

University of Minnesota
Research Initiatives, Centers and Institutes
Life Sciences related research
February 1, 2010

Presidential Interdisciplinary Academic Initiatives

Initiative on Biocatalysis

The University of Minnesota has a long tradition and world-class expertise in the science of biocatalysis, the use of biological catalysts and processes to transform plant material into useful products. Biocatalysis enables renewable resources, such as forests, grasslands, and the wheat and corn raised by farmers, to become the new raw materials for our production and energy needs. This initiative will use the most modern approaches to biology, in areas where we have great strength in faculty and facilities, to develop exciting new uses for Minnesota's abundant agricultural products and natural resources, from plastics and other industrial products to new, helpful pharmaceutical products. Initiative leader: Victor Bloomfield, Vice Provost for Research, at victor@umn.edu or 612-625-2809

Initiative on Brain Function Across the Lifespan

New tools, including state of the art imaging techniques, have transformed our ability to begin to understand how the normal brain develops, as well as what can go wrong with the brain throughout the lifespan. This field, also called development cognitive neuroscience, is advancing rapidly and holds great promise for better health and quality of life for millions of people. The University's core academic fields that support this initiative are highly recognized and productive. This expanded interdisciplinary initiative will create new synergies and expand our capacity to bring together the many research strengths of the University of Minnesota, from basic neuroscience to education, to contribute to our understanding of how changes in the brain during development, adulthood, and aging influence the way we think and feel. Developmental cognitive neuroscience has the potential to help us understand everything from when infants and children are ready to learn and how best to teach them to understanding the decrements and declines that accompany aging with the potential for helping us to diminish the ravages of Alzheimer's and other age-related disorders of the brain. The working group is developing a proposal for a Center for Developmental Cognitive Neuroscience modeled after the Cancer Center. Initiative leaders: Dr. Frank Cerra, Senior Vice President, Academic Health Center, (cerra001@umn.edu or 612-626-3700), Prof. Charles A. Nelson, Inst. of Child Development, (canelson@umn.edu or 612-624-3878), Prof. Timothy Ebner, Dept. of Neuroscience (ebner001@umn.edu or 612-626-6800) and Prof. Apostolos P. Georgopoulos, Department of Neuroscience (omega@umn.edu or 612 725-2282).

Initiative of Environment & Renewable Energy

Perhaps the most critical global challenge for the 21st Century is maintaining a healthy, productive environment that will continue to support life in the face of an increasing world population, energy shortages, shrinking freshwater supplies, destruction of natural habitats, and declining genetic diversity. Integrating all we know—from scientific, economic, social, and spiritual perspectives-- is key to understanding and resolving these issues.

The initiative will begin with three major inter-related projects:

- The first will build on the recommendations of the Commission on Environmental Science and Policy, appointed by then Provost Robert Bruininks, to create an integrated and transparent approach to the environment at the University of Minnesota.
- The second will focus research and technology transfer on renewable energy with funding from Xcel Energy under a mandate from the legislature through the Prairie Island Bill.
- The third will aimed at integrating sustainable practices and energy conservation across the full range of University activities under the leadership of University Services.

Initiative leaders: Susan G. Stafford, Dean, College of Natural Resources (stafford@umn.edu or 612-624-1234), Robert Elde, Dean, College of Biological Sciences (elde@umn.edu or 612-624-2244) and Charles Muscoplat, Dean, College of Agricultural, Food and Environmental Sciences (cmuscop@umn.edu or 612-624-5387)

Initiative on Health Foods & Healthy Lives

The University of Minnesota is uniquely positioned as a national leader for an initiative focusing on food and health promotion, being one of only two U.S. universities to integrate six key components on one campus: agriculture, human nutrition, medicine, public health, exercise science, and veterinary medicine.

This initiative seeks to build the University's capacity in research, learning and outreach to grow and sustain impact in the interdisciplinary arena of food, nutrition and health-- bridging quality science to sound public policy, and transforming what we know into what we do.

