May 2013

This month, we are excited to welcome the Michigan Center for Integrative Research in Critical Care or M-CIRCC to NCRC. This is a strong program in the study of acute illnesses and injuries, and unprecedented in its breadth of cross-disciplinary research partnerships.

NCRC is a vibrant research space today, a large number of faculty, members, researchers, post-doctoral fellows and graduate students are engaged in many new areas of innovative research. In this issue we have focused on a young post-doctoral researcher, to hear his perspective at this stage of his career and being based in the NCRC research environment.

David Canter, Executive Director, NCRC

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M-CIRCC: New Critical Injury and Illness Center based at NCRC Creates an Important Comprehensive Research Platform

The vision for interdisciplinary, collaborative research at U-M has gained significant strength in an exciting new development. The university recently launched the Michigan Center for Integrative Research in Critical Care or M-CIRCC, a new center for the study of acute illnesses and injuries, to be based at NCRC. Like other flourishing research programs at NCRC such as the Biointerfaces Institute, Institute for Healthcare Policy and Innovation, the Cardiovascular Research Center, the Translational Oncology Program and the Department of Computational Medicine and Bioinformatics, M-CIRCC will focus on innovative translational research in a team science framework. It brings together scientists, physicians and engineers in a broad range of specialties, from emergency medicine, surgery, internal medicine, nursing and pediatrics to biomedical engineering, pharmacy, epidemiology and bioinformatics.

With the formation of M-CIRCC, the already renowned critical illness and injury research at U-M has acquired an integrated and comprehensive platform across several major clinical entities, ranging from adults to children, and trauma to medical, while also drawing on cutting-edge engineering and applied basic science expertise of U-M's world-class research enterprise. This creates an enormous potential to help a large variety of patients with a range of acute and critical illnesses and injuries.

M-CIRCC is a unique program, probably the only one in the country that is as broad based and integrated between all the critical care specialties and with an extensive level of involvement with medical, engineering and other schools across campus. Several locational benefits of NCRC add to the synergies between the key areas within M-CIRCC. Apart from the close connection with the medical school, the proximity to the College of Engineering on north campus and the presence of the Office of Tech Transfer right on the NCRC site are major advantages in the translation of the research into tangible patient benefits.

The center is already planning its first annual conference this Fall to discuss the challenges and barriers in the care of the critically ill, the matching of medical needs and engineering solutions, and business opportunities for entrepreneurs. More information is available here.

An important part of the center's mission will be serving as a place where junior investigators in the life sciences and engineering can get exposure to the intellectual richness and complexity of the challenges encountered when caring for the most...
severely ill patients. Dr. John Younger, one of the founding members of the group, put it this way. "In every hallway of this institution, and on a daily basis, I walk by the brightest, most motivated students I have ever seen. All of these kids are going to apply their brains, energy, and passion to something. One of my personal goals for M-CIRCC is for the center to serve as a magnet for all of this talent, for it to be a place where students, residents, and fellows can get a sense of the impact they might have on the lives of our patients. We want them to spend some time with us and realize that there’s nothing else in the world they’d rather work on.”

Several major participants in M-CIRCC have already moved to NCRC. Research operations include the labs of Drs. Neumar, Younger, and Ward from the Department of Emergency Medicine - researchers who focus on cardiac arrest, sepsis, and critical care monitoring, as well as Dr. Hasan Alam’s surgery group with a large trauma research program. Researchers who will collaborate in the bioinformatics area will be dual-based in the new center and in the Department Computational Medicine and Bioinformatics. Close collaborations with strategic partners such as the Biointerfaces Institute, Michigan Center for Clinical and Health Research (MICHCR) and the Institute for Healthcare Policy and Innovation (IHPI), all of which are already at NCRC, will be facilitated by the location. M-CIRCC is thus not only internally composed of a wide range of researchers, its deliberate strategy of reaching out to other established research programs to foster new collaborations adds yet another dimension. After all, when critical masses of researchers from diverse groups are co-located and are provided ample opportunities for interaction, who can predict the path-breaking innovations that could result?

Read a media release about M-CIRCC [here](#).

And the website of M-CIRCC is [here](#).

