WISCONSIN STATE LEGISLATURE COMMITTEE HEARING RECORDS

2003-04
(session year)

Assembly
(Assembly, Senate or Joint)

Committee on Public Health (AC-PH)

(Form Updated: 11/20/2008)

COMMITTEE NOTICES ...

➢ *Committee Reports* ... *CR*
**

➢ *Executive Sessions* ... *ES*
**

➢ *Public Hearings* ... *PH*
**

➢ *Record of Comm. Proceedings* ... *RCP*
**

INFORMATION COLLECTED BY COMMITTEE FOR AND AGAINST PROPOSAL ...

➢ *Appointments* ... *Appt*
**

Name:

➢ *Clearinghouse Rules* ... *CRule*
**

➢ *Hearing Records* ... *HR* *(bills and resolutions)*
****03hr_ab0104_AC-PH_pt03**

➢ *Miscellaneous* ... *Misc*
**

⇦ Previous Story | Related Stories | Next Story ⇨

Source: **Advanced Cell Technology**
Date: **2001-11-26**

Important Milestone In Therapeutic Cloning: Advanced Cell Technology Reports Publication Of Results Of Human Somatic Cell Nuclear Transfer And Parthenogenesis

Worcester, MA – November 25, 2001 – Advanced Cell Technology, Inc. (ACT) today announced publication of its research on human somatic cell nuclear transfer and parthenogenesis. The report, published in today's Journal of Regenerative Medicine, provides the first proof that reprogrammed human cells can supply tissue for transplantation.

Human embryonic stem (ES) cells, and other cells derived from the inner cell mass of the preimplantation embryo are totipotent, that is, they are capable of forming any cell or tissue in the human body. While numerous human ES cell lines are now in existence, they are of little value in human transplantation, as they would be rejected by a patient as foreign. Human therapeutic cloning has the potential to solve this problem by providing cells that are an exact genetic match for the patient.

ACT's paper reports preliminary studies on two means of manufacturing such cells. The first method is parthenogenesis. In this technique an egg cell is activated without being fertilized by a sperm cell. A patient in need of a particular cell or tissue type provides the egg cell, the activated egg cell forms a preimplantation embryo, and the resulting stem cells are differentiated into the type of tissue the patient needs. The paper reports success in activating egg cells in this manner to form many-celled embryos resembling blastocysts. The paper does not report data on stem cell isolation.

In a second series of studies, the company performed somatic cell nuclear transfer (cloning) to form preimplantation embryos. In this instance, human

egg cells were prepared by removing their DNA and adding the DNA from a human somatic (body) cell. The paper reports that the somatic nuclei showed evidence of reprogramming to an embryonic state as evidenced by pronuclear development (a type of nucleus observed only in the fertilized egg) and by early embryonic development to the six-cell stage. Again, the company did not report on stem cell isolation.

"Our preliminary results add to the weight of evidence that human cell reprogramming is possible," said Jose B. Cibelli, Ph.D., D.VM., Vice-President of Research at ACT and the first author of the report. "We understand that these are early and preliminary results, but given the importance of this emerging field of medicine we decided to publish our results now."

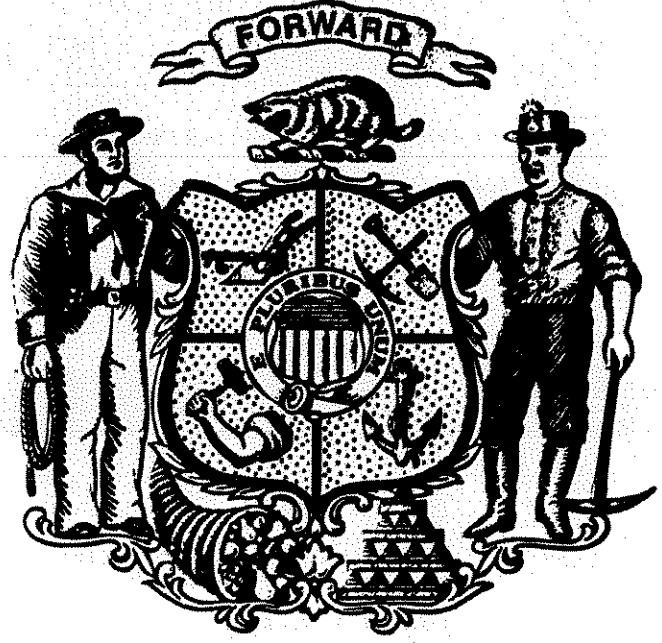
The company's goal in applying cloning to human medicine is to create stem cells capable of differentiating into a variety of cells, such as heart cells, neurons, blood cells or islets for transplant therapies. "These are exciting preliminary results," said Robert P. Lanza, M.D., Vice President of Medical and Scientific Development at ACT and an author on the paper. "This work sets the stage for human therapeutic cloning as a potentially limitless source of immune-compatible cells for tissue engineering and transplantation medicine. Our intention is not to create cloned human beings, but rather to make lifesaving therapies for a wide range of human disease conditions, including diabetes, strokes, cancer, AIDS, and neurodegenerative disorders such as Parkinson's and Alzheimer's disease."

"Human therapeutic cloning could be used for a host of age-related diseases," said Michael D. West, Ph.D. the company's CEO and an author of the paper, "if the human cells behave as animal cells have in previous studies, we may have found a means of rebuilding the lifespan of cells at the same time. This would allow us to supply young cells of any kind, identical to the patient, that could be used to address the tidal wave of age-related disease that will accompany the aging of the population."

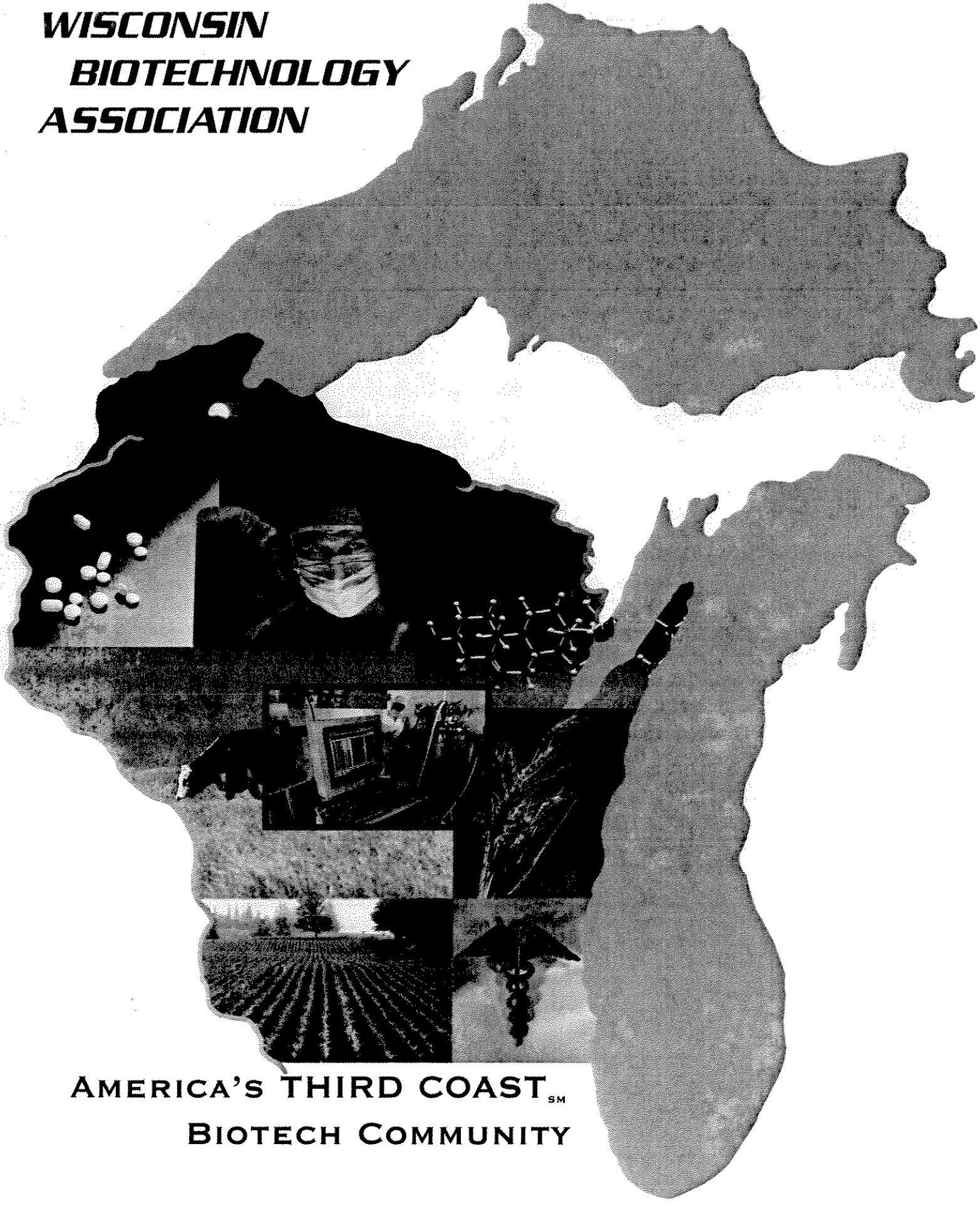
Researchers from Advanced Cell Technology collaborated with scientists from Duncan Holly Biomedical of Somerville, Massachusetts on the paper. The other authors are Kerrianne Cunniff of ACT, and Ann A. Kiessling and Charlotte Richards.

Advanced Cell Technology is a biotechnology company focused on discovering and developing cloning technology for human medicine and agriculture.

Editor's Note: The original news release can be found here.


FORWARD

WISCONSIN BIOTECHNOLOGY ASSOCIATION



AMERICA'S THIRD COAST℠

BIOTECH COMMUNITY

Presenting the

WISCONSIN BIOTECHNOLOGY ASSOCIATION

AMERICA'S THIRD COAST BIOTECH COMMUNITY

The Voice of Wisconsin's Biotechnology Community

For more than a decade the Wisconsin Biotechnology Association (WBA) has been the voice of Wisconsin biotechnology. We have an acclaimed industrial and service business sector that has begun to recognize the economic and scientific contributions of this community of biotechnology businesses.

Biotech Enterprise Expansion in Wisconsin

About 100 Wisconsin companies are currently members of the Wisconsin Biotechnology Association. This Third Coast biotech community is located in Wisconsin, whose borders are formed in large part by Lakes Superior and Michigan as well as the Mississippi River. Biotech companies are locating, relocating and expanding their businesses every day in this dynamic Midwestern research center.

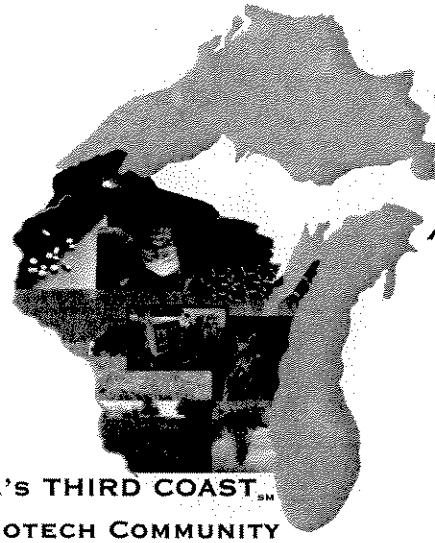
Internationally Acclaimed Research Universities

The Third Coast state has an international reputation for the quality of its public and private university systems. Our great research universities are producing the science, and the scientists, fueling biotechnology transfer to private enterprise. A business- and biotech-friendly state government encourages biotech growth. Significant state funding is expanding the educational facilities necessary to nurture biotech research.

Capital Resources are Growing

The WBA is the place for innovators to share their ideas and collectively develop the private and public policy initiatives that promote biotech growth. Capital resources continue to grow. New and expanding capital sources support both new and established biotech businesses. The WBA is committed to identifying and encouraging new sources of capital for its member companies.

Manchester Place-Capitol Square
2 East Mifflin Street, Suite 600
Madison, WI 53703
Phone 608-252-9393
Fax 608-283-5508
E-mail wba@dewittross.com
www.wisconsinbiotech.org



WISCONSIN BIOTECHNOLOGY ASSOCIATION

AMERICA'S THIRD COAST℠
BIOTECH COMMUNITY

Wisconsin Biotechnology Association

April 2003

WBA BIOTECH/BIOTECH-RELATED MEMBERS

ABS Global
Abbott Laboratories
Agtech Products, Inc.
Allograft Resources
American Bioanalytical, Inc.
American International Chemical
Analytical Instruments
Ardeabio Systems, LLC
AstraZeneca
Aventis Pharmaceuticals
BellBrook Labs LLC
BioDevelopment Resources, Inc.
BioPharmaceutical Technology Center Institute (BTCI)
Bio-Technical Resources
The Blood Center of Southeastern Wisconsin
Celebrus Consulting Group

Clasmann BioHoods & Cleanrooms
Columbus Chemical Industries
ConjuGon, Inc.
Covance Laboratories, Inc. ***(Sustaining Member)***
DNASTAR, Inc.
Earth Tech Consulting, Inc.
Eli Lilly & Company
EPICENTRE Technologies
EraGen Biosciences Inc.
Fisher Scientific ***(Platinum Sponsor)***
Flynn Creek BioConsulting
Four Lakes Scientific, Inc.
Gala Design, Inc.
Genencor International, Inc. (Enzyme BioSystems LTD)
Genetel Laboratories, LLC
GenTel, Inc.
GeriGene Medical Corporation
GlaxoSmithKline
Harlan Bioproducts for Science
Imago Scientific Instruments Corp.
Infigen, Inc.
Kendrick Laboratories, Inc.
KiwiChem International, Inc.
LabTech Midwest, Inc.
LifeScience Partners LLC
Lucigen (formerly Microgen)

Madison Area Technical College
Madison Skin & Research, Inc.
Marshfield Clinic ***(Sustaining Member)***
Medic Group, Inc.
Medical College of Wisconsin Research Foundation
Midwest PhRMA ***(Platinum Sponsor)***
Milwaukee County Research Park
Mirus Corporation
Molecular Chimerics Corporation
Monsanto Company-Agracetus Campus ***(Sustaining Member)***
NeoClone Biotechnology International LLC
nPoint
Next Generation Clinical Research Consulting, Inc.
NimbleGen Systems, Inc.
Novartis
Nutra-Park Inc.
Ortho Biotech Products, L.P. ***(Sustaining Member)***
PanVera Corporation
Paradocs Consulting
Paul F. Umbeck & Associates, LLC
Pel-Freez Clinical Systems, Inc.
Pfizer
Pierce Milwaukee LLC
Platypus Technologies, LLC
Powderject Vaccines, Inc.
PPD Development

Prodesse, Inc.
Promega Corporation ***(Sustaining Member)***
ProtoPROBE, Inc.
Quintessence Biosciences, Inc.
rlQ Inc.
Schering-Plough
Schwarz Pharma USA, Inc. ***(Sustaining Member)***
Scientific Protein Labs
Soft Flow, Inc.
Stratatech Corporation
The Strategy Factory
Susan E. Atkins + Associates
Tetrionics, Inc.
Third Wave Technologies, Inc.
University of Wisconsin Biotechnology Center
University of Wisconsin-Madison, MS in Biotechnology
University of Wisconsin-Madison, University-Industry Relations
University of Wisconsin-Madison, Waisman Center
University Research Park, Inc.
Wisconsin Alumni Research Foundation (WARF)
Wisconsin Viral Research Group
Wyeth-Ayerst

The Role of the Wisconsin Biotechnology Association

The WBA is dedicated to...

