Team Science Conference Draws Global Participation, Enhances Research Community

The 1995-96 Chicago Bulls basketball team demonstrated the value of a team effort, winning an NBA-record 72 regular season games and leading the league in average points scored per game. Significant research has been done on sports teams like the Bulls, as well as business teams. Northwestern University Kellogg School of Management even offers a class called "Leading High-Impact Teams," which teaches MBA students to rely on teams to achieve objectives, find solutions to problems, and more.

The Research Team Support (RTS) group of the Northwestern University Clinical and Translational Sciences (NUCATS) Institute asserts that collaborations are also key to enhancing clinical and translational research, and aims to understand as much about science teams as we understand about other kinds of teams.

With that in mind, Northwestern will host the first ever Annual International Science of Team Science Conference on April 22-24 in Chicago. The conference will focus on the science of team science, which promotes interdisciplinary, team-based research by empirically examining processes by which teams organize, communicate, and conduct research. This includes understanding how teams connect and collaborate to achieve scientific breakthroughs that would not be attainable by either individual or simply additive efforts, and determining ways to define,
track, and measure their efficiency and success.

"Much of science is individualized, especially in academia," says Holly Falk-Krzesinski, PhD, research assistant professor, director of RTS at NUCATS, and chair of the conference. "However, productive, cross-disciplinary research collaboration is an essential feature of a robust translational research enterprise."

Falk-Krzesinski works with colleagues at Feinberg, Kellogg, the School of Communication, and the Robert R. McCormick School of Engineering and Applied Science to further team science research, but says working with other institutions affords Northwestern the opportunity to have a broader impact.

"We want to build up this discipline, be a point of convergence, and establish a community of practice related to team science," says Falk-Krzesinski. "At Research Team Support, we also want assistance in framing our ideas and need the partnership of others in defining a new research agenda."

The conference program committee and speakers are comprised of thought-leaders from around the globe — individuals from various backgrounds and fields of study who Falk-Krzesinski identified by combing through a diverse body of literature and attending events where she could network with experts. She hopes these researchers, including Daniel Stokols, PhD, a professor from the University of California-Irvine, and Kara Hall, PhD, a health scientist at the National Cancer Institute, who together coined the phrase "science of team science," will elicit innovative ideas by leading investigators and practitioners who will cover the following topics:

- Perspective on challenges related to the science of team science
- Collaborative dynamics of teams: content and connection
- Network perspectives of teams
- Praxis of team science
- Strategies for facilitating team science
- Emerging directions for the science of team science and science policy
- Workshop on basic methods of social network analysis for team science

While its research is in the early stages, the final topic in the list, social network analysis, explores how teams can utilize social networks akin to Facebook and LinkedIn to assess and evaluate scientific teams over time.

"Social network analysis is one of the most advanced tools available for the evaluation of scientific teams," Falk-Krzesinski says. "Researchers underline algorithms and take advantage of bibliometric and survey data to examine the networks of people in teams, using that knowledge to diagnosis a team and improve it. There's no set formula, but Northwestern is a leader in this area of study."

Conference participants — investigators studying science teams, team science practitioners, data providers, knowledge management/social networking database developers and representatives from federal funding agencies such as the National Institutes of Health — will learn more about the tools available to evaluate scientific teams and how to overcome the communication conflicts and costs associated with collaboration.

The conference will serve as a conduit between team science investigators and practitioners of team science, engage funding agency program staff to provide guidance on developing and managing team science initiatives and provide data providers and analytics developers with insight about team tracking and analysis needs.

Another objective of the conference is to pique researchers’ interest in team science training — from senior level faculty who have established research practices, to early career graduate students currently focused more on individual research projects. The conference will highlight curricula that empower researchers to pursue team science as effectively as individual scientific pursuits.

"Attendees will have the opportunity to see the empirical research on team science and catch a glimpse of the types of projects underway," Falk-Krzesinski says. "We encourage people to share their work, gain feedback, and make connections with potential collaborators."

