# WISCONSIN STATE LEGISLATURE COMMITTEE HEARING RECORDS

**2007-08**
(session year)

**Senate**
(Assembly, Senate or Joint)

**Committee on Economic Development (SC-ED)**

(Form Updated: 08/11/2009)

## COMMITTEE NOTICES ...

➢ Committee Reports ... CR
**

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## INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL ...

➢ Appointments ... Appt
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Name:

➢ Clearinghouse Rules ... CRule
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➢ Miscellaneous ... Misc

**07hr_SC-ED_Misc_pt01a**
**(2007 documents)**


# The Economic Contribution of the University Research Park

**Dennis K. Winters**
**Vice President & Director of Research**


**August 2006**

# The Economic Contribution of the University Research Park

## Introduction

The University Research Park (URP) is a manifestation of the combined presence of the UW-Madison and the Wisconsin Alumni Research Foundation. Combining the research that takes place on the UW-Madison campus with the financial, legal, management and support expertise of WARF has made the URP a center of innovative high-tech product development. This concentration of people and capital is one reason Madison and Dane County continues to attract talent and income.

URP asked NorthStar Economics to estimate the economic impact the activities in the park make to the local economy. Using data collected from companies in the park and an economic impact model, NorthStar calculated the economic contribution URP makes to Dane County, the number of jobs supported by activities in URP and the tax revenue generated due to the existence of the companies in URP.

The estimated contribution URP makes to the local economy is presented in this report.

## About URP

The University Research Park was established in 1984 with support from Madison Gas & Electric Company as a non-profit, technology park designed to foster the growth in technology transfer and new start up companies in Wisconsin. Located in Madison, the 255 acre park offers business incubator space and land parcels for building construction. The incubator building, MG&E Innovation Center, consists of 113,000 square feet of office and laboratory space, conference facilities and common areas. In addition to the incubator facilities, URP leases land for companies that wish to expand within the park and offers build to suit and multi-tenant buildings for lease. The park now has 34 buildings housing 114 companies.

**URP Physical Statistics**
2006

| | |
|---|---|
| Acreage | 255 |
| Buildings | 34 |
| Square Footage | 1,532,000 |
| Companies | 114 |

Companies located in the park represent a wide spectrum of business and industry. Biotechnology firms dominate the URP landscape, but also residing within the park are a business bank, three venture capital firms, an economic consulting firm, an on-line learning company, and two childcare facilities. Most of the high-tech start-up companies in the Park are off shoots of research conducted at the UW-Madison and supported by WARF.

URP accepts no state or local funding and, in fact, paid over $2.8 million in property taxes in 2005. All URP assets and net income are for the benefit of the UW-Madison to continue the research that will create more high-tech start up companies in the future.

## Economic Contribution

The economic contribution URP makes to the community is greater than just the activity that occurs within the Park. The business activity of the firms in URP has a greater economic impact on the surrounding community through the ripple effect of dollars spent by URP companies and employees. For example, for every dollar spent on computers by a company in URP, there are a number of people and businesses in the greater Dane County community that sell and service the computers for the URP companies. These providers in turn spend the income they receive from URP company business on other goods and services in the community, such as food, clothing, and shelter. Expansion of the direct economic activity of firms within the park out to the greater Dane County community is known as the multiplier effect. The multiplier effect affects commerce dollar flows through the community, job activity, and tax revenue generation.

### Direct Impacts

There are 114 companies employing over 4,100 people in the University Research Park in 2006. URP firms' employees are highly educated with over 90% having at least a bachelor's degree and almost 44% having advanced degrees. URP employees earn over $62,000 on average. This is substantially above the state average earnings of $35,503 and the average Dane County earnings of $39,029.

**URP Company Employee Statistics**
2006

| | |
|---|---|
| Number of Companies | 114 |
| Number of Employees in URP | 4,155 |
| Percentage with BS degree | 47.9% |
| Percentage with Advanced Degree | 43.8% |
| Average Annual Earnings per Employee | $62,290 |

URP firms have a total gross payroll of almost $260 million dollars with annual average earnings of over $62,000. Of this $260 million in payroll, about 25 percent leaves the local area for federal taxes and other deductions. Another roughly 20 percent leaves the area due to personal spending outside Dane County.

**URP Company Employee Payroll**
2006

| | |
|---|---|
| Gross Payroll | $ 258,816,290 |
| Net Payroll | 194,112,218 |
| Local Spending | 155,736,232 |

URP firms also spend over $200 million on non-payroll goods and services, such as computers. About 47 percent of that spending occurs within the local economy, $100 million.

**URP Company Non-Payroll Spending**
2006

| | |
|---|---|
| URP Company Non-Payroll Spending | $ 212,909,476 |
| URP Company Local Spending | 100,373,993 |

All the employees in the Park pay income tax to the state, over $8 million. They also pay sales taxes on purchased goods, $6 million, and property taxes to the local communities, over $11 million. The Park it self pays almost $3 million dollars in local property taxes.

**URP Economic Statistics**
2006

| | |
|---|---|
| Total URP Non-Payroll Spending | $ 212,909,476 |
| URP Companies' Local Spending | 100,373,993 |
| URP Property Tax | 2,828,353 |
| URP Companies' Employee Income Tax | 8,282,121 |
| URP Companies' Employee Sales Tax | 5,926,893 |
| URP Companies' Employee Property Tax | 11,051,456 |
| Total Direct URP Tax Revenue Generated | $ 28,088,823 |

**Total Economic Impact**

The total economic impact of URP is expanded using economic multiplier coefficients applied to the direct economic activity of URP companies. Multipliers are applied to payroll spending, non-payroll spending, and to employment levels.

The multiplied economic expansion brings the total economic contribution the URP makes to the local economy to over $630 million. Payroll spending accounts for $376 million of the total. Non-payroll spending accounts for $254 million.

Total employment in the area also expands due to URP activity. Employment is affected by non-payroll spending and by the employees of URP companies. Non-payroll spending by URP companies creates 3,030 jobs in the local communities. The existence of URP companies' employees create 1,301 more jobs.

The total number of jobs created by activities at URP is 8,486.

With the addition jobs comes additional tax revenue. For the 4,331 of new jobs created by URP companies and their employees, there is another $16 million in tax revenue generated. This

consists of $5.2 million in income tax revenue, $3.8 million in sales tax revenue, and $7.1 million in local property tax revenue.

**URP Company and Employee Tax Revenue**
2006

| | |
|---|---|
| URP Companies' Employees | 4,155 |
| Indirect Jobs Created | 4,331 |
| Total Tax Revenue of Indirect Jobs | $ 16,129,665 |

The total economic contribution to the local economy due to the presence of the University Research Park is large, $630 million. The Park's presence is also responsible for 8,486 workers in Dane County and over $44 million in tax revenue.

**URP Total Economic Contribution**
2006

| | URP | Indirect | Total |
|---|---|---|---|
| **Economic Contribution** | $ 256,110,225 | 374,056,459 | **$ 630,166,684** |
| **Jobs Created** | 4,155 | 4,331 | **8,486** |
| **Tax Revenue Generated** | $ 28,088,823 | 16,129,665 | **$ 44,218,488** |

**TOP STORY**

WEDNESDAY, JULY 25, 2007

# States work to plug 'brain drain'

**By Pauline Vu, Stateline.org Staff Writer**

A "brain drain" problem is plaguing a number of states in the Midwest, Great Plains and Northeast. Young, educated people flee, taking high tax revenues and economic potential with them.

To reverse the loss of such a valuable asset, states are trying solutions that veer from granting financial incentives to stay, to trying to create jobs to keep and attract new workers, to improving the quality of life for young people.

The problem for states is there's no sure-fire solution.

"There is an argument of what comes first – the businesses who hire the graduates, or the graduates who lure the businesses? I don't think the research on that is definitive," said Dan Hurley, the director of state relations and policy analysis for the American Association of State Colleges and Universities.

Maine will become the first state to give future college graduates a hefty tax credit to help pay back their student loans if they stay and work in the state. The incentive could amount to a yearly tax credit of just under $5,000 a year over the course of 10 years.

But will it work? Yes, says Andrew Bossie, a recent University of Southern Maine graduate who led a successful grassroots effort that convinced lawmakers to pass the tax incentives this year. Several friends wanted to stay in Maine but had to leave for higher-paying jobs elsewhere to begin paying off their loans, Bossie said.

"The economy is going to have the benefits of a more-educated workforce," Bossie said. "It's a really smart way to get more bang for our buck."

But others question whether financial incentives alone will keep the young from leaving.

Bruce Vandal, the director of post-secondary education and workforce development for the Education Commission of the States, a nonpartisan think tank, pointed out that if the jobs aren't there for graduates, "there's no reason ... they would stay, even with the financial incentives."

Many rural states have a natural disadvantage when it comes to a quality of life that appeals to the young. They don't have Colorado's ski slopes, California's beaches or the glamour of cities such as Atlanta and Las Vegas. Omaha, Neb., has been ranked by *Forbes* and *Money* magazines as one of the country's best cities to live in, and yet young people who live there often feel the need to leave, said Richard Baier, Nebraska's director of economic development.

"It's part of the 'big-city syndrome,'" Baier said. "It's a cultural thing."

According to a U.S. Census Bureau report, states that lost the biggest percentage of single, college-educated residents ages 25 to 39 from 1995 to 2000 were North Dakota, Iowa and South Dakota. At least 33 states were "net exporters" of young people, or lost more of that

demographic than they gained.

The beneficiaries were in the West and South, home of the top 10 states that took in more young people than they lost. Nevada, Colorado and Georgia – with major cities such as Las Vegas, Denver and Atlanta – led the list.

Maine's is one of the most ambitious attempts to dangle financial incentives to stem the brain drain.

Other states have experimented with forgiving the loans of college graduates who remain in-state, but those programs usually have been targeted at specific jobs such as doctors or math and science teachers or directed at rural areas. The Pennsylvania Legislature, for example, currently is weighing a bill to forgive doctors' medical school tuition if they practice in the state for 10 years.

Both North Dakota and Iowa in recent years flirted with proposals to exempt residents under 30 from paying the state income tax. This year, lawmakers in Iowa debated but didn't pass a proposal to give tax credits to employers if they pay employees' student loans. Indiana Gov. Mitch Daniels (R) tried but failed to get approval for a scholarship program for technology graduates who promise to work there after graduation.

In December, a Wisconsin higher education commission recommended what it called the "big bang": free college tuition for graduates who live in the state for at least 10 years after college. However, the state took no action on the idea.

Other states instead are focusing on jobs, especially in the technology sector, as a chief draw.

Pennsylvania attracts some of the highest numbers of out-of-state students to its colleges, but four years later, most of them take their degrees and run. Three years ago, the state set up Keystone Innovation Zones (KIZ) to give grants to partnerships between universities and their surrounding communities, including businesses and private foundations. The zones were designed to create new businesses and jobs. There are now 26 zones, with 647 Pennsylvania graduates and interns working at companies inside the zones.

