TECH TRANSFER 2008-09 ANNUAL REPORT

The CU Technology Transfer Office pursues, protects, packages, and licenses to business the intellectual property generated from research at CU. The TTO provides assistance to faculty, staff, and students, as well as to businesses looking to license or invest in CU technology. For more information about technology transfer at CU, visit www.cu.edu/techtransfer.

University of Colorado

Boulder · Colorado Springs · Denver · Anschutz Medical Campus

FY 2009
TTO Performance at a Glance

Invention Disclosures	258
U.S. Patent Applications Filed	204
U.S. Patents Granted	24
Total Options & Licenses	61
Exclusive Options & Licenses	50
Non-exclusive Licenses	11
Start-up Companies Formed from CU IP	11
Service Agreements Executed (see note)	687
Licensing Revenue (in millions)	$4.4
IP-induced Sponsored Research (in millions)	$16.7
Ratio of legal fee reimbursements to legal expenditures	70%

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, 2009

U.S. Patents in Force	288
U.S. Patent Applications in Prosecution	293
Exclusive Licenses in Force	142
Non-exclusive Licenses in Force	203
Companies created since 1993 based on CU IP, still in business	80
Companies in which University License Equity Holdings, Inc. (ULEHI) currently holds equity	44

CU Technology Transfer Office FY 09/10 Budget

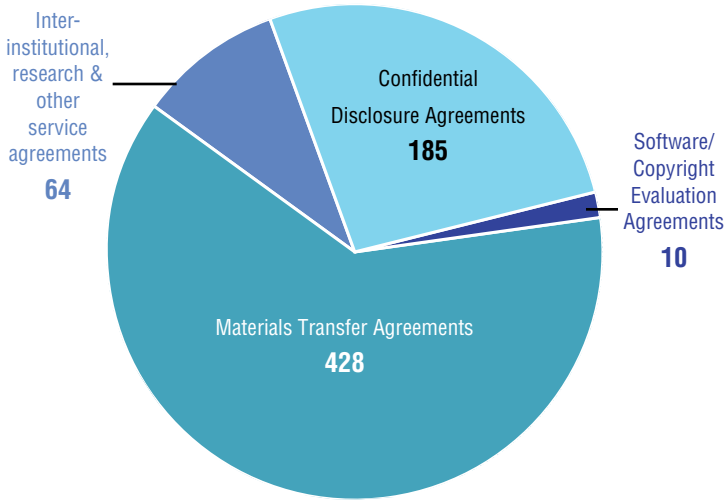
Salaries, Benefits, Students	$2,141,000
General Operating Expenses	240,000
System Overhead	123,453
Building Rentals	170,267
Patent Costs, Legal Expenses	1,178,000
Boulder Innovation Center	50,000
ULEHI Management Fee	75,600
Proof of concept programs	120,000
Total — all expenses	$4,098,320

About the University of Colorado

Founded in Boulder in 1876, the University of Colorado has evolved into a network of four unique campuses: the University of Colorado at Boulder, the University of Colorado Denver, the University of Colorado Anschutz Medical Campus and the University of Colorado at Colorado Springs. The campuses had a combined fall 2009 enrollment of ~55,500.

In fiscal year 2009 CU continued to be a national leader in research funding by attracting some $711M, led by a nearly $60M increase at the University of Colorado at Boulder (FY 07 – $280 million to FY 08 – $339 million). The University of Colorado Denver is the top research institution in the State of Colorado with $363M in research funding, the majority from the National Institutes of Health. The University of Colorado at Colorado Springs attracted $8.7M. Over the last decade, research awards at CU's three universities have increased by 69 percent.