Influencing Public Policy

Building public sector support for scientific research and technology transfer is essential for success. Initiatives promoted by state and federal legislators and other public officials can make or break the scientific community. The WBA provides these policy makers with reliable information in support of biotech research and business community development. The WBA walks the halls of our state's and nation's Capitols, telling the biotech story. Public officials are responding with their support.

Developing Biotech's Image

The WBA is dedicated to developing the image of the biotech community so that it is recognized as Wisconsin's new economic force. Wisconsin has the educational, research and financial resources needed for biotech companies to grow. Our state has a diverse population offering a wide range of cultural experiences. We also have nearly boundless water and forest resources that offer world-class recreational opportunities. The WBA is focused on helping the Third Coast become a world-class biotech center.

Increasing Biotech Research Funding

The WBA is committed to maintaining and expanding state and federal biotech funding. Many scientific advances are simply not possible without research grants from state and federal agencies. The WBA is committed to maintaining existing and identifying new government grant sources. The WBA is the biotech business community's voice in these state and federal budget deliberations.

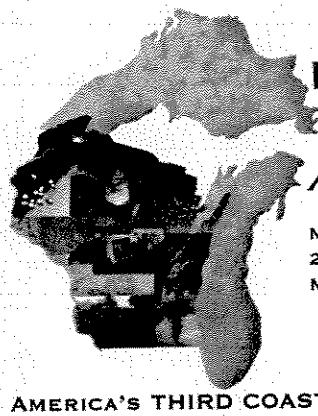
Providing Member Services

Providing services to our members is a critical role of the WBA. As a private trade association, the WBA offers services that are vitally important to biotech, biotech-related companies and associate member companies and organizations.

The WBA Purchasing Consortium saved our members over $1.4 million dollars last year alone. Biotech suppliers also provide important revenue support for the WBA. Both biotech and associate members have the opportunity to purchase goods and services from selected vendors at discounted prices. The WBA is constantly developing new Consortium partnerships.

Seminars and Other Social and Professional Events offer our members important opportunities for learning and networking. Each fall the WBA/Third Coast Biotech Community's annual conference brings to Wisconsin nationally and internationally renowned speakers to address a variety of biotech topics. In 2001, the WBA joined with the Wisconsin Innovation Network (WIN) Foundation to give our members access to WIN's Life Sciences Venture Fair, which was attended by venture capitalists from around the country. The WBA will provide a similar opportunity in 2002. Periodically the WBA offers members seminars and luncheons with programs designed to help them build their biotech companies. Program topics include such issues as how to design a biotech facility from day one to final development and how to identify and evaluate research park locations and opportunities.

Your membership in the WBA would bring these benefits to your company or organization. Likewise, the participation of members in the WBA is critical to our continuing success. We thank you for your support.



WISCONSIN BIOTECHNOLOGY ASSOCIATION

MANCHESTER PLACE
2 E. MIFFLIN ST., SUITE 600
MADISON, WI 53703

AMERICA'S THIRD COAST...
BIOTECH COMMUNITY

The Board of Directors of The Wisconsin Biotechnology Association

President	Frank Langley, *President* *Pel-Freez Clinical Systems, Brown Deer, WI*
Secretary	Dr. William Hendee, *Executive Vice-President* *Research Foundation* *Medical College of Wisconsin, Milwaukee, WI*
Treasurer	Dr. Paul Umbeck *Paul F. Umbeck & Associates, LLP, Madison, WI*

Directors

Sheila Burns, *Vice-President of Sales & Marketing*
Pierce Biotechnology
Rockford, IL

Dr. Michael D. Caldwell, *Director, Medical Research*
Marshfield Clinic
Marshfield, WI

Paul Carbone, *Managing Partner*
Baird Capital Partners & Baird Venture Partners
Chicago, IL

Debra Endean, Ph.D., *Vice-President*
The Blood Center of Southeastern Wisconsin
Milwaukee, WI

Carl Gulbrandsen, *Managing Director*
Wisconsin Alumni Research Foundation
Madison, WI

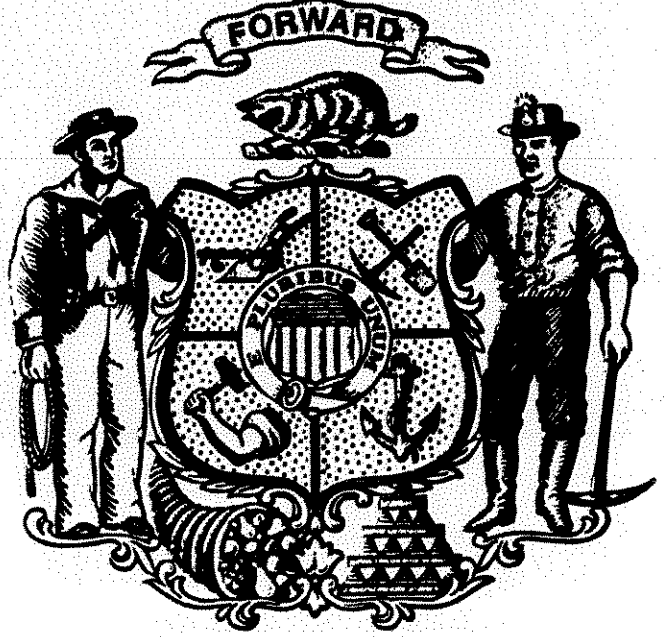
Dr. Kelly Henrickson, *President*
Prodesse, Inc.
Waukesha, WI

Ralph Kauten, *President*
Quintessence Biosciences, Inc.
Madison, WI

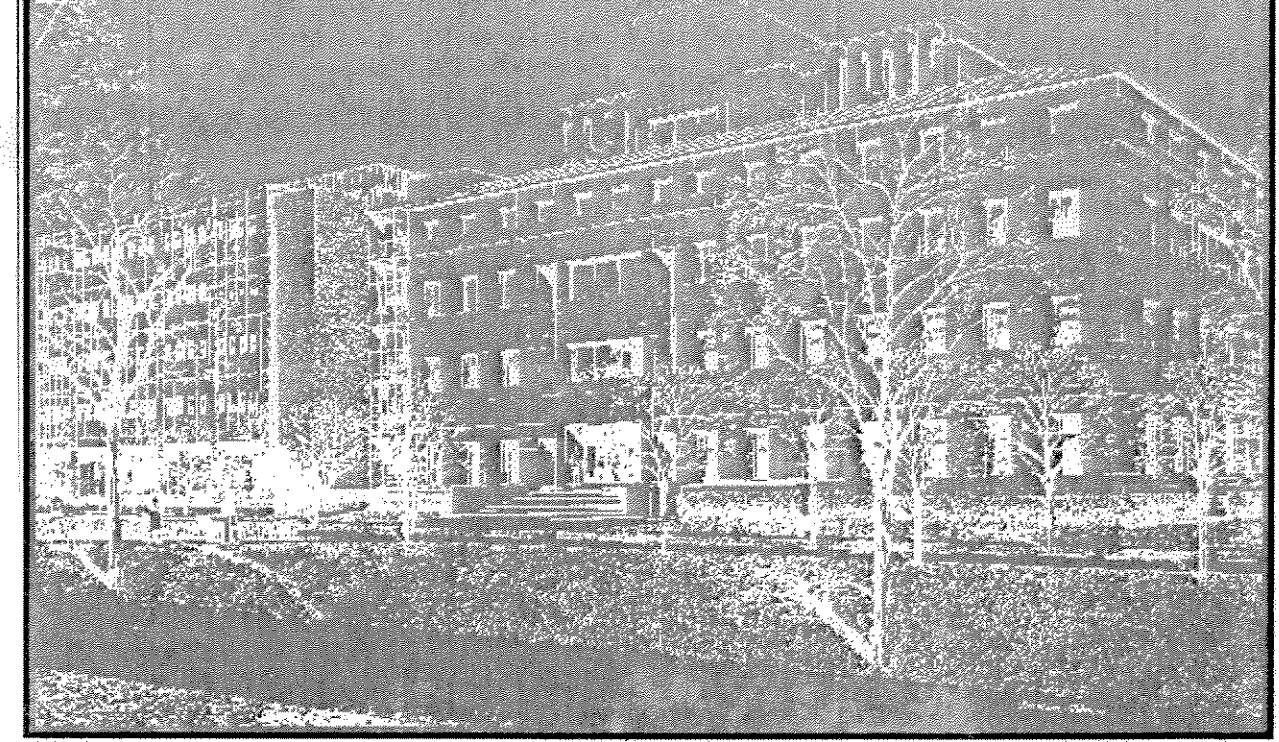
John Neis, *Senior Partner*
Venture Investors Management LLC
Madison, WI

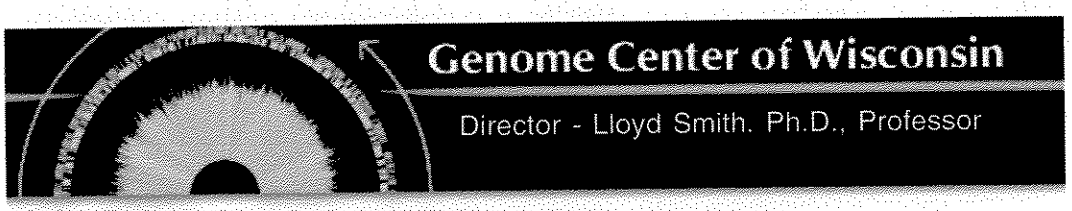
Eric Stahre, *General Manager, Genomics and Molecular Imaging*
GE Medical Systems
Waukesha, WI

Professor Michael Sussman, *Director*
University of Wisconsin Biotechnology Center
Madison, WI


FORWARD

University of Wisconsin Biotechnology Center





Genome Center of Wisconsin

The Genome Center of Wisconsin has been established as a administrative unit within the UW Biotechnology Center of the UW-Madison. It is headed by Professor Lloyd Smith, Professor of Chemistry. He can be reached at 608.265-0037, 425 Henry Mall, Madison, Wisconsin 53706. The UW Biotechnology Center is headed by Professor Michael R. Sussman, who can be reached at 608.262-8606 and/or msussman@facstaff.wisc.edu.

Genomics is a significant new field of knowledge that should be a high priority for our institution of higher learning. We wholeheartedly applaud the announcement of a specific hiring initiative and support the recent interest of several groups on campus toward multidisciplinary hiring in fields relating to genomics. Genomics shares objectives with, contributes to and uses the fruits of many disciplines, and yet offers a fundamentally different "top down" approach which seeks, directly and globally, to exploit the complete blueprints of life forms, rather than focusing on any particular biological system, organism or even scientific objective. Although genomics is reliant on organism-specific fields such as botany, zoology, microbiology and medicine, as well as physics, chemistry, many disciplines of engineering, computer science, mathematics and even the business, legal and ethical professions, none of these departments or fields of knowledge could encompass and nurture genomics.

There are four main divisions of study under genomics, all of which will be represented in the new center:

* **Genome sequencing**
* **Functional genomics**
* **Comparative genomics**
* **Bioinformatics**

Genome sequencing

A genome sequence is a complete blueprint of a life form. There is nothing more stimulating, inspiring or suggestive of new insights to a biological scientist than to have access to complete genome data.

Functional genomics

Functional genomics is the systematic determination of functions of all the genes of an organism with little or no focus on any particular gene. The most recent development, marrying the techniques of semiconductor electronics with genome data allows the creation of biochips that can assay the activity of hundreds of thousands of DNA segments simultaneously within days or even hours. These chips will enable rapid identification of the genes responsible for genetic diseases, rapid diagnosis of infectious agents or cancer, surveillance for emerging pathogens and a host of other applications.

Comparative genomics

Relationships between genomes are indicative of the history of life on earth and can often provide clues relating to the major and minor events of speciation. On another level, genomic comparisons provide information on function, on how different organisms solve the same biological problems, how they adapt to, or take advantage of, their environment. Genomics has already begun to address the unanticipated traffic of genes between species, overturning the paradigm of the static genome. The practical consequences include ascertainment of the differences between pathogens and their benign cousins, the evolution of disease and of disease-resistance as well as resistance to antibiotics. The field of evolutionary biology is in some sense just beginning, now that genomics has extended the scope of studies from a few genes to whole genomes.

Bioinformatics

Bioinformatics has arisen from the digital nature of sequence data and from its large quantity. The current total of publicly accessible sequence data from all species is half a billion residues which is increasing exponentially. The human genome, for example, amounts to 3 billion residues. Bioinformatics has contributed much of the usefulness of genome data by providing database methods for its widespread distribution as well as algorithms for assembling, searching, comparing, and interpreting sequences.

Faculty in the above fields are currently being recruited.

"In Gel" Protein Digestion and Peptide Mass Fingerprint Analysis

Our state-of-the-art Mass Spectrometry/Bioanalytical Facility provides fast and reliable service in protein identification through the In-gel digestion of proteins separated by 1D and 2D electrophoresis and subsequent Mass Spectrometric analysis of resulting peptide fingerprint.

