

M UNIVERSITY OF MICHIGAN
NORTH CAMPUS RESEARCH COMPLEX

research
crossroads



annual report

2012

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Letter from the Director | North Campus Research Complex Annual Report 2012

NCRC: delivering on the promise

Three years into its acquisition, the mission of expanding the University's capabilities in translational research is happening at NCRC. We have two stated missions — to expand the university's strengths in translational research and help lead the resurgence of the Michigan economy. Both these ideas have been actively developed at NCRC. I feel confident that our diligent work to develop a rich portfolio of new capabilities will bear fruit going forward.

What sets NCRC apart from other similar research initiatives?

While other similar research initiatives do exist, what sets NCRC apart is the advantage of high quality, immediately available space. The availability of state of the art research and lab space has been a very powerful enabler to allow our programs to advance relatively quickly. In addition to the U-M Medical School, it has allowed several other U-M schools to get a foot hold at NCRC and establish a presence.

What are some of the top accomplishments in the past year?

Today when I look around this complex, I'm very proud of two major programs: the Biointerfaces Institute and the Cardiovascular Research Center, both of which are now solidly established at NCRC. Each has different research problems to solve, yet by focusing on translational research, both aim to advance their research to ultimately benefit patients and end-users. Research programs are complex —requiring technical support, core research facilities and suitable labs, all of which are now available at NCRC. In initiating these programs, we have been able to establish our lab-based research community, leading to a critical mass that will only help develop future programs.

What is NCRC's role in advancing translational research?

In mid-June we begin to occupy newly renovated building which houses the Institute for Healthcare Policy and Innovation. It was only 18 months ago that we moved the first 100 health services researchers and their staff to NCRC.

These researchers had a taste of the potential for and the ease of collaboration, which is advanced through co-location at NCRC. Research at IHPI is truly translational: adding enormous understanding to how medicine is implemented, and the value gained by the things we do today and the things we should and shouldn't do in the future. We anticipate that the nearly 390 faculty researchers, fellow and staff moved to date are the seeds of a very powerful Institute which will leverage additional brainpower from other sites on campus as well as our partner institutions. Without the contiguous space at NCRC, this Institute would not have come together so rapidly and is a great example of how we can enable research to flourish.

How are the research programs and collaborations at NCRC going to impact health?



David Canter, M.B., Ch.B.
Executive Director, NCRC

I believe that while individual researchers can make valuable discoveries, they may not immediately translate to betterment of human health. Almost all technologies and knowledge that lead to gains in human health require collaborative effort that is not typically available to individual researchers or small groups of investigators. NCRC has the capacity to enable the kind of collaborative and inter-disciplinary efforts that is required for translational research, directly impacting human health as opposed to simply adding to scientific knowledge.

It is important for a university to recognize that the traditional measures of faculty value need to change in order to support collaborative research. Conventionally, faculty members are incentivized to demonstrate research independence. A collaborative and team science approach is clearly different and consequently needs to be rewarded differently within the university structure. NCRC hopes to be the catalyst for this change, by demonstrating what is possible when researchers collaborate.

What is the vision for program development at NCRC?

In creating new programs and bringing this site back to life, we have some interesting strategic choices to make over the next three years. I feel fortunate to have the opportunity to build a robust research environment. The groups here are diverse yet I feel a lot of synergy between them, and it is exciting to be in the midst of the vibrancy that is obvious on this campus.

The translational oncology program, led by Diane Simeone will establish a foothold in the next 12 months. It will grow over the next three years to become a very substantial program here at NCRC, embracing many aspects of both discovery and translational sciences.

The program around Emergency Medicine and critical injury and illness will begin to grow and interact with other groups. IHPI is in its infancy as an Institute but they have tremendous potential to develop into a leading worldwide research center in the area of health services research.



The NCRC administrative team

Where do I hope to see NCRC in the next 3 years?

Going forward, I'd like to see some significant private public partnerships at NCRC, a new way for the University of Michigan to collaborate with the external world. I would like to see that the coming together of inter-disciplinary and collaborative programs at NCRC being rewarded by level of funding that is above what could have expected on their own. I would like us to be able to say that we have been bold enough to try some experiments, even if some of them may have failed. That we took some risks, pushed some boundaries and put our hearts into doing something different.

My dream is to see the programs at NCRC bursting with potential. Programs that are rigorous enough to endure beyond their original leadership, and having depth and richness to continue to interest the best researchers. And the promise of influencing human health for at least a few decades being fulfilled out of our diverse programs.

I invite you to be a part of our exciting growth – as a faculty member, researcher, student, U-M community member, business employee, or a member of the Ann Arbor community. Together, we have much to look forward to in creating an exemplary research crossroads at the University of Michigan.

David Canter, M.B., Ch.B.
Executive Director, NCRC

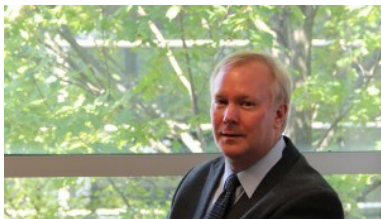
Research Crossroads

Today's medical research and clinical problems demand a new level of research that must combine several disciplines concurrently. In addition to advancing basic and translational sciences to tackle problems that impact human health, a multi-pronged approach involving, for example, DNA sequencing, nano particle therapies, development of new antivirals and stem cell research, are all required to work together to address the new challenges on the horizon.

[The North Campus Research Complex \(NCRC\)](#) is such a place at the University of Michigan, and is enabling diverse groups of researchers across schools and departments to join forces to find solutions to some of the most challenging clinical issues we find today. At the cutting edge of scientific research, NCRC is fertile ground for new collaborations between researchers and for team science, to truly make a difference in people's lives. As a result, NCRC is becoming a unique research crossroads where scientists of various disciplines meet and solve problems that were not possible to solve in any other way. This kind of an environment, conceptualized and created as a melting-pot of research, is a necessary step medical science must take now in order to solve a whole new world of problems, harnessing the new tools and technologies at our disposal.

Cross-University Collaborations Aim to Fuel Discoveries

TOP will partner with the Ross School of Business and the Medical School's Business Development team on a plan to increase interactions with industry and establish more biomedical companies designed to facilitate moving scientific discoveries into the clinic.



Dr. Colin Duckett, Ph.D. Professor of Pathology, Professor of Internal Medicine and Director of Program Development, NCRC

“The North Campus Research Complex offers a unique opportunity for researchers across campus to talk with each other and collaborate in ways they have never had before. We also offer core services that help facilitate the process of biomedical research and produce results that can be quickly translated into benefit for patients,” says Dr. Duckett.

Leadership Vision



MARY SUE
COLEMAN, Ph.D.
President, U-M

“The progress of the North Campus Research Complex is as remarkable as its promise. It is both rewarding and inspiring to know NCRC is moving forward with talented researchers determined to find solutions to some of society’s most vexing issues. Their contributions are the essence of a great research university.”



ORA H.
PESCOVITZ, M.D.
Executive Vice
President for
Medical Affairs, U- M
CEO, U-M Health
System

“As we continue to populate NCRC with innovators from diverse disciplines, we continue to move toward our vision of creating a pioneering hub for science, research and collaboration. We’ve made amazing strides in just three years and I am confident that the next several years will prove to be an exciting evolution of both the campus and the model of interdisciplinary research and public-private partnership driving our work.”



DAVID MUNSON, Ph.D.
Robert J. Vlastic Dean of
Engineering, U-M College of
Engineering

“Michigan Engineering’s largest research partnership is with the Medical School and other health disciplines. NCRC provides the ideal setting to collaborate on solving some of the world’s biggest challenges, where a single discipline has been unable to provide answers.”



STEPHEN R.
FORREST, Ph.D.
Vice President for
Research, U-M

“The NCRC builds on the cooperation among disciplines that is the hallmark of this university and is at the heart of our impact as a research enterprise.”



JAMES O.
WOOLLISCROFT, M.D.
Dean, U-M Medical
School

“It is exciting to see the promise of NCRC becoming a reality. Researchers from across the Medical School, partnering with their campus colleagues and newly recruited faculty, are generating new ideas and investigative approaches to important questions of health and disease. I look forward to the scholarly contributions emanating from these innovative research partnerships.”

Research

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Cardiovascular Research Center at NCRC Ramps Up

As dozens of top researchers move in, NCRC is on track to become the heart of cutting-edge cardiovascular research.

As a steady stream of top scientists and high-tech equipment bring U-M's Cardiovascular Research Center to the NCRC, researchers look forward to new opportunities to intensify their efforts to prevent and treat heart conditions affecting 80 million Americans. In addition, they aim to boost interdisciplinary collaboration and focus their energies on a wide spectrum of cardiovascular research that includes areas such as vascular biology, arrhythmia, cardiovascular genetics, cardiovascular cell and molecular biology, assisted circulation and cardiovascular pharmacology.

"The overall vision is to make the University of Michigan the most important cardiovascular research center in the United States, particularly in the translation of basic science into the treatment of cardiac diseases," said José Jalife, M.D., Director of the Cardiovascular Research Center, and Co-director of the Cardiovascular Center's Center for Arrhythmia Research. "U-M has provided a collaborative environment for advancing our work, and the move to NCRC has been like the icing on the cake."

When the move is complete, the NCRC will house over 100 cardiovascular researchers conducting studies representing millions of dollars in research funding. The Center's scientists come from a wide range of disciplines such as cardiac surgery, vascular surgery, cardiovascular medicine, physiology and electrical engineering and computer science.

The largest laboratory to relocate to the NCRC is the [Center for Arrhythmia Research](#) (CAR), which is focused on improving the outlook for people with heart rhythm defects known as arrhythmias. The most common arrhythmia, atrial fibrillation, affects about 2.5 million people in the United States, and current treatments benefit only a fraction of those patients.

"It's essential to find new treatments that can help us prevent the development of atrial fibrillation or terminate persistent atrial fibrillation," said Dr. Jalife. José Jalife, M.D., Director of the Cardiovascular Research Center, and Co-director of the Cardiovascular Center's Center for Arrhythmia Research.



Michelle Sener, U-M undergraduate student at one of the cardiovascular research labs at NCRC

An additional highlight is the [Cardiovascular Center Cores](#) located at NCRC, in partnership with the Physiology Phenotyping Core. Providing Echo and Ultrasound, Microsurgery, and Telemetry, this core is led by Dr. Dan Michele.

Some key Cardiovascular Research Center research initiatives in the past year have included:

- Insights on causes and treatment opportunities for venous diseases. Researchers at the Conrad Jobst Laboratories are working to reduce the burden of blood clots in the veins, vascular inflammation, traumatic injury, and other disorders affecting veins and arteries. In addition to its cutting-edge research, the lab oversees training for the next generation of vascular surgeons and biomedical researchers.
- Advances in the use of stem cells to study and treat heart disorders. Eric Devaney, M.D., Adam Stein, M.D., and Todd Herron, M.D., the first researchers to move to the Center's new NCRC location, are using stem cells to grow new heart muscle and study how cardiac cells contract. Other Center researchers are helping to inform patient-specific treatment strategies by studying heart cells grown from the stem cells of patients with cardiac disorders.

Researchers are excited by the move to the NCRC facility and the new opportunities it offers. Héctor Valdivia, M.D., Ph.D., joined U-M in December after moving, along with 10 other heart researchers, from his former laboratory at the University of Wisconsin.



Jose Jalife, M.D. (right), Cyrus and Jane Farrehi Professor of Cardiovascular Research, Professor of Molecular & Integrative Physiology, Co-Director, Center for Arrhythmia Research, Director, Cardiovascular Research Center at NCRC; Héctor Valdivia, M.D., Ph.D. (left), Frank Norman Wilson Professor of Cardiovascular Medicine, Co-Director, Center for Arrhythmia Research

"I am thrilled to be at NCRC. The laboratory facilities are world-class: generously spaced, creatively planned, and well maintained," said Dr. Valdivia. "It is immediately obvious that NCRC is not a 'surplus space' to satiate unplanned growth, but

a thoughtfully designed research complex appealing to new and established investigators where top research can thrive.”

He added that the clustering of investigators of specific disciplines or with common research interests opens ample opportunities for collaborations.

