, it is necessary to create a bridge between the university and innovative commercial adopters of early-stage technology. University-based technology transfer is the system of support and service based on policies, people and processes that forms this bridge. Unlike in industry, where transfer often takes place as an actual sale of an IP asset, universities in almost all cases accomplish transfer of intellectual property through the licensing process. The CU Technology Transfer Office handles all aspects of this process, from securing faculty-created inventions through patents to further development of the assets and licensing of the IP to companies who build products and services that benefit society.
About the University of Colorado

Founded in 1876 with a campus in Boulder, the University of Colorado includes three unique campuses with a combined fall 2008 enrollment of 53,755. In fiscal year 2008 CU continued to be a national leader in research funding by attracting some $661M, led by a $14M increase at the University of Colorado at Boulder (FY 07 – $266 million to FY 08 – $280 million). The University of Colorado Denver is the top research institution in the State of Colorado, with $371.5M in research funding, the majority from the National Institutes of Health. The University of Colorado at Colorado Springs attracted $9.2M. Over the last decade, research awards at CU’s three universities have increased nearly 86 percent.

Nomenclature used throughout this report refers to the fact that, as of July 2004, the two campuses in Denver and Health Sciences Center administratively merged into one, which in fall 2007 was renamed the University of Colorado Denver, with a Downtown Campus in Denver and the Anschutz Medical Campus in Aurora.

FY 2008
TTO Performance at a Glance

<table>
<thead>
<tr>
<th>Invention Disclosures</th>
<th>237</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Patent Applications Filed</td>
<td>188</td>
</tr>
<tr>
<td>U.S. Patents Granted</td>
<td>28</td>
</tr>
<tr>
<td>Total Options &amp; Licenses</td>
<td>58</td>
</tr>
<tr>
<td>Exclusive Options &amp; Licenses</td>
<td>45</td>
</tr>
<tr>
<td>Non-exclusive Licenses</td>
<td>13</td>
</tr>
<tr>
<td>Start-up Companies Formed from CU IP</td>
<td>11</td>
</tr>
<tr>
<td>Service Agreements Executed (see note)</td>
<td>759</td>
</tr>
<tr>
<td>Revenue (in millions)</td>
<td>$6.1</td>
</tr>
<tr>
<td>IP-induced Sponsored Research (in millions)</td>
<td>$11.5</td>
</tr>
<tr>
<td>Ratio of legal fee reimbursements to legal expenditures</td>
<td>65%</td>
</tr>
</tbody>
</table>

Notes: The criteria used for TTO’s performance metrics conform to the standards used by the Association of University Technology Managers (see www.autm.net). Service measures include material transfer agreements, confidential disclosure, software evaluation, and interinstitutional and IP agreements.

TTO Portfolio Snapshot as of July 1, 2008

<table>
<thead>
<tr>
<th>U.S. Patents in Force</th>
<th>269</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Patent Applications in Prosecution</td>
<td>267</td>
</tr>
<tr>
<td>Exclusive Licenses in Force</td>
<td>113</td>
</tr>
<tr>
<td>Non-exclusive Licenses in Force</td>
<td>190</td>
</tr>
<tr>
<td>Companies created based on CU IP, still in business</td>
<td>71</td>
</tr>
<tr>
<td>Companies in which University License Equity Holdings, Inc. (ULEHI) currently holds equity</td>
<td>40</td>
</tr>
</tbody>
</table>

TTO Budget for FY 2009

<table>
<thead>
<tr>
<th>Salaries and benefits</th>
<th>$2,105,578</th>
</tr>
</thead>
<tbody>
<tr>
<td>General operating</td>
<td>327,128</td>
</tr>
<tr>
<td>Rent</td>
<td>165,579</td>
</tr>
<tr>
<td>Patent costs and legal expenses</td>
<td>1,388,410</td>
</tr>
<tr>
<td>Drug Development Institute and Boulder Innovation Center</td>
<td>100,000</td>
</tr>
<tr>
<td>ULEHI management fee</td>
<td>72,000</td>
</tr>
<tr>
<td>Proof of concept programs</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Total — all expenses</td>
<td>$5,158,395</td>
</tr>
</tbody>
</table>
Types of Inventions by Major Category

**BIOSCIENCE**
- Therapeutics & Drug Targets: 37%
- Diagnostics: 30%
- Medical Devices: 19%
- Research Tools: 9%
- Biomaterials: 2%
- Drug Delivery: 2%
- Total: 143