To see the full agenda or to register, visit the conference web site. For more information about the conference, NUCATS or team science, contact Holly Falk-Krzesinski: h-falk@northwestern.edu or (312) 503-0889.
Research Day to Showcase Work, Enhance Collaboration
More than 150 posters will be presented by the Feinberg community

Northwestern University Feinberg School of Medicine will host the sixth annual Lewis Landsberg Research Day on Thursday, April 8, from 1 to 5 p.m. in the Robert H. Lurie Medical Research Center (303 E. Superior Street) on the Chicago campus.

Research Day is a campus-wide event to promote faculty and trainee development through the sharing of more than 150 research studies. Attendees will also have an opportunity to learn about research core facilities that can help make research being done at Feinberg more efficient.

“We hope to engage everyone — students, faculty, and staff — in the Feinberg research community,” says Rex Chisholm, PhD, Adam and Richard T. Lind Professor of Medical Genetics and dean for research at Feinberg. “We want everyone to share in the excitement about the outstanding work being done by our colleagues.”

The entire Northwestern community is welcome to attend the event, and investigators from across campus — faculty, graduate students, medical students, MD/PhD students, postdoctoral researchers/fellows, and clinical residents and fellows — will participate in the poster session and competition.

Awards in the areas of clinical research, basic science, and women’s health will be presented at the event. Research Day also provides the venue for presenting the Tripartite Legacy Faculty Prize; guests will hear a lecture from one of Feinberg’s most distinguished faculty members.

The schedule for Research Day follows:

1:00 p.m.  Hughes Auditorium
- Tripartite Legacy Faculty Prize for Translational Science and Education ceremony

2:00 p.m.  Ryan Family Atrium
- Poster session

3:30 pm  Ryan Family Atrium
- Concluding remarks
- Announcement of research prizes for basic science and clinical research
- Announcement of Medical Women Faculty Organization Founders Award

“Research Day is about stimulating our curiosity, enhancing collaboration, and building a sense of community among our researchers,” Chisholm says. “It is one important way for the medical school to emphasize how essential high-quality research is for our mission and to celebrate the discoveries of our investigators.”

Teresa Woodruff, PhD, Wins Tripartite Legacy Faculty Prize

Teresa Woodruff, PhD, Thomas J. Watkins Professor, Obstetrics and Gynecology, chief of the Division of Fertility Preservation, and director and founder of the Institute for Women’s Health Research, has been named the winner of the Tripartite Legacy Prize, presented annually to the faculty member who has demonstrated excellence in research that emphasizes translational approaches, teaching and mentoring, and leadership.

“Receiving the Tripartite Legacy Prize is a great honor for me personally, but is also a recognition of great lab members over a number of years, great students in undergraduate and postgraduate courses, and my wonderful Northwestern colleagues,” says Woodruff.

Woodruff began her academic career at Northwestern in 1995, after working as a research scientist for Genentech in San Francisco. Though the transition from "nearly unlimited budgets" to grant-writing was a challenge, she says, "I believe my background in biotech industry provides a perspective on both career paths that is useful to my students making life choices about fulfilling their career ambitions."

Indeed, teaching and mentoring are at the heart of Woodruff’s successful research career at Feinberg. “My proudest moments come when I welcome a graduate student into the scientific profession, see a postdoc mature into a scientific leader, celebrate the new aspirations of a high school student, or see a high impact publication from one of my colleagues,” says Woodruff, who not only mentors Feinberg students, but also developed the Oncofertility Saturday Academy with the Young Women’s Leadership Charter School as a venue to involve high school girls in college level science.

Though Woodruff is dedicated to teaching and mentorship, her impressive accomplishments already place her among Northwestern’s most honored faculty. She is chief of the newly created Division of Fertility Preservation at Feinberg where she works to translate research founded by two R01 grants with the goal of preserving the fertility of women at risk due to anti-cancer treatments. She holds six patents, has served on numerous editorial boards and professional committees, and has prolifically published in high-impact journals.