Daniel D. Myers, Jr, DVM, MPH, ACLAM, director of the [Conrad Jobst Vascular Research Laboratories](#), agrees. “We are excited about the move to our newly-renovated 4,000 sq ft space at NCRC, and continue to be impressed by the staff here at NCRC as they provide us with continued support,” said Dr. Myers.

New diagnostic methods for endocrine hypertension could eventually spare patients invasive, expensive, and technically difficult diagnostic testing. A better understanding of how obesity raises blood pressure could lead to new treatment strategies for obesity-related hypertension, a type of hypertension that is often resistant to conventional medications.

I have had discussions about possible collaborations with multiple scientists in the cardiovascular group here at NCRC. In addition, from my position here at NCRC, I have built collaborative bridges with individuals in the Division of Metabolism, Endocrinology, and Diabetes.

My office at NCRC is located in a very quiet space, perfect for writing, planning experiments, and other contemplative tasks. The laboratory space is a clean, inviting space in which to work. Potential collaborators and skilled bench scientists are close at hand.

Biointerfaces at NCRC Accelerates Innovation

New multidisciplinary research center brings top minds together to translate basic research into societal benefit.

At the new NCRC [Biointerfaces](#) initiative, founded at NCRC in January 2012, scientists are taking a close look at the critical junctures between living cells and other surfaces, known as *biointerfaces*, to develop new technologies for understanding, diagnosing and treating disease. They are aided in their quest by another, equally critical type of interface—daily, face-to-face interactions among researchers from diverse disciplines—to break through silos, spur collaborations and drive innovation.



Joerg Lahann, Ph.D., Director, Biointerfaces Institute; Professor, Departments of Chemical Engineering, Material Science and Engineering, Biomedical Engineering, and Macromolecular Science and Engineering

“What we’re doing is changing a paradigm,” said Joerg Lahann, Ph.D., institute director and professor of Chemical Engineering. “We want to change the way [biomedical] technologies are developed.”

With researchers from the U-M schools of Engineering, Dentistry, Medicine and Pharmacy working together under one roof, the Institute is advancing the use of biointerfaces in four main areas: nanotechnology, microfluidics and sensors, cell and tissue engineering, and biomaterials and drug delivery.

“We are pooling UM’s strengths in these different areas to focus on facilitating interactions between people who develop technologies—the ‘toolbox’ people—and people who have big research problems to solve,” said Prof. Lahann. “Facilitating those kinds of matches is what the Biointerfaces Institute is all about.”

Interdisciplinary collaborations at the Institute help speed the translation of new research findings into practical applications. In just its first year, the Institute’s projects have led to:

- A unique polymer surface that can grow reprogrammed adult stem cells to produce specific cell types in mice. The new surface avoids problems associated with growing stem cells on living tissue that had plagued researchers in the past, representing a significant step forward for stem cell therapies.
- Gold nanoparticles that store large amounts of information while remaining “invisible” to the human immune system. The discovery could help researchers develop miniscule electrodes that can be attached to neurons to treat disorders like deafness, Parkinson’s and even Alzheimer’s.



Hongli Sun, Ph.D., post-doctoral researcher at the Krebsbach lab at the Biointerfaces Institute at NCRC

The Institute is currently home to seven Principal Investigators; that number is expected to grow to 18 by the end of 2012, representing a total workforce of 250-300 researchers, postdocs and students.

Periodic workshops bring Institute researchers together with other scientists and local companies to compare challenges and exchange ideas. The Institute also offers visiting researchers an “Integration Space”—a flexible, temporary office and laboratory space that can be used for short-term biointerfaces research projects.

“NCRC gives us a home to build a research program where people from many different colleges can come together because they share the same research interests and philosophy,” said Prof. Lahann. “We are thrilled about being part of NCRC, because we believe that it is



Chris Moraes, Ph.D., post-doctoral researcher at the Takayama lab at the Biointerfaces Institute at NCRC

the ideal environment for interdisciplinary and translational research at the University of Michigan.”

In the coming year, the Institute plans to expand its facilities to incorporate cutting-edge research equipment that can be shared among Institute scientists and the broader NCRC community.

Translational Oncology: NCRC-Based Research Program Accelerates Pioneering Cancer Research

As teams come together under one roof, researchers hope to move novel therapies from bench to bedside sooner

Cancer remains the second leading cause of death in the United States. In this year alone, roughly 1.5 million Americans will be diagnosed with cancer — half of these new cases are in people under the age of 65 and still in the prime of their lives.

While remarkable advancements have been made in basic research to characterize and understand the molecular underpinnings that drive cancer and in uncovering potential novel targeted therapies, there is still much more work ahead.

The University of Michigan is already one of the leading institutions in the world in a number of areas of basic cancer research and drug discovery. Now, U-M has developed a translational oncology research engine at NCRC, giving investigators the unique opportunity to translate these important discoveries into clinical advancements that will significantly improve the way cancer is diagnosed and treated.

A first step – Dr. Wicha’s breast cancer research laboratories move in

Dr. Max Wicha, M.D. Distinguished Professor of Oncology and Director, Comprehensive Cancer Center

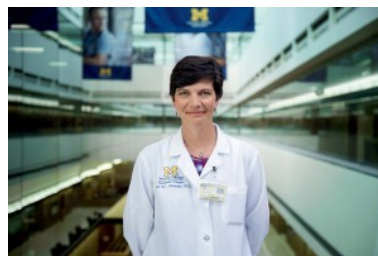
In May 2012, NCRC welcomed Dr. Wicha’s Experimental Breast Cancer Research Laboratories and 40 of his researchers as part of the Translational Oncology Program (TOP).

“The Translational Oncology Program represents a major hub for cancer research and a tremendous opportunity to facilitate new discoveries for patients. Identifying and understanding the molecular pathways at work in cancer, and targeting treatments to these pathways, represents the future of cancer care. Through the Translational Oncology Program we will lead the way in discovering tomorrow’s cancer treatments,” says Max S. Wicha, M.D., director of the U-M Comprehensive Cancer Center.

Cancers currently being studied

TOP investigators are presently exploring cancers of the breast, lung, pancreas, head and neck, colon, prostate and thyroid.

Attracting the best and the brightest minds in oncology



Dr. Diane M. Simeone, M.D., FACS, Lazar J. Greenfield Professor of Surgery; Director, Pancreatic Tumor Program; Chief, Division of H.P.B. and Advanced G.I. Surgery

TOP has quickly engaged the interest of the best and brightest CSC researchers to the NCRC, including its new director, Diane Simeone, MD.

Dr. Simeone, who was selected as the TOP program director in June of 2012, has been lauded by her colleagues as both a dedicated pancreatic surgeon and an internationally recognized biomedical researcher.

“Diane is an inspirational biomedical researcher with an unparalleled record of accomplishment in the area of pancreatic cancer biology, and is one of our leading cancer surgeons,” said Colin Duckett, PhD, director of NCRC’s Program Development. “We’re thrilled that she has accepted this vital leadership role at NCRC.”

Dr. Simeone will lead a diverse program with a large number of research laboratories whose areas of expertise range from basic molecular and cellular biological processes, novel preclinical models of cancer, the identification of new drugs that target cellular processes unique to the cancer cell and the translation of these discoveries into the clinic.

“The focus of the Translational Oncology program at NCRC will be singular – how to treat cancer better,” said Dr. Simeone. “To make this happen we will adopt a comprehensive

approach – on one hand researching the disease from different angles by drawing on the vast and world class expertise of our basic scientists, clinicians and experimental therapeutics researchers, and on the other, focusing on drug development and commercialization processes in order to reach patients faster. I am tremendously excited to develop this vision at NCRC.”

By working together and leveraging NCRC’s extensive scientific resources, TOP scientists can make progress much more rapidly than would be possible by working alone. It is hoped this collaborative approach will revolutionize cancer treatments by targeting and destroying the cells responsible for disease recurrence and metastasis.

Dr. Simeone is the Lazar J. Greenfield Endowed Professor of Surgery and Professor of Molecular and Integrative Physiology, and is currently the director of the Multidisciplinary Pancreatic Tumor Program at the UM Comprehensive Cancer Center. She and her team plan to move their research programs to NCRC in early 2013.

Institute for Healthcare Policy and Innovation (IHPI) Opens New Home at NCRC



Building 16 at NCRC – the home of IHPI

With a common goal of studying how health care works and how it can be improved, nearly 400 health scientists, physicians, and policy analysts from across the University of Michigan and partner organizations have come together to form one of the nation’s largest research entities of its kind.

The Institute for Healthcare Policy and Innovation (IHPI), which opened its new home at NCRC in June 2012, unites members of an already strong U-M health services research community into a true powerhouse in the field. By bringing people together in close proximity to one another, the researchers expect they can accelerate their studies of how health care is delivered today, and test innovations that could improve health care, health insurance and healthcare policy tomorrow.



Sanjay Saint, M.D., M.P.H. Associate Chief of Medicine, VA, Ann Arbor

George Dock Collegiate Professor of Internal Medicine, University of Michigan Medical School

“Moving to NCRC has the potential to be transformative,” said Sanjay Saint, M.D., M.P.H., George Dock Collegiate Professor of Internal Medicine, U-M Medical School, and Associate Chief of Medicine, VA Ann Arbor Healthcare System. “Our patient safety program will now be surrounded by high-caliber and multidisciplinary health services researchers who are committed to turning ideas into action.”

The opening of the new IHPI space in a dedicated building at NCRC coincided with the third anniversary of U-M’s purchase of the site. The newly renovated space is being used as a tool to encourage interactions that will deepen and amplify the impact of U-M health services research, and open new avenues for collaboration within and beyond the University.

“The new IHPI space at NCRC is phenomenal for collaboration! I’ve been here only a few weeks and already I’ve conducted several meetings with colleagues in other specialties,” added Vineet Inder Chopra, M.B.B.S., M.D., Assistant Professor of Internal Medicine, U-M Medical School. “For purposes of engaging researchers and fostering cross-silo discussions, this new space is perfect.”



Vineet Chopra, M.D., M.Sc., Assistant Professor of Medicine

IHPI includes members from more than 30 research groups, focusing on issues ranging from kidney and heart disease to surgical care and cancer, as well as children’s health and mental health. More than half of IHPI members are U-M Medical School faculty. Nearly one quarter are from the U-M School of Public Health. Others come from U-M’s Engineering, Pharmacy, Business, Dentistry, Nursing, and Public Policy schools. IHPI also includes members from

several not-for-profit and private sector organizations such as Arbor Research Collaborative for Health, the Ann Arbor VA Healthcare System, the Center for Healthcare Research and Transformation (a joint venture between U-M and Blue Cross Blue Shield of Michigan), Mathematica and Altarum.

Since its establishment in May 2011, the Institute has:

- Identified and recruited 400+ members,
- Created an interim leadership team (while search for an institute director is conducted),
- Designed its new space at NCRC to support multi-disciplinary interaction (including building formal and informal collaboration spaces and using cutting edge information-sharing technologies), and
- Moved many groups of researchers from across campus into the new space.

In the coming year, the Institute will:

- Continue to build its membership of U-M researchers and external partners,
- Define select core research services to make available to members, and
- Begin identifying research areas to emphasize – especially those that cut across schools, departments, and disciplines – such as health care information technology.

The formation of IHPI has given investigators access to new tools, partnerships and data sources, and is allowing them to more readily share ideas and obtain insights.



Collaborative work spaces in the newly renovated IHPI building at NCRC

Joel Howell, M.D., Ph.D., described it this way: “I’m sitting right next to a diverse group of fascinating colleagues who offer the opportunity for extensive collaboration. There is real virtue in designing space that encourages powerful but unexpected associations between people’s work.” Dr. Howell is the Victor Vaughan Professor of the History of Medicine, and Professor, Department of Internal Medicine, Department of History, and Department of Health Management and Policy with the U-M Medical School, LS&A, and School of Public Health.

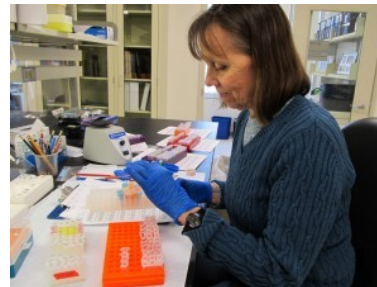
IHPI members and their work will now have an even greater impact on health care policy and practice that will make health care better, safer, more cost effective and more accessible for all.