**PHYSICAL SCIENCES/ENGINEERING**
- Optics & Electronics: 23%
- Software: 20%
- Chemicals and Materials: 13%
- Processes: 12%
- Energy & Cleantech: 11%
- Mechanical Devices: 7%
- Other: 14%
- Total: 94

Invention Disclosures, Patent Applications and Exclusive Licenses/Options

Service Agreements

Confidential Disclosure Agreements: 324
Materials Transfer Agreements: 360
Software/Copyright Evaluation Agreements: 20
Inter-institutional, research & other service agreements: 55

Service Agreements

- Confidential Disclosure Agreements: 324
- Materials Transfer Agreements: 360
- Software/Copyright Evaluation Agreements: 20
- Inter-institutional, research & other service agreements: 55

Invention Disclosures, Patent Applications and Exclusive Licenses/Options

- FY2003
- FY2004
- FY2005
- FY2006
- FY2007
- FY2008

Legend:
- Blue: Invention Disclosures
- Teal: Patent Applications
- Pink: Exclusive Licenses & Options
Summary: Fiscal Year 2007-08

In FY 2007-08, the University of Colorado Technology Transfer Office (TTO) worked with CU research investigators and technology entrepreneurs to deliver another year of solid performance. The pipeline of CU technologies is expanding, and the overall operation is maturing to a level increasingly recognized as nationally relevant.

This report chronicles the year in review and progress over the past few years. The story is told in the charts, graphs and summaries. What might not be evident is the context in which CU technology transfer operates. In this light, the following nine items identify positive aspects of CU’s technology transfer eco-system:

- Strong base of discovery-oriented research and serial inventors, and growth in key areas such as renewable energy and bioscience
- Institutional priority and commitment to success as evident in financial commitment and overall administrative support
- Existence of a funding model that has produced a sustainable, financially self-sufficient technology transfer enterprise
- Best practice technology transfer operations as evidenced in IP policy, licensing procedures and performance evaluation
- Administrative transparency and accountability of TTO, and administration and faculty oversight
- Adequate size staff with business/legal/IP/scientific acumen who have a keen understanding of university culture and an investigator service orientation
- An active and meaningful engagement with the Colorado technology enterprise business community
- One of the nation’s leading technology maturation strategies through the TTO Proof of Concept programs
- Deal-responsive early-stage venture capital and business angel leaders who understand university commercialization

In recent years TTO has been reporting an expected revenue decline over a four year period. Indeed, FY 2007-08 licensing revenue declined to $6.2M from levels three times that over the past four years. These declines were based on the expiration of a three-year monetized royalty stream and a patent expiration leading to termination of a medical diagnostic license that produced over $12M royalty the past few years.

Although annual licensing revenue will not be sufficient to cover TTO’s operating expenses over the next three years, TTO’s financial viability is ensured through drawing funds from TTO’s long-term investment account managed by the CU Treasury. These funds were generated from the CU System share of a legal action that ended in 2004 and through investment returns. Although TTO has drawn on these reserves to cover the revenue shortfall until revenues exceed the break-even point again in FY 2011-12. For the years to come, TTO will continue its delivery of high quality IP and licensing service to CU, and will continue to play a key role in producing economic opportunity, clinical impact and social benefit for the University, Colorado and beyond.

In fall 2005 TTO began its Proof of Concept (POC) program. Three elements comprise the TTO POC program. First, TTO provides CU inventors grants up to $25k to enhance patentability and commercial adoption. Second, TTO in conjunction with the State of Colorado provides competitively reviewed POC grants to CU bioscience investigators up to $200k. Awards with a pre-clinical and/or product development focus are granted in the fields of therapeutics, diagnostics, medical devices and biofuels. Third, TTO provides $100k POC “seed” investments in the form of convertible debt to new CU licensee companies. Since 2005, TTO has provided approximately $3.5M in POC grants and $1.5 in POC investments. The POC awards from FY 2008 are identified below:

- Brian DeDecker, Department of Molecular, Biological and Developmental Biology, CU-Boulder. "Mechanism by which noble metals disrupt autoimmune disease."
- Harish Vacharajan, Department of Electrical and Computer Engineering, CU-Boulder. "Line-rate filtering and monitoring of multi-gigabit ethernet traffic on commodity hardware."
- Bart J. van Zegbroeck, Department of Electrical and Computer Engineering, CU-Boulder. "Laser diode powered THz source."
- Edward Dempsey, School of Medicine, Cardiovascular Pulmonary Research Laboratory, UC Denver. "Moving Bryostatin-1 from lab to clinic for treatment of pulmonary hypertension."
- Linda F. van Dyk, School of Medicine, Department of Microbiology, UC Denver. "Development of microRNA diagnostic assays."
- Stephanie J. Bryant, Department of Chemical and Biological Engineering, CU-Boulder. "Bioreactor to mechanically load soft material under tension."
- Thomas T. Perkins, Department of Molecular, Cellular and Developmental Biology, CU-Boulder. "Towards a nanoscale milling machine."
- Ryan T. Gill and James W. Medlin, Department of Chemical and Biological Engineering, CU-Boulder. "Molecular Biorefining to Liquid Alkanes and Alcohols."
- J. David Port, School of Medicine, Department of Cardiology. "MicroRNAs as therapeutic targets in heart failure."