Nebraska is trying to link people and jobs in a brain re-gain effort. In the last 10 years, the state has targeted alumni through its Nebraska-focused job site, Careerlink.org, and by contacting Nebraskan expatriates with mailings, luncheons and job fairs.

A little more than a decade ago Oklahoma unveiled Project 1000, asking a thousand of the state's companies to hire one more Oklahoma college graduate than they planned to hire; the state even held a job fair at the Capitol the following year.

States also are trying to figure out how to spice up their quality of life. This year, the Iowa Legislature created the Generation Iowa Commission to tap 18-to-35-year-olds for ideas on how to keep them in the state. More than 250 people applied for one of the commission's 15 spots.

New Hampshire's "55% Initiative" – so named because the state hopes to raise the portion of college graduates who stay in the state from the current 50 percent to 55 percent – plans to mount a tourism-like marketing campaign. Step one: State colleges will survey students and alumni on why they chose to leave the state or stay put.

# MGE Tenant Company Profiles:

## Alator Biosciences

Suite 165, 510 Charmany (subleasing)

Alator Biosciences supplies the world's leading bioscience researchers with restriction enzymes, molecular weight markers and hundreds of other high quality life science research tools.

## Ash Access Technology, Inc.

Suite 268, 510 Charmany

Ash Access Technology is dedicated to developing and commercializing innovative products that address high unmet need in the area of vascular access-related complications with a focus on infectious disease therapies and device performance.

## Baird Venture Partners

Suite 275A, 510 Charmany

Baird Venture Partners is the venture capital group of Baird Private Equity, Robert W. Baird & Co.'s $1 billion direct investment business. BVP invests in early to late stage companies with superior growth potential.

## BioSentinel

Suite 261, 510 Charmany

BioSentinel LLC was founded to create novel detection systems, to develop high specificity and sensitivity portable, biosensor devices and to discover antagonists for prevention of bioterrorism by use of botulinum neurotoxins (BoNTs).

## Cell Line Genetics

Suite 254, 510 Charmany

Cell Line Genetics, LLC provides services and products to support research institutions, as well as biotechnology and pharmaceutical companies focused on Embryonic Stem Cell and Cancer Research.

## Deltanoid Pharmaceuticals

Suite 150, 510 Charmany

Deltanoid Pharmaceuticals is a drug development company involved in breakthrough treatments for osteoporosis, renal osteodystrophy, psoriasis and other disease targets. The company specializes in designing advanced vitamin D analogs, and several of its vitamin D-based therapies are already being tested in human clinical trials. Deltanoid will develop therapies through early stage human trials and will then seek partners to conduct later stage human trials and commercialize the products.

# GWC Technologies

Suite 269, 510 Charmany

GWC Technologies develops, manufactures and markets scientific instruments for life science and materials science research.

# LifeGen Technologies

Suite 262, 510 Charmany

LifeGen Technologies, LLC is a Madison based genomics company that is focusing on gene expression analysis as it relates to the aging process of humans and animals.

# Master of Science in Biotechnology

Suite 171, 510 Charmany

Master of Science in Biotechnology at UW-Madison provides students with an overarching view of modern biotechnology operations, addressing fundamental scientific and legal matters, innovative technologies and complex business issues.

# MioSoft

Suite 266, 510 Charmany

MioSoft delivers software products that help leading enterprises worldwide in understanding, managing, and leveraging one of their most important assets: their enterprise data and information.

# Nemean Networks

Suite 172, 510 Charmany

# NorthStar Economics

Suite 275C, 510 Charmany

NorthStar Economics is an economic consulting and research firm dedicated to the development and implementation of "New Economy" economic development strategies in Wisconsin and the Midwest.

# OpGen

Suite 151, 510 Charmany

OpGen, Inc. is commercializing technology that will revolutionize modern medicine by providing fast and affordable ways to compare genomes and is a leading provider of genetic analysis services and systems. The company's proprietary "Optical Mapping" system is a particularly powerful method for detecting genome rearrangements, including the insertions, deletions, and translocations responsible for most variation in microorganisms.

# Pair O Docs Professionals

Suite 55, 510 Charmany

Pair O Docs Professionals L.L.C. is a engineering research and consulting company that specializes in all aspects of anti-corrosion technology including a) electrochemical corrosion testing, b) corrosion inhibitor development, c) consulting on corrosion failures, and d) corrosion prevention and control.

# Posiden Probes

Suite 61, 510 Charmany

Poseidon Probes develops and manufactures fluorescent dyes used by researchers around the world. Products from Poseidon are used in lifetime imaging and related areas; with an emphasis on laboratories working with two photon microscopy systems. Poseidon Probes also offers contract organic chemical synthesis capabilities for customers requiring custom synthesis work.

# Primorigen Biosciences

Suite 259, 510 Charmany

Primorigen develops, manufactures, and distributes laboratory products for cell characterization, quantitative protein detection, and basic biochemical research. These products include thin-film nitrocellulose slides and kits, well-characterized monoclonal antibodies, target protein standards, and other laboratory reagents. The company is developing new multiplexed immunoarray products for several applications.

# Promoter Neurosciences

Suite 52, 510 Charmany

Promoter Neurosciences LLC develops innovative therapeutic compounds to treat stress, anxiety, and depressive disorders through genetic regulation of the CRF systems.

# Quintessence Biosciences

Suite 165, 510 Charmany

Quintessence Biosceinces, Inc. is developing novel protein-based therapeutics as anti-cancer agents. The Company is in the late pre-clinical stages and is on target to conduct human clinical trials starting in early 2008.

# Ratio Drug Delivery

Suite 256, 510 Charmany

Ratio, Inc is a biotechnology company developing a solution for conveniently administering large molecule drugs such as insulin. Our product is a disposable, adhesive drug delivery pump worn on the skin. This device can be worn for up to 24 hours and deliver a steady dose of drug, then it is discarded and a new device is applied. It is fully self-contained and is small in size, making it convenient to wear and easy to hide. The key to this technology is the small non-electronic pump that allows for constant dosing.

# Renovar

Suite 267, 510 Charmany

Renovar, Inc., is engaged in breakthrough research and development of assays that will make life better for people who have had organ transplants. Renovar's assays will identify which patients are at risk of chronic rejection of the transplanted organ.

# Stratatech Corporation

Suite 169, 510 Charmany

Stratatech Corporation is a regenerative medicine company focused on the development of cell-based, tissue-engineered products for wound care and has patents on revolutionary technology in skin cell and tissue engineering. Stratatech is developing new products that have been genetically enhanced to over-express natural, human wound-healing factors that reduce infection, improve blood flow to the wound, and increase the rate of healing with reduced scarring.

# TaKaRa Bio

Suite 273, 510 Charmany

TaKaRa Bio USA is a subsidiary of TaKaRa Bio-Japan. TaKaRa Bio USA will market, sell and support TaKaRa Bio's complete line of Molecular Biology products in North and South America, as well as Canada.

# Aristotle Ventures/aKa Card

Suite 124, 505 S. Rosa

Aristolte Ventures/aKa Card empowers consumers with control over their personal financial information. In partnership with leading financial institutions, Aristolte Ventures/aKa Card proactively protects consumers against privacy violations and prevents identity theft.

# CellCura

Suite 115, 505 S. Rosa

*Moving in soon

CellCura, Inc. is a company dedicated to the development of novel equipment and products for use in assisted reproductive technology (ART) and stem cell research throughout the world. The core technologies have been created through 15 years of research, and products from CellCura will improve safety and efficiency in both clinical and research environments.

# ConjuGon, Inc.

Suite 117, 505 S. Rosa

ConjuGon develops breakthrough technologies to combat the growing epidemic of antiobiotic-resistant bacteria.

## Frontier Science & Technology Research Foundation

Suite 100, 505 S. Rosa

Frontier Science & Research Foundation collaborates in important frontline clinical trials designed to advance and improve the treatment of cancer, AIDS and cardiovascular disease.

## Functional Bioscience

Suite 17, 505 S. Rosa

Functional Biosciences specializes in helping researchers make fast, low-cost breakthroughs in many areas of genomics research. The company produces reagents an informatics tools, and provides services that simplify preclinical drug development, reduce the costs of toxicity screening, improve the efficiency of DNA sequencing, and more.

## Helix Diagnostics

Suite 30A, 505 S. Rosa

Helix Diagnostics products are focused on infectious disease, cancer, and pharmacogenomic applications where clinicians need to identify and quantify viral agents or genetic mutations prior to treatment decisions. Helix was founded on exclusive licenses from WARF, who remains an equity interest holder.

## Long Term Care Institute

Suite 123, 505 S. Rosa

Long Term Care Institute conducts quality-monitoring reviews of long-term care providers. The company's clients include individual provider organizations and government agencies, such as the U.S. Department of Health and Human Services, Office of the Inspector General and individual state justice departments.

## Medigen Biosciences

Suite 28, 505 S. Rosa

Medigen is a service contract research organization that provides services in pre-clinical drug discovery and development.

## MetaBiologics

Suite 18, 505 S. Rosa

MetaBiologics manufactures toxins used in healthcare research and in anti-biological weapons research.

## Mirus Bio Corporation

Suite 104, 505 S. Rosa

Mirus Bio Corporation is a biopharmaceutical company focused on discovering, developing and commercializing innovative nucleic acid based technologies and products.

## SCORE

Suite 37, 505 S. Rosa

SCORE, in Madison for 20 years, is a not-for-profit arm of the Small Business Administration. SCORE, comprised of 54 retired business executives, volunteers to provide counseling and business planning to clients without charge.

## SmartSoftKey

Suite 118, 505 S. Rosa

SmartSoftKey designs sophisticated software to prevent piracy and other unauthorized uses of software products and digital information.

## Spectrum Research

Suite 100, 505 S. Rosa

Specturm Research LLC develops and markets very specific and sophisticated software to government, university and industry researchers throughout the world.

## UW Learning Innovations

Suite 200, 505 S. Rosa

UW Learning Innovations is a collaboration of University of Wisconsin-Extension and UW System to provide instructional design and development, marketing, faculty development and learner services expertise to the 26 UW campuses in support of their online degree and certificate programs.

## Venture Investors

Suite 201, 505 S. Rosa

Venture Investors LLC specializes in providing seed and early-stage venture capital financing to growth companies based in Wisconsin and contiguous states.

## WiCell Research Institute

Suite 20/120, 505 S. Rosa

WiCell Research Institutes mission is to expand Human Embryonic Stem Cell research worldwide. The Research Park location has a technical training facility, and is home to the National Stem Cell Bank distribution facility.


