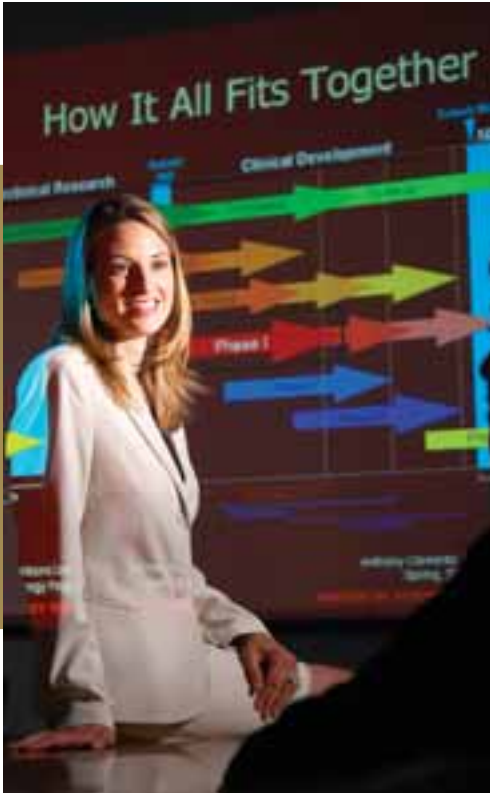




University of Wisconsin-Madison

Master of Science in **BIOTECHNOLOGY**



www.ms-biotech.wisc.edu

A World-Class Degree from a Global Leader in Biotechnology



The Master of Science in Biotechnology

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

The Master of Science in Biotechnology at the University of Wisconsin-Madison is an ideal solution for professionals in the biotechnology industry seeking to move into positions of greater responsibility, leadership or security. Drawing on the resources of a world-class university — a global leader in the field of biotechnology — the M.S. in Biotechnology is intended for practicing scientists, technical professionals, attorneys and business/operations strategists who seek a cross-functional understanding of biotechnology without having to interrupt their careers to pursue studies full time.

Practical and results-oriented, the two-year curriculum provides the solid scientific, business and legal foundation so critical for success and advancement in one of the fastest-growing and most complex industries in the world. Graduates of this unique program praise its relevance and immediate application. Employers recognize the value of the degree’s cross-disciplinary approach and the broad worldview students acquire during their time in the program.

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

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Rated No. 1 Research University
Washington Monthly magazine, September 2005

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

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



► Practical Learning for Working Professionals

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

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



The M.S. in Biotechnology program is intense and rigorous. Students are not only indoctrinated in the science, business, law and ethics of running a biotechnology enterprise; they develop the skills to be a highly effective manager, CEO and/or entrepreneur. I learned how to interact with people from diverse professional and scientific backgrounds, improved my presentation skills and learned to work under pressure to meet multiple deadlines. Instructors, alumni and fellow students provided support throughout the program and today are a key component of my professional network. ”

*Cynthia R. Cauthern, Ph.D., Class of 2005
Chief Customer Officer
Beacon Technologies*

Groundbreaking Curriculum

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

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

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

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

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

1 Year I Fall

Principles and Practices of Biotechnology

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

Business of Biotechnology: Fundamentals

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

Molecular Technologies I

The curriculum in this course covers four key areas: biotechnology methods and practice, effective presentation, writing and teaching in a scientific environment, and biotechnology product improvement and applications.

3 Year II Fall

Technology Applications in Early Drug Discovery

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

Molecular Technologies III

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

Along with mastering course concepts and laboratory practices, students demonstrate their knowledge and skills through effective scientific communication.

Business of Biotechnology: Contemporary Challenges and Applications

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

2 Year I Spring

Biotechnology Operations

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

Molecular Technologies II

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

Topics and laboratory activities include gene cloning, protein expression and purification, genetically modified organisms (GMO) and their implications for science and society, human genetic identity, and automation in biotechnology.