She has been honored nationally by the “Speaking of Women’s Health” Distinguished Service Award (2007), the American Women in Science (2008) Innovator Award, and the American Medical Women Association Gender Equity Award (2009). She was awarded the Endocrine Society’s Richard E. Weitzman Memorial Award (2000), and was elected a fellow of the American Association for the Advancement of Science (2005).
Meet Hossein Ardehali, MD, PhD, Assistant Professor of Medicine, Molecular Pharmacology and Biological Chemistry

Hossein Ardehali, MD, PhD, joined the Feinberg School of Medicine in 2005. He is assistant professor in the Department of Cardiology, and in the Department of Molecular Pharmacology and Biological Chemistry, and member of the Feinberg Cardiovascular Research Institute.

Ardehali has been honored as a Fellow of the American Heart Association and the American College of Cardiology, and holds leadership positions on several national committees, including a position as chair and editor of the Communications Committee for the American Heart Association (AHA) Council on Basic Cardiovascular Sciences.

In recognition of his achievements, Ardehali was nominated by the National Heart, Lung and Blood Institute (in 2008 and 2009) for the Presidential Early Career Award for Scientists and Engineers. He has been honored with a host of other awards, including the National AstraZeneca Young Investigator Award, Jeremiah Stamler Distinguished Young Investigator Award, Schweppe Foundation Research Award, and the AHA Council on Cardiovascular Sciences Young Investigator Award.

Ardehali is highly involved in programs at Northwestern. He’s a member of the Assistant Professors Research Committee, as well as the Department of Medicine Research Council and Fellows Research Task Force. He is director of the MSTP Admissions Committee, co-director of Cardiology Fellowship Research, and co-organizer of Cardiology Grand Rounds.

FSM Researcher recently caught up with Dr. Ardehali to learn about his research and current projects.

What are your research interests?
The main research interest of our lab is to characterize novel mitochondrial and metabolic pathways that protect cardiomyocytes against cell death. Ischemic heart disease is the number one cause of death in the developed countries. The major pathogenesis of this disorder is cardiomyocyte death as a result of ischemic insult. Thus, our goal is to understand mechanisms that contribute to myocardial cell death and identify potential ways to reverse this process.

More specifically, our group is interested in the following three cellular proteins and processes: mitochondrial ATP-binding cassette proteins, regulatory mechanisms of cellular metabolism and regulation of myocardial gene expression by microRNAs in response to hypoxia.

For the first project, we have specifically focused on the process of mitochondrial iron homeostasis and iron/sulfur (Fe/S) cluster transport out of the mitochondria. We have identified a novel mitochondrial protein called mABC1 to play a role in the transport of Fe/S cluster and maturation of Fe/S cluster proteins in the cytoplasm.

For the second project, we have shown that a novel protein called SNF-1 related kinase (SNRK) plays a critical role in regulating cellular metabolism. Our results suggest that SNRK translocates into the nucleus and regulates cellular proliferation. We are also interested in the role of a specific glycolytic enzyme called hexokinase II (which carries out the process of glucose phosphorylation) in cardiac hypertrophy and myocardial response to ischemia-reperfusion injury.

Finally, our group is also working on changes in the cardiomyocyte microRNA profile in response to hypoxia. MicroRNAs are small RNA molecules that regulate gene expression. We have identified a specific microRNA called microRNA-210 (miR-210) to be unregulated in response to hypoxia in cardiomyocytes.

What research projects are you currently pursuing?
Our lab is pursuing three major research projects. As far as the mABC1 project, we have generated animal models of mABC1 knockout and transgenics and are currently studying the phenotype of these animals in response to various physiological and pathological stimuli. We have made cardiac specific knockout, which results in severe cardiomyopathy and heart failure. Thus, alterations in mitochondrial iron homeostasis results in severe damage to the heart. We are now in the process of making mABC1 knockout in other tissues and studying the regulation of the protein.

