

THE TECHNOLOGY TRANSFER OFFICE 2003-04 ANNUAL REPORT
THE PROCESS OF TRANSFORMING KNOWLEDGE INTO TECHNOLOGY
UNIVERSITY OF COLORADO SYSTEM



Knowledge • Innovation • Technology

Executive Summary

Annual Report and 2003-04 TTO Action Plan

The past fiscal year (July 1, 2002-June 30, 2003) marked the beginning of a turnaround for technology transfer at the University of Colorado (CU). Under the guidance of the Technology Transfer Office's (TTO) first strategic plan, prepared in June 2002, much was accomplished. The *2003-04 TTO Action Plan* as formulated in this report is informed by lessons and results from the *2002 TTO Strategic Plan* and new issues that have emerged in the past year. Overall, the *2002 TTO Strategic Plan* remains a viable road map for the future. Objectives and action items from the *2002 TTO Strategic Plan* have been updated and a few new items have been included in this year's plan.

The two main themes of the past year were to build TTO's infrastructure (people, policies, and processes) and to demonstrate the viability of the new organization. A primary objective emerged as the year progressed—to reach financial break-even by the end of the year. The strategies and objectives underlying these themes were largely accomplished, but more must be done to ensure that CU is on a trajectory to become the best technology transfer operation among research universities.

This year the main themes are to continue building credibility among university and business communities, explore new approaches that leverage community business resources, and improve internal processes to create a more seamless operation. Two primary objectives are to increase the inventor base and continue to manage the operation to attain long-term financial sustainability.

It is an understatement to say it has been a tough year in the technology and venture sectors. The protracted technology recession generally impacts university technology transfer operations in four fundamental ways: licensee sales of products decrease, adoption of new technologies by companies declines, the venture capital industry retrenches, and for successfully executed licenses, valuations are lower and developmental milestone payments are deferred. In spite of those forces, TTO met most of its stretch targets and action objectives. Furthermore, most of the companies in the CU license portfolio have strengthened their businesses, and significant growth and commercialization is underway (see accomplishments list). The economy and technology market will gradually improve and TTO will continue to increase the impact of technology transfer at CU, in the state of Colorado, and the nation.

The Role of Technology Transfer in the State of Colorado's Action Plan to Grow Colorado's Bioscience Cluster (March 2003)

Since the 1999 creation of the Governor's Office of Innovation and Technology, the State of Colorado has worked to become a global leader in creating and implementing technology. The State of Colorado has a strong technology enterprise community, but critical mass in biotechnology has yet to emerge. The Action Plan is both an assessment and agenda for Colorado's bioscience sector. The following items specify CU's roles and responsibilities in the State of Colorado plan:

- CU senior officers motivated cooperation and helped define the consultant's engagement
- The overall strategic thrust is indigenous development heavily predicated on commercialization of university research
- Considerable weight is placed on completion of the CU-Health Sciences Center campus at the former Fitzsimons hospital (accelerated by the passage in May 2003 of the Certificate of Participation bond funding mechanism), and build out of the adjacent bioscience park
- Continued enhancement of university technology transfer; a fund to support the proof of concept for early stage inventions, and a seed-stage biosciences fund

CU Research Centers that Develop Intellectual Property

The Center for Spoken Language Research (CSLR) in the Computer Science Department at the University of Colorado at Boulder is one of the country's leading research groups in the area of advanced dialogue systems. These systems are human-computer interfaces that support natural, unconstrained conversations in specific task domains such as a telephone travel reservation system. These systems incorporate human communication technologies, including speech and speaker recognition, natural language processing, speech and language generation, dialogue management, computer vision, and computer animation technologies to enable accurate, robust, and graceful conversational interaction between people and machines. In FY 2002, two major electronics companies and an educational software company licensed technology created at CSLR.

cslr.colorado.edu

Review of the 2002 Technology Transfer Office Strategic Plan and Directions for the FY 2003-04 Technology Transfer Office Action Plan

The 2003-04 *Technology Transfer Office (TTO) Action Plan* is predicated on what has been learned from execution of the 2002 *TTO Strategic Plan* and new issues that have emerged in the past year. In general, the 2002 *TTO Strategic Plan* remains a viable road map for the future; the 2003-04 plan updates objectives and action items and includes a few new action items for the new fiscal year. This section of the report reviews accomplishments related to the five strategic thrusts and implications for the 2003-04 *TTO Action Plan*. Quantitative targets for key performance metrics are on the inside back cover of this report.