4 Year II Spring

Business of Biotechnology: Frontiers and Strategies

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

Biotechnology Law and Society

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

Global Biotechnology

Unlike most commercial products, biotechnology innovations reach the marketplace with immediate application to international communities. In this course, students deepen their technical understanding of important areas of biotechnology while considering each in a global context. Students complete an independent research project, achieving an elevated level of synthesis and depth of understanding about key scientific, business, legal and political issues in biotechnology.

Researchers from UW-Madison join leaders from the biotechnology industry to create and deliver a one-of-a-kind curriculum. From left: Linda Hogle, Associate Professor, UW-Madison Medical School; Hansi Dean, Independent Biotechnology Consultant; and Derek Hei, Technical Director, Waisman Clinical Biomanufacturing Facility, UW-Madison.



World-Class Faculty

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

Richard L. Moss, Ph.D.

Executive Director, M.S. in Biotechnology
Professor and Chair
UW-Madison Physiology Department

Gail Robertson, Ph.D.

Director, M.S. in Biotechnology
Associate Professor
UW-Madison Physiology Department

Natalie Betz, Ph.D.

Senior Applications Scientist
Promega Corporation

Karin Borgh, Ph.D.

Executive Director
Biopharmaceutical Technology Center Institute

Thomas J. Burke, Ph.D.

Independent Biotechnology Consultant
Co-Founder, PanVera Corporation

Mason Carpenter, Ph.D.

Associate Professor of Strategic Management
UW-Madison School of Business

R. Alta Charo, J.D.

Warren P. Knowles Professor of Law and Bioethics
University of Wisconsin Law and Medical Schools
Associate Dean for Research
and Faculty Development
UW-Madison Law School

Anthony J. Clemento Jr., M.S.

Adjunct Professor
UW-Madison Medical School

Hansi J. Dean, Ph.D.

Independent Biotechnology Consultant
Adjunct Professor
UW-Madison Medical School

Randall P. Dunham, Ph.D.

Professor of Management
and Human Resources
UW-Madison School of Business

Phillip Greenwood, MBA, Ph.D.

Senior Lecturer
UW-Madison School of Business

Carl Gulbrandsen, Ph.D., J.D.

Managing Director
Wisconsin Alumni Research Foundation

Derek J. Hei, Ph.D.

Technical Director
Waisman Clinical Biomanufacturing Facility
UW-Madison

Linda S. Hogle, MBA, Ph.D.

Associate Professor
Department of Medical History and Bioethics
UW-Madison Medical School

Today I work on a global team focusing on product development and engineering, sales and customer relationship management, manufacturing, and financial analysis and reporting. The program gave me the skills and confidence to speak to the wide spectrum of disciplines and stakeholder interests within biotechnology. The multi-disciplinary coursework and holistic view of biotechnology taught in the program allow me to demonstrate a more intimate understanding of my employer's challenges, opportunities and needs.

*Lynda Bader, Class of 2004
Delivery Assurance Manager
Quality and Program Delivery
GE Healthcare*



C. Richard Hutchinson, Ph.D.
Professor Emeritus of Medicinal Chemistry
UW-Madison School of Pharmacy
Research Fellow, Kosan Biosciences