FORWARD

# *UW-Madison Office of Corporate Relations Role in Startup Business Development*

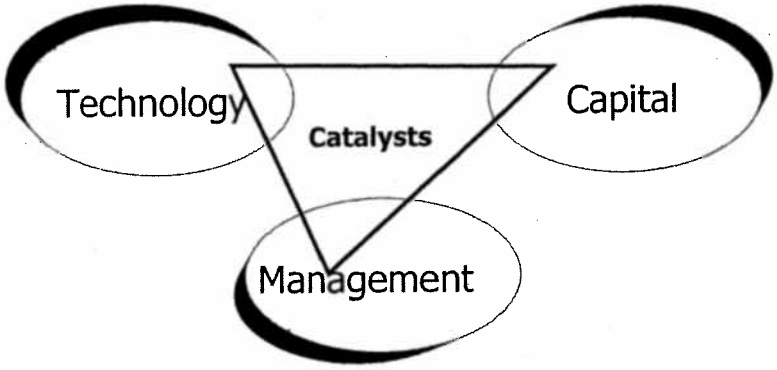
**Allen J. Dines**
Assistant Director
Office of Corporate Relations
University of Wisconsin-Madison
August 2007

## *OCR: UW-Madison's "Front Door" for Business*

Facilitating access to the university campus-wide since 2003
- Graduate recruitment
- Intern placement
- Continuing education and professional development
- Assistance from faculty experts, sponsored research
- Access to research centers and consortia
- Assistance with International business issues and global markets
- Transferring technology to the private sector

- Communicating awareness of university resources to the business community
- Promoting startup enterprise development

# *Ingredients for Startup Business Creation*




*Slide 5 August, 2007* *Prepared by Allen Dines, Asst. Dir. Corporate Relations*

# *The players in UW-Madison Startup Business Development*

- Office of Corporate Relations
  - Assists startups with business connections
  - Provides faculty/staff with single point of entry access to UW resources
- WARF - Patents, licensing, guidance, leadership
- University Research Park - Provides a place to grow for UW-related businesses
- School of Business
  - Weinert Center for Entrepreneurship
  - Technology Business Development Institute
- Graduate School – Gap funding, seminars
- Campus-wide resources
  - INSITE (Initiative for Studies in Technology and Entrepreneurship)
  - Student Competitions – Burrill Business Plan, Schoofs and Tong prizes
  - Wiscontrepreneur.org - Kauffman Campuses challenges, events
  - Wisconsin TechSearch – Engineering library data search
  - Student Entrepreneurship Organizations (EA, SIFE)

*Slide 6 August, 2007* *Prepared by Allen Dines, Asst. Dir. Corporate Relations*

## *Working Conclusions on How to Foster Startups*

- Connect faculty inventors early with
  - Management-savvy risk-takers (entrepreneurs)
  - High-tech-savvy service providers
- Focus on the business opportunity, not the technology innovation
- Cultivate angels and VCs seeking seed stage investments
- Manage faculty/inventor expectations



## *For more information:*

- My Email: ajdines@wisc.edu
- Startup Guide: http://www.ocr.wisc.edu/docs/startupguide.pdf
- OCR Entrepreneur's Page: http://www.ocr.wisc.edu/entrepreneurs.html
- Kauffman Campuses at UW-Madison: http://wiscotrepreneur.org
- WARF Startups Webpage http://www.warf.org/inventors/index.jsp?cid=16
- Graduate School Commercialization Grants http://info.gradsch.wisc.edu/research/techtrfgrants/grantopps.html
- SBIR/STTR Information http://www.wisconsinsbir.org/
- Regional Hi-Tech News, Commentary & Analysis http://wistechnology.com

**Testimony**
***Senate Committee on Economic Development, Job Creation, Family Prosperity and Housing***
**Allen J. Dines, Assistant Director**
**UW-Madison Office of Corporate Relations**
**Wednesday, August 22, 2007**

Thank you, Senator Lassa. Good afternoon everyone. I'm Allen Dines, assistant director of the Office of Corporate Relations at UW-Madison. Batting clean up with such stellar teammates in front of me is not going to be easy, especially when they have names like Still, Nice (Neis) and Strong.

So, let me do my best to be informative, succinct, and, best of all, brief.

I am here to speak about the role of Office of Corporate Relations, or OCR, in tech transfer at the UW. If there is one thing we have learned, it is that successful technology transfer requires a complex ecosystem of supporting entities. At OCR we fill an important niche in that ecosystem but it is important to recognize there are several other key components. Within the UW-Madison we have our "technology transfer team" consisting of WARF, the University Research Park and OCR. Several other campus entities at the School of Business, in our College of Engineering and our Graduate School are also involved. Beyond the university, we have other important players including the venture capital community, angel investors, experienced entrepreneurs, and a wide variety of service providers that are savvy about the legal, accounting, prototyping, communications and IT support that emerging high tech companies need.

Let me tell you a little about OCR. Our office was created three and a half years ago to be the front door to the university for business and industry. In creating the Office of Corporate Relations, UW-Madison Chancellor John Wiley, established an office that would enable the university to "serve the increasingly complex needs of the Wisconsin business community and to help build a stronger state economy in the 21st century." Most everyone agrees that we are increasingly living in a knowledge-based economy where ideas are the currency of innovation and innovation is key to not only business growth but indeed business survival. The UW-Madison is a wellspring of ideas and innovative talent. This is what universities are good at and UW-Madison is one of the best. At OCR our mission is essentially to facilitate access to university ideas and innovators for companies in Wisconsin and beyond. We do this by focusing on three primary objectives:

1. Building and strengthening awareness of, and appreciation for, the resources of UW-Madison among the business community in Wisconsin.
2. Facilitating relationships between UW-Madison and companies in Wisconsin and beyond.
3. Promoting entrepreneurship, particularly among faculty, staff and students

Since we opened our doors in 2003, we have had more than 2,500 company contacts and handled more than 1,500 requests for assistance.

In the handout materials I have brought with me, you can get an idea of how our operations are strengthening businesses, entrepreneurs, students, and organizations by bringing them closer to the university environment:

- UW Business News Wire – a monthly e-Zine that highlights the diverse ways the university connects with and facilitates success of the Wisconsin companies
- Resources for entrepreneurs – a link to our website that provides entrepreneurs with the basic information they need to build a business around their great ideas.
- UW-Madison Biosciences – www.bio.wisc.edu is literally a virtual university within our 933 acre campus focused entirely on the myriad bioscience resources here on campus.

The other handout is a slide set that provides further details on the mechanisms here at the university to foster the growth of startup companies. I won't take the time to go through all of that content here but instead I will relate a little story that I hope conveys a sense of the importance of further fanning the flames of innovation that have so characterized the strong economy surrounding this research university.

"Once upon a time" (or maybe I should say –"There was a time not so long ago - - really just 25 years ago"), "technology transfer" was a foreign concept on most university campuses. Everywhere, that is, but on the UW-Madison campus where pioneering minds that recognized the value of research excellence, created a model of tech transfer that brings the benefits of academic research to private industry. Today, that model is being put to use not only in Wisconsin but in the global marketplace as well.

The model is the Wisconsin Alumni Research Foundation (WARF), which was founded in 1925 as a separate, not-for-profit organization to commercialize new technologies and support research at UW-Madison. The income generated by that commercialization is used to fund still more research at the university...something akin to a perpetual motion machine. Since its inception WARF has contributed more than $900 million to fund research at UW-Madison. ...These WARF gifts to the university are only part of the economic benefit created by the strong partnership of WARF's technology transfer excellence and UW Madison's research excellence. Of course, we now have other institutions like OCR and the University Research Park that make up that all-important ecosystem I mentioned a few minutes ago.

Today, WARF and the UW-Madison have a highly regarded model for other universities looking to turn academic discoveries into license revenues that in turn support more research. In 2000, to give a tech transfer boost to the other campuses in the UW System, WARF and the UW System joined together to create **WiSys**, a conduit to support research and educational programs at the other UW-system campuses.

WiSys also collaborates with local businesses and economic development authorities in the communities surrounding these campuses to bring UW System technologies and innovations to people all over the state.

The moral of this story is that the UW is indeed a leader in tech transfer and commercialization largely because of its excellence in research. In fact, at last count, more than 240 technology-based startup businesses in Wisconsin are either based on UW inventions, or were started by a UW-Madison faculty, staff, or students. Companies like TomoTherapy, Promega, Quintessence Biosciences, and Third Wave are just a few. The presence of global companies in Wisconsin like Roche (acquired Nimblegen), SAFC ( acquired Tetrionics), Invitrogen (acquired Pan Vera) and Cardinal Health (acquired Gala Biosciences) further reinforce the value of UW Madison research that provided the starting point for each of these companies.

There is much more to tell in this story but I think you get the picture. Universities like ours, and offices like OCR, have become "ground zero" for the new innovation economy. Each year, universities such as UW-Madison around the country create hundreds and hundreds of new startups based on cutting-edge technology and university discoveries. These companies, in turn, are becoming the foundation of the new national innovation economy.

So, while "once upon a time" traditional tech transfer consisted of licensing patents to commercialize university R&D, "entrepreneurial tech transfer" is the current focus of universities that emphasize startup creation and funding.

Our goal, working with the Governor and all of you, is to position the state for success in a knowledge economy. We welcome your collaboration and support. And for now, I'll welcome the opportunity for members of the committee to ask their questions.

Thank you.

# # #

Senate Committee on Economic Development and Job Creation

# Challenges facing biotech start up companies

Laura E. Strong, Ph.D.
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Quintessence Biosciences, Inc.
505 South Rosa Road
Madison, WI 53719
PH 608-441-2950
FX 608-441-2952
lauras@quintbio.com

I believe that in order to support the further development of the biotechnology industry here:

- Wisconsin should focus resources on telling the story of a maturing biotechnology industry.
- Support for the Department of Commerce programs that aid biotechnology companies should be increased.
- Wisconsin should change tax laws to support the emerging class of R&D companies.

**Story**

I am not a Wisconsin native – I was born and raised in New Orleans and went to college in Richmond Virginia. I came to Wisconsin twelve years ago to get my PhD in chemistry at the UW and remained here to take part in starting Quintessence in July 2000. Over the last few years, I have become more involved in promoting the biotech industry here in Wisconsin – for example I am on the board of the Wisconsin Biotechnology and Medical Devices Association.

One of the drivers for me in seeing the biotechnology industry grow in Madison is self-interest. Over the last few years, I have developed a greater appreciation for the quality of life that Wisconsin, particularly Madison, provides relative to other areas. I would like to remain in Madison. I would also like to have the opportunity to bring back many of the scientists I was in school with who have gone on to jobs in other parts of the country but keep tabs on the jobs available in Wisconsin.

Quintessence Biosciences, Inc. was founded with a solid base of patented technologies from the UW Madison. We are using this technology to develop cancer drugs that have an exceptional combination of efficacy and safety relative to existing drugs. Our first product will soon enter the first phase of human trials, a Phase 1. We are currently looking for $5-7M to fund our Phase 1 work and develop additional drug products. We have eight employees, all earning more than the city, county, and state averages.

I believe the successful development of biotechnology companies relies on two main factors: People and Money. My comments will focus on how the state can help the biotechnology startups with People and Money.

Quintessence has looked at recruiting employees in state as well as out of state. Our current employees are all from the Madison community, and their salaries are all greater than the state and county averages.

