GENETIC MATERIAL

Center for Genetic Medicine | Northwestern University

Fall 2008

CGM Directors Advocated for Genetic Nondiscrimination Act

Thirteen years after it was introduced in Congress, the Genetic Information Nondiscrimination Act, or GINA, was finally signed into law in May. Ensuring protection from employment and health insurance discrimination based on genetic information, GINA is significant for the future of both genetics-based health care and research.

Maureen Smith, clinical director of the NUgene project, recognized the bill's importance in its early stages. In 1997 Smith served as president of the National Society of Genetic Counselors (NSGC). She provided patient scenarios to the staff of Representative Louise Slaughter of New York, who had introduced GINA in 1995, and met with other members of Congress about the bill.

Cathy Wicklund, director of CGM's Graduate Program in Genetic Counseling, who was president of NSGC in 2007, also advocated for GINA on the Hill, meeting with members of the Senate and House and working closely with the Genetic Alliance and the Coalition for Genetic Fairness.

NSGC reviewed GINA as the bill changed over 13 years. What eventually passed represented a compromise, but with many of its original aims intact. The legislation establishes basic legal protections that should encourage people to take advantage of genetic testing and therapies. It also prevents health insurers from denying coverage or adjusting premiums and prohibits employers from discriminating on the basis of genetic predispositions.

Maureen Smith and Cathy Wicklund

Smith and Wicklund agree that the increased strength of genetics advocacy groups contributed greatly to the bill's eventual passing, but dramatic advances in genetics research also drove the bill forward.

Smith notes that most of the genetic tests available when GINA was drafted were for rare, specific genetic disorders, and many politicians felt the bill was not yet necessary. Making the need for legislation finally apparent were the completion of the Human Genome Project, a great increase in the number of available genetic tests, and research advances toward finding genetic markers for more widespread, common conditions affecting adults, such as heart disease and diabetes.

While genetic counselors have felt it necessary to bring up the possibility of genetic discrimination to patients, "we now can bring up the bill as well," says Wicklund. Once the GINA provisions become effective (May 2009 for the health insurance regulations and six months later for employment), Wicklund and Smith hope that people who decide there are benefits to genetic testing will now feel comfortable seeking it. "In addition, people may also feel more comfortable participating in research studies, which is imperative to better understanding genetic conditions and possible treatment," Wicklund says.

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High school students get hands-on experience at CGM's second annual Careers in Genetics Day. See story on page 10.

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Wicklund notes, however, that there is more legislation needed. GINA does not address long-term care, disability, or life insurance, nor does it cover those already diagnosed with a genetic condition.

Other issues regarding genetic testing also must be considered. Genetic counseling and testing are not covered by all insurance companies, and genetic counselors cannot directly bill insurance companies as independent providers. Wicklund also cites a need for better regulation and oversight to be sure genetic tests are appropriately marketed, reliable, and clinically valid.

The resolution of these issues, along with GINA, will further ensure that all people can access their genetic information without penalty, moving health care one step closer to truly personalized medicine.

Connecting Science, Art, and Community

The award-winning artwork created from software usually used to map DNA

Simon Lin, Brian Chamberlain, and Jared Flatow of the Robert H. Lurie Comprehensive Cancer Center combined science and art at the "Visual Reflections on Science" event held by the Intelligent Systems for Molecular Biology Student Council this past summer.

Lin, research assistant professor, and Chamberlain and Flatow, systems analysts and programmers, exhibited and won an award for an extraordinary piece of art they created using a mosaic algorithm generated from Python language software. The software, which they ordinarily use to map and discover hidden patterns within DNA, allowed them to piece together hundreds of Creative Commons (CC)–licensed photos from Flicker photo sharing and manipulate the photos to reveal a hidden pattern reading "DNA and Community."

Lin found inspiration for the project while searching Flicker under the term "DNA and me." The search revealed hundreds of pictures taken by people expressing their thoughts on the subject of DNA. Over the course of a month, Lin, Chamberlain, and Flatow used those photos to create their CC-licensed artwork.

Though they have only created two pieces of art so far, they hope to continue their artistic expressions of science. They say they are excited to share their work with not only the scientific community but also artists and the general public. "We hope to inspire more conversation about genetic information and, through art, help some people get past the initial fear that they might have about the research," Lin says.