2002 Strategic Plan Strategy I

—Increase Invention Disclosures

Many of the plan's organizational and structural objectives that were thought to impact invention reporting were completed. At the end of the year, however, only three more inventions, for a total of 124, were reported to TTO compared to last year. To a considerable extent, technology transfer is a "numbers game," i.e., the more inventions the greater the licenses. That is why increasing the reporting of inventions is critical to technology transfer's long-term success. For 2003-04 we have set a goal of 15 percent increase in invention disclosures. The latent base of untapped inventions at CU is likely appreciable; by peer standards, CU should be producing 50 percent to 75 percent more inventions.

Given the size of its intellectual property (IP) portfolio relative to peer universities, CU has to increase the number of both first-time inventors and repeat (serial) inventors. First-time inventors accounted for slightly less than half of reported inventions last year. This rate is better than previous years, but given the latent base, TTO is targeting two-thirds of inventions next year from first-time inventors. TTO will continue to provide high quality service to serial inventors, but it is also necessary to expand the base of inventors from the research community.

To accomplish the objective of continually broadening the base of inventors, CU must move from the perspective of invention as an afterthought to invention as a central and ongoing aspect of the research process. Although changing the conventional culture will take many years, change can be led by continued education and support by senior administrators and serial inventors. TTO will become

more proactive in reaching out to these two groups and asking them to encourage and mentor first-time inventors, including lab-by-lab IP education. A special award will recognize first-time inventors and the mentors who have supported them. TTO staff will also increase communication at the department level via staff meetings and use regular campuswide e-mails to provide "inventor tips."

Other accomplishments in this category:

- To reduce the long-term backlog and demonstrate diligence to inventors, TTO offered to return 40 discrete IP items (e.g., invention disclosures, patent applications, and patents subject to maintenance fees) to inventors. TTO deemed these abandoned IP items as unpatentable and/or unmarketable. Of 40 IP items offered for return to inventors, four were transferred to inventors who decided to seek IP protection in their own name.
- To recognize the significant accomplishments of CU inventors and licensee companies, the first annual Technology Transfer Awards was held Nov. 13, 2002. By all accounts, the event was a success; the Second Annual Technology Transfer Awards will be on Nov. 4, 2003.



2002 Strategic Plan Strategy 2 —Best Practice Licensing Operations

In order to leverage Colorado's extensive technology commercialization resources, TTO created the Colorado Technology Commercialization Partnership (CTCP) program. In CTCP projects, TTO licensing associates supervise paid graduate students augmented by resource teams of seasoned business volunteers. The resource teams are composed of professionals from the technology business community, including IP attorneys, serial entrepreneurs, industry domain experts, management consultants, and venture capitalists. The quasi-governmental Colorado Institute of Technology (CIT) recognized the potential of this commercialization partnership approach by awarding a planning grant to CTCP. The CIT grant was used to develop materials and conduct a summer 2003 pilot session. A National Science Foundation (NSF) Partnership for Innovation grant application was submitted in April 2003 to expand CTCP and run it for a three-year period; NSF will make its funding decision in the fall of 2003.

During the past year, TTO executed three restated (substantially revised) licenses with a fourth close to execution. Improvements in the licenses are bilateral and the net result is a win-win situation with benefits for both parties. One of TTO's important objectives in restated licenses (as well as new licenses) is to limit licensee's rights to new inventions created by the initial inventor group. When a licensee's rights to new inventions go beyond the initial inventor group, and when subsequent inventions in that field are not valued by prevailing market conditions, inventive activity by new inventors in that field is stifled.

The approach of benchmarking best practice institutions has been continued beyond the June 2002 strategic plan. Based on research and benchmarking conducted in the spring of 2003, TTO staff concluded that nearly all universities base transactions on multiple economic terms. "Equity only" transactions are not common, particularly to the extent this practice has previously occurred at CU. In a few cases, equity only transactions are appropriate, but in general, they limit opportunities for university stakeholders to optimize the chances for economic return. In the future, TTO will pursue the practice of seeking multiple economic terms in license agreements.

Other accomplishments and initiatives in this category:

- The TTO Business Advisory Board met three times last year and most members are actively engaged in different committees and related tasks, including participation in CTCP and selection of annual awards nominees.
- Significant resources have been dedicated to business development within TTO and University License Equity Holdings, Inc. (ULEHI), and numerous relationships have been built with Colorado's entrepreneurial community. During FY 2002-03, six options or licenses were granted to new companies, which met the 2002 strategic plan's goal. Given improved TTO connections with the venture community and TTO's steadfast commitment to work with entrepreneurs and capital sources, nine companies are targeted to be formed from CU technology during FY 2003-04.