In state, there are a large number of very talented scientists; however these scientists often lack the focus that comes with industry experience. For small companies, making the investment of both time and money to train scientists is too burdensome. We are typically looking for employees who can come in and hit the ground running. Workforce development issues are critical, and some in-state programs have been developed to target the development of scientists for industry, including Madison Area Technical

College's Associate degree in Biotechnology and their Intensive Post-Baccalaureate Program in Biotechnology.

- Wisconsin should focus resources on telling the story of a maturing biotechnology industry.

I believe that if we are effective at telling a great story, the biotech industry in Madison will benefit in terms of both people and money.

One of the major contributors to our lack of success in out-of-state recruiting for very specific skill sets are the perceptions that people outside of Wisconsin have about the biotech industry here. This issue is directly related with a challenge that comes with raising money from out-of-state investors. Most people have not heard of Wisconsin's biotech industry and are very concerned that if they move and the company fails, they will not be able to find another similar position here.

**External perceptions about Wisconsin**

Outside looking in: When I first started traveling to look for pharmaceutical or large biotech partners, people were consistently surprised to hear that our company was in Wisconsin. I got a lot of questions about why are you in Wisconsin, what other companies are there, how do you find people who would choose Wisconsin over the coasts.

When talking to coastal venture firms, we are often asked upfront if we are willing to move the company for the investment. The founders and management are committed to succeeding here in Wisconsin.

I believe that we (meaning the stakeholders in Wisconsin) need to tell a story about a maturing technology industry base – not a story based on scientific discovery. While the university deserves significant attention for the discoveries made there, the story of the biotechnology industry here can and should be one of maturity. When the state is supporting messages about the industry, I believe the message should be about the maturing biotechnology industry in Wisconsin.

Successes such as the acquisitions of companies like Bone Care, PanVera, Tetrionics, and Nimblegen support that message. In addition, the number of biotech companies and their revenue has increased significantly over the last few years (2005 numbers show the Wisconsin bioscience industry comprised 338 companies throughout the state with 22,372 Wisconsin employees and revenues of $6.4B) and this strength needs to be the message of the industry.

In addition to having the story to tell, we also need to be able to tell it. The state of Wisconsin spends fewer dollars than most Midwest states in marketing the state as a place for technology development.

- Wisconsin ($0.35M per year between DOC and Forward WI)
  - State funding for Forward Wisconsin, which admittedly is a public-private partnership, has dropped significantly since receives (inflation adjusted ~66% from $500k to $320k).
- Michigan ($8M/yr)
- Iowa ($5.7M/yr)
- Ohio ($5.2M/yr)
- Minnesota ($0.5-1M/yr)
- Illinois ($0.5-1M/yr) and
- Indiana ($0.5-1M/yr)

Telling the biotech story to the rest of the country – the rest of the world – is necessary for a number of reasons, including attracting money (partners, distributors, investors) and people.

- Support for the Department of Commerce programs that aid biotechnology companies should be increased.

The Department of Commerce has a number of programs to assist biotechnology companies, and these programs are greatly appreciated by companies such as ours.

These programs could be modified to provide even greater benefit to biotech companies and additional support should be provided to DOC for these programs.

- Early Stage Investment Tax Credits
  - Our financing (~$7M) has come from angel investors – almost all Wisconsin-based investors. The Angel Investment and Venture Capital Tax Credit (Act 255) was very useful for us when we raised our previous round of funding. We are currently raising an additional $5M to fund our phase 1 clinical trial. Unfortunately, our newest investors will not benefit from these credits because only $1M of the angel investment qualifies for this credit.
  - Our situation seems to mirror that of other WI bioscience companies – While venture dollars invested in WI decreased from $69M in 2005 to $61M in 2006, the angel investments increased from ~$67M to $102.9M over the same timeframe. Almost half ($42.7M) was devoted to biotech investments.
- Technology Assistance Grants (TAG)
  - a) 25% matching funds and b) grant money must be spent in Wisconsin
  - 10 February 2005 $15,000 for Grant Research and Writing Assistance
- Technology Bridge Grants
  - We have not used this program.
- Technology Matching Grants
  - We have not used this program.
- Technology Venture Fund Loans and Technology Development Fund
  - TVF = 31 May 2005 $150,000
    - To pursue the development of EVade™ Ribonuclease
    - Deferred until 6/1/2010
  - TDF = 3 December 2002 $350,000
    - Product Development
    - Deferred until 12/1/2007
  - This program could be modified to consider the various business models of biotech companies – there are four main types of biotech companies – tools, diagnostics, medical devices, and therapeutics. Tools companies are typically able to develop products on a rapid timeframe and get to sustainability quickly. For therapeutics companies such as Quintessence, the development cycle is much longer and we will spend significantly longer time before we generate revenues. I believe that considering the business model in structuring of the payoff of these types of loans could benefit companies that have these longer product cycles.
- Technology Development Loans

DOC also has programs to aid in participation in international trade shows. Along with the UW's Center for International Business Education and Research (CIBER) program, this DOC program has assisted us in identifying and meeting potential foreign partners. We attended partnering meets in Canada ($4,600) and the Europe ($1,800) and developed contacts with foreign pharmaceutical companies. While the types of deals we have discussed typically take a significant time investment, we are still in discussions with multiple companies we met at these meetings.

We have recently heard that current funding for these programs is limited and future support may be threatened. These programs deserve strong support and protection. In preparing for this meeting, I talked with a number of C-level people at various types of biotech businesses and the one thing they all mentioned was support for the DOC programs.

- Wisconsin should change tax laws to support the emerging class of R&D companies.

We pay a state and county tax of 5.5% on our R&D activities. While a tax credit is available, this non-refundable credit does not rapidly benefit companies like therapeutic companies like ours where the lead product (the drug) will not hit the market for 8-10 years.

**To review, I believe that:**

- Wisconsin should focus resources on telling the story of a maturing biotechnology industry.
- Support for the Department of Commerce programs that aid biotechnology companies should be increased.
- Wisconsin should change tax laws to support the emerging class of R&D companies.

Just one example of how businesses access the resources of the university: Chuck Gates (right), president of RenewAire Inc., in the company's Madison facility working with Rajan Suri, director of the university's Center for Quick Response Manufacturing.

## How to Contact Us:


**We've Moved!**

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University of Wisconsin-Madison
455 Science Drive, Suite 230
Madison, WI 53711-1077 U.S.A.

VOICE Toll Free: 1–877–OCR–WISC
FAX: 608/263–2841

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website: www.corprelations.wisc.edu


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CORPORATE RELATIONS
University of Wisconsin-Madison

In the world of business...

The University of
Wisconsin-Madison
comes to mind.

W

OFFICE OF
CORPORATE RELATIONS
University of Wisconsin-Madison

# A Resource for Business in the 21st Century

The university, occupying a 933-acre campus on the shores of Lake Mendota, is the oldest and largest in the University of Wisconsin System, a statewide network of 26 campuses and extension services.

Welcome to the Office of Corporate Relations at the University of Wisconsin-Madison. We are here to help companies and entrepreneurs connect with a broad range of services available on our campus.

UW-Madison is ranked among the top public universities in the United States, a well-earned reputation based on our longstanding commitment to teaching, research and outreach. With...

- A world-class faculty and staff...
- More than $700-million in research being conducted on campus...
- More than 200 research centers, institutes and industrial consortia studying topics of vital interest to businesses... and
- More than 9,000 graduates a year in a broad range of academic programs that include 138 different undergraduate majors, 157 master's degrees, and 114 doctoral programs...

UW-Madison is a fountain of intellectual assets for companies competing in the knowledge-based economy of the 21st Century.

Our office is your 'front door' to these resources and assets, and we hope that when you face your next business challenge, UW-Madison comes quickly to mind.

## Offering Businesses Access To:

- Students and graduates for internships and employment
- Faculty and staff for consultations, presentations, and research projects
- Continuing education and professional development programs
- New technologies available for licensing
- Programs and assistance for new business start-ups
- Information about doing business in the global marketplace
- Connections with a wide range of resources available on other UW System campuses all around Wisconsin

**Bioscience Research Facilities & Resources**

- Biology New Media Center
- Biomedical Engineering Center
- Biotron
- Center for Eukaryotic Structural Genomics
- Center for Neuroscience
- Clinical Cancer Center
- Food Research Institute
- General Clinical Research Center
- Genome Center of Wisconsin
- Institute on Aging
- Institute for Molecular Virology
- Interdisciplinary Research Complex
- International Studies
- Lenor Zeeh Pharmaceutical Experiment Station
- Materials Research Science and Engineering Center
- Microbial Sciences Building
- Molecular and Environmental Toxicology Center
- Nanoscale Science and Engineering Center
- Polymer Engineering Center
- Rheology Research Center
- Synchrotron Radiation Center
- UW Biotechnology Center
- W. M. Keck Laboratory for Biological Imaging
- Waisman Clinical BioManufacturing Facility
- Waisman Laboratory for Brain Imaging and Behavior
- WiCell Research Institute
- Wisconsin Alzheimer's Institute
- Wisconsin Center for Space Automation and Robotics
- Wisconsin Institute for Discovery
- Wisconsin National Primate Research Center

**Unique Educational Opportunities**

- Master of Science in Biotechnology Program
- Program in Neuroscience and Public Policy
- Strategic Management in the Life and Engineering Sciences MBA

**Business/Technology Transfer Resources**

- Center for Quick Response Manufacturing
- Fluno Center for Executive Education
- Initiative for Studies in Technology Entrepreneurship
- New Business Startup Initiative
- Small Business Development Center
- University Research Park
- Wisconsin Alumni Research Foundation