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

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

Jack Reinert, MBA
Senior Lecturer
UW-Madison School of Business

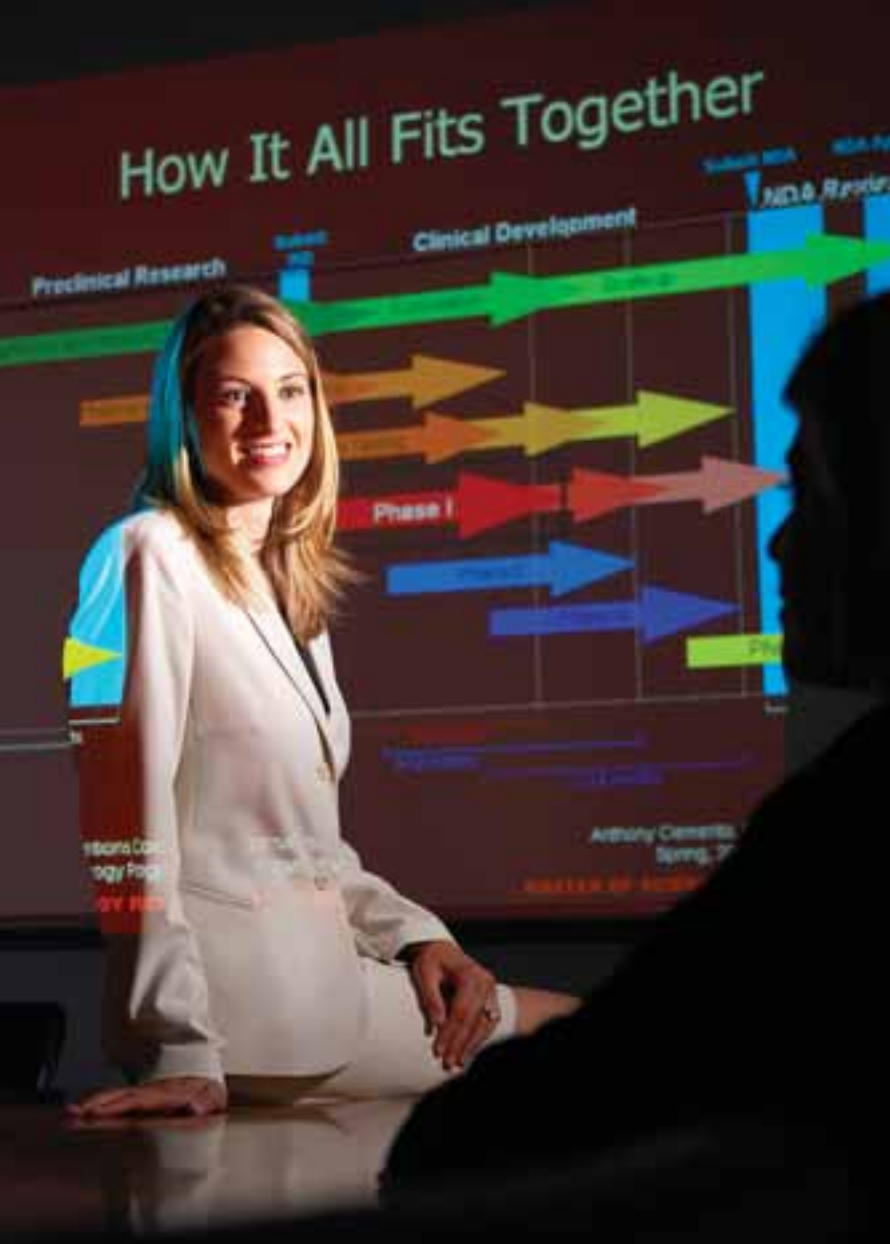
Michael Roy, Ph.D., RAC
Senior Scientist
Science Applications International Corporation

Richard L. Salatino, M.S.
Manager, Scientific Training Department
Promega Corporation

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

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

Jon S. Thorson, Ph.D.
Associate Professor
UW-Madison School of Pharmacy



To Employers

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

An elevated understanding of business strategies, sensitivity to bioethical issues and awareness of global matters allows graduates greater influence on the development, launch and delivery of new and groundbreaking products. Students also benefit from a close network of professional peers spanning multiple facets of the biotechnology industry.

Companies Represented by Student Enrollments (Classes of 2004, 2005, 2006, 2007)

Abbott Laboratories Incorporated
Agility Corporation

American Consulting Incorporated

aOvaTechnologies, Inc.