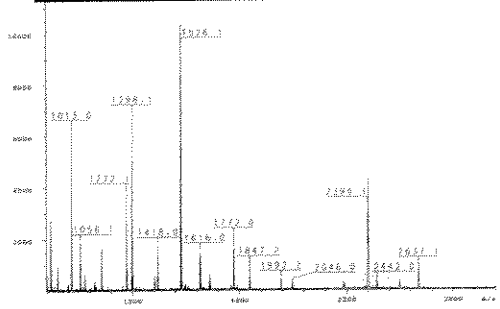
With our current methods we are able to process and generate unique mass fingerprint data from as little as 500 femtomoles of silver or SYPRO Ruby stained polyacrylamide gels. For Coomassie stained gels our detection levels are below the sensitivity of the dye (YOU SEE A BAND WE CAN ANALYZE IT).

The protocols used along with requirements for the initial sample preparation and submission are included on our facility s web page: www.biotech.wisc.edu/ServicesResearch/MassSpec/

Contact Person: Grzegorz (Greg) Sabat Proteomics Specialist
Tel. (608)-265-2313 E-mail: gsabat@facstaff.wisc.edu

- Protein band excision
- In-Gel Digestion
- Peptide Extraction
- MALDI-TOF MS

Mass Spectrum

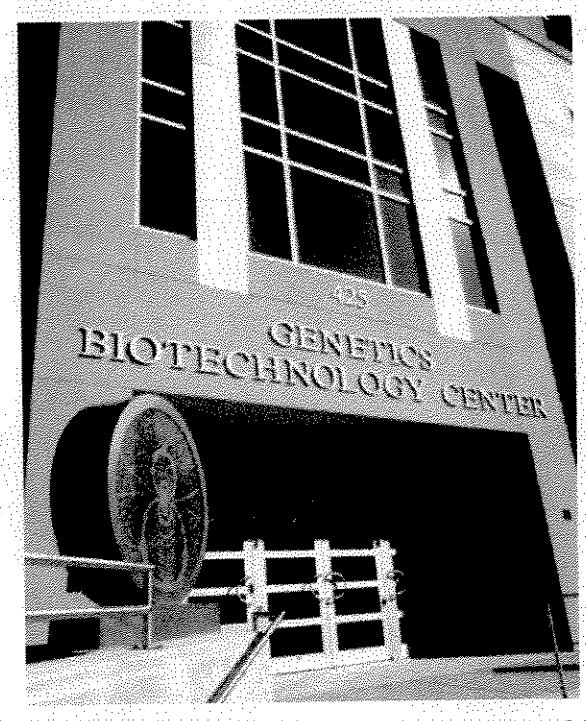


- Unique Peptide Mass Fingerprint
- Internet Database Search

PROTEIN IDENTITY

UW Biotechnology Center
Research Service Facilities

The University of Wisconsin Biotechnology Center (UWBC), located at 425 Henry Mall, offers state-of-the-art research services at competitive user fees to UW-Madison scientists. The services can increase the quality and quantity of your biological science research and enhance your competitiveness for federal grant support.



We also provide education programs and multimedia technology resources. In the near future, as a service to the biological community at large, we will be hosting a local mirror of Biology Workbench.

Most of our services are also available to state, regional, national and international researchers.

Some of these services include: production of transgenic/knockout mice and rats, DNA synthesis and sequencing, peptide synthesis, proteomic/ mass spectrometry of phosphopeptides and small metabolites, plant biotechnology, gene expression analysis, molecular interactions and high throughput computing.

Check out UWBC's services on our website at:

http://www.biotech.wisc.edu/service

- **DNA Synthesis Facility** serves as a resource for the timely and economical synthesis of high quality oligonucleotides. A variety of synthesis scales are available, and literally dozens of special DNA modification orders can be accommodated. Quality control is carried out by a variety of methods to insure product integrity. For ordering information and current pricing see http://www.biotech.wisc.edu/service, then click on the "synthesis" window. You may also contact the facility manager Dr. Charles Nicolet at cnicolet@wisc.edu or call 608-263-9880.

- **DNA Sequencing Facility** offers a variety of sequencing related services depending on users' needs and experience. State of the art capillary based sequencing equipment is utilized to insure rapid turnaround of data (typically 1-2 days, depending on requested services) and quality output (1000 base reads are not atypical). Training is available for users just starting in sequencing. Fluorescent fragment analysis for population experiments is also offered as a service. More information is available at http://www.biotech.wisc.edu/service, then click on the "sequencing" button. Also check out https://dna.biotech.wisc.edu for a list of useful documents relating to sequencing. The facility manager Dr. Charles Nicolet can be reached at cnicolet@wisc.edu or call 608-263-9880.

- **Peptide Synthesis Facility** offers custom peptide synthesis. Fmoc chemistry with three ABI Model Synergy 432A instruments is used. Synthetic peptides are furnished in cleaved and deprotected form as lyophilized powders; analytical HPLC characterization and mass spec analysis are part of our basic service. Basic synthesis, cleavage, and deprotection is $25/residue. For more information on protein services and prices, contact Dr. Gary Case 608/263-9881, or email at glcase@facstaff.wisc.edu .

- **Proteomic /Mass Spectrometry Facility** performs a variety of services involved in the purification and analysis of molecules from biological sources, with an emphasis on

peptide and phosphopeptide sequencing, and protein identification by peptide fingerprinting using electrospray triple quadrupole mass spectrometry. For more information, contact Dr. Amy Harms at 608/262-5637, fax 608/262-6748 or harms@biotech.wisc.edu.

- **Gene Expression Facility** provides access for campus PI's and their labs to a new technology for analyzing gene function, utilizing, DNA affixed to glass surfaces. The affixed DNA, in high-density arrays spotted on a microscope slide, allow a lab to rapidly analyze the expression pattern of every gene in an organism in a single experiment. The state of the art technology will allow researchers to explore physiological and genetic responses on a previously unattainable genome wide scale. Contact Sandra Splinter BonDurant at 608/265-3029 or sandra@genome.wisc.edu .

- **Plant Biotechnology Laboratory** staff employ molecular approaches to maximize foreign protein expression in crop plants and develop methods to extract and purify these proteins. Laboratory staff develops and test methods to assess the risks of releasing transgenic plants into the environment. The staff welcome collaborative or contract research projects with academic and industrial users. Contact Dr. Sandra Austin-Phillips, 608/262-7293 or saustinp@facstaff.wisc.edu.

- **Biotechnology Outreach** provides information, insight, and analysis on technical and social issues of biotechnology. The program's goal is to enable individuals to make informed personal choices and to participate effectively in public policy about biotechnology. Schedule a workshop in UWBC's new building, or staff will travel to your community, anywhere in the state. Workshops can be tailored for students, teachers, journalists, parents, community leaders, or the public. You can contact Dr. Thomas Zinnen at 608/265-2420 or at zinnen@macc.wisc.edu.

- **Biology New Media Center** (BNMC) aids the campus biological sciences community integrate specialized information and multimedia technology into biology and biotechnology teaching and research. Operated as a joint venture of UWBC, the Center for Biology Education (CBE), and the Division of Information Technology (DoIT), the BNMC provides equipment, software tools, access to information, and expert assistance. For more information, contact Dr. Jean-Yves Sgro, Research Consultant, 608/263-2532, or bnmc_res@gene.biotech.wisc.edu .

- **Transgenic Animal Facility** has the capability to generate "knock-out" mice in which any gene sequence of interest is deleted. Facility staff provide the expertise, laboratory space, and pathogen-free animal quarters necessary for the efficient production of transgenic mice and rats. Clients may receive guidance in DNA preparation for microinjection, transgenic animal husbandry, and analysis of transgenic animals. For more information contact Facility Director, Dr. Anne Griep at 608/262-8988 or aegriep@facstaff.wisc.edu.

- **Molecular Interactions Facility** offers the following services for identifying protein and small molecular ligands of target proteins: Interaction proteins, Phage-display antibodies, peptide ligand discovery and screens of small molecule libraries for inhibitors. Candidate interacting proteins can be identified to proteins of interest by screen ordered arrays of cDNA clones by the yeast two-hybrid technology. Contact Dr. Eileen Maher at 608/265-3011 or eamaher@facstaff.wisc.edu .

- **High Throughput Computing Facility** provides genomic researchers and their academic collaborators access to computing power that would otherwise be outside the scope of their organization. For more information contact John Holt at 608/263-9981 or email at jrholt@genome.wisc.edu .

Tours: Tours of our building and facilities can be arrange by calling 608/262-8606.

Conference Facilities: The UWBC has a well-equipped auditorium and large conference room benefiting UW-Madison biological science community, primarily in biotechnology and/or genetics. We host many events on a weekly basis. Call us at 608/ 262-8606 to receive a reservation form and other information.

Biological Sciences Events Calendar: Check our website for campus-wide events. You can check what's happening daily as well as add your own events.

4/2003

DNA Synthesis

•Automated, custom oligonucleotide synthesis •Consulting •Experimental design

The UWBC DNA Synthesis Laboratory serves as a resource for the timely synthesis of high quality oligonucleotides. Staff are dedicated to providing clients with a convenient and friendly source for all oligonucleotide needs. UWBC staff specialist, Matt Morgan, is experienced in the incorporation of nucleoside analogs and other custom reagents, RNA synthesis, mixed base site oligos, and oligonucleotide design.

Ordering:

Room 2360 in the Genetics/Biotechnology Building at 425 Henry Mall.

Fax: 608/265-6573

Electronic orders

Via the UWBC web site:

http://www.biotech.wisc.edu/service/

Then follow the links to the oligo order form and fill it out.

Pricing

Check our web site for current pricing. We operate as close to cost as possible. Thus our services are very competitively priced.

For more information contact:

Charles Nicolet or Matt Morgan
608/263-9882

e-mail:

cnicolet@facstaff.wisc.edu

UWBC Web Page

http://www.biotech.wisc.edu/service/

Services

Basic Synthesis

40 nmol: The UWBC DNA Synthesis Facility utilizes an Applied Biosystems 3948 DNA Synthesizer that can produce 48 oligonucleotides at the 40 nmol scale in one synthesis run. Part of the automated procedure involves cartridge oligonucleotide purification followed by trityl removal. Oligonucleotide orders received by early afternoon are usually ready the next day.

0.2 and 1.0 µmol scale syntheses are also available. Further purification is usually not required for most manipulations. An inexpensive, unpurified 0.2 µmol scale option is also available. Contact us for details.

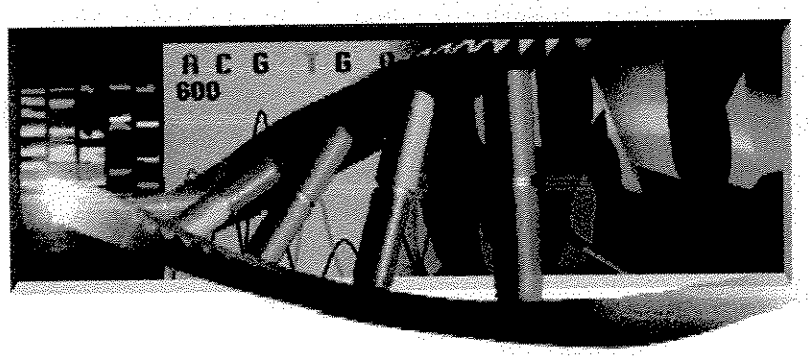
NOTE: Scale synthesis values reflect the concentration of the initial base, not the final yield.

Special Synthesis

There are no additional charges for special or mixed base syntheses beyond the extra cost of the reagent. Some of the special syntheses available are shown below.

Special Reagents (other options available)

- RNA oligonucleotide synthesis
- Fluorescent nucleosides
- 5' or 3' phosphorylation
- Thiol linkages
- Biotin modified nucleosides, (any position)
- Amino (C6 or C3)-dT
- dI incorporation
- Amino-linker, 5' and/or 3' internal



4/2003

All charges are for University of Wisconsin System researchers. Other scientists are charged an additional 44% for overhead. Prices are subject to change.

DNA Sequencing

•Automated (fluorescence) DNA sequence analysis•Consulting
•Experimental design

The UWBC **Nucleic Acid and Protein Facility's** DNA Sequence Laboratory serves as a resource for automated sequence utilizing Applied Biosystems capillary based sequencers. Staff is experienced in sequencing many types of templates, including double-stranded and single-stranded plasmids and PCR products.

Sequence data are provided in a variety of electronic formats that can be accessed over the internet. The DNA sequence Laboratory offers a wide variety of personal services and collaborations. Multiple discount options for processing large numbers of sequence reactions are available. Users are encouraged to discuss sequencing strategies, potential problems, and troubleshooting issues with staff members. Positive controls are provided and analyzed free of charge. Detailed protocols on sequencing are also available free through us.

Ordering

Room 2360 in the Genetics/Biotechnology Center building at 425 Henry Mall where you can drop off your completed reactions or DNA to be sequenced. You also can pick up sequencing reaction mix here. All paperwork can be filled out on-site. First time users should contact Charles Nicolet (address below).

Pricing

Check our website for current pricing. The UWBC is a non-profit center that exists as a service facility for UW researchers. We operate as close to cost as possible. Thus our services are very competitively priced.

For more information

Contact Charles Nicolet, Ph.D.
608/263-9880 or 263-9882
e-mail : cnicolet@facstaff.wisc.edu
Fax: 608/265-6573
UWBC Web Page
http://www.biotech.wisc.edu/service/

Services

I. Users perform the cycle sequencing reactions with fluorescent dye terminators, then we run the completed reactions on our automated sequencer. The dye terminator mixes are sold through the UWBC, and since we purchase these reagents in bulk, we pass the volume discounts on to you. Sequence data can be retrieved from our server within 1-2 working days. This is the most economical option. Discounts provided for multiple samples, please inquire.

II. UWBC staff carries out all reactions and subsequent manipulations. For this option, users provide (clean) template DNA, including plasmids, single strand templates, or PCR products. Standard primers for sequencing (e.g., T7, SP6, M13 Forward and Backward) are provided free; custom primers can be ordered and purchased through our DNA Synthesis Facility or provided by the users. Discount options are available, please inquire.

III. Staff members work with users to accomplish large sequencing projects. May include primer walking or random library generation to sequence large inserts. Staff designs and synthesizes all required primers, and generates and assembles sequence of the required fidelity.

IV. Fluorescently labeled fragment analysis using Applied Biosystems Gene Scan Software. Analyzed files containing mobility data are provided, subsequent analyses are carried out by the user.

4/2003

All charges are for University of Wisconsin System researchers. Other scientists are charged an additional 44% for overhead. Prices are subject to change.