**For more information:**

OFFICE OF
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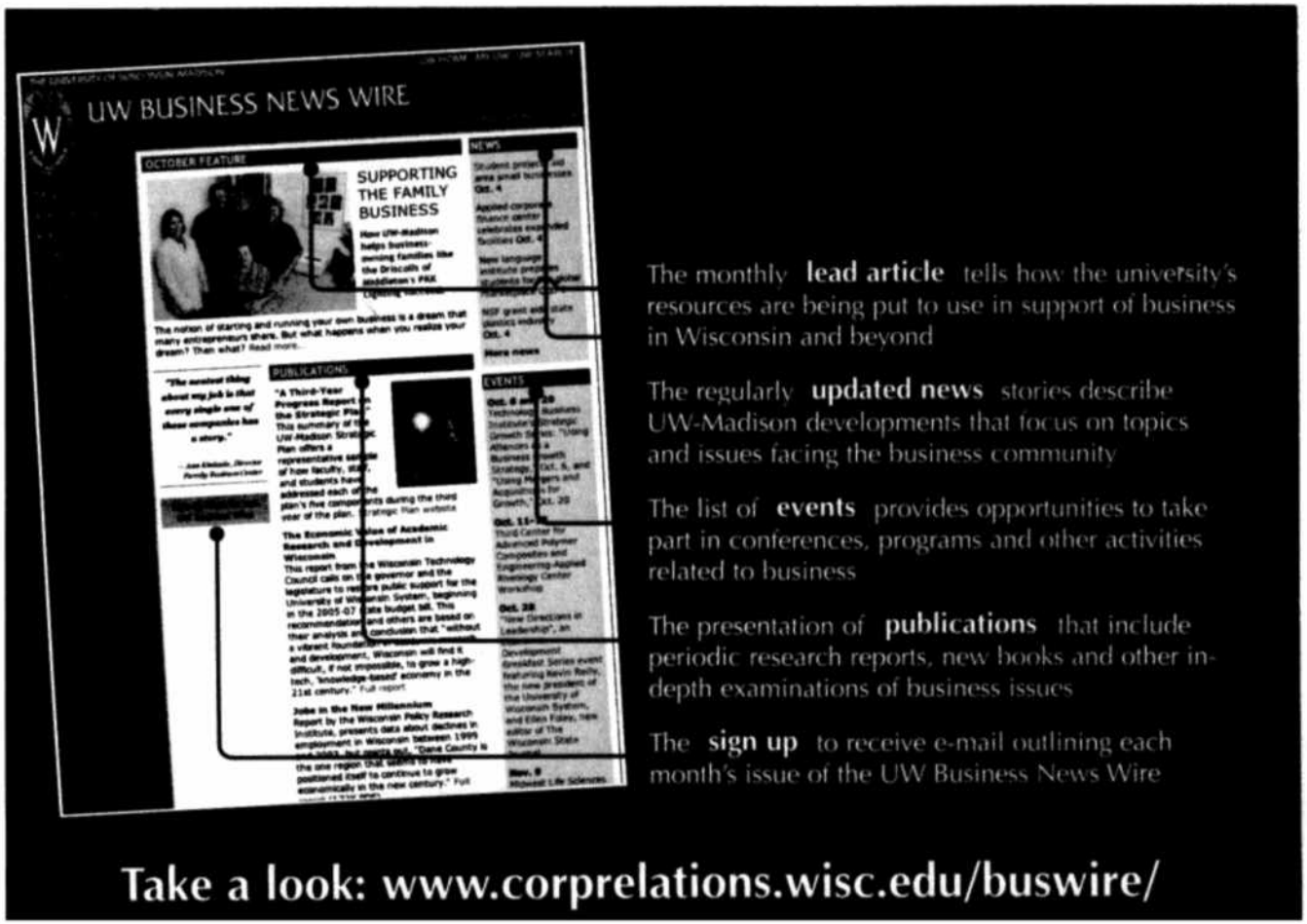


The monthly **lead article** tells how the university's resources are being put to use in support of business in Wisconsin and beyond

The regularly **updated news** stories describe UW-Madison developments that focus on topics and issues facing the business community

The list of **events** provides opportunities to take part in conferences, programs and other activities related to business

The presentation of **publications** that include periodic research reports, new books and other in-depth examinations of business issues

The **sign up** to receive e-mail outlining each month's issue of the UW Business News Wire

**Take a look: www.corprelations.wisc.edu/buswire/**

THINKING ABOUT A STARTUP?

# HERE'S A PLACE YOU CAN GET STARTED:

## www.ocr.wisc.edu/entrep

This web site serves up a menu of entrepreneurship resources on and off the UW-Madison campus to help inventors and investors get connected, and turn good ideas into sound business ventures.

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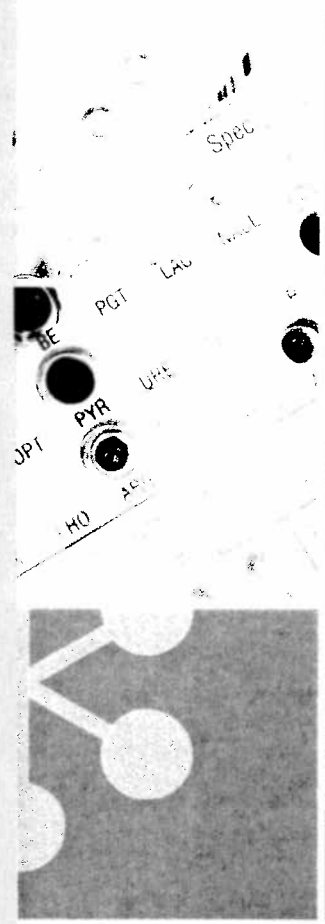
# UNIVERSITY RESEARCH PARK

UNIVERSITY OF WISCONSIN-MADISON

# Biotechnology



# UNIVERSITY RESEARCH PARK

## UNIVERSITY OF WISCONSIN-MADISON

Nowhere in the United States is the accelerating biotechnology sector mo apparent than at University Research Park (URP) in **Madison, Wiscons** Tenants in the park include some of biotechnology's biggest succe stories, including Third Wave Technologies, NimbleGen Systems, EN Biosciences (Novagen), Invitrogen (PanVera), SAFC (Tetrionics) and Cellu Dynamics — a drug screening company founded by UW-Madison ste cell pioneer James Thomson.

Home to **114 companies**, most of which were founded on discoveri made at the University of Wisconsin-Madison, URP's groundbreak approach and innovative tenant solutions encourage the developme and commercialization of cutting-edge ideas. The park is a partner UW-Madison, where the world-renowned research faculty hold mo scientific patents than at any other public university in the count The partnership generates great jobs in the community while affordi tremendous access and support for URP companies at the university.

In addition to providing infrastructure and facilities for established compani University Research Park offers unique opportunities, resources and ince tives for early-stage companies through specialized growth environmen

Early-stage companies enjoy:

- **UW Library access**
- **Career Services**
- **Voice mail and phone system**
- **DS-3 data connection**
- **9 conference rooms**
- **Dining commons**
- **Mail and copy rooms**
- **24-hour access**
- **Shared lab equipment**
- **Shipping and receiving**
- **Small animal facility**

# Tenant Listing

❊ Listings in orange are biotechnology companies

A.G. Edwards

Aberdean Consulting

Affiliated Engineers, Inc.

❊ **Alator Biosciences**
Supplies the leading bioscience researchers with high-quality life science research tools.

Aristotle Ventures Inc. IPIC

❊ **Ash Access Technology, Inc.**
Ash Access Technology is dedicated to developing and commercializing innovative products that address unmet needs in the area of vascular access-related complications, with a focus on infectious disease therapies and device performance.

Baird Venture Partners

❊ **Bellbrook Labs LLC**
Bellbrook Labs develops automated tests called high throughput assays that help researchers screen new chemical treatments for serious diseases.

Canadian Synchrotron Radiation Facility

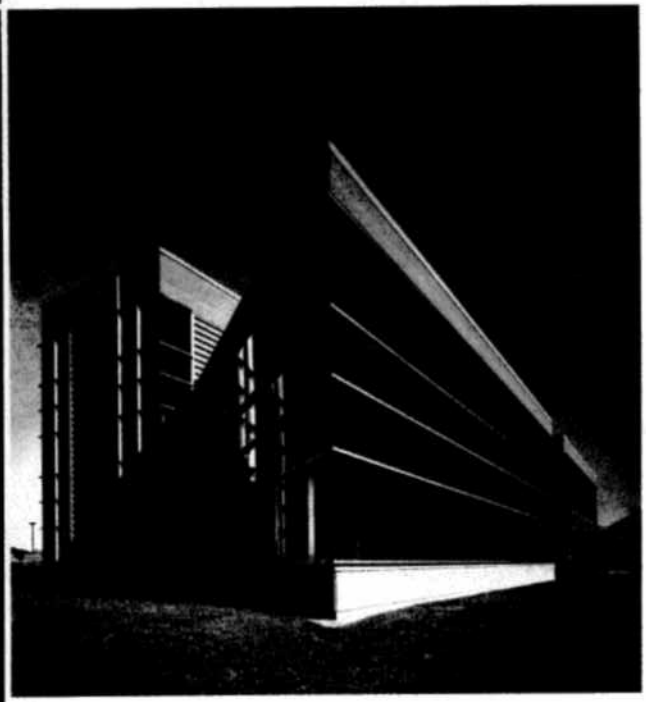
Capitol Associates

❊ **Cell Line Genetics, LLC**
Cell Line Genetics, LLC provides services and products to support research institutions, as well as biotechnology and pharmaceutical companies focused on embryonic stem cell and cancer research.

❊ **Cellectar**
Cellectar is developing unique compounds and molecules that will be capable of creating revolutionary breakthroughs in fighting cancer.

❊ **Cellular Dynamics International, Inc.**
Cellular Dynamics International Inc. (CDI) is a privately held drug screening company founded by the scientific team of Drs. James Thomson, Craig January and Tim Kamp in partnership with Tactics II Ventures, LLP.

Clifton Gunderson



❊ **ConjuGon, Inc.**
ConjuGon develops breakthrough technologies to combat the growing epidemic of antiobiotic-resistant bacteria.

Custer Financial Services

❊ **Deltanoid Pharmaceuticals**
Deltanoid Pharmaceuticals is a drug development company involved in breakthrough treatments for osteoporosis, psoriasis and other disease targets.

Drs. Carey & Peterman

❊ **EMD Biosciences**
EMD Biosciences, Novagen Brand, manufactures and sells state-of-the-art molecular biology tools — including gene splicers, protein purifiers, and more — that boost important research and development involving DNA, genes, proteins and other building blocks of life.

The Energy Center of Wisconsin

First Business Bank

Flad & Associates

Foundation for Madison Public Schools

Frontier Science & Research Foundation

❊ **Functional Biosciences**
Functional Biosciences specializes in helping researchers make fast, low-cost breakthroughs in many areas of genomics research. The company produces reagents an informatics tools, and provides services that simplify preclinical drug development, reduce the costs of toxicity screening, improve the efficiency of DNA sequencing, and more.

Fundus Photograph Reading Center

❊ **Genetic Assemblies, Inc.**
Genetic Assemblies, Inc. was established in 2003 to develop low-cost, fast-turnaround genetic material that will speed advances in cutting-edge genetic research.

❊ **Genome Technologies**
Genome Technologies is a research and development company specializing in genomics and proteomics.

❊ **GWC Technologies**
GWC Technologies develops, manufactures and markets scientific instruments for life science and materials science research.

❊ **Helix Diagnostics LLC**
Helix Diagnostics LLC is pursuing development and commercialization of multiplexed DNA detection systems based on capillary electrophoresis.

InteliStaf Healthcare

❊ **Invitrogen Corporation**
Invitrogen Corporation's Madison-based Discovery Sciences business unit develops and produces products and services used in the discovery of new drugs, including biochemical and cell-based assays and compound screening services.

IPIC

The Learning Gardens

❊ **LifeGen Technologies, LLC**
LifeGen Technologies, LLC is a Madison-based genomics company focusing on gene expression analysis as it relates to the aging process of humans and animals.

Lincoln Financial Advisors

Long Term Care Institute

Luminis Group, Ltd.