Composition of IHPI

Centralized Research Core Services Provide Extensive Research Support at NCRC

Vision is to offer one-stop shop for U-M and NCRC-based research programs



Katherine Borysko, M.S.,
Sanger Sequencing Technician, DNA Sequencing Core

Imagine being a top-notch researcher and having access to state-of-the-art instruments and resources in one convenient location? That’s exactly what NCRC-based staff and faculty have at their fingertips thanks to the Biomedical Research Cores Facilities (BRCF).

The BRCF, which is part of the U-M Medical School Office of Research, offers faculty and staff at NCRC and across the University a collection of labs, expert staff and services to use on a fee-for-service basis. BRCF provides customers with high quality, economical and efficient services with the ultimate goal of positively impacting human health.

BRCF's director, Cassandra Wong, explains plans are underway to co-relocate several additional core services. Eventually, she envisions a core facilities mall – a one-stop shop in a sense – to meet the needs of investigators across the continuum of biomedical research and keep pace with research technology.

“In some ways, we are a hub consisting of a variety of different labs that serve researchers in different ways,” she said. “Now that the lines are being blurred between traditional fields of study, partnerships and interdisciplinary collaborations are increasingly becoming the norm, and we are seeing this in the cores facilities too.”



Labs at NCRC provide critical research support

In the past, these services were very separate areas, but having them centrally located is adding convenience and spawning collaborations.

“The spontaneous interaction between the people using the core facilities and the core facilities themselves can produce some powerful synergies and provide a seamless process for investigators who use these services,” said Wong.

Since moving to NCRC, the core facilities have further expanded, for example:

- Providing added value to NCRC customers by partnering with them to help conduct and design experiments
- Acquiring new equipment that will enable researchers to use the latest core technologies in their research.
- Under the guidance of a faculty advisory committee that aids in evaluating technology and service needs, Cassandra Wong and others continually evaluate researcher needs, coordinate applications for grants to purchase equipment, and offer comprehensive training for investigators.

“We have never had the ability to co-locate all of the cores in one area,” said Wong. “NCRC has given us this rare opportunity and it benefits investigators and helps advance their research.” Over the long haul the core facilities will change as technology and the way science is conducted changes. “Now that we are at the NCRC, we will continue to evolve in order to remain relevant with the changing nature of biomedical research,” Wong added.

For more information, visit BRCF's new [website](#).

In another exciting development, in partnership with the Medical School Office of Research, the Center for Molecular Imaging opened at NCRC, giving researchers access to the state-of-the-art IVIS Spectrum system; initially the facility will provide bioluminescence and fluorescence in vivo imaging services to small animal users and will then expand to include large animal studies.

Sampling of Core Facilities at NCRC

Some of the core facilities available onsite include:

- The [Center of Molecular Imaging](#) for small and, eventually, large animal studies;
- the IVIS Spectrum system uses Xenogen's novel patented optical imaging technology to facilitate non-invasive longitudinal monitoring of disease progression, cell trafficking and gene expression patterns in living animals.
- The [Bioinformatics Core](#) provides bioinformatics support to researchers using their expertise in computational methods.
- The [Biomedical Research Store](#) provides investigators with on-site procurement of enzymes, reagents and kits used in molecular, cell biology and some protein chemistry.
- The [DNA Sequencing Core](#) provides DNA analysis for research clients on a recharge basis. It houses the Pacific Biosciences 'RS,' or 'real-time sequencer,' a potential game-changer in DNA analysis.
- The [Flow Cytometry Core](#) provides instrumentation and expertise, including cytometric analysis and cell sorting. It is equipped with a state-of-the-art Coulter MoFlo XDP cell sorter and two Miltenyi MACSQuant analyzers.

Collaboration

Private Companies

Lycera



Dave Hoffman, Ph.D., Senior Scientist, Biology

[Lycera Corp.](#), a private sector biopharmaceutical company, completed its move to NCRC in late 2011 and is thriving within this increasingly vibrant and collaborative community.

In the last year, the company has made significant progress in building a portfolio of innovative research programs focused on treating serious autoimmune diseases. The lead program is advancing towards clinical development and the first milestone has been reached under an exclusive research collaboration with Merck & Co. The scientific team, led by founder and chief scientific officer Gary D. Glick Ph.D., Werner E. Bachman Collegiate professor of chemistry in U-M's College of Literature, Science & Arts and professor of biological chemistry at the Medical School, continues to build on Glick's pioneering work in the field of immune metabolism to identify opportunities to develop novel therapeutics.



Dr. Kathleen Metters, Ph.D. CEO, Lycera Corp.

Finally, the company has hired Kathleen M. Metters, Ph.D., a 25-year pharmaceutical veteran, as their new chief executive officer and president, and looks forward to recruiting a small number of key hires over the next year.

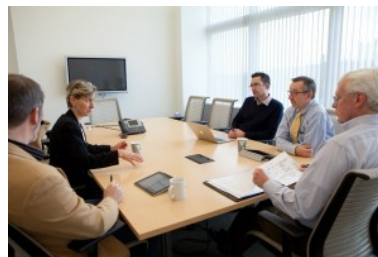
"The dynamic environment at NCRC and the opportunity to collaborate more broadly across the health sciences sector within Michigan make this a truly outstanding research setting," says Dr. Metters. "This is a great home for Lycera and we will continue to look for ways to work with other groups in the public and private sector."

BoroPharm

[BoroPharm, Inc.](#) moved to the NCRC in 2010 as the first onsite public-private partnership tenant. Due to the NCRC's availability of specialized space, BoroPharm was able to remain in Michigan— a win for BoroPharm, the NCRC and the Michigan economy at large. BoroPharm has been successful in utilizing a specialized chemistry building to continue production of chemicals for drug and agricultural companies. In the past year, BoroPharm has continued to thrive at NCRC.

Venture Accelerator Ignites Entrepreneurial Spirit at NCRC and in Surrounding Community

Project gives U-M start-ups opportunity to grow



Kenneth Nisbet (right), executive director of the Office of Tech Transfer, in meeting with colleagues

U-M is among the top institutes for creating new university-based start-ups, and in January 2011 [U-M Tech Transfer](#) launched the Venture Accelerator to further develop its capabilities.

Through its [Venture Center](#), the new Accelerator is enhancing the quality and time to market for promising start-ups emerging from U-M research, leading to job creation and expanding the University's contribution to economic development.

The Accelerator now occupies 16,000 square feet at NCRC. As part of this project, U-M startups have the unique opportunity to sign flexible leases for access to world-class laboratory and office space, along with the entrepreneurial talent, business services and resources from the Venture Center.

"Before the Accelerator, our assistance was limited when we licensed the technology or the company secured space off-campus," said Jim O'Connell, director of U-M's Venture Center. "Now with our co-located Venture Accelerator, we can provide them with the full spectrum of support and be very hands-on and engaged."



Bruce E. Markham, Ph.D., Chief Scientific Officer and Vice President of Research, Phrixus; Stace Kernodle, Research Technician, Phrixus

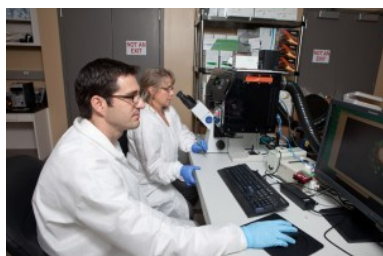
Accelerator companies span the life sciences, clean-tech, software and other technology ventures from the portfolio of emerging U-M start-ups. Tenants are able to take advantage of support to help them refine business models, attract investors, acquire gap funding and connect to talent who would enhance the company's sustainability and long-term prospects. O'Connell says the facilities at NCRC have also

provided a focal point for the entrepreneurial community both inside the University and within the greater Ann Arbor area to network and leverage opportunities to expand upon and develop start-ups.

Some of Tech Transfer's Venture Center key accomplishments in the last year include:

- Reaching planned capacity with 18 new U-M start-ups, a year ahead of plan, with exciting new businesses as 3DBioMatrix, ArborLight and Phrixus
- Being recognized by AnnArbor.com's Business Review, winning the Business Deal of the Year in the research category in 2011 for this productive investment within the former Pfizer space
- Engaging the outside community more actively through the establishment of the Venture Center Council, an advisory body consisting of leaders from the entrepreneurial and venture communities

The Venture Center and its Accelerator has allowed U-M to strategically tap into other entrepreneurial efforts focused on stimulating the Ann Arbor region and economy. Something O'Connell believes is a critical part of this effort.



Brandon McNaughton, Founder and Chief Technology Officer, Life Magnetics; Maureen Carey, Research Associate, Life Magnetics

"We are actively engaging the entrepreneurial community and the rest of the community to play a role inside NCRC to make sure we're not just operating in an ivory tower," he said. "We've had success bringing in and launching companies and we are also playing an active role in the entrepreneurial environment and ecosystem in Ann Arbor."

The hope is that community and public-private partnerships will open even more doors for entrepreneurs.

"With U-M Tech Transfer, the Business Engagement Center and our new start-up Accelerator located at NCRC, we have established a foundation for exploring a wide range of public private partnerships," said Stephen Forrest, VP of Research at U-M.

By all accounts companies housed in the new NCRC space are flourishing.

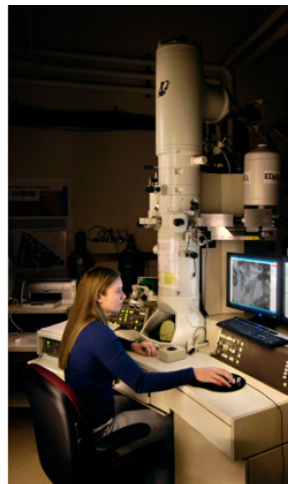
"We can pull together investors and entrepreneurs from all the companies we've supported and all the companies we interact with and the Accelerator provides the central focus to do that, which we could not have done before," said O'Connell.

The Accelerator is part of U-M Tech Transfer. Funding for the project is provided by U-M Tech Transfer, the Office of the Vice President for Research, the Provost, the College of

Engineering, Literature Science and the Arts, the Medical School, and the U-M Health System.

U-M's Electron Microbeam Analysis Laboratory (EMAL) Moving to NCRC

Highly advanced microscopes offer new opportunities for collaboration and equipment sharing.



NCRC will soon become the new home of some of the most advanced microscopy equipment in the State of Michigan. The [Electron Microbeam Analysis Laboratory \(EMAL\)](#), a facility used by scientists across many disciplines to precisely characterize the structure and chemical composition of materials at the nanoscale, is moving to NCRC thanks to a collaborative partnership between U-M's Engineering and Medical schools.

The move places EMAL just around the corner from the Medical School Microscopy Image-analysis Lab, opening new possibilities for researchers at the two facilities to collaborate and share advanced equipment.



Steven L. Kunkel, Ph.D. Senior Associate Dean for Research, U-M Medical School and Endowed Professor in Pathology Research

"The Medical School has had a longstanding relationship with the College of Engineering, and we are excited to partner again with them for the EMAL's move to NCRC," said Steven

L. Kunkel, Ph.D., Senior Associate Dean for Research and Endowed Professor in Pathology Research. “This is another example of how we are able to come together to solve problems and provide resources to both schools, as well as the research community at large.”

EMAL is currently located in the Space Research Building on the U-M North Campus, where it has a user base of more than 600 researchers and is visited by 120 users per week. The facility’s move to NCRC building 22 will enhance the performance of its extremely sensitive, state-of-the-art microscopes, because the new location’s field and vibration characteristics are far superior to those at the current 25-year-old facility.



John Mansfield, Ph. D, Associate Director and Manager of North Campus Electron Microbeam Analysis Laboratory and Associate Research Scientist in Materials Science and Engineering

“The EMAL staff and I are excited by the move to NCRC, the new space promised to provide the much needed space to comfortably house our state of the art equipment in a much improved low vibration and low field environment,” said John Mansfield, who manages the North Campus EMAL.

New Initiatives

Department of Computational Medicine and Bioinformatics

At the very heart of NCRC lies a commitment to foster the development and expansion of innovative, interdisciplinary research programs through its state-of-the-art facilities.