Service Agreements

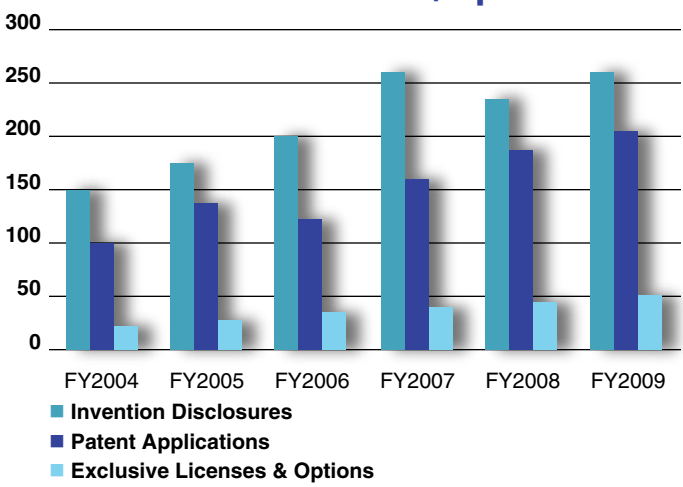


Types of Inventions by Major Category

BIOSCIENCE	
Therapeutics & Drug Targets	38%
Medical Devices	19%
Diagnostics	18%
Software-Health IT	9%
Research Tools	6%
Biomaterials	6%
Processes, Drug Delivery Other	3%

PHYSICAL SCIENCES/ ENGINEERING	
Electronics & Optics	24%
Software-General	6%
Chemicals and Materials	24%
Processes	12%
Micro & Nanotech	5%
Mechanical Devices	8%
Other	7%

Invention Disclosures, Patent Applications and Exclusive Licenses/Options



Summary: Fiscal Year 2008-09

In FY 2008-09, the University of Colorado Technology Transfer Office (TTO) continued to build upon the high quality research of CU investigators and delivered value to its customers and stakeholders. Despite the national economic downturn, TTO maintained a brisk deal flow, expanded the CU technology portfolio, and continued to increase its presence in the Colorado and national technology communities.

This report provides proof points demonstrating TTO's performance and relevance to our community. Some highlights from the last year of technology transfer at CU:

- Continued growth of CU's pipeline of technologies: this was our best year yet for new invention disclosures, especially in renewable energy. Bioscience related inventions continue to dominate our portfolio. Our continued positive relations with CU investigators have been crucial to this growth, and have improved the overall quality of the disclosures we receive.
- Continued growth of CU's patent portfolio (patent applications, applications in process and patents issued): although we experienced a slight budget contraction for new patent filings, strong patent reimbursements from licensees more than offset this decrease.
- Continued excellence in exclusive options and licenses, and company creation: our performance in these areas places CU TTO at a nationally prominent level.
- Continuation of CU's nationally-recognized technology maturation strategy: the TTO Proof of Concept programs have demonstrated worth and have been responsible for increasing the commercial attractiveness of CU technologies.
- Relationships with the Colorado technology entrepreneurship community: TTO's partnerships with local incubators, business advisors, investors and entrepreneurs helps create a 'running start' for new companies emerging from the University.

Over the last few years TTO has been reporting an anticipated revenue decline based on the expiration of a key patent estate and completion of a royalty stream monetization. In 2008-09, this predicted revenue decline was amplified by the national economic recession. As the recession continued, licensee product sales slowed, licensee development programs were curtailed, and financing ground down to a near-standstill. Revenue for 2008-09 was $4.4 million, the lowest level for many years. To offset the low revenue, TTO drew down $916,000 from a CU Treasury loan.

TTO expects that annual licensing revenue will not be sufficient to cover operating expenses for at least the next two to three years. By the end of FY 2009-10 TTO plans to draw from the remainder of the Treasury loan and our long-term investment account. The long-term investment account had a FY 2008-09 year-end closing balance of $6.1 million, down from the start of the fiscal year by $1.4 million, another way in which TTO was impacted by the national recession. In FY 2009-10 TTO will greatly reduce our contributions to the Proof-of-Concept grant and investment programs, although some of these programs will continue with alternate funding mechanisms.

Looking forward, TTO's customers and stakeholders within the University and external to it can expect a continued high level of service. TTO's team has outstanding expertise and high morale, and our office enjoys continuing support from the University administration. TTO is committed to helping create economic growth within Colorado, and clinical and social impact around the world.