Madison Community Foundation

Madison Endodontic Associates

Madison Investment Advisors

Madison Oral and Maxillofacial Surgeons

Makin' HEY! Communications

❊ **Master of Science in Biotechnology**
Master of Science in Biotechnology at UW-Madison provides students with an overarching view of modern biotechnology operations, addressing fundamental scientific and legal matters, innovative technologies and complex business issues.

❊ **Medigen Biosciences**
Medigen is a service contract research organization that provides services in pre-clinical drug discovery and development.

Medlen & Carroll, LLP

Meicher & Associates

❊ **Mentor Corporation**
Mentor Corporation was founded in 1969 and is a leading supplier of medical products for the global healthcare market.

Meriter Physical Therapy — West

❊ **MetaBiologics**
MetaBiologics manufactures toxins used in healthcare research and in anti-biological weapons research.

**Visit universityresearchpark.org/tenants for up-to-date listings**

*** MioSoft Corporation**
MioSoft delivers software products that help leading enterprises worldwide in understanding, managing, and leveraging one of their most important assets: their enterprise data and information.

*** Mirus**
Mirus is a biopharmaceutical company that develops and commercializes innovative nucleic acid based technologies and products.

*** Mithridion**
Mithridion is a biopharmaceutical company that discovers and develops drugs for neurodegenerative diseases, with a focus on Alzheimer's disease.

The National Primate Research Center
Neider & Boucher

*** Nerites Corporation**
Nerites Corporation produces novel medical adhesives and medical device coatings.

*** NimbleGen Systems, Inc.**
NimbleGen Systems, Inc. is the world leader in custom-designed, high-density DNA microarrays and analysis, offering unprecedented flexibility for genomics research.

NorthStar Economics
Oakbrook Corporation

*** OpGen, Inc.**
OpGen, Inc. is commercializing technology that will revolutionize modern medicine by providing fast and affordable ways to compare genomes.

Otjen, Van Ert, Lieb & Weir, S.C.
Pair O Docs Professionals
The Phenomenelle Angels Fund I

*** Poseidon Probes, LLC**
Poseidon Probes develops and manufactures fluorescent dyes used by researchers around the world.

Preschool of the Arts

*** Prevagen Brands**
Prevagen™ is a dietary supplement designed to fight aging. Prevagen is the first supplement to address aging through the restoration of calcium-binding proteins. Studies show a reduction in cellular death with Prevagen.

*** Primorigen Biosciences LLC**
Advancing cell therapy research technologies.

PRISM Computational Services, Inc.

*** ProCertus BioPharm**
ProCertus BioPharm, a biotechnology pharmaceutical company, is developing products that will protect humans against the toxic side effects of cancer chemotherapy and radiation.

*** Promoter Neurosciences LLC**
Promoter Neurosciences LLC develops innovative therapeutic compounds to treat stress, anxiety and depressive disorders through genetic regulation of the CRF systems.

*** Quincy Bioscience**
Quincy Bioscience is a biotechnology company focused on the development and commercialization of compounds to fight the loss of brain cells related to the aging process and in neurodegenerative diseases such as Alzheimer's.

*** Quintessence Biosciences**
Quintessence Biosciences, Inc. is developing novel protein-based therapeutics as anti-cancer agents. The company is in the late pre-clinical stages and is on target to conduct human clinical trials starting in early 2008.

*** Ratio Drug Delivery**
Ratio, Inc. is a biotechnology company developing a solution for conveniently administering large molecule drugs such as insulin.

*** Renovar, Inc.**
Renovar, Inc., is engaged in breakthrough research and development of assays that will make life better for people who have had organ transplants. Renovar's assays will identify which patients are at risk of chronic rejection of the transplanted organ.

RHS Companies
Rogerson, John S., M.D., S.C.

*** SAFC, Inc.**
SAFC, Inc. is an FDA-registered, Good Manufacturing Practices, organic synthetic laboratory specializing in the production of experimental pharmaceuticals and pharmaceutical products.

ScheduleSoft

*** SciGro, Inc.**
SciGro, Inc. offers technology assessment and scientific management services for the pharmaceutical, biotechnology and diagnostic industries.

SCORE
Shamrock Title, LLC
Skyward, Inc.
SmartSoftKey
Sonoco Products
Southern Training Partnership
Spectrum Research LLC

*** Stem Cell Products, Inc.**
Stem Cell Products, Inc. (SCP) is a stem cell company founded by the scientific team of Dr. James Thomson, Dr. Igor Slukvin and Dr. Dong Chen in partnership with Tactics II Ventures, LLP.

**University Research Park** is home to many of the country's most interesting and exciting biotechnology firms. Our tenants also include some of the top bioscience service providers, creating an enviable, world-class collaborative community.

*Mark Bugher, Director*
*University Research Park*

*** Stratatech Corporation**
Stratatech Corporation has patents on revolutionary technology in skin cell and tissue engineering.

Sweeney & Sweeney S.C.

*** Takara Bio USA**
Takara Bio USA is a subsidiary of Takara Bio-Japan. Takara Bio USA will market, sell and support Takara Bio's complete line of Molecular Biology products in North and South America, including Canada.

*** Third Wave Technologies, Inc.**
Third Wave Technologies develops and markets revolutionary DNA/RNA analysis technology that advances breakthroughs in discovering and treating serious diseases.

Ultratec, Inc.
Unemployment Insurance, Madison Call Center
United States Geological Survey
University Health Care
UW Division of Information Technology
UW Health — Research Park Clinic
UW Health Administrative Services
UW Learning Innovations

*** UW-Madison AIDS Vaccine Laboratory — Dr. David Watkins**
Research on AIDS and development of vaccines that elicit cellular immune responses.

*** UW-Madison Influenza Research Institute — Dr. Yoshihiro Kawaoka, UW-Madison School of Veterinary Medicine**
Research on emerging influenza viruses and vaccines.

UW-Madison Office of Corporate Relations
The UW Pain and Policy Studies Group
The UW Psychiatric Institute & Clinics
Venture Investors LLC

*** WiCell**
WiCell Research Institute's mission is to expand human embryonic stem cell research worldwide. The Research Park location has a technical training facility and is home to the National Stem Cell Bank distribution facility.

William F. Vilas Trust Estate
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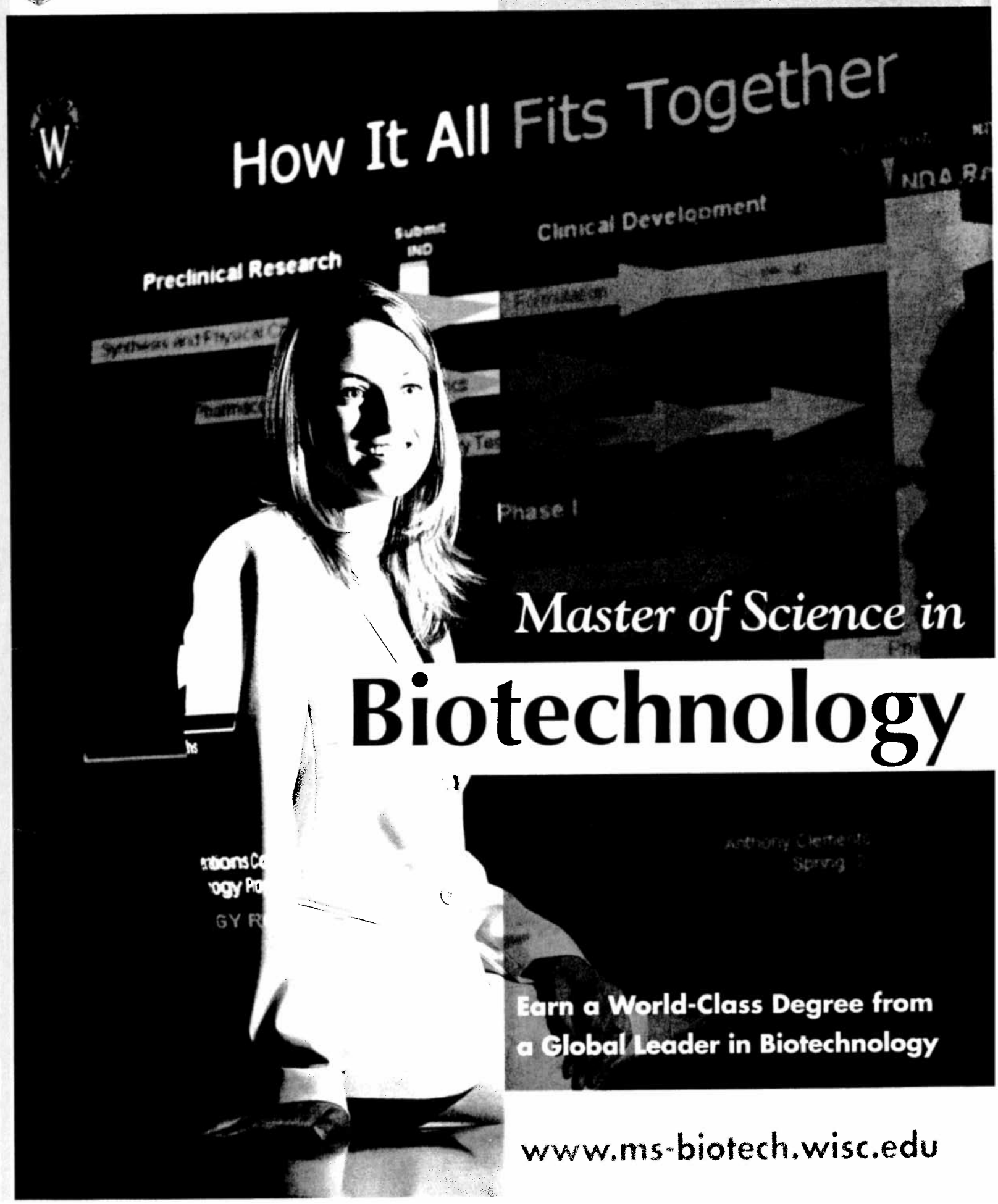



*Master of Science in*

# Biotechnology

**Earn a World-Class Degree from a Global Leader in Biotechnology**

www.ms-biotech.wisc.edu



# *The Master of Science in* Biotechnology

Biotechnology continues to expand at an astounding pace, yielding a steady stream of new discoveries and lifesaving products. The unlimited potential of this industry demands a new type of professional, one fusing the capabilities of scientist, business strategist and advocate for public policy. Cross-functional professionals — skilled beyond a narrow specialty — represent the future of global biotechnology.

The Master of Science in Biotechnology at the University of Wisconsin-Madison is an ideal solution for professionals in the biotechnology industry seeking to move into positions of greater responsibility, leadership or security. Drawing on the resources of a world-class university — a global leader in the field of biotechnology — the M.S. in Biotechnology is intended for practicing scientists, technical professionals, attorneys and business/operations strategists who seek a cross-functional understanding of biotechnology for career advancement or new professional opportunities.

Convenient evening and weekend courses accommodate professionals who have challenging careers and demanding personal schedules. Committed instruction, personalized assistance with career planning, and program-based technical support round out the measures designed to ensure success.