TTO's role in completing the transfer of discoveries and innovation to the commercial sector involves the following:

- Clarifying intellectual property (IP) contributions of inventors, sponsors, and collaborating organizations
- Evaluating and making profitable investment decisions for protecting IP (primarily patents)
- Recognizing and responding to companies' specific licensing requirements
- Diligently developing and commercializing new technologies through relationships with inventors and licensee companies, and managing the complex relations and diverse interests of these and other university stakeholders
- Distributing license revenues to university inventors and others in support of the university's research endeavors

Example of CU's Research Centers that Develop Intellectual Property

The Center of Computational Pharmacology in The School of Medicine, CU-Health Sciences Center conducts leading edge research in the area of medical information retrieval systems.



Examples of intellectual property being generated at the center under the leadership of Dr. Larry Hunter are: software systems for reducing full forms of English words to their stems, co-reference analysis of genes and gene products in biological literature, visualization of large graphs, improved methods for identifying references to genes in free text, and mapping names of genes and gene products to entries in a reference database. compbio.uchsc.edu

2002 Strategic Plan Strategy 3 —New IP Policy Infrastructure

A major accomplishment of the past year was the January 2003 Board of Regents approval of the revised *IP Policy on Discoveries and Patents*. The former regent IP Policy on Discoveries and Patents needed minor changes recognizing new organizational arrangements and updated definitions. The regent policy by itself, however, only addresses higher order concerns and many important, albeit subsidiary, matters are open to interpretation. Therefore, for the first time, an *Administrative Policy Statement on Discoveries and Patents* was created to address operational level IP and licensing matters within TTO.

The issue of greatest concern during the discovery and patent policy deliberation was distribution of royalties generated from technology licensing activities. The new allocation formula is similar to the old formula in that 25 percent goes to the inventor(s) as supplemental income, 25 percent goes to the inventor(s) lab, and 25 percent goes to the university to support TTO. The main difference concerns the remaining 25 percent, which formerly went entirely to the inventor(s) department. In the revised policy, 25 percent is directed to the inventor(s) campus with the department share averaging about one-half of that amount, depending on the campus (see the web site listed at the end of the report for campus details). During this lively debate on royalty allocation, TTO was heartened by the support of many faculty and administrators to retain the quarter share for the university's support of TTO.

The issue of the 25 percent share for the university was further clarified by an agreement between the chancellors and the system administration. This agreement also serves as a growth plan for TTO in that its growth is entirely predicated on an increase in royalty revenue as discussed in a later section of this report. In summary, TTO will grow at a steady rate predicated on the increased demand for IP and licensing services with cooperative supervision from the campus chancellors and the vice president for academic affairs and research.

The CU IP environment was further defined by the January 2003 approval of regent and administrative policies on educational materials. The advent of new educational media such as web-based learning created need for such a policy; these educational materials policies primarily clarify issues of author and university ownership. The policies reinforce traditional canons of academic freedom and author/creator ownership of scholarly and creative works (as opposed to discoveries created from the research process).

Other accomplishments and initiatives in this category:

- The new *Administrative Policy Statement on Discoveries and Patents* created a guideline for TTO to request a business plan prior to negotiating terms for licenses to start-up companies. Key people in the venture community asserted that unless the economic terms were clear ahead of time, they had minimal interest in investing resources in a business plan. To address this “chicken or egg” problem, TTO engaged a group from its Business Advisory Board. This process resulted in a commitment for new guidelines that set a range or band for economic terms in licenses to start-up companies. These guidelines will be determined during the summer of 2003. TTO will continue to rely on conventional “industry-university standard terms” in options agreements when both parties agree such terms are appropriate. Two additional timely response objectives were asserted by TTO: 90 days from first meeting to contractual document (license or option) and three-day TTO turnaround response during negotiations.

Vision Statement

By 2010 the University of Colorado Technology Transfer Office will be recognized as the best among public universities.

Mission Statement

The mission of the CU Technology Transfer Office is to aggressively pursue, protect, package, and license to business the intellectual property generated from the research enterprise and to serve faculty, staff, and students seeking to create such intellectual property.



2002 Strategic Plan Strategy 4 —Create a Quality TTO Staff

The first new addition to TTO's staff in the fiscal year was the July 2002 hiring of Kate Tallman, MBA, as IP manager for the Boulder TTO. The next hire was Rick Silva, MBA/PhD, as licensing associate at Health Sciences Center (HSC) TTO. Directors for the Boulder TTO and HSC TTO were hired in November: Ken Porter, MBA/PhD, and Vivian Dullien, PhD, respectively. In December, Kristin Diamond, JD, was hired to support TTO in legal matters. Although Kristin is housed in TTO's offices, she reports to Charles Sweet, university counsel. At the end of the fiscal year, Donna Sichko became TTO's financial manager with a move from contractor to employee status.