The four aspirations of this initiative are:

- To utilize and advance knowledge about the integration of agriculture, food science, nutrition and medicine to promote healthy lives;
- To emphasize prevention of diet-related chronic diseases and obesity through diet, exercise and human behavior;
- To enhance food safety at all stages, from farm to table; and
- To inform public policy.

This is accomplished primarily by:

- "Seeding" interdisciplinary research teams whose goal is the development and implementation of next generation extramurally funded research and training programs;

- Developing cross-college programs to expand teaching in these areas, provide innovative training and mentoring opportunities for junior faculty, graduate students and high-performing undergraduate students; and
- Building interdisciplinary support efforts across teams and colleges to encourage joint learning, discussion, problem solving, dissemination of impact and public learning.

Initiative Co-leaders: Allen S. Levine, Dean, College of Food, Agricultural and Natural Resource Sciences at aslevine@umn.edu or 612-626-7173, John Finnegan, Dean, School of Public Health at finne001@umn.edu or 612-625-1179

Initiative Contact: Lori Engstrom, Chief of Staff, College of Food, Agricultural and Natural Resource Sciences lmengstr@umn.edu or 612-626-5985.

Initiative on Law, Law and Values in Health, Environment, and the Life Sciences

This Initiative deepens the University's commitment to the Consortium on Law and Values in Health, Environment & the Life Sciences. The Consortium was founded in 2000 to respond to the most challenging legal and ethical questions of the 21st century, questions posed by biomedicine and the life sciences. These are questions that require a new kind of cross-disciplinary work fully marrying legal, ethical, and scientific expertise. The University's commitment to grappling with these emerging and complex questions is part of its land-grant legacy of serving the people of Minnesota, the country, and the world.

The Consortium links 17 of the University's leading programs and centers, leveraging the University's strengths in the life sciences, biomedicine, law, bioethics, and public policy to do cutting-edge work on the societal implications of the life sciences. The Consortium's partner program, the Joint Degree Program in Law, Health & the Life Sciences offers 21 degree combinations, allowing exceptional students to combine a law degree with a wide range of graduate and professional degrees in the life sciences, biomedicine, and environmental studies.

The Presidential Initiative allows the Consortium to launch the Minnesota Journal of Law, Science & Technology; increase the capability to seek and manage externally funded grants; create a Visiting Senior Scholar position to bring to campus and the community each year a prominent scholar focusing on the societal implications of the life sciences; support work on the implications of the life sciences by Consortium members and Joint Degree Program partners; and continue extensive programming including a lecture series, lunch series, and two annual conferences.

Initiative leaders: Prof. Susan Wolf, Law School (wolfx009@umn.edu or 612-625-3406) and Prof. Jeff Kahn, Director, Center for Bioethics (kahnx009@umn.edu or 612-624-9440)

Initiative on Translational Research in Human Health

This initiative will strengthen the ability of the University of Minnesota to continue to play a leading role in the rapidly changing world of health sciences.

The working group for this initiative will collaborate with working groups from the other bioscience/health science based initiatives in an effort to solidify the University's commitment and reach.

Three key components of this initiative are:

- Translational Research Facility, which will provide scientists with a physical environment that promotes collaboration, fosters creativity, promotes innovation, and shortens the time it takes to develop new technologies.
- The Minnesota Partnership for Biotechnology and Medical Genomics, which will bring together Mayo and University researchers to collaborate on projects that can be translated into innovations that promote human health; and
- Targeted investments in faculty to maintain leadership in cutting-edge research in areas such as oncology (cancer), neurosciences (brain functions and diseases), cardiovascular (heart) disease, organ transplantation, applications of stem cell development, and clinical research.