## Success

Graduates of this unique program praise its relevance and immediate application. The success of students and alumni is notable for the common thread of advancement in areas relating to product leadership/development and technological entrepreneurship. Among the positions held by alumni:

- Product Manager or Leader
- Director of Manufacturing
- Patent Attorney
- R&D Scientist
- Entrepreneur
- Senior VP Business Development
- Chief Operating Officer
- Director of Licensing
- Quality Assurance Manager

# Contents

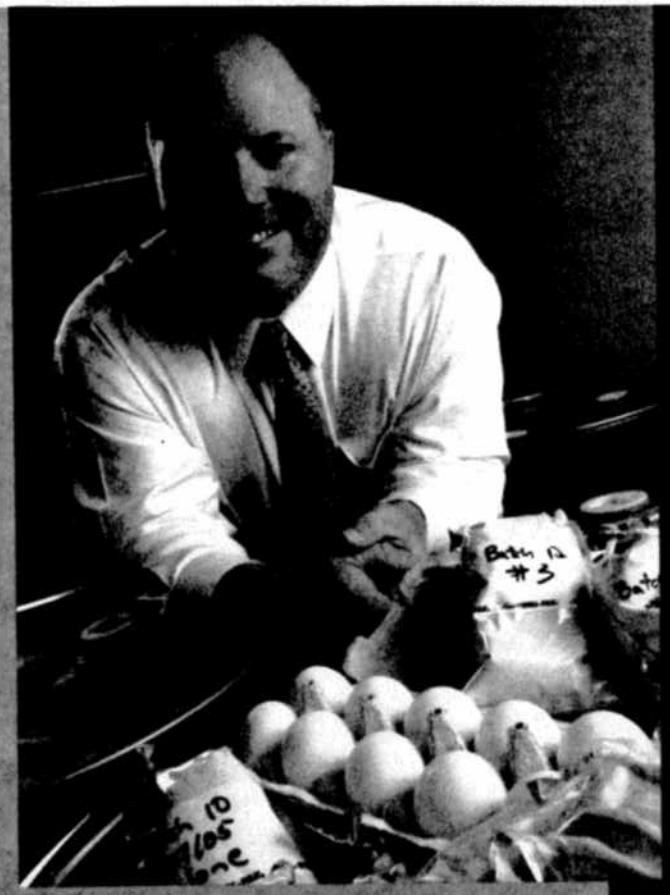
**Tori Barron**
**Class of 2005**
**Research Specialist II**
**WiCell Research Institute**

**"Stem cell research represents the most promising frontier in biotechnology today. The M.S. in Biotechnology provided me broad exposure to concepts in policy, science, ethics and business that influence my work on a daily basis. As we move this research forward, I feel confident in my abilities to responsibly address issues that will translate innovation and discovery into quality of life."**

## *Practical Learning for*
# Working Professionals

Students thrive in a learning environment rich in academic and industrial collaboration. Leading-edge curriculum content is drawn from the UW's highly ranked schools of Law, Medicine, Business, Pharmacy, Engineering, and Agricultural & Life Sciences. Affiliations with University Research Park, the Wisconsin Alumni Research Foundation — the university's patenting and licensing agency — and the Biopharmaceutical Technology Center Institute offer students a rare view of emerging technologies and startup companies. Instructors and case studies are drawn from the regional biotechnology corridor — among the fastest growing in the United States — to provide an enriching, real-world industry perspective.

The resulting coursework is highly application-oriented, fostering in students critical proficiencies in teamwork, effective communication and problem solving. As students learn about modern challenges faced in the biotechnology industry, they acquire knowledge and skills that are easily and immediately applied to current positions, while laying the groundwork for career advancement.



**The M.S.** in Biotechnology program's interdisciplinary approach to business, science and law directly influenced my entrepreneurial success by expanding my core aptitudes. It has strengthened my business acumen while exposing me to scientific concepts applicable to the biotechnology industry. I now possess the ability and increased confidence necessary to identify opportunities and compete in the emerging knowledge-based economy.

**Scott D. Schneider**
**Class of 2005**
**Chief Operating Officer**
**aOvaTechnologies, Inc.**

## Groundbreaking Curriculum

The curriculum of the M.S. in Biotechnology is unique in the world for its fully integrated approach to studying the science, the business, the law and the ethics of biotechnology.

All courses are team-taught by world-class instructors drawn from both the UW and the surrounding biotechnology industry. This balance integrates the distinct perspectives of emergent research with accelerated industry application.

The program begins each fall with a class of 24 working professionals advancing together in a supportive learning community. The M.S. in Biotechnology purposefully seeks students from broad professional backgrounds, ensuring enriching and varied perspectives of topics discussed in classes. Experienced professionals enrolled in the program share their expertise and learn from one another as well as from faculty.

The M.S. in Biotechnology requires 24 graduate credits earned by completing the courses listed on page 5. All are built around team projects and extensive written and oral communication exercises. The program is fast-paced and designed for completion in two years.

## Year I Fall

### Principles and Practices of Biotechnology

The foundation of the program's curriculum, this course examines the political, legal, social and business environment in which biotechnology exists. Course content focuses on the evolution of biotechnology, intellectual property and patent law, and the regulatory and ethical issues surrounding the advancement of products to market.

### Business of Biotechnology: Fundamentals

This course is designed to equip students with the skills to participate in the management process, to understand and apply current trends in business, and to write and present a business plan to an approval committee.

### Molecular Technologies I

The curriculum in this course covers four key areas: biotechnology methods and practice, effective written and oral scientific communication, genetic mutation detection, and the role of automation in biotechnology. The goal of the course is to introduce students to the basic science of molecular biology and biotechnology, and to give them the tools needed to effectively communicate it.

## Year I Spring

### Biotechnology Operations

Students learn the specialties of nonclinical and clinical development, regulatory affairs, quality assurance, manufacturing, quality control and program management. Central to this course is the interdependency of these issues and how they are best coordinated and synchronized. Students participate in practical exercises, including developing products to fill the corporate pipeline, adding value to their products, and generating revenue for model firms.

### Molecular Technologies II

Examining several topics in molecular biotechnology applications, this laboratory-intensive course focuses on biotechnologies with research, industrial, diagnostic and genotyping applications.

Topics and laboratory activities include Gene Cloning, Protein Expression and Purification, Genetically Modified Organisms (GMO) and their implications for Science and Society, and Human Genetic Identity. The protein expression and purification aspects are taught in coordination with the Biotechnology Operations course, providing experience on a small industrial scale.

## Year II Fall

### Technology Applications in Early Drug Discovery

Students get an overview of the early drug-discovery process, including target identification and validation, generation of diverse chemical libraries, assay development and high-throughput screening, lead optimization by compound profiling, and drug targeting and delivery.

### Molecular Technologies III

A hands-on examination of topics and concepts in the drug-discovery process, this course emphasizes laboratory assays, methods and data analysis used in primary, secondary and ADMETox (absorption, distribution, metabolism, excretion, toxicity) drug screening.

Along with mastering course concepts and laboratory practices, students demonstrate their knowledge and skills through effective scientific communication in all of the laboratory courses.

### Business of Biotechnology: Contemporary Challenges and Applications

The course is built around functional needs related to identifying, obtaining and managing/organizing resources in building and sustaining a successful organization. Specific topics include product development, negotiation and licensing, marketing, and finance and accounting.

## Year II Spring

### Business of Biotechnology: Frontiers and Strategies

Developing a sound business strategy is key to competing in today's highly competitive global scientific and business environment. This course focuses on types of business strategies as well as issues that affect the analysis, development and application of those strategies.

### Biotechnology Law, Ethics and Society

This course gives students a broader understanding of the environments in which biotechnology research, development and marketing proceed. Students are introduced to existing as well as emerging political arenas, public debates and social concerns to be considered when planning new products and when writing business and strategic plans in biotechnology organizations. Students also gain working knowledge of ethical guidelines and policy development related to a variety of biotechnological products and services.

### Advanced Biotechnology

Students deepen their technical understanding of important areas of biotechnology while considering each in a global context. They complete an independent research project, achieving an elevated level of synthesis and depth of understanding about key scientific, business, legal and political issues in biotechnology.

Full course descriptions are available at: **www.ms-biotech.wisc.edu**


Coursework in areas such as biomanufacturing and drug discovery have given me an understanding of how to take products from conception to the marketplace. The diversity of the student cohort mirrors the cross-functional teams I participate in every day, allowing me to not only learn more about biotechnology, but also to see firsthand how critical issues are viewed and evaluated by individuals from many different facets of the industry.

**Katie Zurbuchen**
Class of 2006
Research and Development Scientist
Genetic Analysis
Promega Corporation

# *World-Class* Faculty

The University of Wisconsin-Madison is recognized internationally for faculty expertise and partnerships with industry. The M.S. in Biotechnology builds on this collaborative tradition with a faculty composed of leading academic researchers and corporate leaders in the biotechnology industry.

**Richard L. Moss, Ph.D.**
Executive Director, M.S. in Biotechnology
Professor and Chair
UW-Madison Physiology Department

**Gail Robertson, Ph.D.**
Director, M.S. in Biotechnology
Associate Professor
UW-Madison Physiology Department

**Natalie Betz, Ph.D.**
Faculty Associate
UW-Madison School of Medicine and Public Health

**Karin Borgh, Ph.D.**
Executive Director
Biopharmaceutical Technology Center Institute

**Thomas J. Burke, Ph.D.**
Chief Executive Officer
Primorigen Biosciences LLC

**Mason Carpenter, Ph.D.**
Associate Professor of Strategic Management
UW-Madison School of Business

**Gabriela S. Cezar, Ph.D.**
Associate Professor of Animal Sciences
UW-Madison College of Agriculture and Life Sciences

**R. Alta Charo, J.D.**
Professor of Law and Bioethics
UW-Madison Law School and School of Medicine and Public Health

**Anthony J. Clemento Jr., M.S.**
Adjunct Professor
UW-Madison School of Medicine and Public Health

**Hansi J. Dean, Ph.D.**
Technology Assessment
Research and Development
International AIDS Vaccine Initiative

**Randall P. Dunham, Ph.D.**
Professor of Management and Human Resources
UW-Madison School of Business

**Phillip Greenwood, MBA, Ph.D.**
Senior Lecturer
UW-Madison School of Business

**Carl Gulbrandsen, Ph.D., J.D.**
Managing Director
Wisconsin Alumni Research Foundation

**Linda F. Hogle, MBA, Ph.D.**
Associate Professor
Department of Medical History and Bioethics
UW-Madison School of Medicine and Public Health