For more information about their work, please visit www.iscb.org/ismb2008/vrsimages.php.

CGM Partners with Boys and Girls Club

Last spring CGM partnered with the McCormick Boys and Girls Club of Chicago in a 10-week pilot "Science Club." The program, designed by Michael Kennedy, CGM director of educational and research programs, and Carolyn Jahn, associate professor of cell and molecular biology in the Feinberg School of Medicine, was started to broaden CGM's outreach activities and increase science awareness among middle school students.

The McCormick Boys and Girls Club was an ideal partner for this initiative. Its McCutcheon site is a fixture in the Uptown neighborhood, providing mentoring, tutoring, and opportunities to develop social and leadership skills — although nothing like the Science Club has been done there before. After receiving a call from Kennedy, McCutcheon site director Mike Anderson was eager to add the novel Science Club to his programming.

Armed with periodic tables, molecule kits, and plenty of pipettes, Kennedy, Jahn, and a team of volunteers visited the club every Thursday from April to June, turning the club's art room into a makeshift lab. The volunteers included Miranda Bernhardt, Julia Jackson MacKenzie, Suzan Hammond, and Rebecca Daugherty, all students in the Integrated Graduate Program in the Life Sciences (IGP), and Lauren Strelec, a program assistant with the club.

Science Club members demonstrate DNA isolation at the science fair.

Lab activities began with simple introductions to elements, molecules, and genetics and grew more involved. Science Club members eventually learned to isolate DNA from pureed strawberries and to culture bacteria from different areas of the club. Armed with fistfuls of cotton swabs, they swiped keyboards, toilet seats, and the insides of their noses.

Club members were also invited to Northwestern's campus in late May for a look at science in a real lab. The fieldtrip provided an opportunity for the IGP student volunteers to present their own research and demonstrate techniques and equipment they use as scientists.

After nine weeks in the program, Science Club members had an opportunity to show what they'd learned. They formed small groups and prepared speeches, skits, and colorful posters to present topics of their choice to their families and peers at a science fair. Following presentations by each group, the audience was treated to hands-on demonstrations.

Kennedy, Jahn, and Anderson all thought the Science Club's pilot project a success. "It allowed the students to see how simple yet complex science could be," says Anderson. "They've been asking about the Science Club for the past few months, and they can't wait for it to start up again."

Kennedy and Jahn are looking to ensure that Science Club will be back. With a recently funded grant from Motorola and other proposals submitted, including one to NIH, they look forward to further developing the program at the McCutcheon site and even expanding it to other clubs in Chicago.

CGM Associate Director Beitel Bringing Two Campuses Closer

Greg Beitel, associate professor of biochemistry, molecular biology, and cell biology in Weinberg College, is working to strengthen CGM's presence in Evanston as the center's first associate director.

Many of Beitel's goals for this position involve bridging the gap between the Chicago and Evanston campuses. In addition to raising awareness about the genetics resources CGM offers, he is working to provide richer research experiences for students and faculty whose research involves genetics. He is in the preliminary stages of developing a cross-campus genetics training program for graduate students in the Integrated Biological Sciences (IBiS) and Northwestern University Interdepartmental Neuroscience (NUIN) programs and Integrated Graduate Program in the Life Sciences (IGP). An important near-term goal will be to secure NIH training grant funding.

Greg Beitel

The training program should create a more comprehensive array of genetics training opportunities by making it easier for students to rotate through labs on both campuses. It also will enhance opportunities for collaboration between Chicago and Evanston faculty.

Beitel's own lab is an example of collaborations that can arise from greater contact between the Chicago and Evanston campuses.

It has formed strong connections to researchers in the Feinberg School investigating the effects of hypercapnia (elevated CO_2 levels) on cells. Hypercapnia is common in patients with chronic obstructive pulmonary disease and is associated with poor patient outcomes. Graduate students in the Beitel lab, one of whom is jointly advised by Jacob Sznajder, chief of the Feinberg Division of Pulmonary and Critical Care, have found that elevated CO_2 levels suppress innate immune function in cultured immune cells from the model organism *Drosophila.* Hypercapnia can also increase the mortality of flies infected with bacteria.