For the SNRK project, our major goal is to determine how this protein is different from the well characterized metabolic regulator, AMPK. Our results thus far suggest that the major effect of SNRK may be its regulation of cellular proliferation. Also, SNRK appears to employ distinct signal pathways from AMPK to exert its cellular effects. Currently, we are studying the role of...
SNRK in metabolic processes in the cytoplasm of both the in vitro and in vivo models.

Finally, for the microRNA project, we are interested in the signal transduction pathways that regulate the expression of miR-210. We are interested in characterizing the intracellular molecules that activate miR-210 levels in response to hypoxia.

What brought you to Feinberg?
I completed my residency and cardiology fellowship at Johns Hopkins in Baltimore. I started my faculty position there but moved to Northwestern after six months. I had offers from other institutions, but I chose Northwestern for several reasons. It had become clear to me that Northwestern had made a commitment to invest and improve its research infrastructure and become one of the leaders in biomedical research. I also felt that the leadership at Northwestern was completely dedicated to the advancement of the institution and to making Northwestern one of the top schools in the country.

The protected time and effort that I was given to conduct my research further solidified my interest in Northwestern.

Finally, Chicago is a great city to live in and to raise a family.

What are some of the challenges you face?
Northwestern has been extremely supportive since my move here five years ago and has helped me eliminate many challenges young investigators face. However, I think the major challenge all of us in the field of biomedical research face is funding. I am well funded now, but I always worry about what will happen in the future.

Animal Corner

The Center for Comparative Medicine (CCM) and the Institutional Animal Care and Use Committee (IACUC) are currently working on standardizing operations and procedures through the development of several types of approved documents. All documents go through a peer review process and committee review prior to approval.

IACUC documents fall into two categories: approved animal procedures (AAPs) and policies.

- AAPs are used to describe general animal procedures and are designed to allow the investigator to reference the AAP rather than writing the entire procedure out in their animal study protocol.
- Policies establish the guidelines and rules at Northwestern University for certain activities related to animal care and use.

CCM documents fall into three categories: standard operating procedures (SOPs), forms, and guides.

- SOPs are used to describe how a specified task is accomplished.
- Forms are used to describe how and when a specified form is used.
- Guides are used to establish a guideline for staff to follow for a certain procedure or situation.

IACUC AAPs and policies may be found on the IACUC web site at http://www.research.northwestern.edu/OPRS/acuc/.

CCM SOPs, forms and guides may be found on the CCM web site at http://www.research.northwestern.edu/ccm/.

Both sites require the user to enter their Net ID and password to gain access. As documents are developed and approved, they will be posted on the relevant web site.
How long have you been at Northwestern? I’ve been at Northwestern for nine and a half years.

Where are you from? While I was born in Michigan City, Ind., I was raised in the southwestern suburbs of Chicago. I also have lived and worked in St. Louis, Boston, and Washington, DC.

What’s your educational background? I completed my doctorate degree in Biochemistry at Northwestern University. I then worked in research at Harvard Medical School, Rush Medical College, and the National Institutes of Health, and then in education administration at Midwestern University and the University of Chicago. Along the way, I completed my Med in higher education administration at Loyola University.

What is your role in the Medical Scientist Training Program (MSTP)? MSTP is a combined MD-PhD degree program in the biological and physical sciences to prepare MD-PhD physician-scientists for dual careers in biomedical research and in patient care. The 92 MSTP students at Northwestern earn the MD degree from Feinberg and the PhD degree in biological and biomedical sciences, neuroscience, biomedical engineering, chemical and biological engineering, or chemistry.

As the associate director, I work closely with the MSTP student council, the faculty who serve as class advisors, our committees and our director, Dr. David Engman, to administer MSTP admissions, finances and advising, to serve as webmaster for the MSTP web site and to organize a variety of special programs (retreat, graduate reception, visiting scholar seminars, women’s forum) and the courses for MSTP students (Topics in Molecular and Translational Medicine and MSTP Grand Rounds).