Initiative leader: Dr. Frank Cerra, Senior Vice President, Academic Health Center, at cerra001@umn.edu or 612-626-3700

Research Institutes & Centers

Theme: Biomedical Engineering

BioCor <http://www.biocor.net/>

Center for Biotransport <http://www.me.umn.edu/centers/bhmt/index.htm>

Center for Magnetic Resonance Research <http://www.cmrr.umn.edu/index.shtml>

Center for Neuroengineering <http://www.cne.umn.edu/>

Center for Interdisciplinary Applications of Magnetic Resonance <http://www.ciamr.umn.edu/index.html>

Digital Technology Center <http://www.dtc.umn.edu/>

Experimental Surgical Services <http://www.ess.umn.edu/>

Imaging Center <http://www.cbs.umn.edu/ic/>

Industrial Partnership for Research in Interfacial and Materials Engineering <http://www.iprime.umn.edu/>

Center for Nanostructured Applications <http://www.nano.umn.edu/>

Characterization Facility <http://www.charfac.umn.edu/>

Materials Research & Science Engineering Center <http://www.mrsec.umn.edu/index.shtml>

Nanofabrication Center <http://www.mtl.umn.edu/>

Institute for Engineering in Medicine www.iem.umn.edu

BioCor <http://www.biocor.net/>

Center for Cardiovascular Repair <http://www.ccvr.umn.edu/video/home.html>

Medical Devices Center http://www.it.umn.edu/news/archives/07_06_erdman.html

Minimally Invasive Medical Technology Center (MIMTEC) <http://www.mimtecc.org/>

Lillehei Heart Institute <http://www.med.umn.edu/lhi/>

Minnesota Dental Research Center for Biomaterials & Biomechanics <http://web.dent.umn.edu/>

Minnesota Supercomputing Institute for Advanced Computational Research <https://www.msi.umn.edu/>

Nano & Microsystems Application Center <http://nmac.umn.edu>

Northern Lights Technology Center <http://www.nrri.umn.edu/NLTC/default.htm>

Tissue Mechanics Lab http://www1.umn.edu/bme/html/res_tissuelab.html

Theme: Biomedical & Health Research

Affordance Perception-Action Laboratory <http://www.cehd.umn.edu/Kin/research/apal/>
Bob Allison Ataxia Research Center <http://www.mmf.umn.edu/ataxia/>
Center for Aging <http://www.hpm.umn.edu/coa/>
Center for Children with Special Health Needs <http://www.nursing.umn.edu/CCSHCN/home.html>
Center for Diabetes Research <http://www.med.umn.edu/cdr/>
Center for Excellence in Critical Care <http://www.pharmacy.umn.edu/centers/cecc/home.html>
Center for Health Trajectory Research <http://www.nursing.umn.edu/CHTR/home.html>
Center for Infectious Diseases Research & Policy <http://www.cidrap.umn.edu/>
Center for Neurobehavioral Development <http://www.cehd.umn.edu/cnbd/>
Center for Lung Science & Health <http://www.lung.umn.edu/clsh/home.html>
Center for Youth Health Promotion <http://www.epi.umn.edu/cyhp/default.htm>
Clinical and Translational Science Institute <http://www.ctsi.umn.edu/research/ctrs/index.shtml>
Deborah E. Powell Center for Women's Health <http://www.womenshealth.umn.edu/>
Diabetes Institute for Immunology & Transplantation <http://www.surg.umn.edu/diabinst/home.html>
Epidemiology Clinical Research Center <http://www.epi.umn.edu/ecrc/>
Epilepsy Research & Education Program <http://www.pharmacy.umn.edu/centers/epilepsy/home.html>
Gait & Posture Laboratory <http://www.cehd.umn.edu/Kin/Research/gait/>
Health Survey Research Center <http://www.sph.umn.edu/facstaff/resources/hsrc/index.asp>
Lillehei Heart Institute <http://www.med.umn.edu/lhi/>
Masonic Cancer Center <http://www.cancer.umn.edu/>
Medical Industry Leadership Institute <http://www.csom.umn.edu/Page6241.aspx>
Minnesota Obesity Center <http://www1.umn.edu/mnoc/>
N. Bud Grossman Center for Memory Research and Care <http://www.memory.umn.edu/>
Obesity Prevention Center <http://www.obesityprevention.umn.edu/>
Otitis Media Research Center <http://www.omrc.umn.edu/omrc/home.html>
Paul and Sheila Wellstone Muscular Dystrophy Center <http://www.mdcenter.umn.edu/>
Peters Institute of Pharmaceutical Care <http://www.pharmacy.umn.edu/centers/peters/home.html>
Pharmaceutical Research in Management & Economics Institute <http://www.pharmacy.umn.edu/centers/prime/home.html>