TTO also made one Proof of Concept investment (POCI) to Hiberna Corp., "Identification of novel therapeutic targets for preventing or reversing metabolic disorders."
New Business Development Based on CU Intellectual Property

In the last 15 years, 83 companies have been formed based on CU IP. 12 are known to be nonoperational. Of the 71 companies still in business:

- 67 have operations in Colorado (although the headquarters may be located out-of-state)
- 14 have received CU Technology Transfer Office (TTO) Proof of Concept investments
- 5 have “gone public,” becoming publicly traded companies
- 10 have been acquired by public companies (including four from the above five that have gone public)

<table>
<thead>
<tr>
<th>Companies Created Based on CU IP, FY 2007-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>2C Tech Corp.</td>
</tr>
<tr>
<td>3QMatrix, Inc.</td>
</tr>
<tr>
<td>BioAMPS International, LLC</td>
</tr>
<tr>
<td>HepQuant, LLC</td>
</tr>
<tr>
<td>Cello Bioengineering, Inc.</td>
</tr>
<tr>
<td>Peak Aging, Inc.</td>
</tr>
<tr>
<td>Precision Biopsy, LLC</td>
</tr>
<tr>
<td>Sierra Neuropharmaceuticals, Inc.</td>
</tr>
<tr>
<td>Taiga Biotechnologies, Inc.</td>
</tr>
<tr>
<td>BlueSun, Inc.</td>
</tr>
<tr>
<td>V-Clip Pharmaceuticals, Inc.</td>
</tr>
</tbody>
</table>

Major Financing Events for CU Licensees

Based on 25 separate financial transactions, FY 2007-2008 witnessed slightly more than $160M of financing for companies created based on CU IP. Funding occurred in all categories except for IPOs and acquisitions. The distribution of financings is skewed by two deals, a Series “B” round for Taligen, Inc. and a Series “C” round for GlobImmune, Inc.

<table>
<thead>
<tr>
<th>Type of Funding</th>
<th>FY 07-08 Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grants</td>
<td>$1,051,550</td>
</tr>
<tr>
<td>Federal Grant</td>
<td>$2,664,698</td>
</tr>
<tr>
<td>Seed/Bridge</td>
<td>$6,973,162</td>
</tr>
<tr>
<td>Series A</td>
<td>$30,610,000</td>
</tr>
<tr>
<td>Series B</td>
<td>$85,100,000</td>
</tr>
<tr>
<td>Series C, D, E, F</td>
<td>$41,200,000</td>
</tr>
<tr>
<td>TTO POCi</td>
<td>$100,000</td>
</tr>
<tr>
<td>SBIR/STTR</td>
<td>$3,171,019</td>
</tr>
<tr>
<td>Total Financing</td>
<td>$170,870,429</td>
</tr>
</tbody>
</table>

Recognizing Excellence in Technology Transfer

The CU Technology Transfer Office presented its annual awards January 14, 2008 at the historic Tivoli Turnhalle, CU Denver. The event was attended by more than 200 business leaders and faculty inventors. Following an address by Governor Bill Ritter, awards were presented to inventors, companies and others who demonstrate best practices in technology transfer. Awards were given to:

- **Michael Larson**, New Inventor of the Year, UCCS
- **Lia Gore & Deborah DeRyckere**, New Inventors of the Year, UCD
- **Stephanie J. Bryant**, New Inventor of the Year, UCB
- **Paul A. Bunn**, Inventor of the Year, UCD
- **Douglas L. Gin**, Inventor of the Year, UCB
- **Dan Mitchell**, Bioscience Business Advisor of the Year
- **Paul Nelson**, Physical Sciences Business Advisor of the Year
- **BaroFold, Inc.**, Bioscience Company of the Year
- **ColorLink, Inc.**, Physical Sciences Company of the Year

Inductees into the CU Pinnacles of Inventorship:
- **Myron J. Levin**, UC Denver
- **John M. Stewart**, UC Denver
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