Peptide Synthesis

- **Custom synthesis and characterization of peptides**

The **Peptide Synthesis Facility** offers custom peptide synthesis. Automated synthesizers use Fmoc chemistry to build peptides at 25 to 2000 µmole batch scale. Chain lengths of up to 100 amino acids are possible. Either acid or amide C-terminus may be selected, as well as N-terminal acetylation. A wide variety of peptide modifications can be performed, including biotinylation, fluorescence labeling, phosphorylation and incorporation of non-physiologic residues. Peptide conjugation to carrier proteins and synthesis of multiple antigenic peptides (MAP) are also performed.

Synthetic peptides are furnished in cleaved and deprotected form as lyophilized powders. Analytical HPLC and mass confirmation by ESI or MALDI-TOF are included as part of the basic service. Peptide purification by HPLC is available. Staff also provides assistance in preparation of scientific research grant applications.

For information or for services contact:
Gary Case Ph.D. 608/263-9881
email: glcase@facstaff.wisc.edu
UWBC Web Page
http://www.biotech.wisc.edu/service/
Fax: 608/262-6748

Services and Prices

• Basic synthesis, 25 µmole Cleavage & deprotection (includes analytical HPLC and mass spectrophotometry)	$25 per residue (inquire for scales up to 2.0 mmole)
• Multiple antigenic peptides (4 branch or 8 branch)	$25 per residue
• Preparative scale HPLC purification (up to 100 mg load)	Cost $165
• Peptide-protein conjugation (KLH or Albumin)	$75 (5mg scale)
• Do it yourself peptide synthesis (synthesis only-inquire)	$10 per coupling (training required)

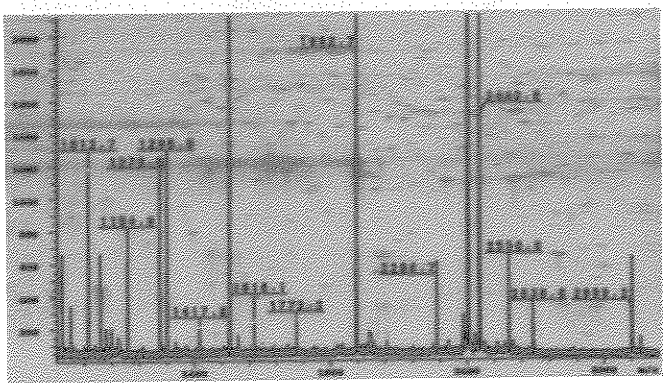
5/02

All charges are for University of Wisconsin System researchers. Other scientists are charged an additional 45.5% for overhead. Prices are subject to change.

Mass Spectrometry/Bioanalytical Facility

Mass Spectrometry

The University of Wisconsin Biotechnology Center has acquired a state-of-the-art Micromass Q-TOF2 Hybrid Quadrupole/ Orthogonal Time of Flight Mass Spectrometer, a Bruker Biflex III matrix assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometer, and a Applied Biosystems / MDS Sciex API 365 LC/MS/MS triple quadrupole. These are useful for the analysis of biomolecules, including proteins, DNA, RNA, peptides, oligonucleotides, oligosaccharides and other small organic and inorganic molecules. In addition to measuring the molecular weight of compounds, the instruments are designed to perform MS/MS so that the structure of a selected ion can be deduced from the fragments. This is particularly useful for peptide sequencing and post-translational modification mapping. The two ESI-MS are also equipped with HPLC systems which are used with reversed phase (RP) microbore / capillary columns, for LC/MS/MS experiments. LC/MS/MS is extremely useful for quantitation of known compounds and for the rapid screening of a mixture to identify the components of interest.



In Gel Digest Services

A protein of interest isolated by gel electrophoresis can be identified by peptide mass fingerprinting. The MALDI Mass Spectrometer will provide a list of specific MW masses (plotted as peaks) generated from the peptide mixture of the trypsin digested protein of interest, these masses in turn should lead to identification of analyzed protein by cross-referencing against a database. Our Facility will process proteins separated by 1D and 2D electrophoresis containing as little as 50 ng of sample.

Bioanalytical

The basic purpose of the Bioanalytical Facility is to purify and analyze bio-molecules especially proteins, peptides, metabolites and other natural products, on a fee for service basis. This work is performed for the entire scientific community including industry, as well as academic researchers. The UWBC Bioanalytical facility is

- Designed for the separation of biomolecules and other organic molecules.
- The facility has state-of-the-art equipment and expertise in extraction, HPLC, gel filtration and electrophoresis, etc., from trace analysis to large-scale preparation.
- We perform proteolytic digestions of proteins, which can be further analyzed by HPLC, MS, LC/MS and MS/MS for peptide mapping and peptide sequencing.

The facility is always interested in expanding its capabilities and welcomes contracts for the evaluation of equipment.

Services and Prices

For more information contact: Amy Harms, Ph.D. 608/262-5637 **e-mail:** harms@biotech.wisc.edu
Fax: 608/262-6748 **UWBC Web Page** http://www.biotech.wisc.edu/ServicesResearch/MassSpec/ 05/02

All charges are for University of Wisconsin System researchers. Other scientists are charged an additional 45.5% for overhead. Prices are subject to change.

UWBC Gene Expression Center

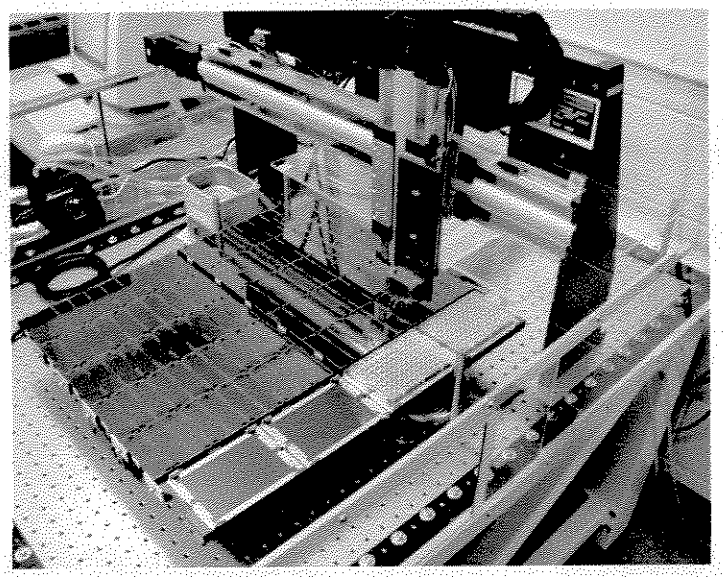
University of Wisconsin Biotechnology Center
Genome Center of Wisconsin

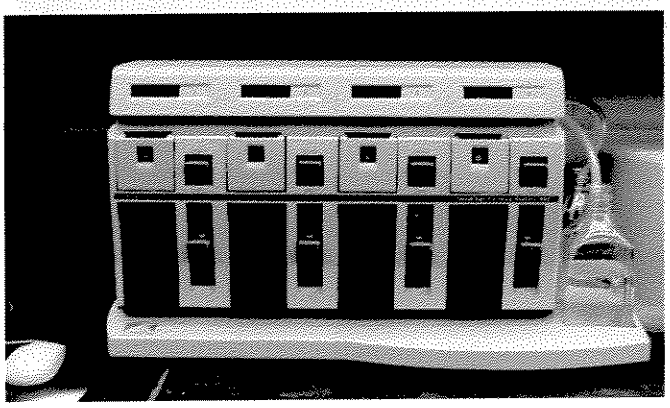
Facility Manager: Sandra Splinter BonDurant
Phone: 265-3029
Email: sandra@genome.wisc.edu

The UW Gene Expression Center has been established as part of the Genome Center of Wisconsin and the UW Biotechnology Center. The Center provides researchers with products and services for large-scale gene expression studies using DNA microarrays and Affymetrix GeneChips.

DNA Microarrays:

We offer a number of services and products for making and using DNA microarrays. The Gene Expression Center will print custom microarrays from user supplied DNA samples. Typical print runs produce 100 identical microarrays. The Center also prints and sells whole genome *E. coli* DNA microarrays. These arrays are printed using PCR products from greater than 95% of all ORFs in the *E. coli* genome as well as ~200 positive and negative controls. For data acquisition we have a GSI-Lumonics SA5000 microarray scanner which can be used to scan any microarray printed on glass slides. After initial training, users simply sign up for time on the scanner through our web site. Software for image acquisition, quantitation and data analysis are available to all users of the facility.





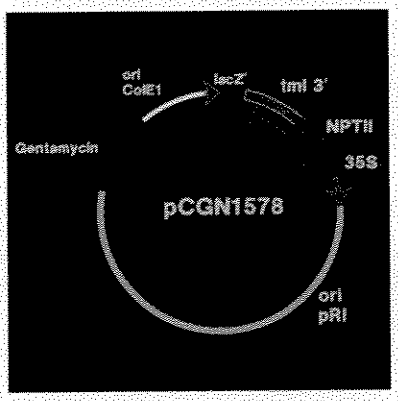
Affymetrix GeneChip System:

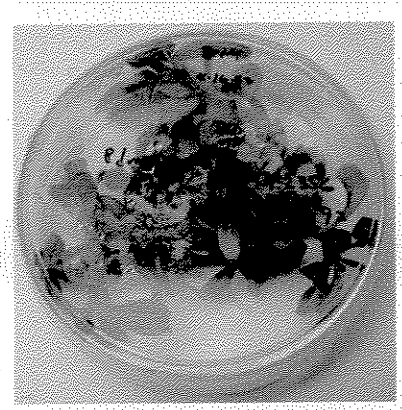
An Affymetrix GeneChip Analysis System is available in the Center for analysis of experiments performed using any currently available Affymetrix GeneChip. The Center has two options available for use of this system.
We offer a hybridization service where users supply labeled RNA samples and GeneChips for hybridization and the Center performs hybridization, scanning and raw data analysis. The samples and GeneChips are returned to the user along with a CD containing all data generated. Software for data analysis can be accessed in the Expression Center. For users wanting to perform large numbers of experiments (≥100 chips) the instrumentation can be run by a trained member of the users lab. The University of Wisconsin has an Affymetrix Academic Access Agreement which allows UW researchers to receive a discount on all commercially available Affymetrix GeneChips. Please contact the facility Manager for a copy of the current price list.

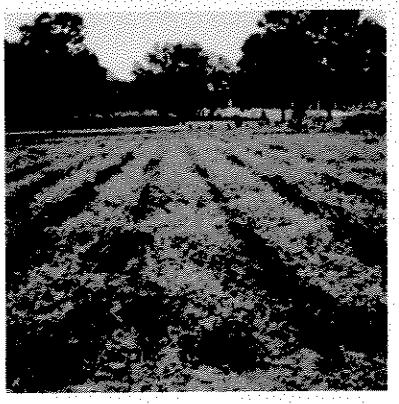
For more information about any of these services please contact the Gene Expression Center Manager.

Plant Biotechnology Laboratory

•Genetic engineering of crop plants •Micropropagation
•Protoplast isolation and fusion







The **Plant Biotechnology Laboratory** specializes in all aspects of plant tissue culture with emphasis on the genetic transformation of crop plants using *Agrobacterium tumefaciens*. The Laboratory is particularly skilled at the transformation of potato and alfalfa and the subsequent analysis of transgenic plants. Most of the laboratory's funding is from competitive federal research grants. Plant tissue culture and molecular biology services are available and the staff welcomes collaborative or contract research projects with academic and industrial users.

Research Interests

Crop plants as bioreactors

Current research focuses on a multidisciplinary feasibility study for producing industrial enzymes in transgenic alfalfa i.e. using alfalfa as an animal feed bioreactor. This involves molecular approaches to maximize foreign protein expression and methods development for the extraction and purification of commercial proteins from field-grown transgenic alfalfa.

Services

Services are primarily custom research projects ranging from micropropagation to plant transformation. Contract research can be performed on an hourly basis or arranged as a long-term project.

Rates inclusive of supplies:

Plant tissue culture services	$40/hour
Molecular biology services	$50/hour

For more information, or to request services, contact:

Sandra Austin-Phillips, Ph.D. 608/262-7293
e-mail: saustinp@facstaff.wisc.edu

Fax: 608/262-6748
UWBC Web Page
http://www.biotech.wisc.edu/service/

4/00

All charges are for University of Wisconsin System researchers. Other scientists are charged an additional 44% for overhead. Prices are subject to change.

Biotechnology Outreach

•Tours •Workshops •Web resources •Science Alliance

BioTrek is the Outreach Program of the UW-Madison Biotechnology Center and of the Family Living Program of UW-Extension Cooperative Extension.

Our mission is **Sharing Science With Wisconsin.**

Our objective is **Transforming How People View & Do Science.**

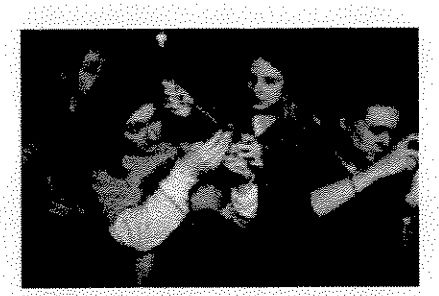
Our goal is **to enable people to use science in making personal choices** and public policies.

BioTrek started in June 1991 as a joint project of the Biotechnology Center and the Family Living Program of UW-Extension Cooperative Extension. The program arose out of the Bovine Growth Hormone controversy and is authorized by state law passed in 1990 to provide consumers with "extension programs to educate consumers about biotechnology processes and products and risk assessment techniques" (36.25.31 Wisconsin Statutes).

The program reflects its broad mandate by encompassing all aspects of biotechnology (including recombinant DNA technology, genomics, stem cells), and its historical origins by focusing on biotechnology & food.

Extension professionals, teachers, journalists, medical and food professionals, and community leaders comprise our target audiences. **BioTrek** uses the statewide system of UW-Extension County Offices to serve people across Wisconsin.

For more information, contact:
Tom Zinnen
608/265-2420
zinnen@biotech.wisc.edu
Fax: 608/262-6748



Extracting DNA from Wheat Germ

Tours & Workshops

•**Come tour** the Biotechnology Center at UW-Madison. Experience science as discovery!

•**Schedule a workshop** at the Biotechnology Center. If you can't come to Madison, our staff will travel to your community, anywhere in the state. Workshops can be tailored for students, teachers, journalists, parents, community leaders, or the public. Call 608 265 2420 for cost and availability.

Resources

•**BioTrek's Website** at **http://www.biotech.wisc.edu/Education** lets learners anywhere explore our resources on biotechnology and on the nature of science in exploring the unknown.