Theme: Basic & Translational Health Research

Basic Research Center on Molecular and Cell Biology of Drug Addiction <http://mcbda.ahc.umn.edu/>

BioCor <http://www.biocor.net/>

Biomedical Genomics Center <http://www.bmgc.umn.edu/>

Biotechnology Institute <http://www.bti.umn.edu/>

Biostatistics Design and Analysis Center <http://www.ctsi.umn.edu/research/ctrs/biostatistics/bdac.shtml>

Brain Barriers Research Center <http://www.d.umn.edu/~mdbc/BBRC/about.htm>

Brain Sciences Center <http://www.cogsci.umn.edu/about.htm>

Center for Cardiovascular Repair <http://www.ccvr.umn.edu/video/home.html>

Center for Cell & Molecular Biology <http://www.med.umn.edu/duluth/CCMB.html>

Center for Cognitive Sciences <http://www.cogsci.umn.edu/about.htm>

Center for Immunology <http://www.immunology.umn.edu/>

Center for Infectious Diseases and Microbiology Translational Research <http://www.cidmtr.umn.edu/>

Center for Magnetic Resonance Research <http://www.cmrr.umn.edu/index.shtml>

Center for Mass Spectrometry and Proteomics <http://www.cbs.umn.edu/msp/>

Clinical and Translational Science Institute <http://www.ctsi.umn.edu/research/ctrs/index.shtml>

Cognitive Developmental Neuroimaging Lab <http://www.cehd.umn.edu/ICD/CDNLab/>

Consortium for Computational Biology & Bioinformatics <http://www.cbcbl.umn.edu/>

Developmental Biology Center <http://www.dbc.umn.edu/>

Human Sensorimotor Control Lab <http://hsc.umn.edu/default.asp>

Imaging Center <http://www.cbs.umn.edu/ic/>

Institute of Human Genetics <http://www.med.umn.edu/ihg/>

Institute for Molecular Virology <http://www.virology.umn.edu/virology/home.html>

Institute for Translational Neurosciences <http://itn.umn.edu/>

Masonic Cancer Center <http://www.cancer.umn.edu/>

Mayo – University of Minnesota Partnership for Biotechnology & Medical Genomics <http://www.minnesotapartnership.info/>

Office of Clinical Research <http://www.ahc.umn.edu/ocr/home.html>

Oral Health Clinical Research Center <http://www.dentistry.umn.edu/research/crc.html>

Stem Cell Institute <http://www.stemcell.umn.edu/>

Theme: Pharma / Biologics

Advanced Genetic Analysis Center <http://www.agac.umn.edu/>

Antibiotic Pharmacodynamic Research Institute

http://www.courses.ahc.umn.edu/pharmacy/6124/Fellowship_program/fellowship_description.htm

Biotechnology Institute <http://www.bti.umn.edu/>

Biotechnology Resource Center <http://www.bti.umn.edu/brc/index.html>

Brain Barriers Research Center <http://www.d.umn.edu/~mdbc/BBRC/about.htm>

Center for Clinical and Cognitive Neuropharmacology <http://www.pharmacy.umn.edu/centers/cccn/>

Center for Drug Design <http://www.ahc.umn.edu/cdd/home.html>

Center for Excellence in Critical Care <http://www.pharmacy.umn.edu/centers/cecc/>

Center for Mass Spectrometry and Proteomics <http://www.cbs.umn.edu/msp/>

High-Throughput Biological Analysis Facility <http://www.bti.umn.edu/htba/index.html>

Institute for Therapeutics Discovery & Development <http://www.pharmacy.umn.edu/itdd/home.html>

Minnesota Molecular & Cellular Therapeutics Facility <http://www.mmct.umn.edu/>

Stem Cell Institute <http://www.stemcell.umn.edu/>

Theme: Animal Health

Center for Animal Health & Food Safety <http://www.cvm.umn.edu/cahfs/>

Center for Dairy Health, Management & Food Quality <http://www.cvm.umn.edu/dairy/>