This year, NCRC opened its doors to two important departments – the [Department of Computational Medicine and Bioinformatics](#) (DCM&B) and the [Department of Emergency Medicine Labs](#) (DEML) – helping each build its infrastructure and research capacity.

The move to NCRC is allowing DCM&B researchers and scientists to keep pace with the ever-changing world of medical research and maintain a competitive advantage.



Brian Athey, Ph.D. Professor and Chair for Department of Computational Medicine and Bioinformatics, Associate Director, Michigan Institute of Clinical and Health Research (MICHR) University of Michigan Medical School

“Modern biomedical research is now digital, so having the means to organize and analyze this information both at the individual and population level is critical,” explained Brian D. Athey, PhD, collegiate professor and chair of the new department. “Our charge is to be the institutional leader across the entire spectrum of biomedical informatics disciplines. The interdisciplinary culture that the NCRC exemplifies will no doubt help us get there.”

The new, dedicated space at NCRC not only affords physical proximity to collaborating departments including the DNA Sequencing Lab and the Michigan Institute for Clinical and Health Research, but Athey reports it is also helping to attract top new research faculty and train the next generation of bioinformaticians. He says this location will benefit the entire university and medical school.

Since expanding to NCRC, the department has been successful in:

- Establishing two new labs, including its first-ever wet lab that will be used largely to validate findings from its computerized data analysis
- Forming and helping to spearhead transSMART, an enterprising public-private partnership to develop a data sharing and analytic platform for clinical and translational research in the US and Europe
- Securing new faculty members, post-docs and emerging scholars in the field



Brian Athey, Ph.D. Professor and Chair for Department of Computational Medicine and Bioinformatics, and David Shultis, Ph.D. post-doctoral researcher, with UROP students

Athey also sees unique opportunities to grow the department in the area of translational bioinformatics – that is, applying the department’s expertise in proteomics, genomics, metabolomics and other data and bringing it together with the world of diseases, conditions and health care. An example would be linking laboratory measurements and electronic medical records.

“This could be very powerful in helping us to understand complex diseases and conditions and accelerate research,” said Dr. Athey. “We are making progress, and NCRC is certainly helping us.”

DCM&B’s presence at NCRC and its relationship with the Center for Computational Medicine and Bioinformatics – a campus-wide interdisciplinary academic center – will also enhance other NCRC programs that are in growing need this type of information and expertise.

What is DCM&B’s purpose?

Its main purpose is to create novel informatics and computationally-based methods, tools, and algorithms to extend the capabilities and results of basic and clinical research. content.

Department of Emergency Medicine Lab



John Younger, M.D., M.S. Professor of Emergency Medicine Associate Chair for Research, Department of Emergency Medicine

This year, the [Department of Emergency Medicine](#) was able to expand its footprint and embark on exciting new areas of research, thanks to new dedicated laboratory space at NCRC. The first faculty member to move to NCRC was John Younger, M.D., M.S., the associate chair for research in Emergency Medicine, and member of the Biointerfaces Institute.

In July 2012 Robert W. Neumar, M.D., Ph.D., a renowned expert in brain damage after cardiac arrest and head trauma, was appointed chair of the University of Michigan Medical School’s Department of Emergency Medicine.

“It really was a matter of all of the pieces being ready to fall into place at exactly the right time,” adds Younger. Drs. Younger and Neumar talked about the need to expand the program just last year and by 2012, they say the move to NCRC has made the basic and translation laboratories in Emergency Medicine at Michigan the largest and most established in the country.

Neumar comes to U-M from the University of Pennsylvania Perelman School of Medicine, where he was an associate professor of emergency medicine and associate director of the Center for Resuscitation Science. Along with maintaining an active clinical practice at the Hospital of the University of Pennsylvania, Neumar conducted extensive research focused on understanding the mechanisms of brain injury, and developing therapies to minimize brain damage and improve the brain’s ability to recover after cardiac arrest and traumatic brain injury.

Robert W. Neumar, M.D., Ph.D. Professor and Chair of Department of Emergency Medicine

Following his appointment, Neumar moved his lab to NCRC, and also recruited an additional scientist and his team — Kevin Ward, M.D., the current director of the Virginia Commonwealth University Reanimation Engineering Science Center. Ward’s research is focused hemorrhagic shock and combat casualty care with an emphasis on developing innovative technologies for the diagnosis, monitoring, and treatment of critically ill patients.

Together, the Emergency Medicine researchers based at NCRC expect to study the biology of critical injury and illness, including causes, diagnoses and treatment. The labs will serve as a scientific home and platform for basic scientists, clinical investigators, inventors, and entrepreneurs across the university interested in the care of patients with life-threatening acute illness and injury. Research will take new ideas in the basic sciences – whether biological, physical, or theoretical – and carry them to clinical application in the treatment of critical illness and injury. In particular, the space gives basic scientists, clinical investigators, inventors, and entrepreneurs across the university a scientific home to support pioneering research into acute illness and injury—its causes, diagnosis and treatment. These are injuries and illnesses for which rapid detection, decision making, and treatment are necessary. Some examples include traumatic injury and sudden cardiac death, as well as in-hospital acute problems such as sepsis, hospital-acquired infections and acute organ failure.

The program — which has already captured national attention — is also benefiting from close proximity to the [Center for Arrhythmia Research](#), the [Jobst Laboratory](#), and the [Biointerfaces Program](#), giving access to world-class expertise in heart disease, vascular disease and state-of-the-art materials science.

Kevin Ward, M.D. Professor, Department of Emergency Medicine

Younger says there are very few centers that can effectively quilt together the many research activities needed to advance new ideas in the basic sciences — biological, physical, or theoretical— into clinical application. “The NCRC’s approach to biomedical research and development with an eye towards

translation and technology development is something we wanted to be a part of and contribute to,” he said.

An important task over the next six months is to broaden the participation and leadership in this area by involving experts both in other schools and colleges within the University and being recruited to Michigan from elsewhere.

UMTRI Expands to NCRC to Fulfill Multi-Million Project with U.S. Department of Transportation (UMTRI)

Project aims to reduce motor vehicle accidents by getting vehicle to “talk” to one another



The [University of Michigan Transportation Research Institute \(UMTRI\)](#) is occupying space at NCRC as part of a multi-million dollar grant award.

Funded by the United States Department of Transportation (U.S. DOT), the Safety Pilot Model Deployment aims to determine the real-world effectiveness of wireless, connected vehicle safety applications to reduce crashes, and will measure how drivers respond to these technologies while operating a vehicle.

As part of this effort, the UMTRI-led team will equip 2,800 cars, trucks and buses with wireless technology similar to wi-fi to allow these vehicles to “talk” to one another and ultimately alert drivers to potential dangers on the road. The hope is that early in-vehicle warnings of dangerous traffic situations – for example, a car stopping short or a car careening around a blind corner – will help avert accidents.

All told, motor vehicle accidents kill more than 34,000 people in the U.S. each year; they are the leading cause of death in those under 35 years of age.

The designated space at NCRC allows UMTRI to expand its capacity. It will be specifically for use with their collaborators, and allows researchers to maintain a separation between this project and other UMTRI research. The space at NCRC will be used to work on instrumented vehicles and collect data that the U.S. DOT will use to make future research

and regulatory decisions about the deployment of connected vehicle technology.

“The loading dock area at NCRC is ideal for this type of work because we can drive the vehicles right into the bay, and it is conveniently located directly across the street from UMTRI,” said Jim Sayer, Ph.D, the Principal Investigator on the grant. “The NCRC allowed us to expand UMTRI to support this project right here in our neighborhood.”



Community

Our Community

A vibrant and thriving community continues to grow at NCRC



In just three short years, NCRC has created a vibrant community, enriching the lives of its workers, collaborators and visitors. NCRC is about people and, by creating such a collegial and engaging environment, its leaders say anything is possible.

That's why NCRC is committed to improving the quality of life on campus.

Among the many programs and services offered, the visual and performing arts, community newsletters, wellness events and fitness, childcare, dining and library services all help support a balanced life for employees in the community.

Collaborate!@NCRC lunches

During the last year, the number of lab-based faculty at NCRC increased on a monthly basis, and eventually reached a point where it was felt that it would be productive to have regular meetings with the entire faculty based at NCRC to seek their feedback on the research environment at NCRC. This was also a good moment to ensure that faculty members know each other and about each other's research. This is part of the mandate to actively enhance collaboration, in the spirit of the concept of Collaborate!@NCRC. Eight such meetings have taken place so far.

The campus spreads across more than 170 acres. Twenty-seven buildings with more than two million square feet of state-of-the art labs, offices, collaborative space and equipment dot a landscape of native plants and abundant wildlife.

Art Program



The NCRC art program brings both visual and performing arts to the NCRC community, the greater U-M community and the general public. These programs feature exhibitions by visiting and U-M artists who create on-site works of art and cultural discussions and meet-and-greets.

The art program is intended to be dynamic and thought-provoking, spanning such topics as the living arts, science, social commentary and technology.

Recent exhibits include:

Looking Both Ways, a contemporary Chinese, Taiwanese and American art exhibition presented in collaboration with Eastern Michigan University.

Emmelene Landon: Observations, a selection of paintings that were the culmination of an artist-in-residency at the Parke-Davis laboratories in Fresnes France. Visiting from Paris, Landon offered a gallery talk at NCRC and worked with graduate students at the School of Art and Design.

James Payne: Columns, the first Emerging Art exhibition, which included seven innovative woodcut prints from the artist's M.F.A. exhibition at Cranbrook.

Curtis Rhodes – Yaddo Series: Eccentric Flints, a selection of work created during a residency at the prestigious art community Yaddo. These large format paintings on paper offer a modernist interpretation of ancient Mayan eccentric flints.

David Landau: Interconnected, recent colorful and lively paintings inspired by neuron connections, energy, life sciences and spirituality.

Re-Synthesis, a group exhibit of paintings, quilts, drawings and more by recent graduating seniors from the School of Art and Design.

Recent art program exhibits \U Y]bW XX

Curtis Rhodes, Yaddo Series: Eccentric Flint 1

David Landau, Competing in the Void

David Landau, Hearth

David Landau, Enraged Medulla

Curtis Rhodes, Yaddo Series: Eccentric Flint 4

Curtis Rhodes, Yaddo Series: Eccentric Flint 3

Curtis Rhodes, Yaddo Series: Eccentric Flint, detail

Christopher Gryder, Pfizer Commission

Robert Reed, Tree For Mine, Park Her Gray

Robert Reed Tree For Mine, Maggie Walk Her

food vending machines. Currently free coffee is being offered in Building 26 and the Central Service Center in Building 18.

NCRC is excited to announce that [Opus One](#) has been awarded a University of Michigan contract to operate a cafeteria and catering services at NCRC. With nearly 1,600 people — including U-M scientists, staff and students, and employees of 21 small private companies currently working at NCRC, and hundreds more to move there over coming years, a more robust dining option was imperative.



Opus One offers a range of food service options at NCRC

Opus One opened in NCRC building 520 on Monday, September 17, 2012. Food service consists of Opus One Signature sandwiches, soups, prepared entrées, salads, side dishes, chips, hot and cold beverages, cookies, and brownies ([Click Here for Menu](#)). Throughout the months of September and October, service will continue to expand to include items such as specialty coffees, smoothies, ice cream, juices and sundries. The full service cafeteria located in building 18 is scheduled to open in November, after the Patient Food and Nutrition Services team moves back to their newly renovated kitchen in the University Hospital.

Opus One has a green initiative and will be using eco-friendly disposable dishes, cutlery and beverage containers, and will accept both credit and debit cards as well as cash.

Amenities

Amenities Support Healthy Work-Life Balance and bring Vibrancy to NCRC

In just three short years, NCRC has created a vibrant community, enriching the lives of its workers, collaborators and visitors. NCRC is about people and, by creating such a collegial and engaging environment, its leaders say anything is possible.

“Without the individuals who bring ideas, creativity, drive and experience to the NCRC community every day, the goals for partnerships and translational research would be impossible to meet,” said David Canter, the executive director of NCRC.

That’s why NCRC is committed to improving the quality of life on campus.

[needed: Quote about why this is so important to NCRC’s vision and/or reports from workers who say they are more productive, can be part of something bigger, etc.]