•**Science Alliance:** BioTrek is helping to build the campus-wide Science Alliance for Outreach. Our goal is to organize outreach programs both for welcoming people to campus and for extending the resources of the university to communities across the state as we enter the Second Century of the Wisconsin Idea. See **http://science.wisc.edu.**

4/03

Biology New Media Center

•Multimedia biology-related resources for teaching and research

•Computer teaching lab

The Biology New Media Center (BNMC) aids the campus biological sciences community integrate specialized information and multimedia technology into biology and biotechnology teaching and research. Operated as a joint venture of UWBC, the Center for Biology Education (CBE), and the Division of Information Technology (DoIT), the BNMC provides equipment, software tools, access to information, and expert assistance:

- Aid users in the use of information technologies, tools, and resources,
- Enable users to find, adapt, and create instructional materials,
- Assist in the analysis and presentation of research data,
- Help evaluate the effectiveness of new resources and technologies.

The BNMC works to facilitate communication and linkages within the campus biological sciences community and enhance the outreach programs and activities of this community.

For more information, contact:

Jean-Yves Sgro, Research Consultant,
608/262-2532, **e-mail:**
bnmc_res@gene.biotech.wisc.edu

Alan Wolf, Learning Technology Consultant
608/263-0919
email: ajwolf@doit.wisc.edu

Dan Lavalley, BNMC Manager,
608/263-4501 or 608/265-4817,
e-mail: lavalley@doit.wisc.edu

John Staley,
Program Manager
(608) 263-3911
e-mail: jstaly@doit.wisc.edu

BNMC Hours:
Monday – Thursday, 8:30-7:00
Friday, 8:30-5:00
http://wiscinfo.doit.wisc.edu/ltde/nmc/bnmc

Instructional Materials Development

Serves faculty and staff teaching undergraduate biology

- Workstations and multimedia equipment for developing instructional materials used in teaching biology and biotechnology
- Staff with expertise in computer technology, biology, and instruction to assist in identifying discipline-specific materials, adapting them for classroom applications, and evaluating their effectiveness
- Referrals to other appropriate campus technology resources

Information Access

Provides access and links to biology and biotechnology information resources

- Biology-related software for teaching and research
- Collections of digital images, animations, video, and audio
- Test site for new information resources, applications, and technologies
- Staff with expertise in use of information technology to assist users in finding, manipulating, and analyzing textual, sequence, and image data

Special Services

- Large size poster printing
- slide maker
- slide scanning
- classroom presentation equipment for loan

Research Development

Provides the faculty, staff and graduate students with specialized research hardware and software targeted for research projects

- Sequence analysis
- Protein modeling

All charges are for University of Wisconsin System researchers. Available to UW campus only.

Transgenic Animal Facility

•Transgenic mice and rats •Mouse chimeras •Cryopreservation •Consulting •Training

The **Transgenic Animal Facility** provides UW Madison researchers access to the latest technology for generating transgenic animals at a reasonable cost.
Facility staff provide the expertise, laboratory space, and pathogen-free animal quarters necessary for the efficient production of transgenic mice and rats.

Clients may receive guidance in DNA preparation for microinjection, transgenic animal husbandry, and analysis of transgenic animals.

For more information, contact:

Anne Griep, Ph.D., Director,
608/262-8988, 608/262-9495 or
608/265-2801

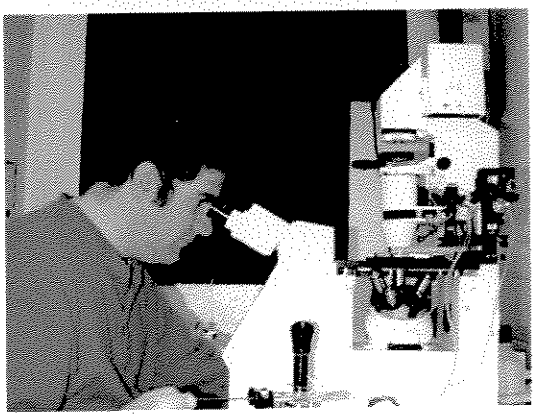
e-mail : aegriep@facstaff.wisc.edu

Fax: 608/262-6748

UWBC Web Page
http://www.biotech.wisc.edu/service/

Services

- Consultation on experimental design.
- Production of transgenic mice by pronuclear microinjection of one-cell embryos.
- Production of transgenic mice on specific mouse genetic backgrounds.
- Production of transgenic rats by pronuclear microinjection of one-cell embryos.
- Mouse embryo cryopreservation.
- Production of chimeric mice by embryo aggregation.
- Production of chimeric mice by microinjection of embryonic stem cells into blastocysts.
- Training on the handling and analysis of transgenic animals.
- Creation of "knockout" mice via gene targeting.
- Cryopreservation of rat and hamster embryos.



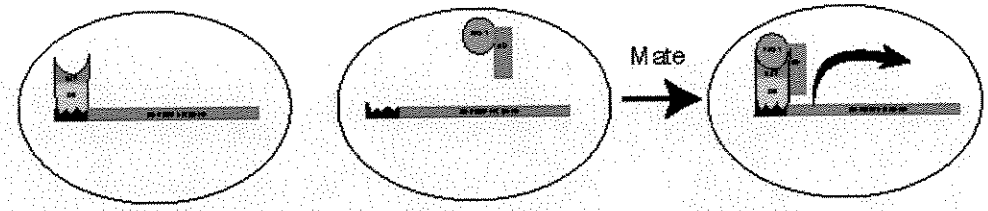
04/00

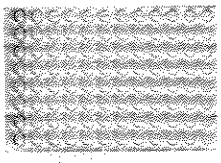
All charges are for University of Wisconsin System researchers.

Molecular Interactions Facility

• Yeast two hybrid screening • Phage-display library screening
• Phage-display antibodies

The Molecular Interaction Facility (MIF) began offering yeast two-hybrid (Y2H) screens in February, 2001.





In high-throughput format screens, yeast expressing the GAL4 DNA-binding domain:bait fusions are mated to yeast expressing libraries of cDNAs fused to the GAL4 activation domain. Putative interactors are isolated from microwells in which reporter genes (e.g., §-galactosidase) have been activated.

Clients supply MIF with bait sequence and bait cDNA template. MIF inserts the bait sequence into the vector, transforms the vector into yeast and tests for autoactivation. MIF screens the library requested and isolates putative interactors. Positive interactions are validated by assaying the interactions between isolated preys and the target bait. Confirmed interactors are sequenced to identify. At the end of the screen, clients receive interactor sequences and Y2H vectors with inserts to pursue further experiments. The entire process takes approximately two months.

Libraries available initially include the following:

- *S. cerevisiae* genomic libraries
- Human cDNA (B-cell, prostate and breast)

Additional libraries MIF expects to add in 2001:

- Mouse cDNA (embryo, pre-B cell and T-cell)
- Arabidopsis (seedling)
- Drosophila cDNA (3rd instar)
- *C. elegans* (mixed-stage hermaphrodite)

For more information contact:

Eileen A. Maher, Ph.D. 608/265—3011 (Phone)
eamaher@facstaff.wisc.edu 608/262-6748 (FAX)
http://www.biotech.wisc.edu/mif

4/2000

High Throughput Computing Facility

In May of 2000 the Genome Center of Wisconsin opened a new supercomputer facility built around a Sun Microsystems Enterprise 10000 and several smaller computers. The E 10000 is designed to provide flexible computational power using from between 1 and 36 processors as needed configurable on the fly. In addition to its processor power, it has 36 gigabytes of memory and 3 terabytes of disk storage to provide the optimal computing environment for genomic research. In the future the E 10000 will be able to expand to 64 processors, 64 gigabytes of ram and 60 terabytes of online disk storage.

On September 22, 2000, Sun Microsystems designated the High Throughput Computing Facility as a Sun Center of Excellence. Being a Center of Excellence is a statement that Sun recognizes that we are a quality center of computing and that there is a continuing partnership between the Genome Center and Sun Microsystems.

Mission

The mission of the High Throughput Computing Facility is to provide genomic researchers and their academic collaborators access to computing power that would otherwise be outside the scope of their organizations. In providing access to computing power, storage, local databases and most of the commonly available Unix-based biological software, we are offering researchers computing services that they wouldn t be able to afford or manage in an individual laboratory.

Available Tools

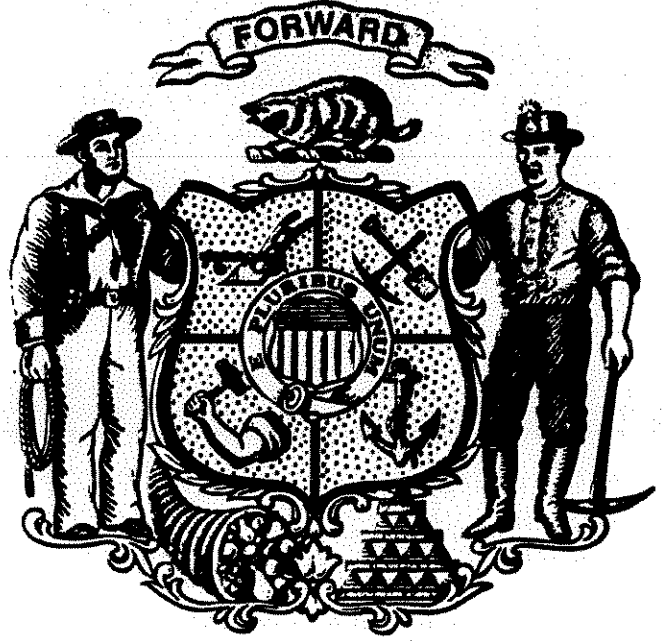
The High Throughput Computing Facility offers a range of tools and capabilities for the biologist interested in genomic analysis, research, and sequential/structural prediction. Starting with the GCG seqweb browser package, there are a range of tools available without the normal limitations imposed by desktop workstations. More advanced tools include:

- **GCG command line tools**
- **GCG X Windows based seqlab**
- **Phred/Phrap/ConSed**
- **NCBI blast and local copies of the database (web access is under development)**
- **Mfold RNA secondary structural prediction (routine folding up to 16,000 bases and more)**
- **Sun Compiler Workshop (now Forte) development tools including C, C++ and Fortran**
- **GNU GCC package**
- **Staden Package**

Consulting and training on a time and materials basis.

Along with currently available software, we are able to provide help in acquiring or porting software to the E 10000 from other unix platforms.

For more information contact :
jrholt@genome.wisc.edu


FORWARD

—Thomas Edison

The value of an idea *lies in the using of it."*

Wisconsin Alumni Research Foundation

WARF

Great ideas are conceived every day, but they lack economic value until applied. WARF, the Wisconsin Alumni Research Foundation, has been creating economic value from great ideas for over 75 years for the benefit of the University, its inventors and society as a whole. We are a world leader in patenting and licensing breakthrough innovations from the University of Wisconsin-Madison that can help you capitalize on the future today.

CONNECTING INVENTORS AND MARKETS

Academic research is now a critical asset to businesses around the world. The transfer of new technologies from academia to the marketplace is an economic boost. It infuses money and creates jobs as well as brings dollars back to the University of Wisconsin-Madison to fund further research.

WARF bridges the gap between research and application – between the idea and the using of it. We help UW-Madison inventors navigate the patent process. Businesses turn to us for the necessary innovations to stay viable in ever-changing markets. The circle is completed when royalties paid by companies for inventions are given by WARF to the University to fund further scientific research.

Technology transfer is connecting ideas, people and business — relationships we develop and nurture.

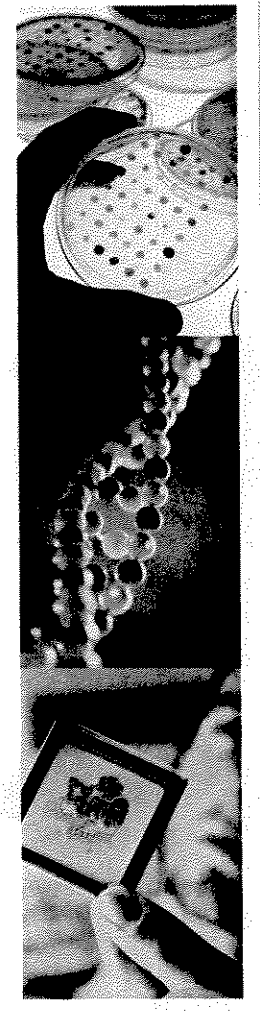
TECHNOLOGY TRANSFER

Technology transfer is not a new idea. In Wisconsin, it was sparked in 1925 by Professor Harry G. Steenbock's discovery that sunlight increased the vitamin-D content of food and by his belief that licensing this and other ideas from university research could help provide critical research funds for the University. On that premise, Dr. Steenbock and a group of forward-thinking alumni formed WARF to protect and license his as well as other inventions arising at UW-Madison. The millions of dollars generated from Steenbock's first patent spawned an endowment that still exists to secure the future of scientific research at the University of Wisconsin-Madison.

Annually, WARF:

- Receives about 300 invention disclosures
- Accepts about 60% of disclosures for patent applications
- Licenses over 90 technologies
- Returns royalties to over 200 UW-Madison researchers
- Builds relationships in over 20 foreign countries
- Provides millions of dollars to fund research, fellowships, scholarships and other critical programs at UW-Madison

FUNDING THE CYCLE OF DISCOVERY



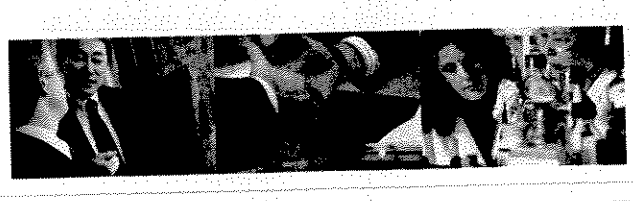
The following inventions have provided significant improvements in the human condition and new products to numerous businesses. WARF provides the generated revenues to the UW-Madison which supports research in a wide variety of departments and disciplines.