Equine Center <http://www.cvm.umn.edu/umec/home.html>

Equine Neuromuscular Diagnostics Laboratory <http://www.cvm.umn.edu/umec/lab/home.html>

Swine Center <http://academic-server.cvm.umn.edu/swine/>

Swine Disease Eradication Center <http://www.cvm.umn.edu/sdec/>

The Raptor Center <http://www.cvm.umn.edu/raptor/>

Veterinary Diagnostics Laboratory <http://www.vdl.umn.edu/>

Veterinary Clinical Investigation Center <http://www.cvm.umn.edu/cic/>

Veterinary Medical Center <http://www.cvm.umn.edu/vmc/>

Theme: Food & Nutrition

Center for International Food & Agricultural Policy <http://www.cifap.umn.edu/about/goals.html>
Center for Plants & Human Health <http://cphh.cfans.umn.edu/>
Food Industry Center <http://foodindustrycenter.umn.edu/>
Microbial and Plant Genomics Institute <http://www.mpgi.umn.edu/>
Minnesota Institute on Sustainable Agriculture <http://www.misa.umn.edu/>
Minnesota-South Dakota Dairy Research Center http://fscn.che.umn.edu/research_discovery/centers/mndak.html
National Center for Food Protection & Defense <http://www.ncfpd.umn.edu/>
Minnesota Obesity Center <http://www1.umn.edu/mnoc/>
Obesity Prevention Center <http://www.obesityprevention.umn.edu/>
Sensory Center http://fscn.cfans.umn.edu/research_discovery/centers/sensory_center.html

Theme: Renewables

Biotechnology Institute <http://www.bti.umn.edu/>
Biotechnology Resource Center <http://www.bti.umn.edu/brc/index.html>
Center for Biorefining <http://biorefining.cfans.umn.edu/home.php>
Center for Compact & Efficient Fluid Power <http://www.ccefp.org/>
Center for Diesel Research <http://www.me.umn.edu/centers/cdr/>
Initiative for Renewable Energy & the Environment <http://www1.umn.edu/iree/>
Institute for Social, Economic and Ecological Sustainability <http://fwcb.cfans.umn.edu/isees/>
Institute on the Environment <http://environment.umn.edu/>
Natural Resources Research Institute <http://www.nrri.umn.edu/default/about.htm>
 Central Analytical Lab <http://www.nrri.umn.edu/cwe/analyticallab.htm>
 Development Lab <http://www.nrri.umn.edu/machine/default.htm>
 Minerals Research Lab <http://www.nrri.umn.edu/cartd/cmrl/default.htm>
NorthStar Initiative for a Sustainable Environment <http://environment.umn.edu/nise/index.html>
St. Anthony Falls Lab <http://www.safl.umn.edu/aboutus/aboutus.html>
Water Resources Center <http://wrc.umn.edu/>

Theme: Innovation & Commercialization

Office of Business Relations www.business.umn.edu

Center for Economic Development <http://www.umdced.com/>

Clinical and Translational Science Institute <http://www.ctsi.umn.edu/research/ctrs/index.shtml>

Gary S. Holmes Center for Entrepreneurship <http://www.csom.umn.edu/page6242.aspx>

Joseph S. Juran Center for Leadership in Quality <http://www.csom.umn.edu/Page5309.aspx>

Institute for Research in Marketing <http://www.csom.umn.edu/Page6247.aspx>

Medical Industry Leadership Institute <http://www.csom.umn.edu/Page6241.aspx>

Northern Lights Technology Center <http://www.nrri.umn.edu/NLTC/default.htm>

NorthStar Initiative for a Sustainable Environment <http://environment.umn.edu/nise/index.html>

Office for Technology Commercialization <http://www.research.umn.edu/techcomm/>

Licensing Center <http://www.research.umn.edu/techcomm/about.htm#license>

Venture Center <http://www.research.umn.edu/techcomm/about.htm#venture>

Strategic Management Research Center <http://www.csom.umn.edu/Page7258.aspx>