Among the many programs and services offered, the visual and performing arts, community newsletters, wellness events and fitness, childcare, dining and library services all help support a balanced life for employees in the community.

Dining

Through the past year, NCRC was home to Java City, a coffee shop providing breakfast and lunch daily. NCRC community members also have access to a variety of snack, drink and fresh

Childcare

NCRC is fortunate to have one of the University of Michigan’s childcare centers conveniently located on its site, making life a little easier for working parents.

The North Campus Children’s Center (NCCC), which opened its doors in July 2011, caters to children ages 3 months to 5 years, year-round, with up to 12 hours per day of care and early childhood education. This service – offered to children of faculty, staff, students and community members – is the result of the merger of two long-standing U-M programs known for their excellence in providing high-quality early childhood education. The center also offers a school-aged summer camp program.

NCRC Mothers’ Room

NCRC has four private lactation rooms to support new moms who want to continue to breastfeed while working. The rooms are equipped with sinks, power outlets, comfy chairs and Wi-Fi.

NCRC Wellness Center

NCRC promotes health and wellness through its Wellness Center in the basement level of Building 16.

MHealthy exercise and relaxation classes help U-M faculty, staff, students and the general public get moving, get fit and relieve stress. A sampling of classes includes body sculpting, cardiovascular sculpting, yoga, Nordic walking, dance fitness and more.



An MHealthy yoga class at NCRC

Other MHealthy programs offer support for

- Nutrition
- Weight management
- Ergonomics awareness
- Tobacco cessation
- Mental and emotional health

Periodic on-site StayWell® Wellness Screenings help employees keep track of important numbers, including their blood pressure, cholesterol, weight and height. Health professionals review and provide individualized recommendations if there are any areas of concern.



University of Michigan bus service makes NCRC accessible to the rest of campus

Parking and Transportation

The last year has seen increased connectivity between the NCRC and the rest of U-M. Between the university buses and the city of Ann Arbor AATA buses, NCRC community members have convenient to the central campus, the university's medical school and hospitals, and downtown Ann Arbor. FleetShare cars are available for any U-M affiliated NCRC community member to borrow for trips around campus. There is also ample parking that includes all levels of U-M parking, as well as paid visitor parking. There is a Park & Ride Lot within one mile of the facility.



Tina Bowen, Facilities Project Leader at NCRC bikes to work regularly

Several NCRC community members use alternative modes of transportation, such as bikes. Bike racks are conveniently located all over NCRC for those who work here.

Quality of Life Survey

In 2012, NCRC continued its annual Quality of Life Survey to gauge employee opinions and feedback about life on campus. This survey is part of NCRC's ongoing commitment to invest in and support a happy and healthy workforce.

Quality of Life Survey - Comparison with Year Ago (2011)

Area of Focus	Respondents Satisfied* 2012	Respondents Satisfied* 2011
Overall Satisfaction	76%	65%
Building Access and Security	77%	63%
Services and Infrastructure	74%	67%
Parking and Transportation	73%	66%
Collaboration	44%	34%
Fitness	50%	57%
Food	16%	15%

* Satisfied is defined as: *satisfied* and *very satisfied* on the 6-point scale of the survey.

Quality of Life Survey

We are happy to note that we have improved the quality of work life in almost all the areas overall. A more detailed report can be found [here](#).

“The survey is critical to our ability to make improvements that will positively impact the work environment at NCRC,” (quote here about strength of NCRC being its people and need to create sustainable programs that make them want to stay?)

Enabling Research

Faculty Lunch Gatherings

During the last year, the number of lab-based faculty at NCRC increased on a monthly basis, and eventually reached a point where it was felt that it would be productive to have regular meetings with the entire faculty based at NCRC to seek their feedback on the research environment at NCRC. This was also a good moment to ensure that faculty members know each other and about each other's research. This is part of the mandate to actively enhance collaboration, in the spirit of the concept of Collaborate!@NCRC. Eight such meetings have taken place so far.

Library Services

MLibrary@NCRC opened at NCRC this year. Spearheaded by the Taubman Health Sciences Library, the mission of

MLibrary@NCRC is to provide innovative library services to meet the unique information needs of interdisciplinary and translational researchers, including academic and industry partners, and to support the strategic growth of NCRC and the university.



MLibrary@NCRC Librarians (from left to right)
Jean Song, Judy Smith, Marisa Conte, Marci Brandenburg

MLibrary@NCRC established a location where individuals and groups can gather to learn, collaborate, share information or conduct research on topics of interest, from small molecule science to clinical and health services research to broad market-based analyses. The facility is equipped with computer terminals and access to many of MLibrary's electronic resources, in accordance with license agreements. Research services include, but are not limited to, expert searching, small-group instruction, consultations, and resource services, including facilitating cost-sharing for information resources or identifying data analysis tools.

Jane Blumenthal, Director of the Taubman Health Sciences Library, says, "Meeting the information needs of NCRC's varied population requires a multifaceted approach. MLibrary@NCRC will pursue customized, innovative, and previously unimagined library and information models in collaboration with researchers and other NCRC colleagues. Our presence at NCRC will enable librarians to better to understand users' information needs, and integrate quality information and services into their environment."

Snapshot

GSF 2,207,643 (Building Gross Square Feet) GSF is the entire footprint of the building, to the outside walls.					1
161,000 SF walls and columns	704,000 SF "Non-assignable"	NASF 1,342,000 (Building Net Assignable Square Feet) Excludes: restrooms, mechanical space, and some corridors.			2
NASF 367,000 NCRC service buildings (Chiller, Power Plant) plus Childcare		NASF 975,000 Office & Laboratory Bldgs. NASF of all NCRC office and laboratory buildings. NRI NASF 532,164 (Non-Resource Intensive Space) RI NASF 440,676 (Resource Intensive Space)			3
Inactivated NASF 387,000		Activated NASF 588,000			4
Buildings 25, 28, 30, 35, 50 and 60	Near Term Buildings 20E, 22, 36	Available NASF 138,000	Committed NASF 137,000	Occupied NASF 313,000	5

Gray boxes on this sheet show excluded space.

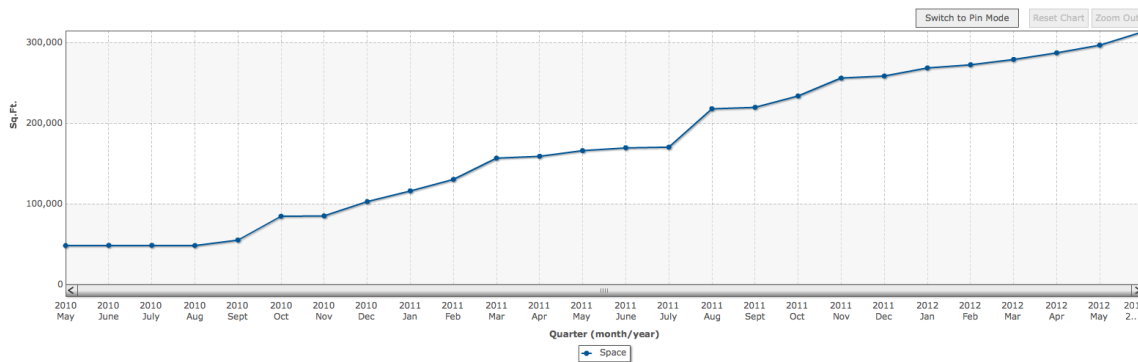
Current Planning and Occupancy

NCRC Current State Space Utilization

This chart is a look at where we are today in terms of usage of space, showing the inclusions, exclusions and commitments. Starting with 2.2 million sq ft of gross sq ft (1), the net assignable sq ft (NASF) is approximately 1.3 million (2). Excluding the 90,000 NASF GMP facility, the NASF for office and lab buildings is approximately 970,000 sq ft (3). Out of this, approximately 580,000 sq ft of space has been activated for offices and labs (4). Out of the activated space, approximately 300,000 sq ft has been occupied, and 130,000 sq ft committed, leaving about 139,000 sq ft as available for future occupancy (5). 53% of the current capacity is now occupied. Another 23% of the current capacity is committed for future occupancy.

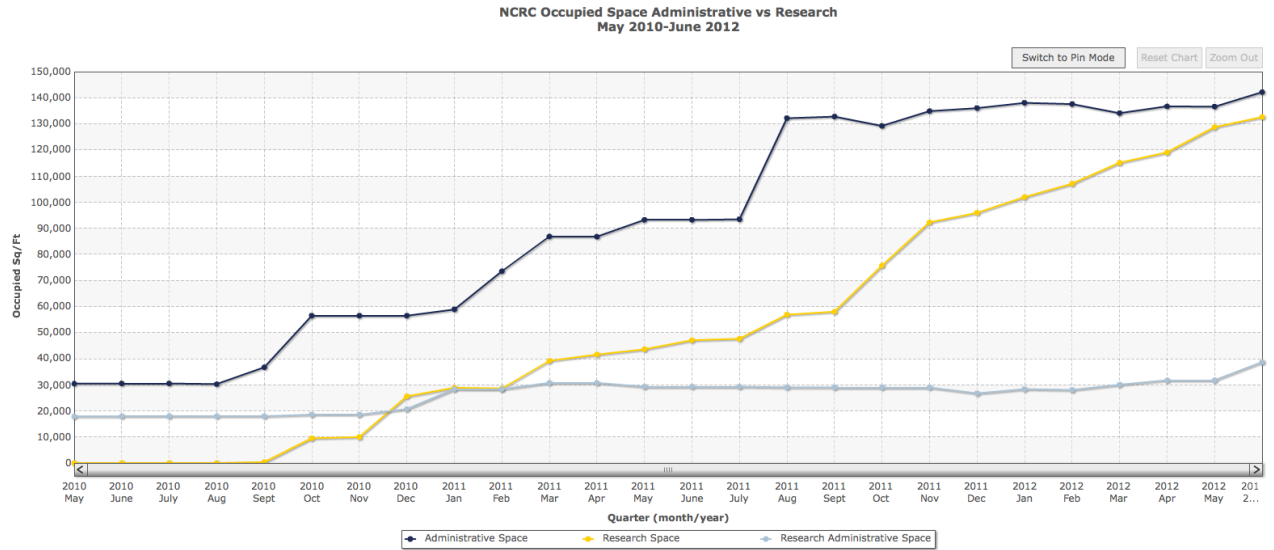
NCRC Total Occupancy
Space and Number of People at NCRC
May 2010-June 2012

Occupancy Facts as of 6/30/2012:
Current Capacity (active space): 588,000 Sq/Ft
Occupied Space: 313,000 Sq/Ft
Committed Space (future occupancy): 137,000 Sq/Ft
Current Availability: 138,000 Sq/Ft



NCRC Total Occupancy Space and Number of People at NCRC

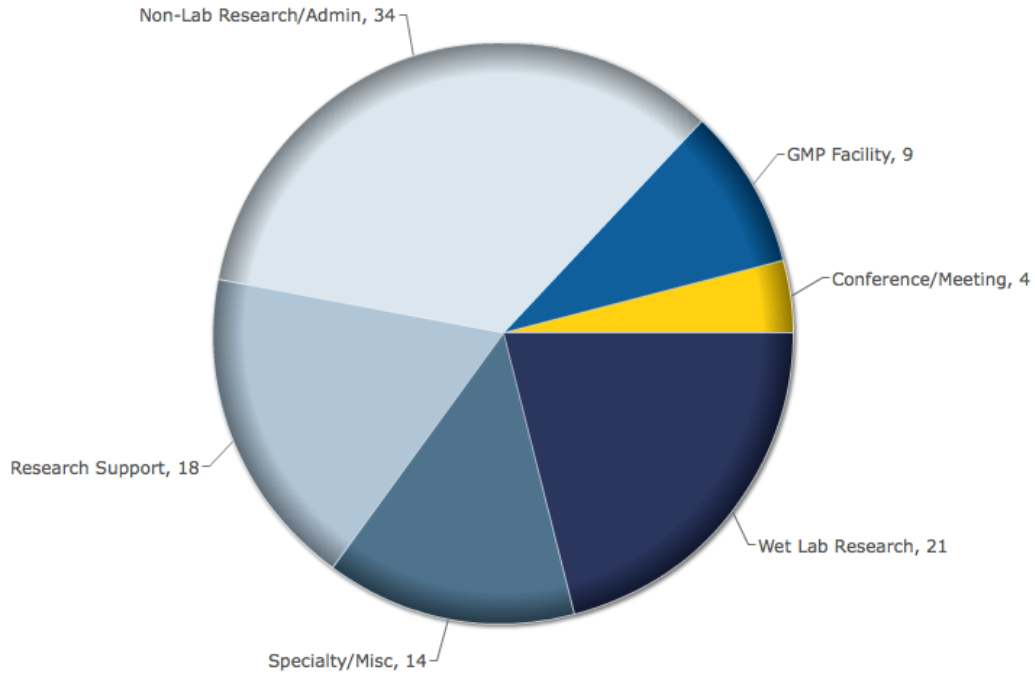
The NCRC Total Occupancy chart shows the growth of occupied space over time as compared to the current capacity of activated space (588,000 sq ft).