- Vitamin-D analogs for the treatment of osteoporosis, cancer, psoriasis and multiple sclerosis
- Magnetic Resonance Imaging (MRI) for early detection of disease
- Belzer/Southard/UW Solution for preserving organs and extending their viability for transplantation
- Human Embryonic Stem Cells for research in human development and therapies for presently untreatable diseases ranging from Parkinson's to birth defects
- New genetic discoveries for the treatment of human genetic disorders such as cancer and diabetes

A LONG HISTORY OF SUCCESS

WARF's accomplishments are staggering:

- Over 3,000 discoveries have been disclosed to WARF
- Over 1,000 U.S. patents and over 1,500 foreign equivalents have been secured by WARF
- Over $500 million has been returned by WARF to the University primarily for funding additional scientific research



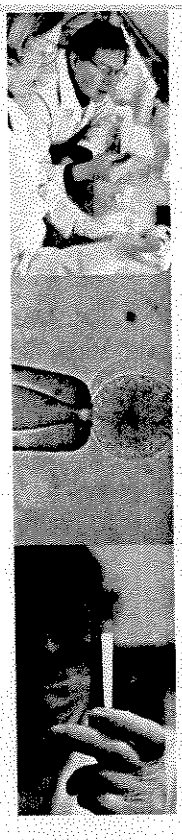
EXPERIENCE AND EXPERTISE

At WARF, our people make the difference! We attract top-notch, experienced talent to work for the Foundation, brilliant academics to work with us, and innovative businesses to use our technologies. Our staff is well trained and highly qualified. They know the intricacies of patenting, have worked with researchers in diverse disciplines, understand industries and markets, and have mastered innovative licensing strategies to meet the individual needs of business clients. Our grasp of the marketplace for technology transfer makes our staff a valued asset for everyone involved.

WARF can structure deals that accommodate the unique needs of individual companies, specific technologies, and changing market conditions. Our experts are available throughout the process continuum. We have a rich history of results. We can help you capitalize on tomorrow's technology today.

WARF's scientific areas of expertise include:

- Biotechnology
  Medical Biotech, Agricultural Biotech
- Small Molecule Pharmaceuticals
- Advanced Materials
- Microelectronic Machines
- Medical Physics
  Radiotherapy, Dynamic Medical Imaging
- Information Technology
- Engineering Innovations
  Photonics, Microfluidics, Power Electronics



SECURING THE FUTURE ONE PARTNERSHIP AT A TIME

Business needs innovation to survive in an increasingly competitive global economy. One proven source is through marketplace partnerships. For over 75 years, WARF has earned its reputation as a recognized leader in forging strong marketplace partnerships that match breakthrough innovations developed by UW-Madison faculty with businesses looking for cutting-edge technology.

THE WARF MISSION

WARF exists to support world-class research at UW-Madison. We carry out this mission by protecting the intellectual property of University faculty, staff and students, and by licensing inventions resulting from their work. Through our licensing efforts, University ideas benefit the public and bring resources back to the University to continue the cycle of investment, research and invention.

WARF
Wisconsin Alumni Research Foundation

PO Box 7365
Madison, WI 53707-7365
PH: 608-263-2500
FAX: 608-263-1064
www.warf.ws

Enclosed are some materials about the Wisconsin Alumni Research Foundation (WARF) and general information on patent activity.

Please feel free to call me with any questions.

Andy Cohn
Government and Public Relations Manager

Excerpted from the AUTM 2000 Licensing Survey Summary

Executive Summary

The Association of University Technology Managers (AUTM) collected data on licensing activities from its academic constituency, including data from U.S. universities, hospitals, nonprofit research institutions, and patent management firms as well as from Canadian institutions. One-hundred ninety (190) U.S. and Canadian universities, teaching hospitals, research institutes, and patent commercialization companies responded to the Survey. Eighty-eight (88) institutions indicated that at least 347 new commercial products were introduced to the marketplace in fiscal year 2000, under license agreements with commercial partners. Two-thirds (66%) of the total 4,362 new licenses/options were granted to companies with less than 500 employees, enabling these companies to grow and become more competitive. Six hundred twenty-six of the licenses went to 454 start-up companies created to develop and commercialize the results of academic research. Additional highlights for fiscal year 2000 follow.

Research Expenditures

Total fiscal year 2000 sponsored research expenditures by the 190 reporting institutions were $29.5 billion, up 10%ii from $26.8 billion reported in fiscal year 1999.

Total fiscal year 2000 sponsored research expenditures funded by federal government sources were $18.1 billion, up 8% from $16.8 billion reported in fiscal year 1999.

Total fiscal year 2000 sponsored research expenditures funded by industry were $2.7 billion, a similar amount as that reported in fiscal year 1999.

Patent-Related Activity

13,032 Invention Disclosures were reported in fiscal year 2000, up 6% from 12,324 in fiscal year 1999.

6,375 New U.S. Patent Applications were filed in fiscal year 2000 up 15% from 5,545 in fiscal year 1999.

3,764 U.S. Patents Issued in fiscal year 2000, up by 3% from 3,661 in fiscal year 1999, bringing the total number of U.S. Patents Issued reported in the Survey to 20,699 since fiscal year 1993 — the first year for which these data were collected.

Figure 1: 0.6% of 20,968 Active Licenses Generated >$1M/License in FY 2000

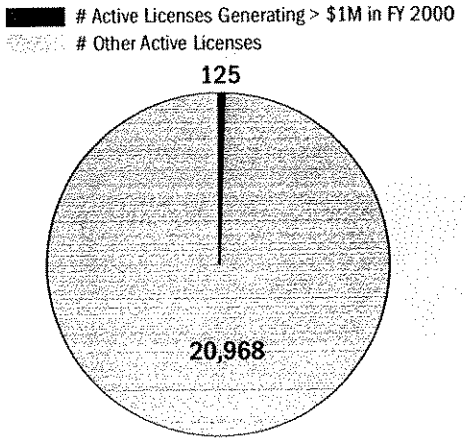
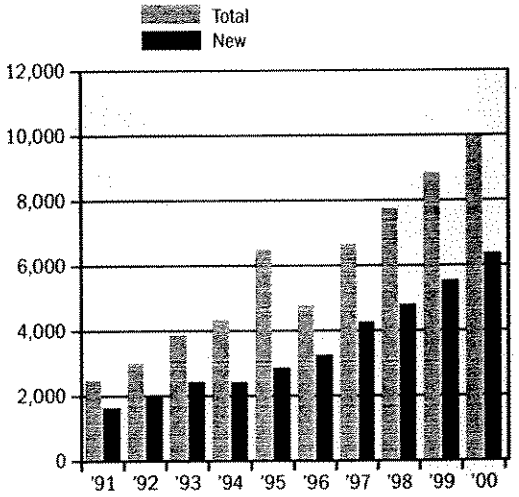


Figure 2: Total and New U.S. Patent Applications Filed (All Respondents)



Start-Up Activity

At least 454 new companies based upon an academic discovery were formed in fiscal year 2000, 80% of them in the state/province of the academic institution where the technology was created.

Since 1980 at least 3,376 new companies have been formed based on a license from an academic institution, including the 454 established in fiscal year 2000.

Academic institutions received an equity interest in 372 transactions in fiscal year 2000, compared to 243 licenses executed with an equity interest in fiscal year 1999.

One hundred eighty-four (184) institutions reported 2,309 start-ups were still operating as of the end of fiscal year 2000. The institutions reported holding equity interests in 252 (56%) of the start-up companies formed in fiscal year 2000.

Licenses and Options

4,362 new licenses and options were executed in fiscal year 2000, up 11% from 3,914 in fiscal year 1999.

20,968 licenses and options were active in fiscal year 2000, up 13% from 18,617 in fiscal year 1999. Licensees reported product sales from 25% of these active agreements.

66% of new licenses and options executed were with newly formed or existing small companies (fewer than 500 employees), while 34% were with large companies.

In fiscal year 2000, 50% of new licenses and options executed were exclusive and 50% were non-exclusive, similar to the breakdown reported in fiscal year 1999.

In fiscal year 2000, 90% of licenses and options to start-ups were exclusive, and 10% nonexclusive. In fiscal year 2000, 54% of licenses to small entities (including start-ups) were exclusive and 37% of licenses to large entities were exclusive.

License Income

9,059 licenses/options yielded income in fiscal year 2000, up 9% from 8,308 in fiscal year 1999.

Adjusted gross license income received from licenses and options was $1.26 billion, compared to $862 million in fiscal year 1999. Much of this increase is due to one-time payments, as explained in the report.

Figure 3: Comparison of Patent Filings and Invention Disclosures Received for Recurrent Respondents

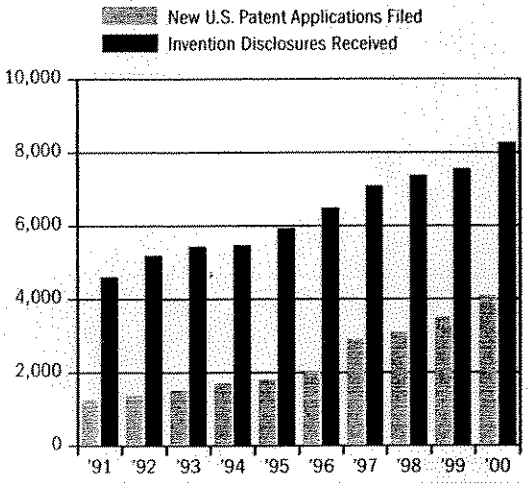


Figure 4: Research Expenditures for 66 U.S. Universities, Hospitals, Nonprofit Research Institutions (Constant $U.S.)

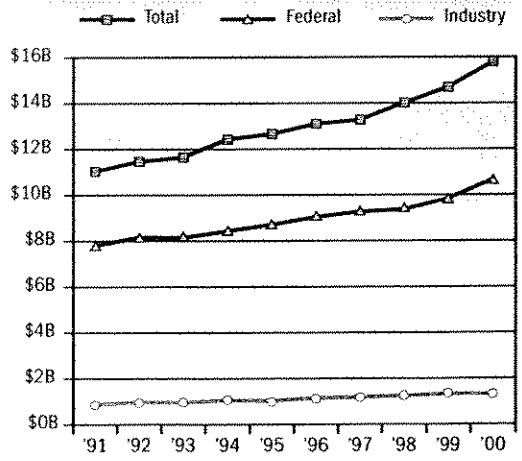


Figure 5: # Programs by Income and Research Expenditures

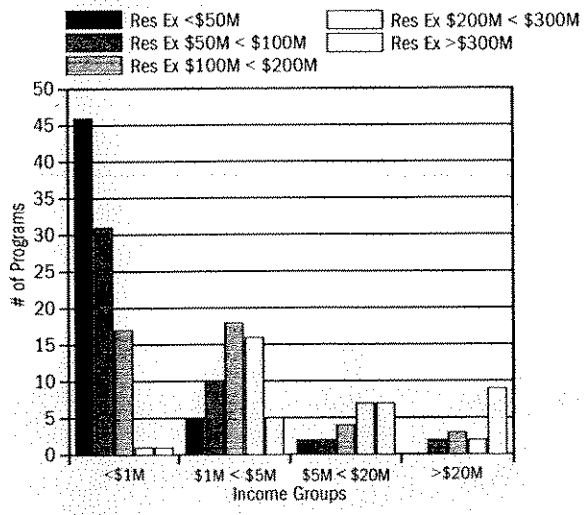


Figure 6: # Programs by Income and # Active Licenses

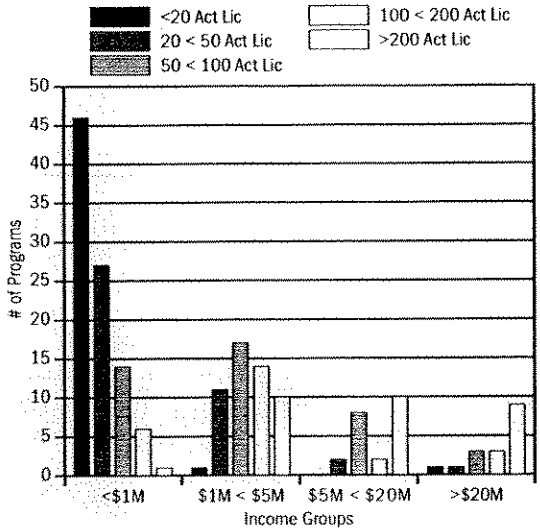
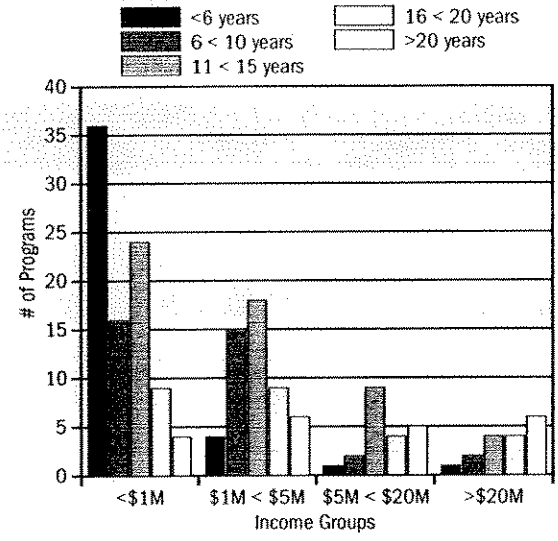


Figure 7: # Programs by Income and Program Age



External Challenges

The Kept University

Eyal Press and Jennifer Washburn

In the fall of 1964 a twenty-one-year-old Berkeley undergraduate named Mario Savio climbed the steps of Sproul Hall and denounced his university for bending over backwards to "serve the need of American industry." Savio, the leader of the Berkeley Free Speech Movement, accused the university of functioning as "a factory that turns out a certain product needed by industry" rather than serving as the conscience and a critic of society. To the modern ear this sixties rhetoric may sound outdated. To many people in the academic world, however, Savio's words ring truer today than ever. Although our national conversation about higher education remains focused on issues of diversity and affirmative action, nothing provoked more debate on many college campuses last year than the growing ties between universities and business — and nowhere was the debate livelier than at Berkeley.

On the afternoon of April 13, a radiant day last spring, the Berkeley campus hardly looked like a site of protest. Students lay on green lawns, soaking in the sunshine. But inside Room 60 of Evans Hall, a concrete building on the northern edge of campus, the lights were dim and the atmosphere tense. There two dozen faculty members, many of them professors in the College of Natural Resources, had gathered to present the disquieting results of a newly released faculty survey.

The focus of the survey was a controversial agreement that Berkeley had signed in November of 1998 with Novartis, a Swiss pharmaceutical giant and producer of genetically engineered crops. Under the terms of the agreement Novartis will give Berkeley $25 million to fund basic research in the Department of Plant and Microbial Biology, one of four departments within the CNR.