TTO now has a fully functioning staff at the 13.5 FTE level. Additionally, TTO staff are assisted by at least three student interns. During the summer of 2003, with funding from CIT and the Robert H. and Beverly A. Deming Center for Entrepreneurship at CU-Boulder, the CTCP program hired four MBA student interns and a part-time program coordinator. The budget resources committed to personnel will not increase during FY 2003-04, with the exception of a program coordinator and student interns, if NSF awards the CTCP program grant proposal. Although budget resources committed to personnel will not increase, some realignment of existing staff duties will occur and all staff will be expected to demonstrate continuous improvement.

Other accomplishments and initiatives in this category:

- TTO staff are exploiting new software tools to enhance efficiency and quality of work. The relational database program implemented in 2002 is functional, and staff are becoming proficient in its use. The database is readily accessible by all staff and certain new technologies are listed on the TTO web site for increased exposure. TTO also acquired a new tool on a trial basis that is expected to improve invention disclosure reviews, enhance identification of license candidates, and strengthen claims drafted in patent applications relative to competitive patents. TTO is the first university licensing office in the nation to use this software.

2002 Strategic Plan Strategy 5 —Communication and Continual Education

TTO has received positive feedback about its progress from many elements of the university and business community. As is the case with many aspects of CU technology transfer, progress is heartening but the climb will be long.

The communications agenda established in the 2002 strategic plan was ambitious and although it was mainly completed, the impact did not materialize as expected. That is, many more people know about TTO, but invention disclosure rates have not appreciably increased. From July 2002 to the end of June 2003, TTO staff organized and participated in 19 technology community sponsored events, 47 meetings with faculty groups and administrators, eight class presentations, and 21 general-topic public seminars held at the university. For the general-topic public seminars, a pattern emerged; by mid-year many of the same people were showing up and generally less than a quarter were faculty. Although attendance at the seminars averaged about 35 people per event, diminishing returns were experienced relative to faculty outreach objectives.

In the new fiscal year, TTO staff will continue an aggressive communications agenda, albeit more focused. TTO will respond to requests to speak at technology community events, continue to meet with faculty groups and administrators (department heads, associate deans, etc.), and make presentations to classes. Fewer general-topic public seminars will be organized by TTO. Instead, greater emphasis will be placed on seminars directed to investigators in technology-focused groups, which are often done in conjunction with an IP attorney who practices in a technology-focused area. Special attention will be given to small group sessions for investigators that are potential first-time inventors.

One element of the feedback is that the technology transfer process is complex and intimidating to many investigators. Subsequently, TTO created a capabilities document intended to demystify technology transfer, which was widely distributed through campus mail. However, comments about complexity and intimidation persist. In part, many CU researchers and people in the business community still operate under old perceptions about technology transfer at CU. This situation will be addressed through communications

Example of CU's Research Centers that Develop Intellectual Property

The Institute of Bioenergetics was established in 2003 at the University of Colorado at Colorado Springs with the scientific purpose of understanding cellular metabolism and cellular communication. Bioenergetics is the multidisciplinary study of how cellular metabolism (choice of fuel, energy production, energy storage, and energy consumption) governs the interactions between cells. The institute provides a mechanism to identify faculty and students and to assist their work on curing diseases based on a novel approach to modifying the immune system. Protecting and enhancing the value and scope of the intellectual property created by the institute's co-director Dr. Karen Newell and her associates is a key thrust of the center. web.uccs.edu/cubioenergetics

approaches. In particular, a new outreach document to be created in early 2004 will break down the technology transfer process into discrete understandable steps to help inform and set expectations.

Other accomplishments and initiatives in this category:

- The TTO web site received additional content as available and needed. The front page now has a link to the invention disclosure form and 10 informational bulletins on topics ranging from open source software licenses and biological materials licensing to what constitutes an invention and the patent process. In the next year, five new informational bulletins will be added and the others will be revised or updated as needed.
- Over the course of the past year, CU issued six press releases about technology transfer. TTO will prioritize greater use of existing university media, particularly for press releases on new licenses. One bright spot has been the inclusion of “tips for inventors” that is part of an HSC campuswide e-mail distribution; this will be expanded to other campuses. Additional examples of technology transfer appearing in the larger academic agenda are inclusion in the School of Medicine Strategic Plan for Research and extensive linkage on the CU System web site (www.cu.edu). Other inexpensive opportunities to reach investigators and the business community with straightforward informative messages will be sought.