NCRC Occupied Space Administrative vs Research

This chart shows the breakdown of the growth of occupied space by Administrative, Research and Research Administrative categories. In the last year, with the establishment of several research programs and labs, the Research category has seen steep growth.

**Space Allocation at NCRC
June 2012
(1.05 million Net Assignable Square Feet*)
Distribution Percentages**

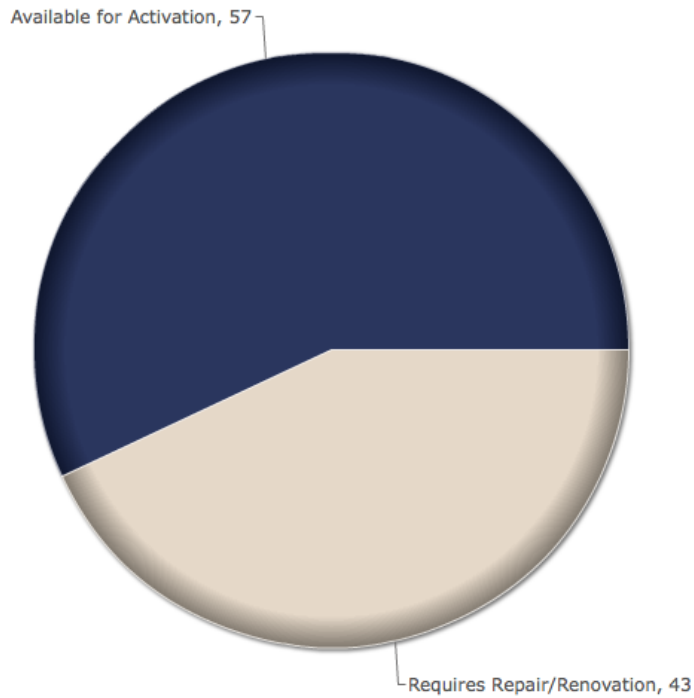


*includes the on-site GMP facility

Space Allocation at NCRC

This chart shows the allocation of the net assignable sq ft of office and lab buildings as of June 2012. Including the GMP facility, this space is approximately 1.05 million NASF. Wet research and research support space account for 39% of the total space, followed by non-lab research/admin space at 34%.

Total Wet Lab Research Space at NCRC*
June 2012
(220,000 Net Assignable Square Feet)
Distribution Percentages

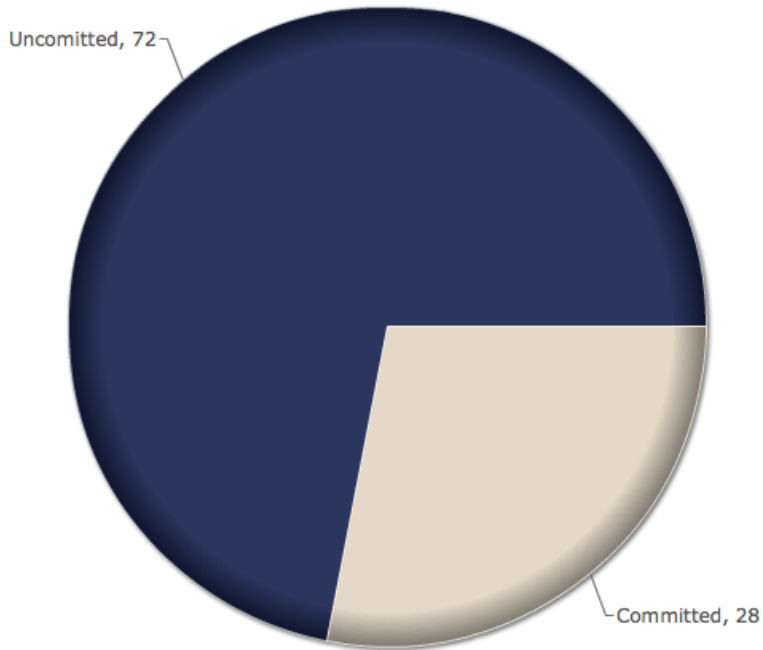


*excludes research support space

Total Wet Lab Research Space at NCRC

Excluding research support space, the space available for wet lab research is approximately 220,000 ft. 43% of this space requires renovation, leaving 57% available for activation.

Wet Lab Research Available for Activation at NCRC*
June 2012
(125,000 Net Assignable Square Feet)
Distribution Percentages

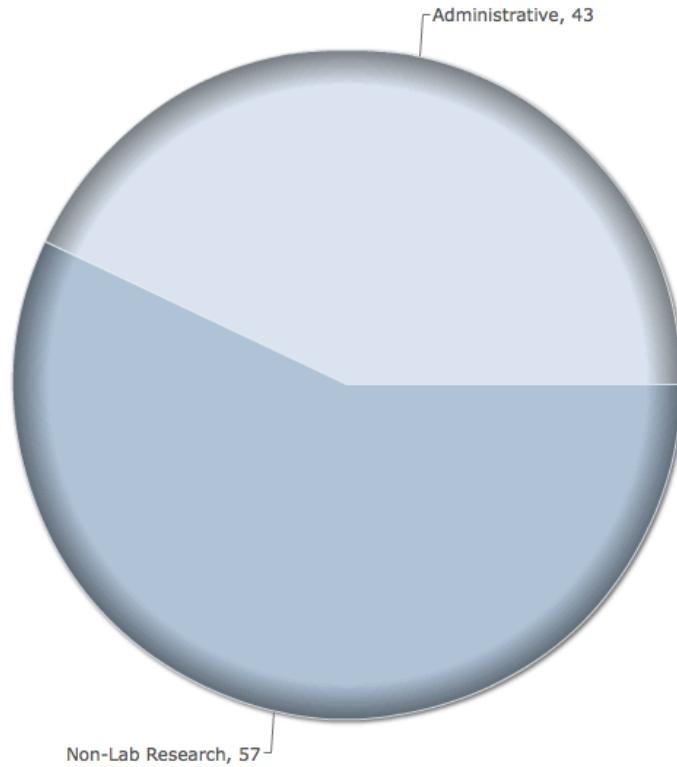


*excludes research support space

Wet Lab Research Space
Available for Activation at NCRC

Excluding research support space, wet lab research space available for activation is approximately 125,000 sq ft. 72% of this space has been committed and 28% is available for future planning.

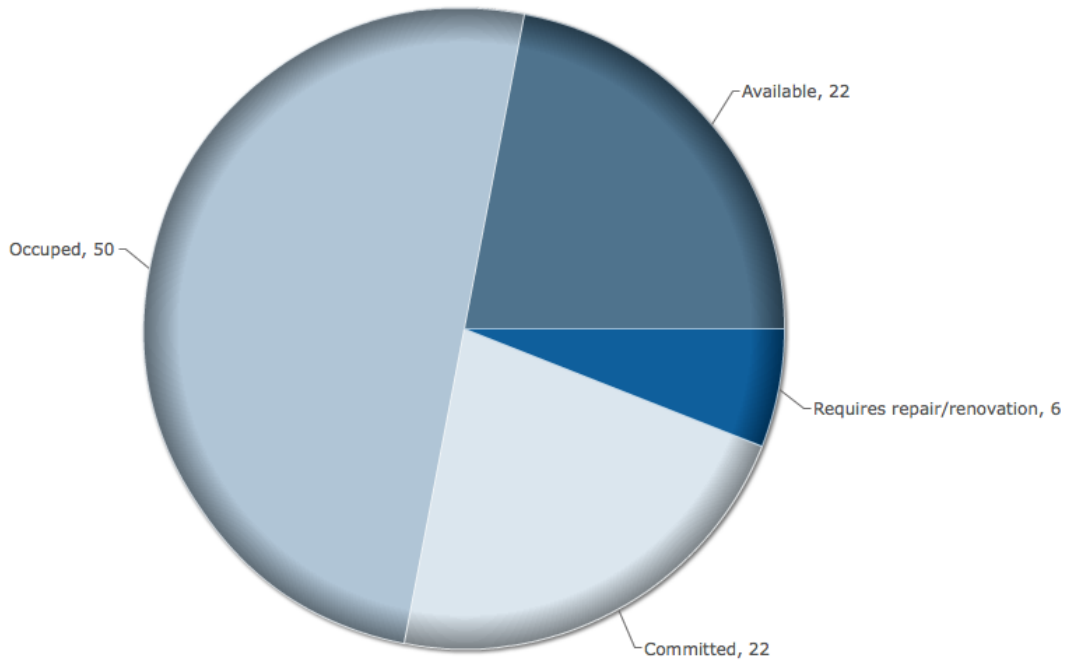
**Non-Lab Research/Administrative Space Allocation at NCRC
June 2012
(360,000 Net Assignable Square Feet)
Distribution Percentages**



Non-Lab Research/Administrative Space Allocation at NCRC

Of the approximately 360,000 sq ft of space available for non-lab based research and administrative functions, the majority (57%) space is for non-lab research and 43% for administrative uses.

**Administrative Space Allocation at NCRC
June 2012
(160,000 Net Assignable Square Feet)
Distribution Percentages**



Administrative Space Allocation at NCRC

Half of the available administrative space at NCRC has already been occupied, 22% committed, 6% requires repairs and renovation, leaving another 22% as available for future occupancy.

Occupancy, People, Jobs and Events

NCRC Key Facts

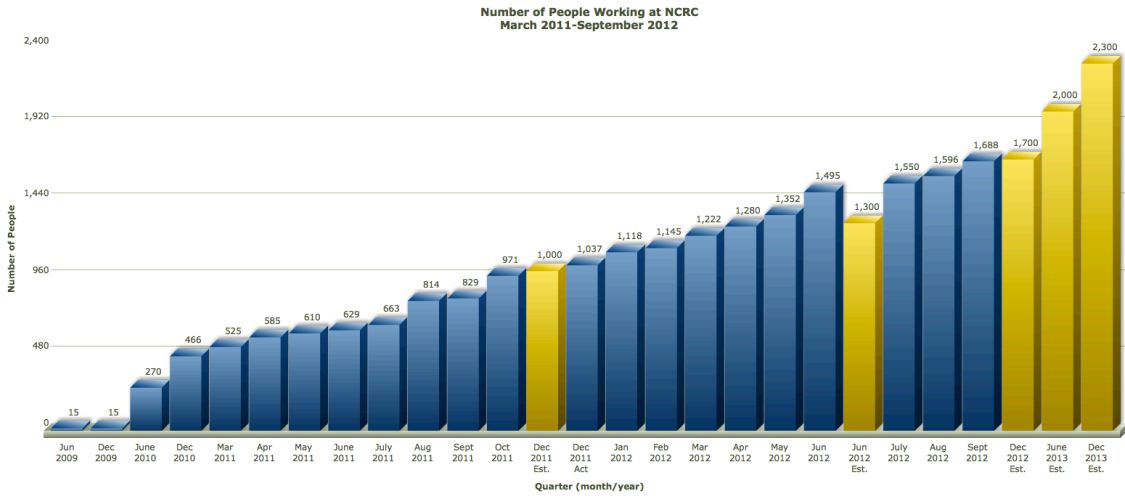
Growth
<ul style="list-style-type: none"> • 1,649 people work at NCRC as of September 2012 • Over 300 new jobs created at NCRC* • 45 people now work in start-up companies in the Venture Accelerator • 7 research programs: Cardiovascular, Translational Oncology, Biointerfaces, Computational Medicine and Bioinformatics, Emergency Medicine, Distributed Health, IHPI • 148 faculty members • U-M Student interactions: internships and School of Information graduate student projects
Mix
<ul style="list-style-type: none"> • 7 research programs • 8 scientific research core services • 10 U-M Schools • 4 Institutes: IHPI, Energy, UMTRI and ISR (research project) • 19 start-up companies in the Venture Accelerator • 2 private companies: BoroPham and Lycera • 1 public partnership: Ann Arbor Department of Veterans Affairs (VA)
Stewardship
<ul style="list-style-type: none"> • \$108M to acquire in 2009 • \$28M total capital expenses FY2010-12 • \$40M operating expenses FY2010-12 • Operating expenses 15% less than budget in FY10-12
New Community
<ul style="list-style-type: none"> • 259 total U-M events since 2010 • Event attendees: <ul style="list-style-type: none"> ○ 14,500 in 2010 ○ 15,500 in 2011 ○ 17,000 in 2012 • 60 U-M Health System events since July 2011 • 3 regular U-M and city bus service connections • Satisfaction with quality of work life among NCRC community members up from 65% in 2011 to 75% in 2012 • NCRC Art Program: 6 art exhibits FY12 • Benefit to city from NCRC presence: Construction of Plymouth Road Plaza, a two-story, 21,000-square-foot commercial and office building. Starbucks, Little Caesars Pizza, Dearborn Financial Credit Union and La Vita Body Spa have already signed leases for the first-floor of the building.