Work in the lab of collaborator Peter Sporn, Feinberg professor of pulmonary and critical care, revealed hypercapnia similarly suppressed immune function in human macrophages and provided evidence that the same mechanism is at work in both cases. The Beitel lab is now working to identify the proteins that sense elevated CO_2 levels and how these proteins signal the levels to the cell.

His lab also studies how cells control their shapes to form epithelial tubes, the central units that make up organs such as the kidneys and lungs. The work has focused on the junctions between cells, again in the model organism *Drosophila*. Lab findings indicate that *Drosophila* cell-cell junctions have more similarities to human cell-cell junctions than previously thought, but that the multiple functions of both human and fly junctions have been assorted to different junctional complexes in the different species.

A novel discovery that the Beitel lab is continuing to follow up is that the Na,K ATPase appears to function as a scaffolding protein in cell junction formation and has a previously unidentified role in cell polarity. Further studies of the basic mechanisms of epithelial tube formation and of how junctional components contribute to cell polarity may help researchers understand causes and improve treatment for conditions such as polycystic kidney disease (PKD).

Beitel began working with model organisms during his graduate training with H. Robert Horvitz at the Massachusetts Institute of Technology, where he earned his PhD. He later joined Mark Krasnow's lab at Stanford University as a postdoctoral fellow. He came to Northwestern as an assistant professor in 2000 and was awarded tenure in 2007. Beitel has been a member of CGM since 2002 and is also a member of the Robert H. Lurie Comprehensive Cancer Center.

Northwestern Team Advances Work of Genomics Consortium

Significant progress made by the Northwestern research team participating in the Electronic Medical Records and Genomics Network (eMERGE) was described to funders at an eMERGE steering committee meeting in June at Northwestern.

An expert scientific panel from the National Human Genome Research Institute, which earlier this year awarded eMERGE a $20 million grant to evaluate whether data from electronic medical records (EMRs) can be used for large-scale genetic research, heard about the Northwestern team's progress in two research areas: community engagement and informatics.

To better understand people's attitudes about collecting, analyzing, and sharing genetic research data, three focus groups were held with participants in NUgene, Northwestern's data banking project, and another three with the public in Chicago communities. Preliminary analysis indicates that 75 percent of focus group participants are neutral or somewhat trusting of medical research. Detailed analysis of focus group data is under way.

On the informatics/phenotype front, the team is close to determining the final definitions for computational algorithms to identify NUgene participants with type 2 diabetes and asthma based on their EMR data. DNA samples from these individuals and suitable controls will be analyzed using genome-wide association study approaches. In conjunction with Vanderbilt University, another institution in the eMERGE consortium, Northwestern plans to study type 2 diabetes genetics in African Americans, a population heavily affected by the disease. The Northwestern team will also study type 2 diabetes in a Caucasian population to test whether published study results can be replicated.

Along with Northwestern and Vanderbilt, other participants in eMERGE are Marshfield Clinic in Wisconsin, Mayo Clinic, and the Seattle-based Group Health Cooperative.

For more information on NUgene (www.nugene.org) and the eMERGE network (www.gwas.net), please visit their web sites.

Genomics Core Making Upgrades

The Genomics Core is making several upgrades to its equipment this fall, including a new iSCAN system from Illumina, a GoldenGate and Infinium Genotyping Post-Amplification Automation system, and an Autoloader. Robots will make the post-PCR steps and scanning of slides faster and more consistent.

The Core also has expanded its facility, with new space on the 12th floor of the Tarry Building, 300 East Superior Street, to house the pre-PCR operations for the SOLiD™ System next-generation sequencer and the Illumina genotyping system.

In addition, the Core has hired a bioinformaticist to manage and analyze the large amount of complex data generated by the high-throughput sequencing system.

Contact Nadereh Jafari, facility director, at 312-503-3331 or n-jafari@northwestern.edu for more information on the Core's genomic services.

Mary McMahon Becomes Administrative Director

Mary K. McMahon joined CGM this spring as administrative director. She oversees all financial aspects of the center, manages day-to-day operations, and leads the center's administrative team.