In exchange for the $25 million, Berkeley grants Novartis first right to negotiate licenses on roughly a third of the department's discoveries — including the results of research funded by state and federal sources as well as by Novartis. It also grants the company unprecedented representation — two of five seats — on the department's research committee, which determines how the money is spent.

That the university had the backing of a private company was hardly unusual. That a single corporation would be providing one third of the research budget of an entire department at a public university had sparked an uproar. Shortly after the agreement was signed, a newly formed graduate-student group, Students for Responsible Research, circulated a petition blasting the Novartis deal for standing "in direct conflict with our mission as a public university." The Daily Californian, Berkeley's student newspaper, published a five-part series on the growing privatization of the university, and a coalition of public-interest groups sent a letter to Berkeley's chancellor, Robert Berdahl, charging that the alliance "would disqualify a leading intellectual center from the ranks of institutions able to provide the kind of research — free from vested interest" that is the hallmark of academic life. Meanwhile, the College of Natural Resources, headed by Dean Gordon Rausser, sent a message to all professors urging them not to speak to the press and to direct any questions to the university's public-relations office. Many viewed this as a hush order.

"We are here to discuss the position of the faculty," Ignacio Chapela, a professor of microbial ecology, announced as the April 13 meeting began. Chapela, who was then the chairman of the college's executive committee, a faculty governing body, snapped on an overhead projector to display the results of the survey, and declared that the Novartis deal had left the CNR "deeply divided."

Summary of License, Sponsored Option and Option Agreements 4/1/2003					
Total all states	566	% of total			
Iowa	5	0.8			
Minnesota	8	1.4			
Illinois	11	1.9			
California	67	11.8			
Wisconsin	168	29.6			

Start-up Investments
February 28, 2003

	Company
1	Alfalight, Inc.
2	Deltanoid Pharmaceuticals, Inc.
3	Gala Design, Inc.
4	NimbleGen Systems, Inc.
5	OpGen, Inc.
6	Stratatech Corp.
7	Third Wave Tech., Inc.
8	Tomotherapy, Inc.
9	Cambria Biosciences
10	ConjuGon, Inc.
11	Faraday Biotechnology
12	Helix Diagnostics, LLC
13	Incharge, Inc.
14	ioGenetics
15	GenTel
16	KnowledgePort Alliance
17	Nektar Worldwide, Inc.
18	Neoclone Biotechnology Int'l
20	NeuroGenomeX, Inc.
21	Platypus Technologies LLC
22	ProCertus BioPharm, Inc.
23	Promoter Neurosciences
24	Quintessence Biosciences
25	SLIL Biomedical Corp.
26	Scarab Genomics, LLC
27	Soft Switching Tech. Corp.
28	Virent Energy Systems, LLC
29	WICAB, Inc.

American Chemical Society

COMMITTEE ON PATENTS
AND RELATED MATTERS

1155 SIXTEENTH STREET, N.W.
WASHINGTON, D.C. 20036
Phone (202) 872-4098

March 3, 2003

Dr. Stanley C. Israel
Chair, Board Committee on Grants and Awards
Southwest Texas State University
College of Science Center 201
601 University Dr.
San Marcos, TX 78666-4685

Dear Dr. Israel:

As you know, the Joint Board-Council Committee on Patents and Related Matters (CPRM) prepares nominations on behalf of the Society for the National Medal of Technology. For the year 2003, the committee has chosen to nominate the Wisconsin Alumni Research Fund (WARF) for this award. Nominations are due by May 23, 2003.

To assist you with this decision, please refer to the enclosed information about the award including nomination guidelines, a proposed citation, background information on WARF, and a list of past medal winners.

I request that the Board Committee on Grants and Awards review and approve this nomination as the ACS nominee for the National Medal of Technology.

Sincerely,

Barbara L. Lenses
Chair

Enclosure

Cc: Dr. Nancy R. Gray
Ms. Caroline Trupp Gil w/o encls.

THE BRIGHT STUFF MADISON, WIS., WANTS TO BE A STAR OF THE BIOTECH BIG TIME AND HAS WORKED HARD TO SIGN KEY PLAYERS. ALL IT NEEDS IS MORE VENTURE CAPITAL.

St. Paul Pioneer Press (ST) - Sunday, July 7, 2002
By: JIM MCCARTNEY, Pioneer Press\
Edition: City Section: BUSINESS Page: D1
Word Count: 2,144

MEMO:
See related story: SPIN-OFF EFFECT BUILDS ON SUCCESS

TEXT:
The same Madison fields where researchers once experimented with agricultural plants are now producing a much different type of crop: biotech start-ups.

Despite its small size and remote location, Madison is a garden of biotechnology. The scientists at the University of Wisconsin at Madison have all but filled up one research park and are about to set up another.

Some think Madison's start-up methods might find application in the much larger Twin Cities.

Madison was too small to be included in a new Brookings Institution survey of biotechnology in the 51 largest metropolitan areas. But it would have stacked up quite well.

For instance, Madison has received $180 million in National Institute for Health grants and 458 patents over the last decade. These measures of life sciences research would have put it 17th among the top 51 cities in each category, just behind the Twin Cities, a metropolitan area more than 10 times its size. Madison's $86.7 million in venture capital for biopharmaceuticals raised over the last six years -- four spots ahead of the Twin Cities -- would have put it 12th on the list.

About 178 technology-based companies in Wisconsin trace their origins to the University of Wisconsin at Madison, according to a university study. More than half of those companies are spin-offs -- employees leaving one biotech firm to start a new one. In all, the companies employ some 6,700 people and produce $1 billion in revenues.

The most avid boosters recognize that Madison has a long way to go to be considered a biotech dynamo. The country's top nine biotech centers dominate the industry in raising venture capital and arranging lucrative alliances with drug companies, and have increased their grip on the industry over the past decade, according to the Brookings study.

Even so, Madison could hit the big time if it can figure out how to lure the venture capital it needs to compete and grow.

"One of our key challenges is to raise enough money and get companies far enough along to create enough critical mass so they can start attracting money from the coasts," said John Nies, a partner in Venture Investors, a Madison-based venture capital firm.

If there were any lingering doubts over the University of Wisconsin's status as a world-class biotech research institution, the cover of Time magazine's Aug. 20 issue last year quickly dispersed them.

Time's story on stem cell research, the hottest and most controversial area of biotechnology, featured a profile and cover photo of James Thomson, "the man who brought you stem cells." Thomson, a developmental biologist at the University of Wisconsin at Madison, had discovered that undifferentiated stem cells from human fetuses could grow into any of the

more than 200 cell types that make up a human being.

LIMELIGHT WAS DUE

University officials felt that the limelight was long overdue.

"The University of Wisconsin is one of the gems of the country," said Mike Sussman, director of the university's Biotech Center.

Thomson is one of dozens of pre-eminent biologists at the Madison campus, where about a third of its more than 2,000 tenure-tracked faculty are in biology-related fields.

The campus is laced with some 17 Nobel laureates and 49 members of the elite National Academy of Scientists, and is one of the leaders in landing research grants.

The Madison campus is now embarking on BioStar, a $320 million biotechnology initiative that will build new centers for research in genomes, microbiology and bacteriology, biochemistry and interdisciplinary biological sciences.

COLLABORATION KEY

Unlike many universities, the University of Wisconsin has all of its life science divisions on one campus, including agriculture, pharmacy, veterinary, engineering, the medical school and the biology and chemistry departments.

"Some of the greatest opportunities emerge when you have collaboration among different fields that results in innovations," Nies said. "This is an environment where that can happen." Madison has been greatly helped in attracting its world class scientists by the Wisconsin Alumni Research Foundation or WARF, a group with some $1.3 billion in assets which gives some $40 million a year to the university - not including its $80 million gift to the BioStar effort.

Much of that money goes to graduate schools in the form of fellowships, stipends, research grants, and hiring new professors. The WARF money has helped the University pursue a strategy of "cluster hires," in which it identifies an area it would like to beef up and then goes out to recruit up to a half dozen scientists.

"We used the money to attract one scientist from New York, and he brought $3 million in research money along with him," Sussman said.

A PROFIT CENTER

Yet it's not enough to have brainpower, you have to possess the entrepreneurial spirit and financial muscle to create a major league biotech center, according to Joseph Cortright, the author of the Brookings study.

Here again, WARF plays a key role, through its main mission: commercializing discoveries made on campus.

The 73-year-old technology transfer group grew from the licensing fees that built up from two homerun discoveries -- how Vitamin D could be made and stored in food and the discovery of an anticoagulant that could be used as a blood thinner for heart patients and as rat poison called warfarin. Last year, the foundation made $30 million in royalties from these and other discoveries -- not including investment income.

WARF is second to none among technology transfer organizations at

universities, says Nies, who has visited comparable organizations at other universities around the country.

WARF aggressively digs out pioneering research discoveries and patents them, Nies said. In addition, it encourages entrepreneurship by making sure the scientists are financially rewarded by their discoveries.

"They have been a tremendous catalyst in company formations," Nies said.

Although WARF has traditionally concentrated on patenting and licensing, it lately has become a more aggressive investor as well, said Carl Gulbrandsen, managing director of WARF. His organization sponsors a grant program for start-ups, and now has equity positions in about 25 start-ups -- something that some public universities forbid due to possible conflicts of interest.

A technology transfer organization like WARF may be the one key ingredient Madison has that the Twin Cities lacks. In fact, University of Minnesota officials are taking a look at WARF as part of efforts to start up a technology transfer organization.

WARF officials caution that it will be difficult, if not impossible, to duplicate its unusual wealth and clout, which were decades in the making.

Gulbrandsen also warns the University of Minnesota against making a common mistake: viewing the technology transfer unit as a cost center, not a profit center. While many of the patents and licenses will yield little or nothing in the way of money, it takes just a few successes to make the effort pay off.

"We're a home-run business," Gulbrandsen said.

A TALL ORDER

That said, home runs that translate into business success have been hard to come by. Only a few of the dozens of companies nurtured by WARF have gone public -- among them are Third Wave Technologies, which makes genetic variation analysis products, and Bone Care International, a drug firm that makes Vitamin D hormone therapies. Both have seen steep falls in stock prices this year.

Yet another key ingredient to biotech growth is to provide a place to grow it.

To get off the ground, biotech companies require heavy upfront investments in lab space and research equipment, not to mention all the typical back-office resources like receptionists and accountants.

That's where the University Research Park on the west side of Madison comes into play. In 1985, the university decided to move its test farms to rural Dane County and develop the 355 acres into a research park. Eventually, the park began to focus on attracting biotech companies started by university researchers, often with a strong WARF connection, said Mark Bugher, the park's director.

103 COMPANIES

The park is now home to 103 companies that employ about 3,500 workers, Bugher said. About 70 percent of the companies are related to university faculty, with the rest -- accountants and patent attorneys for the most part -- dedicated to serve them.

"They've created an environment where biotech firms can hit the ground running," Nies said.

The research park features an incubator space for start-ups, and it will make loans to firms that need special equipment or pay for tenant improvements.

"Incubation is the key to making the park work," Bugher said. "But it's also a big risk, financially."

He added: "So far we haven't made any equity investments in our tenants, but we have thought about it and aren't rejecting it." Although the University of Wisconsin was a research park pioneer, so many other universities have gotten into the act that they now have their own 100-member association.

Bugher said he has had "significant interest from Minnesota" in his park, a concept being considered by University of Minnesota officials.

NO AIRLINE HUB

One tenant in the park is Venture Investors, a 20-year-old venture capital firm that has about $60 million under management.

"Our principal focus is Madison and things coming out of the University environment," said Nies. "I would rather walk down the hall to see a company in my portfolio than take an airplane."

The problem for Madison is that Nies' attitude is common among venture capital firms. Nies' firm has pretty much gone it alone in Madison, until it was recently joined by an investment banking unit of Robert W. Baird, the Milwaukee-based investment firm.

Most centers of biotech venture capital are on the coasts, and they don't like to ride airplanes, either.

"The fact we're not an airline hub is a drag on our ability to raise capital," said Ralph Kauten, an entrepreneur who has taken a hand in forming four Madison biotech firms.

"Venture capitalists don't want to spend two days going to a board meeting."

Aside from the State of Wisconsin Investment Board, which is one of the nation's largest pension funds, there aren't many large institution- al investors interested in Madison's biotech companies, Nies said.

"Lack of venture capital continues to be a real problem," said Kauten, who helped form a Madison biotech firm called Panvera, which was bought last year by San Diego-based Aurora Biosciences.

"Take a look at Panvera. ...Why didn't we buy them? It comes down to the fact that a company in San Diego was able to raise $150 million in venture capital and we were able to raise $4 million."

WARF HAS CLOUT

Gulbrandsen said WARF has tried using its financial clout to help attract more venture capital investors with mixed success.

"It's been difficult attracting the first-tier venture capital companies to Wisconsin," Gulbrandsen admits.

The state of Wisconsin also tries to spur investment.

Several years ago, Wisconsin set aside $50 million in tax credits to

encourage insurance companies to invest in start up companies.

Over a decade, insurance companies can recapture every dime they invest in a state-sponsored fund that invests in start-ups by taking the tax credits. Nies hopes the state will add more such tax credit programs next session.

"It's been extraordinarily effective in Massachusetts and Louisiana," Nies said.

Although he doesn't know the details about Wisconsin's tax credit program, Cortright agrees that it's critical for states to help biotech firms commercialize their products.

For the most part, Nies thinks Wisconsin has done that.

"We're not where we want to be, but the cooperation helps tremendously."

Dave Beal contributed to this report. Jim McCartney can be reached at jmccartney@pioneerpress.com or (651) 228-5436.

CAPTION:
5 Photos: Photos by Jim Gehrz, Pioneer Press
1) The images of a single E. coli 1057 DNA molecule appears on a computer monitor operated by Jessica Severin, who is a "bioinformatician" at the Labratory of Molecular and Computational Biology. The lab does complete genome optical mapping at the University of Wisconsin's Biotechnology Center in Madison.
2) President and CEO Ralph Kauten heads Quintessence Biosciences at the university research park in Madison, Wis. Kauten has been involved in three other biotech start-ups.
3) The University of Wisconsin's Biotechnology Center in Madison is headed by director Mike Sussman, who helped found a firm called NimbleGenSystems.
4) A 384 well plate of DNA samples is held up by research specialist Wayne Davis. The plate is used in a process in which a robotic device creates slides that hold micro-arrays of DNA. Each slide will hold about 10,000 samples. The slides are made in the Gene Expression Center at the University of Wisconsin's Biotechnology Center in Madison.
5) Soon to be filled laboratory space at Quintessence Biosciences is occupied briefly by president and CEO Ralph Kauten, who has helped build four firms in Madison.