The Bayh-Dole Public Law and Its Impact on Technology Transfer

Since 1980, the Bayh-Dole law has guided technology transfer at U.S. research universities and provided the basic empowerment for university ownership of intellectual property (IP) created by federally funded research. The Panel on Federal Investment in Science and Technology, convened by The President’s Council of Advisors on Science and Technology (PCAST), recognized two decades of technology transfer advances with its February 2003 national-level recommendation that “existing technology transfer legislation works and should not be altered.”

Unfinished Business from the 2002 TTO Strategic Plan

The 2002 TTO Strategic Plan was indeed ambitious and not everything was addressed or completed in the first year. One of the greatest unfulfilled needs mentioned in the plan is an early-stage technology commercialization entity. Many research universities have access to a proof-of-concept operation that helps promising IP be directed to market drivers through an operational proof-of-concept or a concept validation financial mechanism. These operations are typically run either as internal adjuncts to technology licensing offices or external to the university as a pre-seed venture capital type fund, although other arrangements exist. State governments or university alumni fund most of these operations. (It is noteworthy that the state’s *Action Plan to Grow Colorado’s Bioscience Cluster* recognized the need for such a fund.) A committee of the TTO Business Advisory Board has been addressing this issue and some progress has been made. In the next year, TTO will continue to work, primarily through the Business Advisory Board, to solve the gap funding need for promising platform IP.

Other incomplete initiatives:

- TTO is constantly in communication with stakeholders, but a customer satisfaction survey has not yet been conducted. This will be a student intern project for 2003.
- The proposed salary bonus plan for TTO staff has not been enacted given the economic situation. The plan is in draft form and will be completed in the new fiscal year.
- TTO proposed a web-accessible database, which would allow stakeholders to access confidential information on a need-to-know basis. This initiative has been indefinitely postponed due to budget constraints.



The Revised Financial Model for FY 2003-04

Last year TTO built a financial model to approximate the development of technology transfer at CU. TTO growth projections were predicated on an economic upturn commencing in fall 2002; clearly, the extent and the duration of the current recession were underestimated. Two key variables in the financial model are: 1) annual invention disclosure increases and 2) expectations about the economic consideration expected in new license transactions such as up-front initiation fees and near-term royalty minimum payments. The issue of invention disclosures has been addressed earlier in this report, and it is a fundamental driver for growth. License initiation and near-term royalty payments have been victims of the continued technology sector recession; today many licensees are only interested in out-year or deferred royalty terms. As the economy improves and the competition for adopting new technology increases, near-term royalty payments will once again be more common. The net result of these two forces and others such as few initial public offerings and depressed technology product sales has been to slow the long-term growth of technology transfer at CU.

As stated earlier, the agreement between the chancellors and the system administration serves as a growth model for technology transfer at CU. As royalty revenue increases and the demand for IP and licensing services increases (as measured by invention disclosures), TTO's overall budget will increase. Royalty revenue increases are expected to occur at a rate that will allow TTO to grow at a reasonable pace and offset the decreasing revenue contributions by the president's office and the chancellors.

TTO's overall budget for FY 2003-04 is \$2.8 million; 57 percent is derived from the 25 percent share of royalties and patent cost reimbursements (see additional financial information on the inside back cover). During FY 2003-04, the contribution from the president's office will decrease by 15 percent from last year; these funds will be offset by an expected 15 percent increase in royalty revenue.

Given the impact of the weak economy on IP valuations and equity liquidations, and new expectations about growth in invention disclosures, it is expected that financial self-sufficiency will not occur until FY 2008. Estimating the future financial status of a university technology licensing operation is more an art than science. The reality of such operations is that one or two licenses (typically a human therapeutic) produce the majority of royalty revenue. Today, CU's licensing portfolio does not have a license producing millions of dollars of royalty, but as can be seen from the accomplishments of our licensees, such potential clearly exists in the portfolio.

Web References

Awards events—

www.cu.edu/techtransfer/about/awards/news_awards.html

Board members—

www.cu.edu/techtransfer/about/board.html

IP Policy on Discoveries and Patents—

www.cu.edu/techtransfer/campus/policies.html

TTO capabilities statement—

www.cu.edu/techtransfer/downloads/TT%20capabilities%20statement.pdf

The Challenge for Technology Transfer at CU

Considerable goodwill among TTO's stakeholders has been built during the last year. Today many more people inside and outside CU perceive that TTO is delivering real value. This perception is not universal, however, and TTO must continually demonstrate how it delivers value.