McMahon has an extensive administrative and management background. She spent nine years working as the administrator of the Feinberg School's Division of Endocrinology, Metabolism, and Molecular Medicine and one as a research administrator in the Department of Medicine. She left Northwestern in 2002 to work as business administrator at the Genome Technology Center of Stanford University before returning to Chicago this spring.

She says that close relationships among center branches and Peter Kopp's leadership of CGM are reasons she is excited to be back at Northwestern.

"I'm not looking forward to walking in the snow, but I'm happy to be back in downtown Chicago again," she jokes.

GPGC Staffs Two Leadership Positions

Medical Director Dungan Works to Improve GPGC Clinical Training

Jeff Dungan, associate professor of reproductive genetics at the Feinberg School of Medicine, has joined CGM as medical director of the Graduate Program in Genetic Counseling (GPGC).

Dungan will work closely with program director Cathy Wicklund to maintain and improve clinical training for students. A primary goal is to strengthen ties between GPGC and the medical school through increased student interaction and joint educational opportunities. Dungan believes both student groups would benefit from better understanding how genetic counselors interact with patients and what their role is within the medical team. He will also help develop curricula and identify clinical venues for student training.

Jeff Dungan

Dungan brings a wealth of clinical expertise to the program. He was the medical director for the University of Maryland School of Medicine's new genetic counseling graduate program and, more recently, a faculty member at the Baylor School of Medicine, where he was the clerkship director, another student-focused position.

Dungan, who joined Feinberg in 2006, specializes in prenatal diagnostics and screening, including ultrasonography to screen for fetal abnormalities. He and his colleagues are interested in developing algorithms to evaluate the usefulness of ultrasounds as a screening method compared with blood testing, looking at overall accuracy and occurrence of false positives.

Dungan's research interests also include the ways that patients understand and choose genetic tests. He is among the physicians at Feinberg working to determine how to best introduce the growing number of carrier tests to patients in a nonintimidating way and how to communicate with patients of different comprehension levels about complicated tests. How patients perceive "significant" risk and then decide what tests to take is another area of interest.

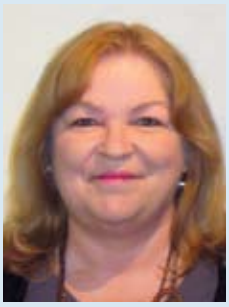
Dungan is also a participating physician in the Northwestern Ovarian Cancer Early Detection and Prevention Program. The program is designed to offer frequent screenings for women at risk of developing ovarian cancer, care for women already diagnosed, and help for researchers in developing early detection tests and therapies.

Dungan graduated from the Creighton University School of Medicine in 1983. He serves on the Department of Obstetrics and Gynecology's Undergraduate Medical Education Committee and the Prentice Women's Hospital Quality Management Committee.

Associate Director O'Neill Looks to Enrich Student Experiences

Suzanne O'Neill, new associate director of GPGC, says she is excited to return to academia after working as a clinical researcher at Evanston Northwestern Healthcare (ENH) Center for Medical Genetics for six years.

O'Neill has many plans to enrich the experiences of GPGC students. One is to incorporate the latest genetics research and new methods of learning into the curriculum. As research advances rapidly and information can be found online quickly, O'Neill feels it is critical to teach students how to determine the right questions to ask, not just how to find answers. Other goals include finding creative ways to increase funding for students and increasing interactions between GPGC and Feinberg School students.



Suzanne O'Neill

Above all, O'Neill says she is excited about spending more one-on-one time with students. She taught many classes and served on multiple committees for GPGC while at ENH, but now she can work more closely with students and faculty. She believes there is real value in what happens outside of the classroom, whether during office hours or impromptu meetings.

Opportunities to collaborate with other researchers also influenced O'Neill's decision to come to Northwestern. She is finishing a project through ENH to evaluate a family history online screening tool developed through the Centers for Disease Control's Family History Health Initiative. The tool, Family Healthware™, was designed to assess risk for heart disease, diabetes, stroke, and three kinds of cancer. ENH, along with the University of Michigan and Case Western University, were responsible for determining whether the assessment provided by the tool influenced patients' behavior. Data from the studies are being analyzed.

At ENH O'Neill also created the online tool MyGenerations, designed to help patients record their own family trees and history of cancer and then receive a risk assessment to share with their health-care providers.