Why did you choose to work here? After earning my doctorate degree at Northwestern University in Biochemistry, I pursued a career in research and teaching. While raising my family, I shifted my interest to education administration and completed my Med in higher education administration at Loyola University. I came back to Northwestern as an administrator because I knew first hand what a vibrant academic organization it is. I work here because I believe in the ideals Northwestern teaches all of us (acknowledgement of our imperfection and pursuit of self-improvement), in the growth it imparts to all of us and, most of all, because of the “improved” men and women Northwestern releases to the world.

What professional activities do you participate in? For the last seven years, I attended the annual MD-PhD directors and administrators conference and was an invited speaker three times. I take computer information systems courses at my local community college to maintain my web programming and technical writing skills because I enjoy using them.

What do you like about your job? The most attractive feature of my position is the opportunity to work closely with the talented and hard-working faculty and students in the MSTP. Their energy and altruism inspire me daily.

What do you like to do outside of work? I am an amateur photographer, a political junkie who believes there is never enough political news coverage, and an avid fan of movies and opera and their juxtaposition as the Metropolitan Opera’s “Opera at the Movies.” I am thrilled that one of my favorite journalists, Christiane Amanpour, will be Northwestern’s commencement speaker in June 2010.
Integrated Graduate Program (IGP) in the Life Sciences

Student Profile: Kevin Bonney

KEVIN BONNEY

Where is your hometown?
I grew up in Port Huron, Mich., a small city located about sixty miles north of Detroit.

Where did you complete your undergraduate degree?
I graduated summa cum laude with a Bachelor of Science degree from Eastern Michigan University, where I had the privilege of attending with a full academic scholarship.

What are your research interests?
I am interested in pathogenic dysregulation of adaptive immune responses. It’s amazing to think of all of the things our immune systems do to keep us healthy when working properly, but I think what happens when something goes wrong is far more interesting. Autoimmune diseases are one manifestation of this phenomenon in which I am especially interested.

What exciting projects are you working on?
My most exciting project involves working toward elucidating the contribution of autoimmunity to Chagas disease pathogenesis. Chagas disease is a chronic inflammatory heart disease of nearly 20 million Latin Americans caused by infection with the single-celled parasite, Trypanosoma cruzi.

Whether or not Chagas disease autoimmunity is pathogenic is of great clinical importance, and much controversy surrounds the role of autoimmunity in this disease, despite decades of research.

My recent work demonstrates that acute cardiac damage and autoimmunity involving both T cells and B cells can be initiated by exposure to T. cruzi antigens alone in the absence of live infection. This suggests that Chagas disease autoimmunity is potentially pathogenic. I have identified several novel candidate antigens in T. cruzi that I think are involved in molecular mimicry of cardiac myosin, and am excited to conduct analysis into this potential cross-reactivity and the role mimic antigen candidates might play in initiating Chagas disease autoimmunity.

What attracted you to the IGP program?
IGP affords students the opportunity to rotate through labs in different departments and take classes on a wide range of topics before deciding on a thesis lab, so I wasn’t concerned that I might get locked into a narrow track of study early and be unable to modify my course if my academic interests shifted.

Also, I liked the fact that even after a lab is chosen, IGP students have opportunities for collaborating with different departments and varying focuses on basic science and translational research.

I chose to work in the laboratory of Dr. David Engman because he has a strong interest in collaborating with other labs, and even within our own lab new students can choose to work on a wide spectrum of projects involving basic cell and molecular biology to host-pathogen interactions to autoimmunity.

What has been your best experience at Feinberg?
One great experience was participating in the Inflammation Research in Progress seminar series, started this year by Dr. William Muller, the chair of the Department of Pathology. This venue provides a collaborative environment for researchers from multiple departments at Feinberg who have an interest in inflammation to discuss their new and exciting research with colleagues representing a wide range of expertise. Of all the seminar series I have attended, this one by far elicited the greatest amount of thoughtful feedback from the audience. I recently presented my research for the group and received a number of helpful insights into future directions for my projects.