Just as many perceive that the past is not the destiny for technology transfer at CU, many understand that the change from past practices will impact their future relationship with CU technology transfer. Three interdependent realities are key to this understanding: first, the technology transfer operation basically exists as an economic enterprise within CU; growth and eventual sustainability is predicated upon increased performance in the form of inputs such as invention disclosures and outcomes such as license royalty and related payments. Second, TTO cannot grant "special terms or discounts" to potential licensees because TTO has a stewardship responsibility to government agency and university stakeholders to maximize societal value and economic value for the university. And third, given these economic and social imperatives, tough decisions must be made concerning which intellectual property to protect and market, and which to abandon or release to the public. Inventors do not want to hear that the infant technology they have conceived and nurtured is commercially unattractive, but the reality is that only a few technologies have commercial potential. Therefore, the focus of the operation has to be on those inventions with positive economic potential.

Balancing the forces of greater inventor involvement, enhancing invention rates, providing economic value to the university and inventors, and delivering economic development and social value for Colorado and the broader society is a creative tension characteristic of university technology transfer. The University of Colorado is committed to becoming a national leader in technology transfer and fully accepts the challenges and risks associated with working to balance these objectives.

Technology Transfer: The Bigger Picture

- It's not just about accepting assignment of intellectual property (IP) rights; it's more about taking ownership and responsibility for the quality of the process and outcome.
- It's not just about licensing technology; it's more about managing IP and inducing adoption of innovation.
- It's not just about acting like a business; it's more about using economic reasoning and supporting academic values.
- It's not just about quick return; it's more about patience, the right partner, and sustained commitment.
- It's not just about assuming CU's technology transfer history is not destiny; it's more about changing a culture that accepted that history and helping those who are motivating change.

FY 2002-03 Accomplishments of Selected CU Portfolio Companies

ALD NanoSolutions — In the past year, CU and ALD NanoSolutions entered into an option agreement covering patent-issued and patent-pending technologies for atomic layer deposition of coated particles. ALD is a Colorado-based specialty nano-material start-up company with technology and expertise in designing thin films capable of enhancing properties of a wide variety of substrates. The company's scientific founders, Drs. Karen Buechler, Steven George, and Alan Weimer, continue their fundamental research at CU-Boulder. The company recently received three Phase I SBIR grants and has pending applications in for additional Phase II SBIR grants. www.aldnanosolutions.com

Aptus Pharmaceuticals, Inc. — In the past year, Aptus executed an exclusive license agreement to commercialize assays for drugs that target G protein coupled receptors, a multi-billion dollar market. The inventors of the assay are CU-Health Sciences Center research investigators Jeffery Karpen, Thomas Rich, Dermot Cooper, and Jerry Schaack. www.aptuspharma.com

Barofold, Inc. — This start-up company signed an exclusive license agreement to develop a patented protein refolding technology invented by CU researchers Ted Randolph in chemical engineering (CU-Boulder) and John Carpenter in pharmacy (CU-Health Sciences Center). The Colorado-based company is commercializing a new method that employs hydrostatic pressure to disaggregate and refold recombinant proteins, thus reducing a production bottleneck that minimizes production yield for biopharmaceutical drugs.

CDM Optics, Inc. — In August 2002, the company added to its growing collaborations by executing an agreement with Olympus Optical Co., Ltd., for the use of CDM Optics' proprietary Wavefront Coding technology in Olympus' endoscopy products. The major value of Wavefront Coding technology lies in its ability to allow imaging with a far greater depth of field than is possible with traditional imaging systems. It also allows for less expensive optical designs to perform as well as highly corrected optical systems by using fewer elements and permitting the use of either plastic or glass optical elements. The company was acknowledged as the eighth fastest growing company in Colorado, and in December 2002, it was featured in the international weekly *The Economist: Images from a blurred world*. In February 2002, the U.S. patent office granted a fundamental patent to CU for the company's Wavefront Coding technology. www.cdm-optics.com

ColorLink, Inc. — In July 2002, the company received a \$5 million equity investment from Three-Five Systems. Three-Five Systems will incorporate ColorLink's color management technology into its new micro display light engine. In April 2003, this Colorado-based company announced that it has developed a new product that will reduce the cost of rear-projection televisions: a two-panel LCOS system that provides nearly the same brightness as a three-panel system and will reduce the cost of assembly. New generations of televisions with this system are scheduled to come to market in mid-2004. www.colorlink.com