**Estimated based on annual survey conducted in 2011 and 2012, asking units to indicate new hires directly related to growth space NCRC provided.*

A look at some key facts about NCRC provides a picture of vibrant growth. With over 1,600 people working on the site as of September 2012, a significant number to note is the number of new jobs created. Since the first groups that moved here in March 2009, over 320 new jobs have been created at NCRC. This translates to the fact that one in every five jobs at NCRC is new.

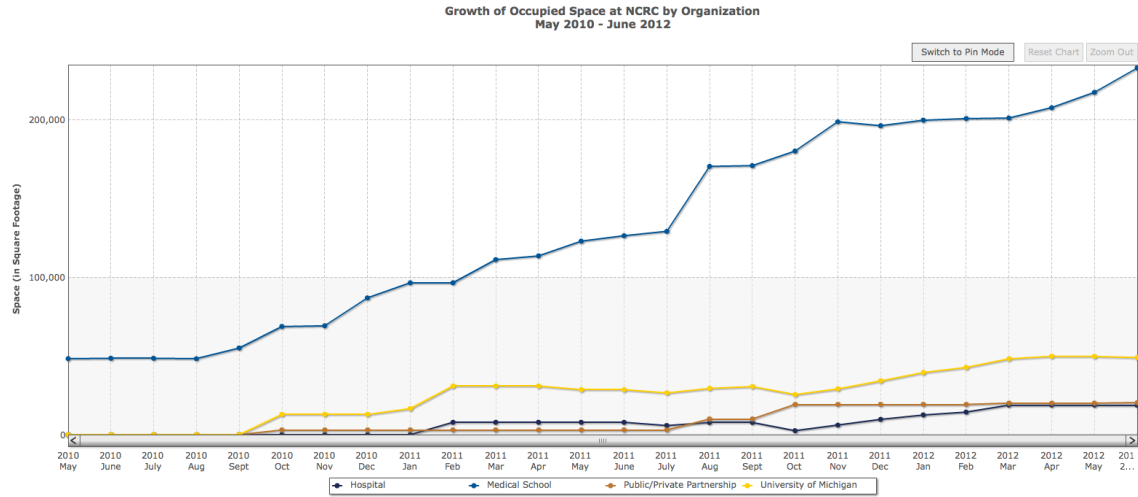
Research growth at NCRC has been significant, with seven well-established, interdisciplinary research programs and eight scientific core services, 148 faculty members and several other researchers, doctoral and post-doctoral students and technicians, the promise of cutting edge research is becoming a reality. Partnerships with private industry has been established and is growing, with two private companies on site and nineteen companies in the Venture Accelerator.

NCRC is now a thriving community with a large number of events taking place on its site, attracting thousands of attendees in the last few years. Dining options have grown, exercise classes are offered regularly and an exciting art program brings cutting-edge art at the intersection of science and art to this campus. With regular and frequent bus connections with the rest of U-M campus, the newest addition to North Campus is now well integrated and connected to the University of Michigan.



Number of People Working at NCRC

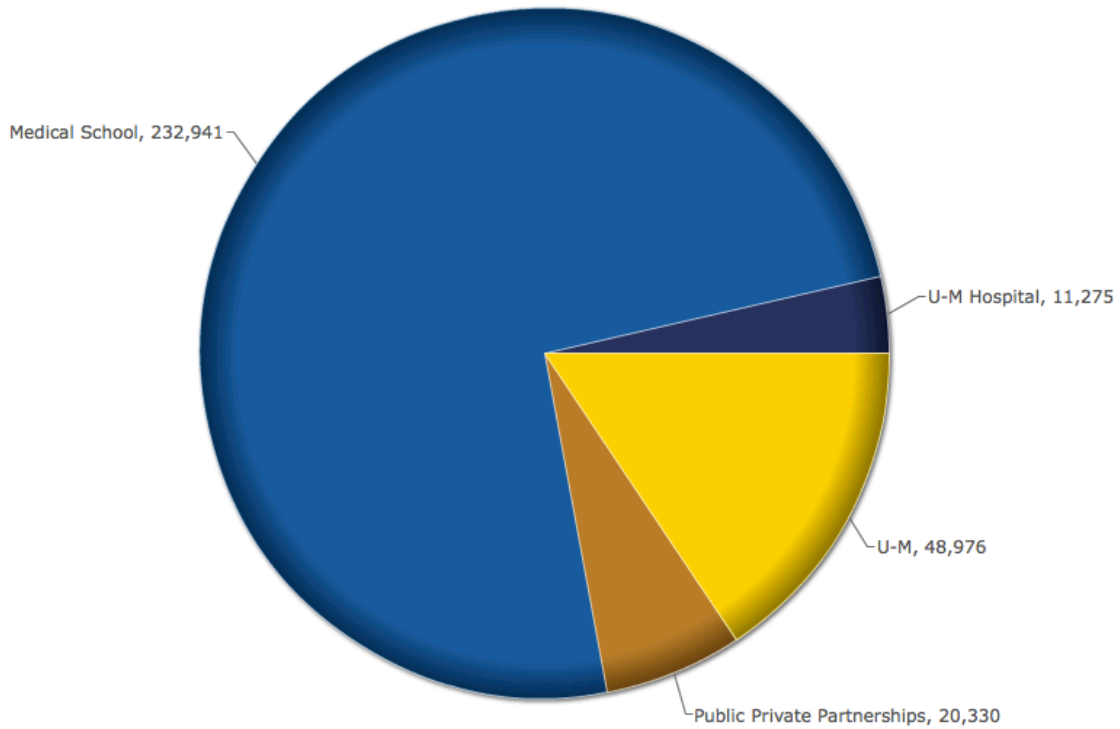
The growth in occupancy or the number of people that work at NCRC has grown rapidly since the first move-ins in March 2009. The actual occupancy numbers have more than kept pace with the estimated numbers.



Growth of Occupied Space at NCRC by Organization

This chart shows the growth in occupied space at NCRC over time, broken into four main categories of U-M Medical School, U-M, public private partnerships and U-M Hospital. The medical school has seen the highest rate of growth.

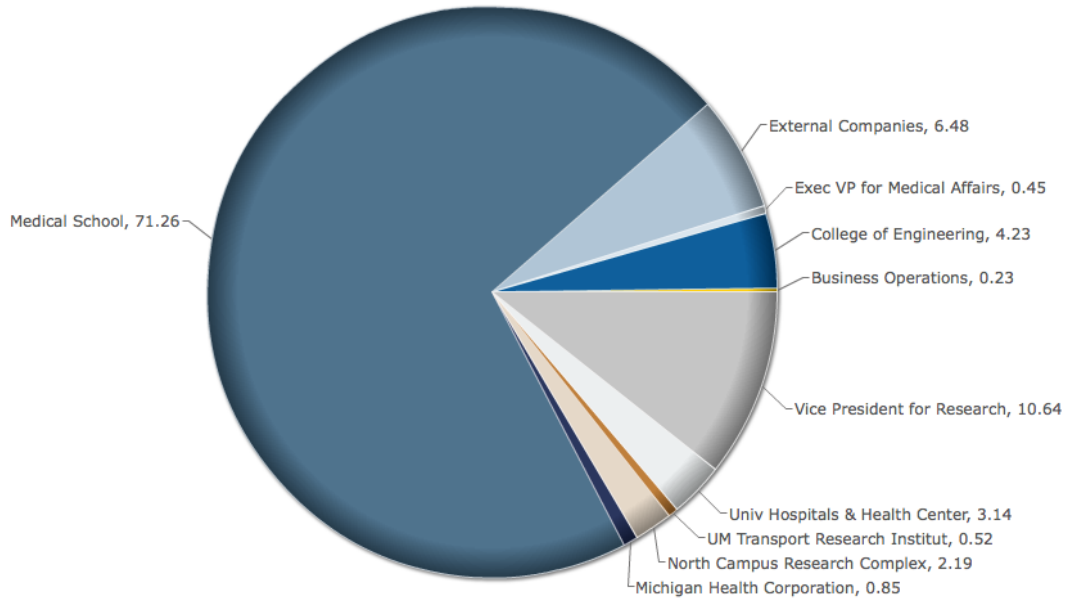
**Occupied Space at NCRC by Major Organization Type
June 2012
Space in Square Feet**



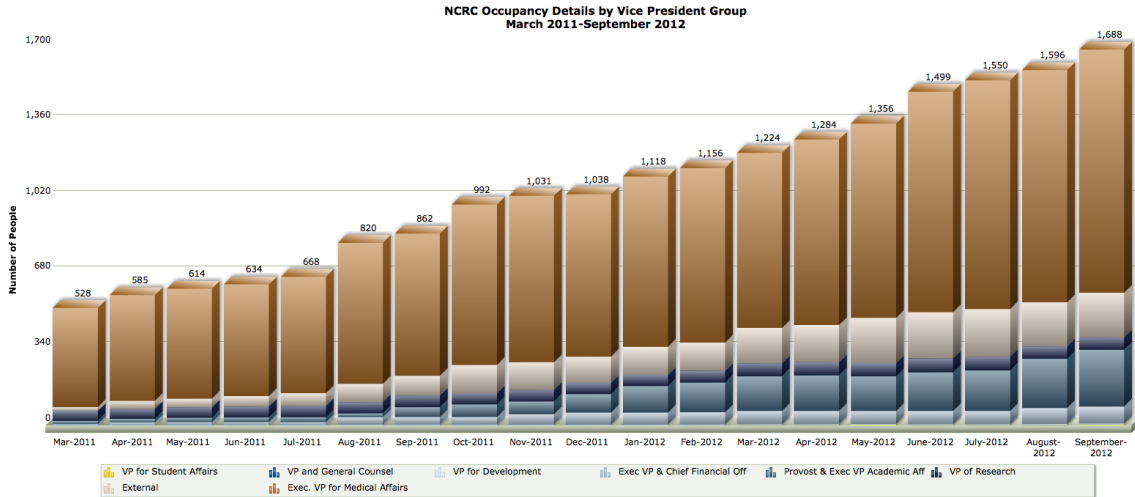
Occupied Space at NCRC by Major Organization Type

U-M Medical School occupies the largest percentage of space at NCRC at 74%. This is followed by several schools and departments of U-M, combined at 16%. Ten U-M schools and departments are currently represented at NCRC. U-M Hospital (4%, meal preparation facility) and public private partnerships (6%) are the other space users at NCRC.