She hopes these tools will lead to more efficient and targeted doctor's visits and encourage people to take preventative measures based on their family's health history. She looks forward to making new connections with collaborators at Northwestern in this and other areas of research.

Before ENH, O'Neill was a clinical instructor in the human genetics department at the University of Pittsburgh, where she received a master's degree in genetic counseling in 1998 and a PhD in human genetics in 2001. She is an active member of the National Society of Genetic Counselors and the American Society of Human Genetics.

Welcome, GPGC Class of 2010

Eleven students make up the class of 2010 in the Graduate Program in Genetic Counseling:

Kristen Barker received a bachelor's degree in molecular and cell biology from Ohio University in 2006. She then worked at the Center for Maternal and Fetal Health in Evanston, where she was able to shadow genetic counselors in cancer genetics, prenatal care, and pediatric care. Barker first joined GPGC as a summer intern in 2007. She also volunteers for a domestic violence crisis hotline.

Amanda Bretl earned a bachelor's degree in biology with a minor in chemistry in 2007 from the University of Wisconsin–Eau Claire. She shadowed genetic counselors and geneticists in the medical genetics department at Marshfield Clinic in Wisconsin. She was employed with Prevention Genetics in Marshfield, performing tasks such as PCR, sequencing of templates, and genetic trace analysis and comparison.

Chantalle Buhl earned a bachelor's degree in biology from Buena Vista University in 2007. She was a genetic counseling intern at the Hubert Humphrey Cancer Center of Minnesota and a summer undergraduate research fellow in prenatal and cancer settings at the Mayo Clinic, and she has created viral vectors for gene therapy. She volunteered at Planned Parenthood and worked with children with cerebral palsy and autism at Partners in Excellence, where she helped organize the Steps of Hope Autism Walk.

Lauren Burch graduated from Haverford College with a bachelor's degree in biology and a minor in psychology in 2008. She has extensive lab and research experience. After learning about the field of genetic counseling, she interned at Northwestern in January 2008, shadowing prenatal and cancer risk genetic counselors.

Erica Hudson obtained a bachelor's degree in life sciences from Queens University in 2003. After graduation she participated in the Japan Exchange and Teaching Program for three years. Since returning she has volunteered with the Cancer Center of Southeastern Ontario and TALK, a confidential crisis hotline.

Amy Knight Johnson received a bachelor's degree in genetics from the University of Nottingham in 2006. In the summer of 2007 she participated in Northwestern's summer internship program, shadowing genetic counselors in oncology, pediatric, and prenatal specialties. She also volunteered at the National Runaway Switchboard, a confidential hotline for runaway youth, and was employed as a family support worker by Little City Foundation in Chicago, working with children with autism.

Meredith Jones graduated from Susquehanna University with a bachelor's degree in biopsychology in 2007. She did an internship with the genetic counselors at Geisinger Medical Center in Danville, Pennsylvania, and completed a mental health practicum at the Selinsgrove Center in Selinsgrove, Pennsylvania. She was employed for a year by Lebanon County (Pennsylvania) Children and Youth Services as an intake caseworker.

Holly LaDuca earned a bachelor's degree in health science from Benedictine University in 2007. She shadowed a pediatric genetic counselor at Children's Memorial Hospital in Chicago and cancer risk and prenatal genetic counselors at Meriter Hospital in Madison, Wisconsin. She volunteered for the Dane County (Wisconsin) Rape Crisis Center hotline.

Jessica Martin obtained a degree in biochemistry from Miami University of Ohio in 2008. She shadowed genetic counselors at University Hospital in Cleveland and Children's Hospital in Cincinnati. She was a genetics intern at Case Western Reserve University, where she worked on a clinical cancer genetics e-curriculum for medical students. She was also a research intern at the University of Cincinnati. She volunteered as a support group facilitator at Fernside, a center for children who have lost a sibling.

Mary Ouwinga received a biology degree from Trinity Christian College in 2007. She worked with special needs children at Elim Christian Services in Palos Heights, Illinois, and constructed a genetic disorders manual for them.

Kristen Rietsema obtained a bachelor's degree in biology from Dordt College in 2005 and a master's degree in biological sciences from South Dakota State University in 2008. She participated in an internship at Northwestern in 2005 and then was hired on as a cytogeneticist, responsible for blood culturing, processing, and interpreting FISH.