Beacon Technologies

Bio-Rad Laboratories

Biotechnology Center,
University of Wisconsin-Madison

Blood Center of Southeastern
Wisconsin

Bone Care International Incorporated

CIBC World Markets

Covance Incorporated

Danisco USA

Department of Biochemistry,
University of Wisconsin-Madison

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

*Katie Zurbuchen, Class of 2006
Production Scientist, Genetic Identity
Nucleic Acids Chemistry
Promega Corporation*

Department of Horticulture,
University of Wisconsin-Madison
Department of Psychiatry,
University of Wisconsin-Madison
Dow Chemical Corporation
EarthTech
GE Healthcare
General Casualty
Gala Design Incorporated
Genetics Department,
University of Wisconsin-Madison
Genome Center of Wisconsin
Genome International Corporation
Greenbrier & Russel
Invitrogen Incorporated
Laboratory for Molecular and Computational
Genomics, University of Wisconsin-Madison
LaFollette, Godfrey & Kahn LLC
Lucigen
McArdle Laboratory for Cancer Research,
University of Wisconsin-Madison
Medical School, University of Wisconsin-Madison
MiniTube of America
Monsanto Corporation, Agracetus Campus
Monsanto Corporation, Protein Technologies
National Primate Research Center,
University of Wisconsin-Madison
Novagen, EMD Biosciences
PPD Development
Pierce Biotechnology Incorporated
Prodesse Incorporated
Promega Corporation
School of Pharmacy,
University of Wisconsin-Madison
Spectrum Research Incorporated
Standard Process, Incorporated
Strategem
ThirdWave Technologies, Incorporated
United States Department of Agriculture
Virtual Care Provider, Incorporated
WiCell Research Institute
Wisconsin Alumni Research Foundation (WARF)
Wyeth Pharmaceuticals



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

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

Advances in biotechnology will not go forward without debate. The broad curriculum of the Master of Science in Biotechnology program exposed me to several areas — including bioethics, law and regulatory affairs — that will all play a crucial role in this debate. The program challenged me to effectively communicate information about biotechnology to very diverse audiences, to understand global implications, and to strategize how best to move innovative technologies forward to potentially life-saving conclusions.

*Ann E. Krohn, Class of 2005
Business Development Manager
Spectrum Research LLC*



When and Where

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

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

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

Tuition and Fees

Tuition for the M.S. in Biotechnology Program is \$28,000 for the full two-year program. This total does not include books or software, most of which are available in educational versions at substantial discounts. Students are encouraged to have personal laptops for use in courses and on team-based assignments.

Admission

The M.S. in Biotechnology is currently seeking applicants to begin the program in fall 2006. Admission to the program requires:

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

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

The deadline for fall 2006 is March 31, 2006; however, if spaces remain, applications received after March 31 will be considered. Because the number of participants is limited to 24 per year, early application increases the probability of admission. Completed files are reviewed upon receipt of all application materials.

The M.S. in Biotechnology program has enhanced my performance in my current position as a bench chemist and is helping me advance toward my long-term professional goals. The business and ethics components of the program complement my chemistry background, enabling me to be more actively involved in the decision-making processes that directly affect my daily work. The opportunity to work with other students from a variety of disciplines provides an expansive breadth to the program that is invaluable.

*Babak Khodavandi, Class of 2006
Lead Analyst
Global Pharmaceutical Operations
Abbott Laboratories*





After graduating, I was promoted to a research and development position at Monsanto's Agracetus campus, the most productive soybean transformation facility in the world. In my new position, I work on new-technology development from a cell biology standpoint and also with respect to system throughput improvements. As I pursue and establish new intellectual property, I draw every day on knowledge gained from the M.S. in Biotechnology program.

*Erik Dersch, Class of 2004
Dicot Transformation Research Associate
Monsanto Corporation*



Contact the M.S. in Biotechnology Program

Kurt J. Zimmerman, Associate Director

Master of Science in Biotechnology

(608) 262-0685

kzimmerman@wisc.edu

MG&E Innovation Center, Suite 171

510 Charmany Drive, Madison, WI 53719-1235

www.ms-biotech.wisc.edu



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510 Charmany Drive

MG&E Innovation Center, Suite 171

Madison, WI 53719-1235

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