Dharmacon Inc. — This emerging Colorado-based company was founded in 1995 to develop and commercialize a new technology for RNA oligonucleotide synthesis. This new chemistry, 2'-ACE RNA, was invented and developed by Stephen Scaringe and Marvin Caruthers at CU-Boulder. In August 2002, Dharmacon renegotiated its license for the technology from CU. In September 2002, the company received \$5.7M in venture funding. This financing enabled the expansion of R&D and production capabilities. In May 2003, Dharmacon released the SARS siARRAY Gene, a library of short interfering RNA (siRNA) duplexes targeted against multiple regions of the coronavirus that is believed to cause SARS. The use of the SARS siARRAY Gene Set enables researchers to study the life cycle and pathogenicity of the virus, and potentially to facilitate development of therapeutics and vaccines against SARS. Additional collaborations were announced in the past year. www.dharmacon.com

Efectka Technologies Corporation — In June 2003, the Colorado-based company entered into an exclusive license agreement for rights to proteomics software. Proteomics based drug discovery is rapidly replacing conventional combinatorial chemistry methods for drug discovery. Dr. Mark Duncan and his team at the Proteomics Facility at CU-Health Sciences Center designed and developed proprietary algorithms for the analysis of data sets from mass spectrometry instruments. The software, called Wombat, greatly facilitates more accurate characterization of the information contained in mass spectrometry data sets. www.efekta.com

EyeTech Pharmaceuticals Inc. — A licensee of SELEX technology invented by a group headed by Larry Gold, previously with CU-Boulder's Department of Molecular, Cellular and Developmental Biology, EyeTech has completed Phase II/III patient enrollment for its lead compound Macugen, a treatment for macular degeneration. The disease is the leading cause of blindness after age 65, affecting more than a million patients in the United States. In December 2002, EyeTech entered into one of the biggest biopharmaceutical development and commercialization deals ever with Pfizer Inc. www.eyetk.com

GlobelImmune, Inc. — This early stage Colorado-based biotechnology company is developing vaccine technology for targets that until now have been unapproachable by current techniques. Building on positive data in mice and primates, the company is currently preparing for a Phase I clinical trial of an AIDS vaccine in conjunction with the National Institutes of Health and has additional products in development for other persistent viral infections and a number of cancers. Three CU-Health Sciences Center researchers, Drs. Duke, Franzusoff, and Bellgrau, founded the company. In June GlobelImmune received a Series A investment that could total up to \$8M dependent on the completion of milestones. www.globeimmune.com

Knowledge Analysis Technologies, LLC — K-A-T revenue growth of 48 percent in the past year qualified the company as 25 on the Mercury 100 list of Fastest Growing Companies in Boulder County. K-A-T has signed a partnering agreement with Pearson Educational Measurement, a world leader in test delivery. The company's Intelligent Essay Assessor is the technology behind Holt, Rinehart and Winston's "Holt Online Scoring" and Steck-Vaughn's "GED 2000" practice test products. The company's impressive SBIR/STTRs accomplishments now include 11 Phase I and 7 Phase II awards. www.k-a-t.com

Lohocla Inc. — Lohocla is a Colorado-based start-up company founded by Dr. Boris Tabakoff, chair of pharmacology at CU-Health Sciences Center. Lohocla is dedicated to the screening, diagnosis and treatment of addictive disorders such as alcoholism. In May 2003, Lohocla executed an exclusive option with CU for two genetic screens that will significantly aid the screening and diagnosis of alcoholism and depression.

Medical Simulation Corporation and Philips

Electronics N.V. — In the past year CU entered into two license agreements for the commercialization of new 3-D software for coronary artery structures. The software is a major improvement over traditional 2-D angiography, providing cardiologists with more accurate, higher quality images of the beating heart. The project is the collaborative effort of two inventors at CU-Health Sciences Center, Dr. James Chen, a computer scientist, and Dr. John Carroll, a cardiologist. The non-exclusive license with Philips Medical Systems, the medical division of Philips Electronics N.V., paves the way for Philips to commercialize copyrights, patents, and software in all applications directly involved in patient care, including medical equipment and clinical workstation software and support. Under the agreement with Colorado-based Medical Simulation Corp., the company retains exclusive rights to market the software in the field of educational medical simulation, giving healthcare professionals access to a realistic training experience that poses no risk to patients. www.simsuiteed.com

Metabolite Laboratories, Inc. — Net income primarily from sales of homocysteine diagnostic tests for this Colorado-based company led by Dr. Robert Allen of CU-Health Sciences Center was up 57 percent for year 2002 as compared with 2001.