Voices of Young Researchers: Interview with Shailender Kanwar

**Can you tell us briefly about your research background?**

I am a post-doctoral researcher from an interdisciplinary background: a biophysicist working in the field of translational oncology. Currently my research focuses on two key areas of cancer research: the use of the circulating tumor cell (CTC) isolation technologies in understanding the metastasis of cancer, and designing better tools for pre-clinical therapeutics and diagnosis to prevent the incidence of cancer and its recurrences and help increase survival rates and patient quality of life.

**What are some of your research inspirations, motivations and goals?**

The world of natural sciences, especially human biology - its anatomy and the wonderfully complex and well-organized system of physiological functions - has captivated me since childhood. Over time I became fascinated by how human life processes are interrupted by diseases. Raised in a small rural town in north India, one that lacked modern diagnostics and treatment facilities, and having witnessed the devastating effects of cancer in people’s lives, I became specifically interested in studying cancer for my doctoral research in Cancer Biophysics.

It motivates me greatly to see that present day medical science has enormous scope to utilize cross-disciplinary approaches to create technologies that can provide answers to current patient needs. Having trained as a cancer researcher, I see opportunities to work in areas that find ways to detect cancer at an early stage as well as improve current therapies to avoid recurrence of cancers or metastasis. This inspires me to work in translational research in cancer therapeutics and understanding the role of CTCs in spreading cancers and to look for clues in environmental factors that promote cancer metastasis. I am passionate in my goal to develop better medical-devices for cancer diagnosis through transforming proof of concept experiments into working biophysical prototypes useful for clinical and research purposes.

**How does your post-doctoral research position at the Biointerfaces Institute advance your career at the intersection of medical and engineering sciences?**

The unique NCRC features of co-location, shared facilities, dynamic interdisciplinary faculty members and projects with translational research objectives are very well aligned with my research goals. As a part of the Biointerfaces Institute, working with Dr. Sunitha Nagrath, I am in one of the best research environments and feel excited to be working on the technological aspects of developing tools that would be used in standard clinical or research practices in the future. At NCRC we share a common research space with scientists from the Cancer Center, the Translational Oncology Group, pharmaceutical sciences, dental sciences, biomedical engineering and chemical engineering. It has provided me a valuable platform to easily interact and exchange ideas with engineers, clinicians and cancer researchers, all working toward a unified goal of developing tools for cancer diagnosis or treatment. In this position I have gained many new perspectives in understanding the engineering aspect of biomedical research, especially issues related to designing, prototyping and micro-fabrication of microfluidic devices. At the same time I have realized the significance of my previous training in adding value to engineering side of research, making it more relevant for biological and clinical applications.
How is the NCRC location advantageous to your research advancement?

Being at the University of Michigan, and at NCRC in particular, I have valuable opportunities to discuss my ideas and projects with leading researchers in interdisciplinary and translational research. I have already initiated research projects in collaboration with researchers from the Comprehensive Cancer Center and various engineering groups. The close proximity of each group at NCRC is advantageous for speeding up research in the lab. NCRC has excellent core-facilities and equipment, located right next to my lab. I frequently use FACS, microscopic imaging and the DNA-sequencing core facilities. The close location of the biomedical research store is also very convenient. NCRC houses the Office of Tech Transfer which provides necessary mentorship and resources for finding commercial success for research outcomes. Through my current projects I am looking forward to using all these resources to commercialize innovative in-vitro diagnostics for the use of disease surveillance and monitoring.

Since it has been easy to meet and work with researchers outside my group at NCRC, I have gained valuable skills of working in cross-disciplinary teams of engineers, clinicians, researchers and technicians. To be able to effectively coordinate and communicate with researchers of different backgrounds in a collaborative environment is a critical skill in a research career today.

NCRC Metrics: Did You Know?

NCRC LANDSCAPE FACTS

**# of TREES**

- **214** Ornamental Trees (Crabapple, Hawthorn, Amelanchier, etc.)
- **619** Shade Trees (Oak, Maple, Honeylocust, etc.)
- **253** Evergreen Trees (pine and spruce)

**AREA**

- **860,000 SF** Maintained Turf
- **780,000 SF** Meadow and Prairie
- **65,000 SF** Planting Beds
- **18,000 SF** Perennial Beds