

From Concept to Cure

2007 REPORT TO THE COMMUNITY
FROM THE UNIVERSITY OF MINNESOTA ACADEMIC HEALTH CENTER



Success in biomedical research today demands collaboration. Individual disciplines have made tremendous progress in the past. But the future is where disciplines meet—where medicine meets physics, where public health meets molecular biology, where neuroscience meets engineering—where scientists from diverse disciplines work together to accomplish what none could alone.

To increase opportunities for such collaborations, we are supporting virtual corridors of discovery. These corridors speed translation from concept to cure. They create multidisciplinary pathways for traveling from idea and understanding, through testing and refining, to better treatments and cures.

At the University of Minnesota Academic Health Center, biomedical corridors of discovery transform new knowledge into better health.

**WE ARE DRIVEN TO DISCOVER,
COMMITTED TO DELIVER.**

UNIVERSITY OF MINNESOTA
Academic Health Center

Driven To Discover, Committed To Deliver

COLLABORATION IS KEY TO RESEARCH AT THE UNIVERSITY OF MINNESOTA

How do corridors of discovery work?

AHC research moves through four stages as it develops better care and cures:

1. **Basic research** explores the science underpinning medicine.
2. **Translational research** applies that new knowledge discovered by basic research to innovative approaches for maintaining and restoring health.



3. **Clinical research** tests the new approaches on people.

4. **Commercialization** brings the new approaches to the marketplace.

Along the way, AHC researchers receive assistance from specialized centers and experts that provide essential **research support**. Research support corridors include engineering, materials science, chemistry, biology, physics, mathematics, and psychology, as well as the Center for Magnetic Resonance Research, the Stem Cell Institute, the Institute for Translational Genetics, the Center for Molecular and Cellular Therapeutics, and Health Informatics.

AHC corridors also receive **support services**, including grant application preparation, financial management, clinical testing, and commercialization. Service platforms include the Center for Translational Therapeutics and the Institute for Clinical and Translational Research.

Support for **technology transfer** is also key. Partners in this process include the BioBusiness Alliance, the Department of Employment and Economic Development, LifeScience Alley, and the Minnesota Partnership in Biotechnology and Medical Genomics, or U-Mayo partnership.

What does it take to develop and support corridors of discovery?

Corridors of discovery need:

- new investment to support faculty in core corridors,
- new facilities, and
- strong collaborations and partnerships.

Based on our strengths, concentrations of expertise, and societal needs, we have defined core corridors of discovery in which to concentrate our efforts (see below).

Core Corridors Of Discovery

Heart and Vascular Disease

The University of Minnesota has a long history of innovation in heart and vascular disease, including the world's first successful open heart surgery, Minnesota's first heart transplant, pioneering work in ventricular assist devices, and invention of the battery-operated pacemaker.

Anchored by the Lillehei Heart Institute in the Medical School, this

corridor of discovery is making further inroads against a leading cause of death in Minnesota. Partners include the Institute of Technology's Department of Biomedical Engineering, the College of Pharmacy, the Stem Cell Institute, the Center for Magnetic Resonance Research, the School of Public Health, the Center for Device Development, and the Minneapolis Heart Institute Foundation.

Cancer

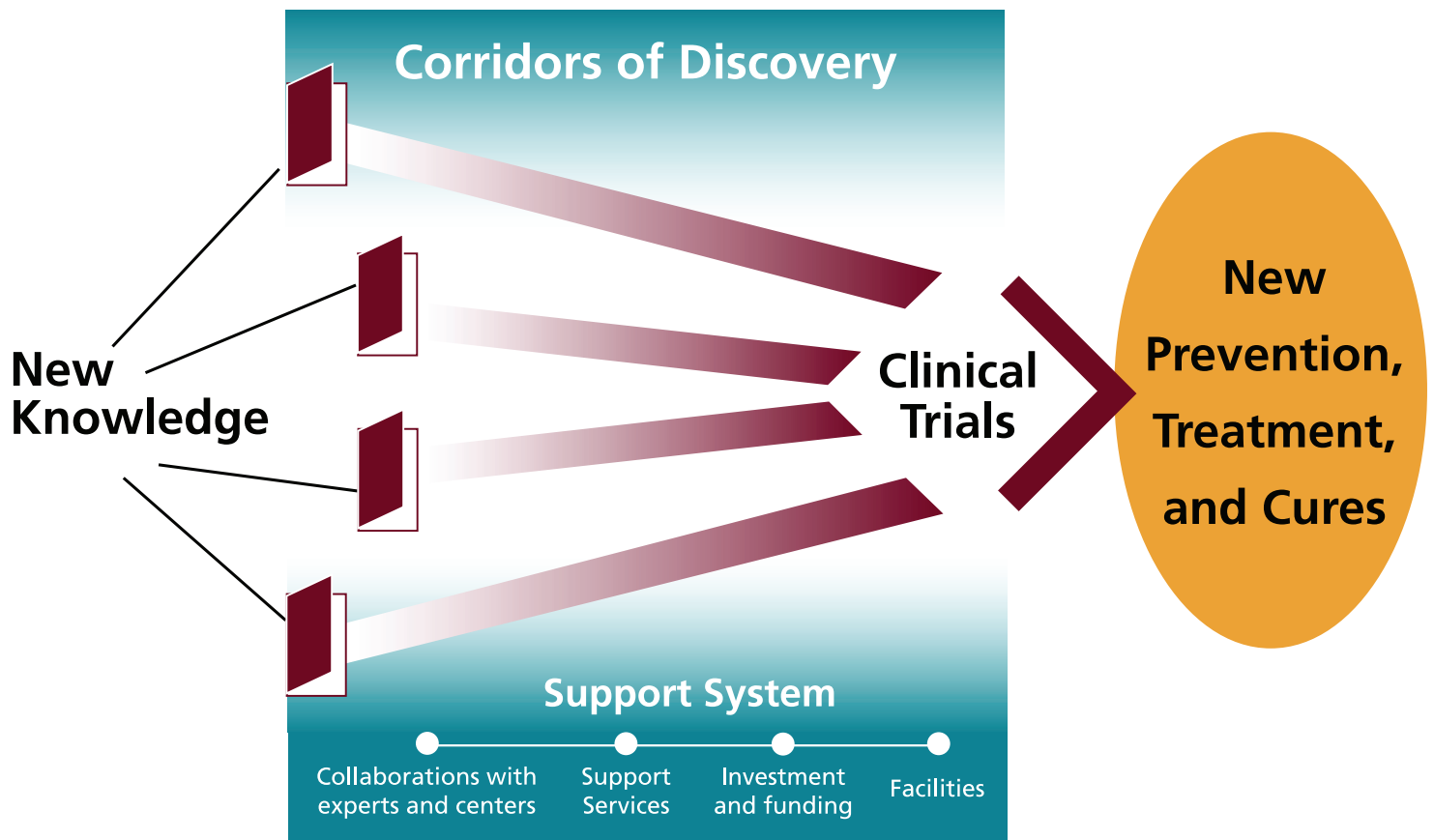
Cancer is a top cause of death in Minnesota. The University's Comprehensive Cancer Center is a leader in the battle against breast, prostate, colon, lung, head and neck cancers, as well as in research in blood cancers and bone marrow transplantation.