How would you describe the faculty at Feinberg?
The faculty have always been extremely helpful to me and I find them to generally be very approachable and willing to offer advice and insight.

One reason Northwestern stood out in my mind during my graduate school interview process was that all of the faculty members I met seemed genuinely passionate about their research and the success of their students.

What do you do for fun?
The two greatest passions of my personal life are music and travel. I regularly attend concerts at small venues that attract independent label acts, but I also appreciate that Chicago attracts the big name performers as well.

As for traveling, my lifelong goal is to visit most of the countries in the world. My favorite place so far is Rio de Janeiro.

What are your plans for after graduation?
I plan on pursuing an academic post-doc, hopefully in a warmer climate than Chicago. In addition to research, I have always been interested in teaching and am currently completing the Graduate Teaching Certificate Program at Northwestern to prepare me for a career as a future university faculty member.

April 2010
Theiler's murine encephalomyelitis virus (TMEV)-induced demyelinating disease (TMEV-IDD) is widely considered the most relevant animal model of virus-induced autoimmune-mediated demyelinating disease model of multiple sclerosis (MS). MS is considered to involve an autoimmune pathological process, but epidemiological evidence strongly suggests it is triggered secondary to a virus infection. TMEV are natural mouse pathogens and intracerebral inoculation of susceptible SJL mice with the BeAn strain of TMEV results in a chronic-progressive, inflammatory T cell immune-mediated demyelinating disorder which is related to life-long persistent CNS virus infection and characterized by spastic hind limb paralysis.

In contrast, resistant C57BL/6 mice make a potent anti-viral cytolytic T cell response and rapidly clear the infection and remain disease free. Like MS, TMEV-IDD is characterized by progressive demyelination with accompanying mononuclear cell infiltrates dominated by CD4+ T cells and activated antigen presenting cells (microglia/macrophages/dendritic cells).

This project examines the role of innate immune regulatory mechanisms controlled by the balance between regulatory T cells (Tregs) and effector T cells, as well as innate immune stimulatory mechanisms controlled by the activity of CNS-resident antigen presenting cells involved in regulating susceptibility/resistance to TMEV-IDD in the two different mouse strains. These studies will provide important information on the mechanisms underlying susceptibility/resistance in virus-induced demyelination and are applicable for the future design of treatment strategies for MS and other CNS inflammatory diseases.
United States Army Department of Defense Physician Research Training Award  
**W81XWH-10-PCRP-PRTA**  
http://cdmrp.army.mil/funding/pcrp.htm  
Submission deadline: May 26, 2010  
**Upper Amount:** $650,000

**Synopsis:** The award supports a mentored training experience to prepare physicians with clinical duties or responsibilities for productive careers in prostate cancer research. Applications must include a robust description of an individualized training program appropriate to the area of study, which may include coursework and seminars, that will provide the PI with experience in key areas such as statistics, bioethics, and/or relevant basic science disciplines. This award requires the involvement of a designated mentor with an established research program in prostate cancer.

Breast Cancer Research Program Idea Award  
**W81XWH-10-BCRP-IDEA**  
http://cdmrp.army.mil/funding/bcrp.htm  
Submission deadline: April 21, 2010  
**Upper Amount:** $750,000

**Synopsis:** The award is designed to promote new ideas still in the early stages of development that have the potential to yield highly impactful data and new avenues of research. This mechanism supports conceptually innovative, high-risk/high-reward research that could ultimately lead to critical discoveries or major advancements that will accelerate the eradication of breast cancer. Research projects should include a well-formulated, testable hypothesis based on strong scientific rationale.

Investigators in postdoctoral positions are strongly encouraged to apply.

To view more funding opportunities, visit:  
www.feinberg.northwestern.edu/research/funding-opportunities/