Myogen, Inc. — During the past 12 months, the company continued its phase III Enoximone clinical trial and received \$750,000 SBIR grant last fall to study novel therapeutics for chronic heart failure. Myogen is a Colorado-based biopharmaceutical company focused on the discovery, development, and commercialization of therapeutic drugs for the treatment of heart disease. Company scientific founders, Drs. Michael Bristow (CU-Health Sciences Center) and Leslie Leiwand (CU-Boulder), continue their research at CU. Myogen markets one product in Europe for acute treatment of advanced heart disease. In addition to Enoximone, the company has another product candidate in clinical development and a portfolio of molecular therapeutic targets for heart disease. www.myogen.com

Newellink Inc. — Newellink is a California headquartered start-up biotechnology company, which will eventually set up operations in Colorado Springs. The company signed an exclusive option agreement as a first step to develop and market the patent-pending bioenergetics platform technologies invented by teams led by Dr. Karen Newell at CU-Colorado Springs. Bioenergetics is the study of how cellular metabolism (choice of fuel, energy production, energy storage, and energy consumption) governs the interactions between cells, which are central to life, death, and disease. The purpose of Newellink is to build a multi-disciplinary platform approach to understanding cellular metabolism and cellular communication with the intention of treating or curing major diseases based on this platform technology.

Phiar Corporation — In the past year, this Colorado-based company was awarded fundamental patents and received an additional \$3M first-round financing from Menlo Ventures, the sole investors in the company. Dr. Garret Moddel of CU-Boulder founded Phiar in 2001. Phiar is developing novel components for integration of optical functions on silicon chips. This will increase data transfer rates and processing speeds of optical communications systems. www.phiar.com

PowerSicel Inc. — This Colorado-based start-up company was the first CU investment for ITU Colorado. Recently, the company completed a \$2.5M second round of venture capital financing. The company, led by CU-Boulder researchers Drs. Bart Van Zeghbroeck and John Torvik, is working to integrate cellular amplifiers on silicon carbide chips, which will yield better production and performance for cellular phone calls and wireless data transmission. www.powersicel.com

Replidyne — Replidyne, Inc. and CU amended their previous agreement related to bacterial replication. Colorado-based Replidyne received \$13M in venture capital investment from a nationally syndicated venture capital consortium in 2002. The amended agreement includes the transfer of certain rights to an international licensing partner who will commercialize intellectual property discovered in the lab of CU-Health Sciences Center researcher Dr. Charles McHenry. www.replidyne.com

SomaLogic — In February this Colorado-based company completed a \$19.5M financing round. In the past year the company, led by Dr. Larry Gold, entered into collaborations with the National Cancer Institute and with Merial Limited. The Merial research collaboration concerns bovine spongiform encephalopathy (BSE) also known as "mad cow disease." www.somallogic.com

2B Technologies, Inc. — This Colorado-based company sells ozone monitors worldwide. In the past year, 2B Technologies licensed from CU the design for a compact, lightweight, and relatively inexpensive ozone monitor. The compact, lightweight, and low power consumption design of the Model 202 and 202M Ozone Monitors make them ideal for vertical profiling using balloons, kites, and light aircraft where space and weight limit long-term monitoring at remote locations, and where power is limited. www.twobtech.com

Technology Transfer Key Performance Indicators			
Item/metric	Projected goals 02/03	Accomplishments	Targets 03/04
Inventions reported to TTO	145 (20% increase on a base of 121)	Actual number = 124	15% increase
Patent applications	53 (15% increase on base of 46)	Actual number = 62 U.S. filings	15% increase
Licensing transactions (options and licenses)	35 (50% increase on a base of 24)	Actual number = 33	15% increase
Ratio of legal fee reimbursements to legal expenditures	Target percentage of 25%	Actual percentage = 28%	Target percentage of 32%
Royalty revenue	\$3.7M (25% increase)	Actual number = \$3.4	15% increase
Start-up companies	6 (100% increase on a base of 3)	Actual number = 6	9
IP induced sponsored research	No goal set	\$5.5M	15% increase
Executed Materials Transfer Agreements	No goal set	330	15% increase

2003/04 TTO Financial Summary

REVENUES (in \$ thousands)

Total Royalties	\$3,915
TTO Portion	\$978
President's Office Support	\$850
Campus Support	\$366
Patent Cost Reimbursements	\$312
Available for Reserve	\$306
TOTAL REVENUES	\$2,812

EXPENSES (in \$ thousands)

Salary & Benefits	\$1,195
Administrative Expenses	\$853
Speculative Patent Costs	\$764
TOTAL EXPENSES	\$2,812

TTO Portfolio Snapshot as of July 1, 2003

U.S. Patents Issued = **233**
U.S. Patents in Prosecution = **134**
Active Licenses/Options = **155**
Start-ups Remaining as Viable Companies = **27**



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