The cancer corridor of discovery helps us to improve cancer treatment through collaboration with the

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Building the Corridors to Deliver Discoveries

WHERE DIVERSE DISCIPLINES, EXPERTISE AND SUPPORT SYSTEMS MEET TO TRANSFORM NEW KNOWLEDGE INTO BETTER HEALTH



Biomedical research today demands collaboration between disciplines. The Academic Health Center is supporting virtual corridors of discovery where disciplines as diverse as neuroscience and engineering, medicine and physics can connect to generate new ideas. These multidisciplinary collaborations take the new knowledge of basic research and, with rigorous testing in clinical trials, transform it into treatments, cures and approaches to prevention to improve the health of people in Minnesota and beyond.

Core Corridors Of Discovery

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Center for Magnetic Resonance Research; Medical School programs in immunology, translational genetics, and biomedical nanotechnology; experimental therapeutics programs, including the Center for Drug Design; the Institute of Technology, the School of Public Health, the Arrowhead Research Institute, the Institute for Therapeutics Discovery and Development, and the Institute for Translational Genetics; and the community network that supports clinical trials.

Diabetes

Diabetes is one of the leading causes of illness in the United States and is on the rise, in part due to increasing obesity. Focal points for research include the Diabetes Institute for Immunology and Transplantation; the Stem Cell Institute; the Medical School departments of Medicine, Pediatrics, Surgery, and Biochemistry, Molecular Biology, and Biophysics; the School of Public Health; and the Minneapolis VA Medical Center.

Partners include the Institute of Technology, the Stem Cell Institute, the Center for Immunology, the School of Public Health, the Obesity Prevention Center, and the Obesity Center.

Brain, Nerve, and Muscle Diseases

This corridor of discovery addresses diseases affecting the nervous

and muscular systems, including ataxia, muscular dystrophy, Duchenne muscular dystrophy, Parkinson's disease, Lou Gehrig's disease, Alzheimer's disease, depression, and schizophrenia. Research is organized into four areas: neurodegenerative and neuromuscular diseases, neurodevelopment and mental health, memory research and care, and neuroengineering.

Partners include the Bob Allison Ataxia Research Center, the Wellstone Muscular Dystrophy Center, the Institute of Child Development, Center for Neurobehavioral Development, experts in psychiatry and psychology, the Institute of Human Genetics, the Center for Magnetic Resonance Research, the Medical School Department of Neuroscience, the College of Pharmacy, and the College of Biological Sciences.

Infectious Diseases

Infectious diseases pose a growing threat to humans and animals. The U has substantial expertise in infectious disease research, including HIV/AIDS, malaria, tuberculosis, toxic shock syndrome, strep infections, cryptosporidium, and such economically devastating animal diseases as porcine reproductive and respiratory syndrome virus and John's disease.

This corridor of discovery brings together world-class faculty with expertise in infectious diseases, microbiology, and microbial immunology to advance our ability to prevent, diagnose, and treat infectious diseases. The corridor focuses on big problems and big opportunities: HIV/AIDS, tuberculosis, and malaria; emerging infectious diseases and bioterrorism; vaccines and microbicides; and new antimicrobials.

It taps expertise from the Medical School, the College of Veterinary Medicine, the School of Public Health, the College of Biological Sciences, and the College of Food, Agricultural and Natural Resource Sciences.

Drug Design and Development

This corridor of discovery enhances the U's capacity to translate biological discoveries into new therapies and bring those therapies to market. It also draws upon regional and national industrial and academic partnerships. The corridor will support four key components of drug development: medicinal chemistry, high-throughput screening, combinatorial chemistry, and synthetic process development.

The Institute for Therapeutics Discovery and Development anchors this corridor, and the Center for Drug Design is a major collaborator.

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