Faculty Honors and Awards

Terry Barrett, chief of the Division of Gastroenterology and professor of immunology and microbiology at the Feinberg School, has been promoted to professor with tenure. In Barrett's clinical practice he predominantly treats inflammatory bowel disease patients with immunomodulatory therapies. His lab is involved in understanding the mechanisms for colitis-induced colon cancer.

Martha C. Bohn, Medical Research Institute Council Professor and director of the neurobiology program at Children's Memorial Research Center, received an award from the Japan Foundation for Neuroscience and Mental Health to spend two weeks in the laboratory of Mari Dezawa at Tohoku University in Sendai, Japan, in September. Bohn was accompanied by postdoctoral fellow Aleksandra Glavaski. The award facilitates the sharing of knowledge and technology about the potential application of genetically modified bone marrow–derived neuroprogenitor cells as a therapy for Parkinson's disease.

Erwin Goldberg, professor of biochemistry, molecular biology, and cell biology in Weinberg College, was recognized at a symposium hosted by the Center for Reproductive Sciences in September for 45 years of reproductive science research at Northwestern. Research in the Goldberg laboratory is focused on male reproduction in general and spermatogenesis in particular. The lab is also involved in studies on HIV/AIDS. It has been working on a delivery system for a DNA vaccine with collaborators at Yale University and the Southwest Foundation for Biological Research.

Philip Greenland, Harry W. Dingman Professor, senior associate dean for clinical and translational research, director and principal investigator of the Northwestern University Clinical and Translational Sciences Institute, all at the Feinberg School, was elected an honorary fellow of the Royal College of Physicians of London in May. Only 13 such fellowships were given worldwide and only 5 from the United States this year. Greenland's research, instruction, and clinical studies all focus on the prevention of cardiovascular disease.

Mary J. C. Hendrix, Medical Research Institute Council Professor and president and scientific director at Children's Memorial Research Center, has been elected treasurer of Research!America, a research, education, and public advocacy alliance that promotes strong and vibrant support for the nation's research enterprise. The Hendrix laboratory's research focuses on the identification of genes and proteins involved in cancer invasion and metastasis, with the overall goal of developing new therapeutic strategies to target tumor cells expressing a plastic, stem cell–like phenotype.

Karen Kaul, professor of pathology and urology at Feinberg and director of molecular diagnostics at Evanston Northwestern Healthcare (ENH), has been named the Board of Directors Chair in Molecular Pathology at ENH. She has also received the 2008 Association for Molecular Pathology Leadership Award. Kaul has been involved in the development and utilization of nucleic acid–based diagnostic testing for many years. Her lab focuses on clinical testing for infectious and oncologic disorders.

Carole LaBonne, associate professor of biochemistry, molecular biology, and cell biology in Weinberg College, has been named the Soretta and Henry Shapiro Research Professor in Molecular Biology. She has also been elected to the national board of directors of the Society for Developmental Biology, which advances understanding of developmental biology in research and education and to the general public. LaBonne studies how a complex body plan is developed starting from a single fertilized egg. Her laboratory studies the links between cells and multiple cancers, including melanoma. LaBonne has been the coleader of the Tumor Invasion, Metastasis, and Angiogenesis program at the Robert H. Lurie Comprehensive Cancer Center since 2005.

Hans-Georg Simon, associate professor of pediatrics at Children's Memorial Research Center, has received tenure. Simon is a developmental biologist with a long-standing interest in the shaping of organs, such as the vertebrate heart and limbs. In addition, his laboratory is studying the repair of tissues, a biological activity of practical importance in regenerative medicine. In comparing development and regeneration, Simon seeks to understand, at the molecular level, how a specific organ forms during embryogenesis and how certain animal species manage to rebuild lost structures as adults.

Travel Fellowship Winners Present Research at Scholarly Meetings

The two winners of spring 2008 CGM Travel Fellowships have traveled to scientific meetings to present their research.