**C. Richard Hutchinson, Ph.D.**
Professor Emeritus of Medicinal Chemistry
UW-Madison School of Pharmacy

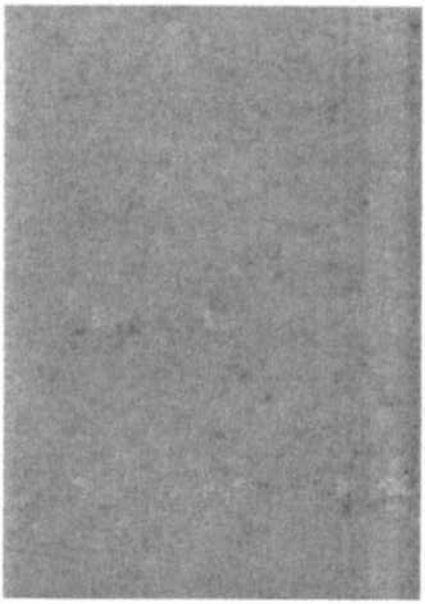
**Anne S. Miner, MBA, Ph.D.**
Professor of Management and Human Resources
UW-Madison School of Business

**R.D. Nair, Ph.D.**
Professor of Accounting and Information Systems
UW-Madison School of Business

**Jack Reiners, MBA**
Senior Lecturer
UW-Madison School of Business

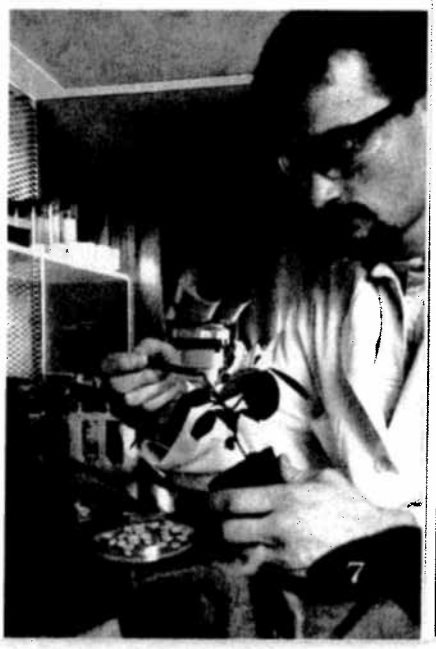
**Michael Roy, Ph.D., RAC**
Senior Scientist
Science Applications International Corporation

**Richard Schifreen, Ph.D.**
Vice President, Research Products
MirusBio Corporation



**Gordon Smith, J.D.**
Professor
UW-Madison Law School

**Eric B. Vincent, Ph.D.**
Product Associate - Core Products
Promega Corporation



# To Employers

What are the benefits of supporting a student in the M.S. in Biotechnology program? The curriculum is based on world-class faculty expertise, significant market research and frequent engagement with the biotechnology industry. Employers can expect immediate returns on their investments. Students bring back to the workplace increased confidence, heightened critical thinking abilities and refined communication skills.

Their elevated understanding of business strategies, sensitivity to bioethical issues and greater awareness of global considerations provides them with invaluable insights about the development, launch and delivery of new and groundbreaking products. Students also benefit from a close network of professional peers spanning multiple facets of the biotechnology industry.

**Companies Represented by Student Enrollments**

Abbott Laboratories Incorporated

American Consulting Incorporated

aOva Technologies Incorporated

Beacon Technologies

Bio-Rad Laboratories

Biotechnology Center, University of Wisconsin-Madison

Blood Center of Southeastern Wisconsin

Cardinal Health Incorporated

CIBC World Markets

Covance Incorporated

Danisco USA

Department of Biochemistry, University of Wisconsin-Madison

Department of Horticulture, University of Wisconsin-Madison

Department of Psychiatry, University of Wisconsin-Madison

Dow Chemical Corporation

EarthTech

G.E. Healthcare

General Casualty

Genetics Department, University of Wisconsin-Madison

**"The challenges associated with a startup company require a breadth of knowledge that a traditional M.S. or MBA degree would not have provided me. The M.S. in Biotechnology has helped me to leverage my background, applying topics in technology, business and intellectual property in ways that facilitated valuable career transitions. The degree provides me flexibility to work in areas that are often beyond the scope of manufacturing."**

**Scott Yoder**
**Class of 2005**
**Manager, Manufacturing Operations**
**Stratatech Corporation**

Genome Center of Wisconsin

Genome International Corporation

Genzyme

Greenbrier & Russel

Invitrogen Incorporated

Laboratory for Molecular and Computational Genomics, University of Wisconsin-Madison

LaFollette, Godfrey & Kahn LLC

Lucigen

McArdle Laboratory for Cancer Research, University of Wisconsin-Madison

MiniTube of America

Monsanto Corporation, Agracetus Campus

Monsanto Corporation, Protein Technologies

National Primate Research Center, University of Wisconsin-Madison

Novagen, EMD Biosciences

PPD Development

Pierce Biotechnology Incorporated

Prodesse Incorporated

Promega Corporation

School of Medicine and Public Health, University of Wisconsin-Madison

School of Pharmacy, University of Wisconsin-Madison

SAFC Pharma

Spectrum Research Incorporated

Standard Process Incorporated

Stratatech

Strategem

ThirdWave Technologies Incorporated

United States Department of Agriculture

Virtual Care Provider Incorporated

WiCell Research Institute

Wisconsin Alumni Research Foundation (WARF)

Wisconsin Entrepreneur's Network

Wyeth Pharmaceuticals


**"In my current position, I leverage my business experience as well as law and biotechnology degrees in the marketing and licensing of some of the most innovative and potentially lifesaving discoveries emerging from scientific labs today. The breadth of the program's curriculum provided me the ability to speak from a common vocabulary with business leaders, inventors and scientists to make sure that cutting-edge technologies most effectively make their way to the marketplace."**

**Craig J. Christianson**
**Class of 2004**
**Director of Licensing**
**Wisconsin Alumni Research Foundation**

**Clinical trials provide a critical bridge between research and discovery and patient use. Courses focusing on problem solving and corporate strategy were immediately applicable to my job, allowing me to expand my influence beyond clinical project execution and to participate more directly in product strategic planning and implementation.**

**Sara Engstrand**
**Class of 2006**
**Associate Director,**
**Clinical Research**
**Genzyme Corporation**

# When and Where

The M.S. in Biotechnology is uniquely designed to meet the needs of working professionals, delivering courses that integrate classroom material with day-to-day work challenges. Convenient evening and weekend scheduling makes it possible to achieve a world-class degree from UW-Madison while fulfilling daily responsibilities to employers.

Classes meet alternate weeks on Thursday evenings, all day Friday and on Saturday mornings. All courses are held in the state-of-the-art MG&E Innovation Center of University Research Park and the Biopharmaceutical Technology Center Institute on the southwest edge of Madison. Students who undertake the program must be able to attend a minimum of 14 class sessions per academic year at these locations.

Targeted services are designed to assist students in balancing the demands of their education with their professional and personal lives. Program-based IT support ensures electronic availability of all materials and immediate response to technical-support needs. Personalized career advising is also provided at the program level, aiding students in developing and meeting their strategic career goals.

# Admission

The M.S. in Biotechnology is currently seeking applicants to begin the program in the fall semester. Admission to the program requires:

- A four-year bachelor's degree or equivalent academic credentials, with a minimum of two semesters of biology or other related life science courses
- Relevant industry experience and/or project work
- Three letters of recommendation
- A personal or phone interview with the Admissions Committee

Interviews with the Admissions Committee are based on assessments of completed application files. All forms and information necessary to submit a completed application may be found at www.ms-biotech.wisc.edu.

The deadline for fall admission is March 31; however, if spaces remain, applications received after March 31 will be considered. Because the number of participants is limited, early application increases the probability of admission. Completed files are reviewed upon receipt of all application materials.

# Tuition and Fees

Tuition for the M.S. in Biotechnology Program is $30,000 for the full two-year program. This total does not include books or software, most of which are available in educational versions at substantial discounts. Students are encouraged to purchase personal laptops for use in courses and on team-based assignments.

**Chris Sebranek**
**Class of 2007**
**Director of Facilities and Manufacturing Operations**
**Cardinal Health**

**"Wanting to see the largest picture possible — across a spectrum that includes business decisions, scientific proficiency and ethical considerations — motivated me to get a graduate degree. The unique curriculum of the M.S. in Biotechnology and its highly applicable focus will be valuable as I look for ways to influence the strategic directions of my employer, and to extend my responsibilities and value in ways that go beyond a title or position description."**


**Contact the M.S. in Biotechnology Program**
Kurt J. Zimmerman, Associate Director
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MG&E Innovation Center, Suite 171
510 Charmany Drive, Madison, WI 53719-1235
**www.ms-biotech.wisc.edu**



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FORWARD

University of Wisconsin–Extension
432 North Lake Street, Room 423
Madison, WI 53706
608-263-7794
608-263-7830 (fax)
711 for Wisconsin Relay
http://www.wisconsinsbdc.org/

August 27, 2007

Senator Julie Lassa
State Capitol
Room 323 South
PO Box 7882
Madison, WI 53707

Dear Senator Julie Lassa,

I am very grateful for your interest in technology business development. I attended the Economic Development and Job Creation committee hearing last week at the MG&E Incubator and wanted to make you aware of another initiative with statewide reach that is supporting the creation of high impact businesses in Wisconsin.

As you know, support of entrepreneurs is a critical component of an economic development strategy for Wisconsin. Interest in entrepreneurship is booming—according to a study conducted by our office in early 2005, over 50% of Wisconsin residents either are already involved with, or are considering, starting their own businesses. Evidence supporting the value of entrepreneurship at the community level is overwhelming---entrepreneurs are the net job creators, the major innovators, and the most generous contributors to charities.

Recognizing the critical contribution of entrepreneurs, the Wisconsin Department of Commerce awarded funding to UW-Extension's Division of Entrepreneurship and Economic Development to create the Wisconsin Entrepreneurs Network, a seamless, integrated system for statewide entrepreneurial support. Our Division was awarded this funding based on our well-established and successful network of Small Business Development Centers at all the four-year UW campuses; these centers have been counseling and training entrepreneurs for over 25 years.

New WEN services include access to four Regional Directors who counsel high impact businesses and support "innovation-oriented" economic development activity in their regions. These regional directors bring expertise in federal R&D funding, manufacturing, biotechnology, software development, technology transfer and intellectual property protection.

Since its inception in 2005, WEN staff and partners have counseled over 14,000 existing and aspiring entrepreneurs —high impact companies receive special attention, but no entrepreneurs are turned away.

Over 100 partners from across the state are now part of WEN, and the number continues to grow. More than 40 inventor and entrepreneur forums supported by WEN have been established or are getting started—these groups cover 54 of the 72 counties in Wisconsin (detail attached). Our ability to award training and assistance grants from the Wisconsin Department of Commerce has enhanced our already-wide array of services for entrepreneurs. Satisfaction survey results from entrepreneurs are consistently outstanding.

We would be pleased to provide additional information on WEN if desired. We take a great deal of pride in our strategic, statewide approach to stimulating entrepreneurship across the state.

Sincerely,

Debra S. Malewicki
Interim Director
Division of Entrepreneurship and Economic Development
Wisconsin Entrepreneurs Network