**Allocation of Occupied Space
Distribution Detail by Organization
June 2012
(313,522 Net Assignable Square Feet)
Distribution Percentages**



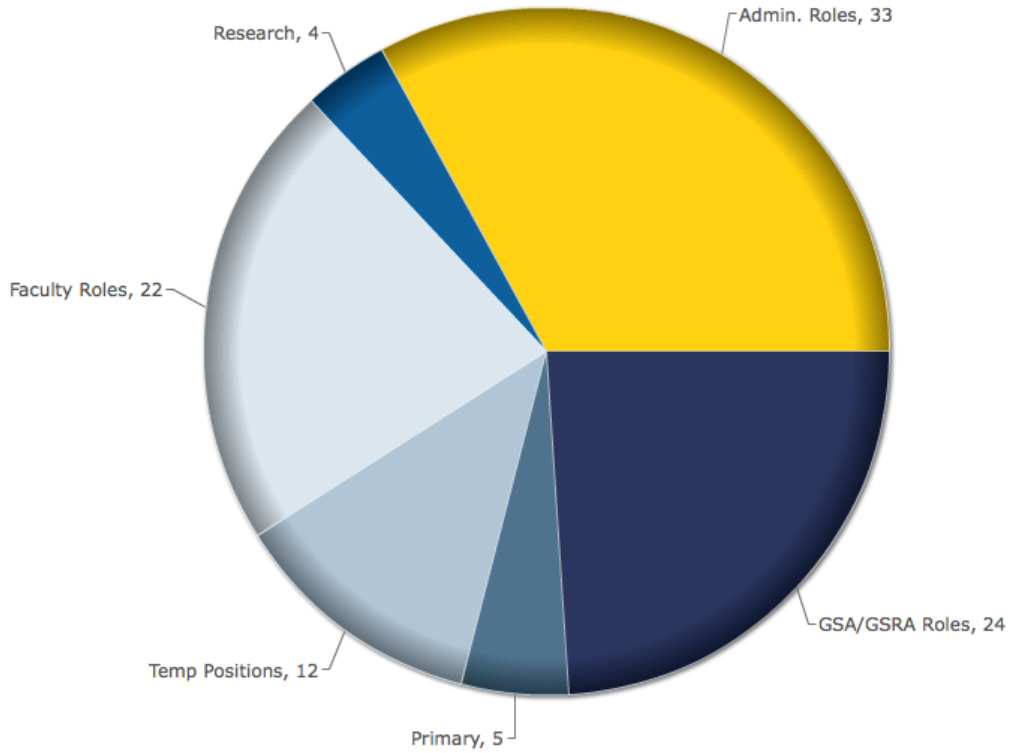
Allocation of Occupied Space- Distribution Detail by Organization
 This chart provides a more detailed look at the distribution of occupied space between various units. U-M Medical School is the largest space user. The combined U-M category is broken into its component units in this view.



NCRC Occupancy Details by Vice President Group

This chart shows the growth in occupancy at NCRC, broken down by U-M VP groups. As can be expected, given the nature of the scientific space, the executive VP for medical affairs has the largest representation.

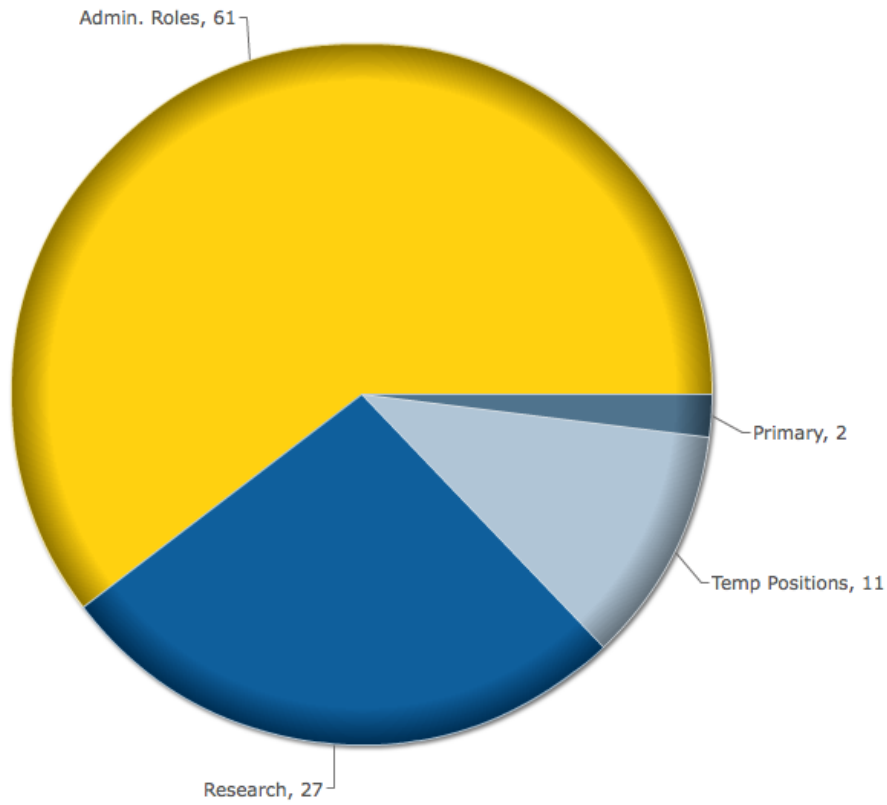
**NCRC Occupancy Details
Role Distribution as of September 2012
Provost Positions
Distribution Percentages**



**NCRC Occupancy Details
Role Distribution as of September 2012
Provost Positions**

This chart shows the distribution of U-M Provost roles at NCRC.

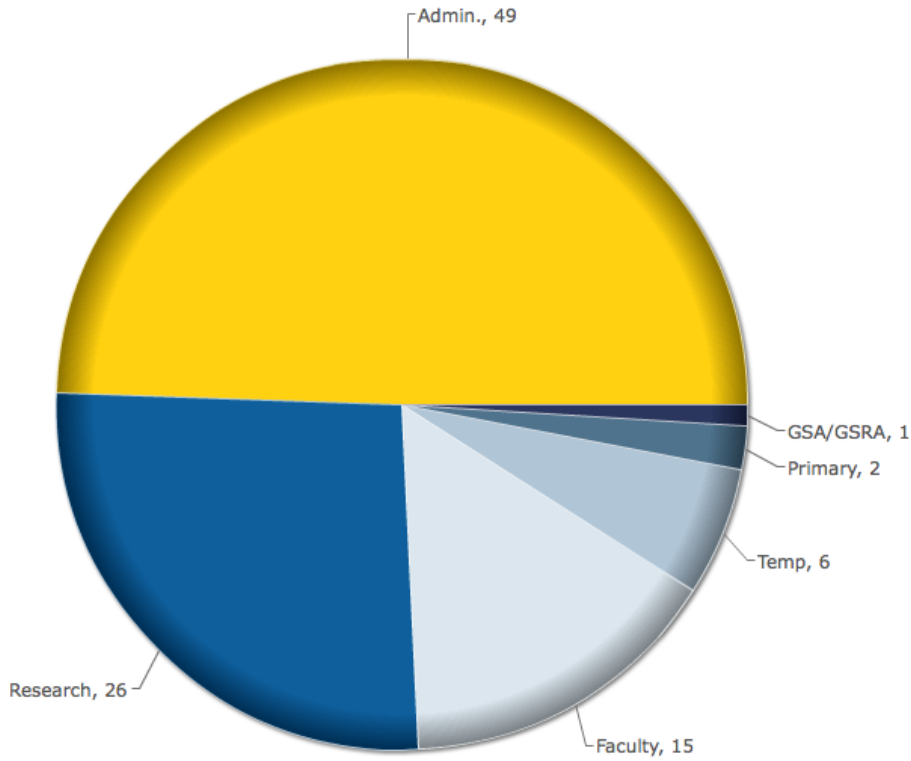
**NCRC Occupancy Details
Role Distribution as of September 2012
Vice President of Research Positions
Distribution Percentages**



**NCRC Occupancy Details
Role Distribution as of September 2012
Vice President of Research Positions**

This chart shows the distribution of U-M Vice President of Research roles at NCRC.

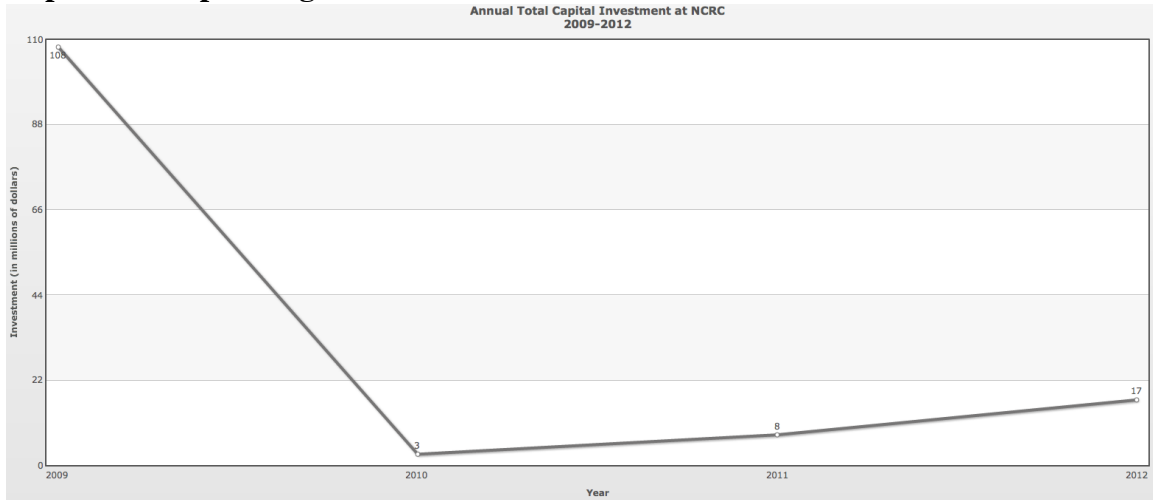
**NCRC Occupancy Details
Role Distribution as of September 2012
Executive Vice President for Medical Affairs (EVP MA)
Distribution Percentages**



**NCRC Occupancy Details
Role Distribution as of September 2012
Executive Vice President for Medical Affairs Positions**

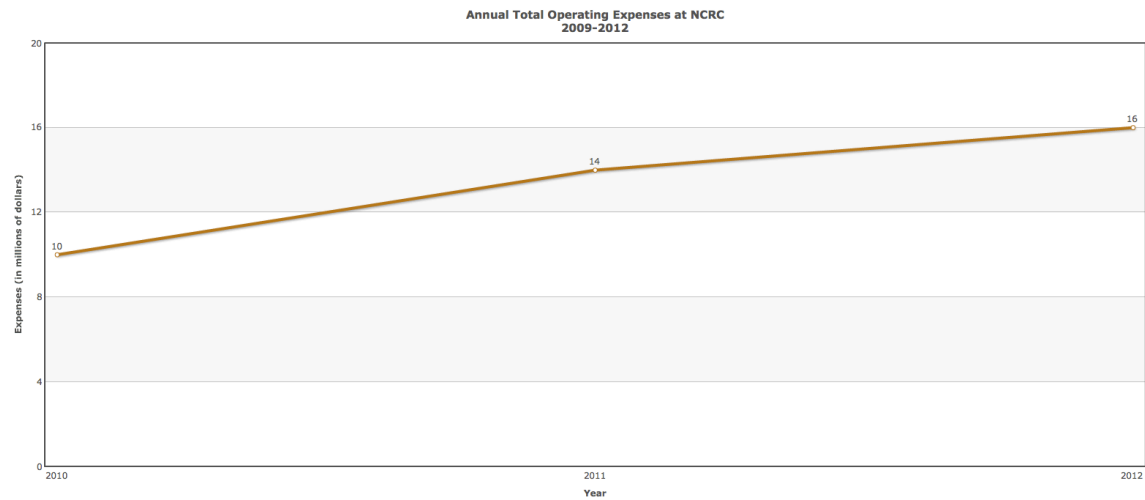
This chart shows the distribution of Executive Vice President for Medical Affairs roles at NCRC.

Capital and Operating Costs



Annual Total Capital Investment at NCRC

After the initial capital expenditure for the purchase, capital expenditure at NCRC has been less than projected



Annual Total Operating Expenses at NCRC

Operating expenses at NCRC have run at 10-15% less than projected.

Regents of the University

Julia Donovan Darlow, Ann Arbor

Laurence B. Deitch, Bingham Farms

Denise Ilitch, Bingham Farms

Olivia P. Maynard, Goodrich

Andrea Fischer Newman, Ann Arbor

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