TTO Proof of Concept Programs

In fall 2005, TTO began its Proof of Concept (POC) program, which consists of four key elements. First, TTO provides grants of up to $25K to CU inventors to enhance patentability and commercial adoption of CU technologies. Second, TTO (in conjunction with the State of Colorado) provides competitively-reviewed POC grants of up to $200K to CU bioscience investigators; awards with a pre-clinical and/or product development focus are granted in the fields of therapeutics, diagnostics, medical devices and biofuels. Third, TTO has partnered with the CU-Boulder Renewable and Sustainable Energy Initiative (RASEI) to provide grants of up to $50K to enable the further development and validation of promising CU-Boulder renewable energy technologies. Finally, TTO provides $50-100K POC "seed" investments in the form of convertible debt to new CU licensee companies. Since 2005 (not including matching funds from the State of Colorado and the Energy Initiative), TTO has disbursed approximately $4.2M in POC grants and $2M in POC investments. The POC awards from FY 2008-09 are identified below:

Kristi Anseth and Christopher Bowman, Department of Chemical & Biological Engineering, CU-Boulder, for an advanced wound care treatment for burns and skin injuries.

Raymond Browning and James O. Hill, Center for Human Nutrition, UC Denver, for a shoe-based physical activity monitor for effective weight management.

Hubert Yin, Department of Chemistry & Biochemistry, CU-Boulder, for discovery of new drugs to treat chronic pain and decrease dependency on opioid pain relief drugs.

Natalie Ahn, Department of Chemistry & Biochemistry, CU-Boulder, for targeted drugs to treat melanoma.

K. Ulrich Bayer, Department of Pharmacology, UC Denver, for a new drug to prevent permanent neurological damage in stroke patients.

Mark W. Duncan and Anthony Elias, Division of Pulmonary Medicine and Division of Medical Oncology, UC Denver, for improved diagnosis and early detection of breast cancer.

Heide L. Ford and Rui Zhao, Department of Obstetrics and Gynecology and Department of Biochemistry & Molecular Genetics, UC Denver, for the identification and development of novel therapeutics that may be used to treat a wide variety of cancers.

Emily A. Gibson and Timothy Lei, Department of Pharmacology and Department of Electrical Engineering, UC Denver, for an improved flow cytometry device for analysis of blood samples.

Bradley Olwin, Department of Molecular, Cellular and Developmental Biology, CU-Boulder, for a method of repairing damaged muscle (including damage from Muscular Dystrophy) using stem cells.

Daniel Schwartz, Department of Chemical & Biological Engineering, CU-Boulder, for liquid crystal-based DNA microarrays to cost effectively measure genetic material and quickly gather gigabases of genomic data.

Timothy F. Scott, Department of Mechanical Engineering, CU-Boulder. Photodegradable materials for temporary and minimally-invasive implantable medical devices.

Robin Shandas, Division of Cardiology, UC Denver and Department of Engineering, CU-Boulder, for a medical device to treat venous valve incompetence.

Wei Tan, Department of Mechanical Engineering, CU-Boulder, for a new type of vascular graft to provide improved access for dialysis patients.

Linda Watkins, Department of Psychology, CU-Boulder, for a novel approach to treating chronic pain and increasing the clinical efficacy of opioid pain relief drugs.

David C. Denkenberger and John Zhai, Department of Civil Engineering, CU-Boulder, for heat exchanger technology to reduce energy usage in buildings and devices.

Chen Li, Department of Mechanical Engineering, CU-Boulder, for thermal management nanotechnology for improving the efficiency of solar energy generation.

James W. Medlin, Department of Chemical & Biological Engineering, CU-Boulder, for more efficient bio-refining processes.

Conrad R. Stoldt and Se-hee Lee, Department of Mechanical Engineering, CU-Boulder, for novel nanoparticle-based materials to be used in battery applications.