?

SPIN-OFF EFFECT BUILDS ON SUCCESS COMPANIES GROW TO CREATE AN INDUSTRY

St. Paul Pioneer Press (ST) - Sunday, July 7, 2002
By: JIM MCCARTNEY, Pioneer Press\
Edition: City Section: BUSINESS Page: D5
Word Count: 532

TEXT:

It's known as the spin-off effect, and it's a sign that Madison's efforts to nurture its biotechnology industry are taking root.

Of the 61 biotech firms started in Madison between 1989 and 1998, 42 were spin-offs, according to a study by Philip Sobocinski, associate director for technology development and commercialization at the University of Wisconsin at Madison.

"When you reach a critical mass, success begets success," said John Nies, a partner in Venture Investors, a Madison-based venture capital firm.

The spin-off effect was a key ingredient in building the Twin Cities' world-class medical device industry, led by such firms as Medtronic and St. Jude Medical, said Ralph Kauten, a biotech entrepreneur based in Madison.

"If a company grows and has success, it brings others who are experts in science or industry," Kauten said.

"Some of them may end up splitting off to form their own companies, bringing in more resources and people."

He should know.

He's had a hand in developing four biotech companies in Madison. His resume tells the tale of how the spin-off effect works in Madison.

In 1978, when Kauten was a teacher of accounting at the University of Wisconsin at Whitewater, a new company called Promega was looking for financial expertise.

Kauten was hired to put together the business plan and raise money. Eight years later, he joined Promega full-time as its chief financial officer.

The privately held company, which started out making enzymes and other proteins used in molecular biology research, now supplies products used in biotech research. It currently has about 700 employee and posts about $120 million in annual sales.

In another example of the spin-off effect, Kauten left Promega in 1992 to start Panvera, a company that develops ways to more effectively test drugs by creating an environment that mimics the human body.

"It costs about $500 million to develop a drug," Kauten said. "If a drug is going to fail, drug companies would like to see it fail fast -- before a lot of money is spent on it."

The company has about 110 employees. Its revenues, now at $12 million a year, are growing at a 40 percent clip.

At Panvera, Kauten and some University of Wisconsin scientists formed a company called Mirus, a company that uses gene therapy to help treat diseases such as diabetes or muscular dystrophy.

He remains a director at Mirus, which has grown to 40 employees with revenues of up to $6 million a year.

Last year, when Panvera was bought by San Diego-based Aurora Biosciences, Kauten decided to start over again. After asking what kinds of biotechnologies were available for licensing at Wisconsin Alumni Research Foundation, Kauten went with a company called Quintessence Biosciences.

Quintessence is working on a technology that helps drugs work more effectively by targeting them to the cell that is causing the disease.

Success would likely mean, for instance, that chemotherapy treatments could be done in lower doses, more effectively and with fewer unwanted side effects, Kauten said.

"It's fun building a company -- a lot more fun than running one," Kauten said.

Jim McCartney can be reached at jmccartney@pioneerpress.com or (651) 228-5436.

?

Chicago Sun-Times
www.suntimes.com

Back to regular view
http://www.suntimes.com/output/business/cst-fin-madison25.html

Print this page

Wisconsin alumni group proves adept at turning ideas into dollars

November 25, 2002

BY JUDY NEWMAN

MADISON, Wis.--Thomas "Rock" Mackie, a University of Wisconsin medical physicist, and UW software engineer Paul Reckwerdt had an idea in 1990: what if radiation therapy for cancer patients could be so focused that only the tumor cells would be destroyed, not the healthy tissue around them?

They spent a decade developing a machine with a device that spirals around a patient, shooting a narrow, high-radiation beam precisely at a tumor.

Today, their company, TomoTherapy, employs 92, occupies a new building on Madison's west side, and has closed on its third round of financing. Just months after receiving U.S. Food and Drug Administration approval for the device, TomoTherapy has sold 10 machines, and expects to operate in the black in 2003.

There's an attitude in this city--known more for its anti-Vietnam War protests and its over-the-top Halloween antics--that the university is more than an ivory tower. It is also an engine for economic growth.

It's a concept--technology transfer--that Illinois institutions are just beginning to grasp, but no one in Illinois embraced the concept as comfortably as Madison. Tech transfer on Illinois campuses remains as it has for generations: bogged down in an elitist disdain for commercial application of academic research and inept marketing for those few projects that seep out of academia.

The 77-year record of success of the Madison plan provides a template for Illinois' high-tech sector.

At the top of the list of Madison players is WARF, the Wisconsin Alumni Research Foundation.

Technically independent from the university, WARF patents the discoveries and licenses the technologies developed by university researchers and professors to leading companies or, in a more recent trend, to the inventors themselves.

WARF was created in 1925 to hold patents for UW professor Harry Steenbock's discovery that vitamin D could be artificially manufactured and used as a food supplement to eliminate the disease rickets. Quaker Oats Co.

licensed the first patents.

Today, WARF's stable of 1,700 active patents includes those for magnetic resonance imaging and for human embryonic stem cells.

Under the arrangement with WARF, the inventor receives 20 percent of all gross royalties, including licensing fees. The inventor's laboratory gets 70 percent of the first $100,000 in revenue generated by the license, while WARF gets 10 percent. For any amount above $100,000, the inventor's department gets 15 percent and 65 percent goes to WARF.

It is the canny acumen of WARF's staff that has turned the non-profit organization into one that generated $27 million in revenue last year from royalties, licensing fees and investments.

Under the foundation's charter, most of the revenue is pumped back into UW's graduate school, to inventors and their departments to support further research.

In fact, WARF's contribution to academia last year totaled $35 million, thanks to some padding from the foundation's whopping endowment fund that's grown over the past 77 years to more than $1 billion.

"The endowment gives us a lot of flexibility," WARF spokesman Andrew Cohn said.

But it's not the only factor.

"One reason why it works at Madison, why it works at WARF, is that we try not to enable bad companies," said Carl Gulbrandsen, managing director.

The support network in Madison extends to business incubators, investors and venture fairs, and flourishes with vocal encouragement from the governor to the university chancellor--all aimed at moving research from the lab to the marketplace.

"A lot of states believe they have the same mechanisms in place, but at the end of the day, they really don't," said Tom Still, president of the non-profit Wisconsin Technology Council.

An incubator at University Research Park provides fledgling businesses with laboratories, conference space and other amenities.

Local venture firms and angel investors are also standing by.

WARF itself began taking a stake in local start-ups and now has 25 in its portfolio. The State of Wisconsin Investment Board also has committed to funneling $150 million into promising tech start-ups, with at least half the money for Wisconsin companies, and the rest spread in the Midwest.

Meanwhile, an annual venture fair in Madison connects entrepreneurs with other potential investors.

Judy Newman is a business writer for the Wisconsin State Journal in Madison.

Making money from minds

Tech classrooms & commerce: CU seeks to improve tech transfer.

Peterson, Eric

ColoradoBiz, 30, 2, 31(3)
Feb, 2003

TEXT:

Turning theory into reality" is the corporate motto at Boulder's Ribozyme Pharmaceuticals Inc. Since 1992, the company has been building on the discoveries and theories of Thomas Cech, a professor of chemistry at CU-Boulder who won a 1989 Nobel Prize for his research regarding the enzyme-like properties of RNA.

Ribozyme's creation was facilitated in part by the University of Colorado's Technology Transfer Office, through which the company licensed Cech's CU-held patents in its effort to commercialize them for use in human therapeutics.

In working with CU, "We had a very satisfactory experience," said Dr. Ralph Christofferson, formerly Ribozyme's CEO and now a partner with Morgenthaler Ventures. "I view (RPI) a true success story of the system."

The problem is that success stories like Ribozyme have been too few.

When Elizabeth Hoffman came on as CU'S 20th president in fall 2000, she took a good, hard look at the recent performance of the Technology Transfer Office. The picture wasn't pretty.

In 2000, CU received $300 million in federal research funding, fourth among the country's public institutions. But, for every dollar of federal funding, CU disclosed fewer than half of the inventions of its similarly funded peers, in the process receiving half of the patents and licensing, and only a fraction of the intellectual property.

One insider labeled tech transfer at CU "an afterthought" of the '80s and '90s.

At many universities, technology transfer is big business. The Wisconsin Alumni Research Foundation--the University of Wisconsin's counterpart to CU's Tech Transfer Office--is one of the standouts of the field, returning $30 million a year to fund research at UW-Madison. While schools such as Yale and Columbia closed around $100 million in licensing deals in the past two years, the licensing revenue reported through CU's administration was about $2.2 million in 2000. (The total is actually about twice that, due to prior licensing arrangements not reported through CU's administration.)

In response, Hoffman and CU's regents embarked on a plan to reorganize and reinvigorate tech transfer at CU. The quality or quantity of CU's research was never the issue; rather, the structure of the TTO and its surrounding culture and processes were the primary concerns.

New blood with experience in tech transfer came to the office when Jack Burns, vice president of academic affairs and research, was appointed in late 2001; and with Assistant Vice President for Technology Transfer David Allen, appointed in early 2002. Their appointments paved the way for a transition in May 2002.

"Previous to the way (the TTO) is arranged now--which is basically an operating unit within university administration--there was a non-profit corporation that received the rights to managing intellectual property for the university," Allen explained. "The problem was that it was perceived to be at a distance from the university, so faculty didn't have the opportunity to have nearly as direct influence and accountability. That's critical, because the faculty are our primary customers."

In the old, "throw-it-over-the-wall approach," faculty reported inventions to officers at each of CU's four campuses (Boulder, Denver, the Health Sciences Center and Colorado Springs), who acted as go-betweens for the non-profit tech transfer corporation. Under this two-pronged structure, there was more room for dispute and misunderstanding and less room for negotiation and mediation.

"Two different reporting structures with common goals ... was not the way to do it," said Jerry Donahue, president of TTO affiliate University License and Equity Holdings Inc. "When there was a disagreement,

there was not any one person to go to. We often ended up with stalemates. That was compounded by the fact that there wasn't enough money to handle the technology transfer demands of four campuses."

In bringing the TTO under the umbrella of campus administration, CU created an office at each of its campuses, each of which reports directly to Allen's system office. "Now the campus not only can receive the invention, but it can do all of the downstream things (filing for patents and licensing) itself," Allen said.

Beyond the consolidated structure, the new TTO includes a more pointed set of strategic goals, a bigger budget (from $1.2 million to $2.5 million), and a larger staff (from five employees to 14). "We've repopulated this," Allen said. "We've got almost all new people--who are experienced."

In the past, CU's tech transfer officers were usually converts from faculty. Not anymore. Allen, for one, has a dozen years of tech-transfer experience at Ohio State University and Ohio University Allen knows from that experience that a successful tech transfer entity needs to be on the same page as faculty, both procedurally and culturally.

And that's one early result of the reorganization. As Donahue put it, "Now we have everybody singing out of the same hymnal at the same church."

Which is a tricky balance, because CU's mission is not about commercializing technology; it's about education and science. "I think the university is seeing its mission redefined a little bit here," said Robert Erickson, CU professor and chair of the Electrical and Computer Engineering Department. "We (CU faculty) had had the traditional roles of doing research, publishing and teaching. Filing patents has never been the mission. If you want to get tenure or get promoted, patents aren't considered."

Because of this, the faculty perspective will likely never be perfectly synonymous with the goals of tech transfer. In the past, CU's inventors often paid little heed to established procedures, Erickson added. "Ten years ago, I think faculty was pretty turned off by the process," he said. "They would say, 'Forget it, I'm not going to file a patent,' whether they were supposed to or not."

The TTO reorganization has sown the requisite seeds for better unifying these "competing purposes," said Erickson. "I think just the change in attitude can go a long way I feel now they (TTO staff) are a resource that faculty can turn to."

Statements like that are music to Allen's ears.

"We're working as much as we can with department chairs and deans to transform the culture that includes technology transfer as a nearer-term reward," he said. Including patents in performance reviews might be part of this shift, but educating faculty about how commercialization can work hand-in-glove with the scientific goals of research--and, in many cases, further it--is another key. Also of critical importance is affording faculty the flexibility to pursue both academic and entrepreneurial goals.

To this end, the TTO has organized 20 seminars for faculty in the past six months (compared with three or four over the previous three years) and focused on a broader base of intellectual property across all four CU campuses, rather than just what Allen termed "the low-hanging fruit"--i.e. standouts like Cech.

The early results look good. CU received 121 invention disclosures and completed 26 license and option agreements for fiscal year 2001-2002, up mightily over 79 disclosures and 14 agreements during the prior year.

Good progress, but not giant steps. "It doesn't happen overnight," said Allen. "Technology takes five to 10 years from the point where we get it before it starts to generate considerable revenue.

"If you don't invest in it up front, you never get to the back end."

Benchmarks per $10 million of federal research funding (2000)

	CU	8 PEERS
Professional tech transfer staff	0.2	0.5
Invention disclosures	3.1	7.1
Patents awarded	1.0	1.8
Licenses granted	0.6	2.8

The peer comparison group is Arizona Illinois Michigan Minnesota Rent State North Carolina Washington and Wisconsin

Source: University of Colorado Tech Transfer Office.

RELATED ARTICLE: CU inventors reap rewards

Revenues from the commercialization of the University of Colorado's intellectual property are split evenly among it's Technology Transfer Office, the inventor, the inventor's department (which shares proceeds with a campus level research account), and the inventor's research account. Tech expert Jerry Donahue labeled CU the "healthiest nationwide in terms of how much goes back to the inventor. That's a huge motivator."

"Our people are not very motivated by the commercial drivers. They're motivated by the scientific drivers," added the TTO's David Allen. "But if they're very successful in commercialization, they can use that to some extent to seed new research."

The TTO's financial model also calls for sustainable growth. "When the overall returns grow, our quarter of the pie is going to grow, and that's how we're going to fund our growth," explained Allen. "If there's anything beyond (the TTO budget), we're using that to pay back the groups that have been providing support for us, the president and the chancellors at Boulder and Health Sciences."

?

Wisconsin Alumni Research Foundation

Photo credit: Jeff Miller/UW-Madison University Communicatio

614 Walnut Street
Madison, Wisconsin 53705
(P) 608-263-2500
(F) 608-263-1064
Web site: www.warf.ws
Email: info@warf.ws

WARF