Conrad R. Stoldt, Department of Mechanical Engineering, CU-Boulder, for improved production of nanoparticles for use in battery applications.

2C Technologies Corp., for developing a novel treatment for eye disease.

BioAMPS International, for targeted antimicrobial drugs minimizing side effects and drug resistance.

Biotricity Medical, Inc., for a bio-battery constructed using live cell cultures.

HepQuant, LLC, for an advanced liver function diagnostic test.

ION Engineering, for new methods of creating ionic liquids for use in sweetening natural gas.

LineRate Systems, for efficient pipeline parallelism enabling high-rate networking.

Phobos Energy, Inc., for a method of increasing the power delivered by a solar photovoltaic array.

Qgenta, for a novel approach to treating pancreatic cancer.

New Business Development Based on CU Intellectual Property

In the last 16 years, 94 companies have been formed based on CU IP. 14 are known to be non-operational. Of the 80 companies known to be operating,

- 77 have operations in Colorado (although the headquarters may be located out-of-state)
- 22 have received CU Technology Transfer Office (TTO) Proof of Concept investments
- 7 have "gone public," becoming publicly traded companies (either through an IPO or via a reverse merger)
- 12 have been acquired by public companies (including five from the above seven that have gone public)

Companies Created Based on CU IP, FY 2008-09

QGenta	Therapeutics for the treatment of solid tumor cancers
Biotricity Medical	Implantable biogenerator to create an indefinite power supply for implanted medical devices
LineRate Systems	Parallel processing technology for multicore computing
ION Engineering	Novel material for cost-effective carbon sequestration and natural gas sweetening
Tusaar	Technology for removing metals from water, for industrial and environmental applications
miRagen	MicroRNAs for the diagnosis, treatment and prevention of heart disease
AlloGenesis	Wound healing extract for treating burns and other tissue damage
TechoShark	Mobile social networking software
QFlux	Novel low-cost method of producing uniform nanoparticles for energy applications
Peak BioSciences	Implantable filament for delivering cancer therapeutics to tumors
Phobos Energy	Photovoltaic power conversion method enabling more efficient grid connection

Major Financing Events for CU Licensees

Based on more than 50 separate financial transactions, FY 2008-09 saw nearly $120M of financing for companies created based on CU IP, a figure that is almost $20M greater than last year. Driving this increase were financings of miRagen, Sierra Neuro, OPX, GlobeImmune and Sundrop Fuels. Funding occurred in all categories except for grants (non-federal) and IPOs.

Type of Funding	FY 08-09 Amount
Federal Grant	$3,632,437
Seed/Bridge	$2,095,000
Series A	$39,941,176
Series B	$17,500,000
State funding	$1,587,163
Series C, D, E, F	$40,000,000
TTO funding	$709,987
SBIR/STTR	$12,762,856
Total Financing	$118,228,619

Recognizing Excellence in Technology Transfer

The CU Technology Transfer Office presented its annual awards on January 12, 2009 to researchers working in areas ranging from cancer treatments to vascular imaging to fuel cells, and to companies and business advisors supporting innovation. Awards were given to:

Theodore W. Randolph (UCB) & John F. Carpenter (UCD), Distinguished Interdepartmental Inventors

Richard D. Noble, Inventor of the Year, UCB

John D. Carroll & Shiuh-Yung (James) Chen, Inventors of the Year, UCD

Heide L. Ford & Rui Zhao, New Inventors of the Year, UCD

Hang (Hubert) Yin, New Inventor of the Year, UCB

Sara Honn Qualls, New Inventor of the Year, UCCS

Boulder Innovation Center (Executive Director Tim Bour), Business Advisor of the Year

KM Labs, Inc., Physical Sciences Company of the Year

Taligen Therapeutics, Inc., Bioscience Company of the Year

V. Michael Holers, Inductee into the CU Pinnacles of Inventorship

To view available CU technologies or to sign up for our monthly e-newsletter, please visit www.cu.edu/techtransfer

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