Rachel Lander

Rachel Lander presented "Regulation of twist function in developmental and pathological epithelial-mesenchymal transitions" at the Keystone Symposia "Signaling Pathways in Cancer and Development" March 24–29 in Steamboat Springs, Colorado. Lander attended many interesting seminars on the role of cancer stem cells and the signaling that controls the maintenance and potency of these cells. She also attended evening poster sessions where she shared her work on cancer metastasis with other cancer biologists. Her adviser/mentor is Carole LaBonne, associate professor of biochemistry, molecular biology, and cell biology in Weinberg College.

Aparna Ramachandran

Aparna Ramachandran presented "STAT2 is a primary target for measles virus V protein mediated alpha/beta Interferon signaling inhibition" at the 27th annual meeting of the American Society for Virology July 12–16 at Cornell University. Ramachandran was able to present her work in front of established scientists active in her field and had opportunities to engage in scientific discussion and collaboration with peers. Her adviser/mentor is Curt M. Horvath, professor of biochemistry, molecular biology, and cell biology in Weinberg College.

Summer 2007 through spring 2008 CGM travel fellowship winners at this year's Robert H. Lurie Comprehensive Cancer Center scientific poster session. Photo by Nathan Mandell.

The CGM Travel Fellowship competition awards exceptional graduate students and postdoctoral fellows a $500 travel stipend to present the results of their genetics-based research at scientific conferences across the country. The fellowship is designed to defray some of the costs of attending and traveling to these meetings, where students network and share their findings with other scientists.

The summer 2008 CGM Travel Fellowship winners, **Christa Chatfield, Anthony Kowal,** and **Anat Ben-Zvi,** will be featured in the spring 2009 newsletter and presented at the annual Robert H. Lurie Comprehensive Cancer Center's scientific poster session in summer 2009. The center thanks all participants in this year's session on June 25, where fellowship winners from summer 2007 through spring 2008 were honored.

All graduate students and postdoctoral fellows who are participating in genetics-based research at the University are encouraged to apply for CGM Travel Fellowships. The next deadline is Friday, November 7, 2008. For more information, please visit www.cgm.northwestern.edu/travel_app.htm.

CGM to Participate in Science Chicago

CGM will host a genetics lab for the public as part of the citywide science outreach initiative "Science Chicago: Life's a Lab."

The lab will explore concepts in DNA, genetic disease, and forensics based on the idea of genetic identity. Following an activity using techniques to isolate their own DNA, participants will tour the DNA sequencing and genomics facilities at the Feinberg School.

All teenage residents of the greater Chicago area are welcome to attend the event, which will take place on the Chicago campus in January. Details will be announced on the center's web site (www.cgm.northwestern.edu) soon.

CGM is one of many Northwestern groups contributing to Science Chicago, an initiative led by the Museum of Science and Industry and supported by more than 80 academic institutions, science-related corporations, and organizations. In September the program began offering a year of free science programming and public education activities. Visit www.sciencechicago.com for more information.

High School Students Learn about Careers in Genetics

Students participating in Chicago State University's High School Summer Enrichment program came to the Feinberg School of Medicine July 23 for CGM's second annual Careers in Genetics Day. They performed DNA and gene isolation in a lab and then heard two faculty presentations about genetics research, technology, and careers.

Carolyn Jahn (right) shows high school students a polymerase chain reaction machine.

Graduate students from the Integrated Graduate Program in the Life Sciences — Miranda Bernhardt, Rebecca Daugherty, Suzan Hammond, Julia Jackson MacKenzie, Christine McCary, and Blayne Sayed — facilitated the genetics lab, which was held in Feinberg's teaching space in the Tarry Building. Following an informal discussion of DNA replication and PCR, the students learned to isolate DNA from their cheek cells.

After collecting cells via Gatorade "mouthwash," students used lab centrifuges, boiling plates, and pipettes to create a small DNA pellet. Gel electrophoresis was used to determine the student's genotype for a sequence of DNA with or without a base pair insertion. Students used images of the gels to determine whether their genome contained the insertion. Because the lab used each student's individual DNA, the results illustrated the concepts of genetic diversity and identity.

Cathy Wicklund, director of the Graduate Program in Genetic Counseling, discussed the growing role of genetic counseling in many areas of health care, including information about why someone might choose to have a genetic test. Her focus on how a counselor presents the findings of genetic tests to patients covered issues in bioethics, discrimination, and the relevance of results to a patient's family.

Carolyn Jahn, an associate professor of cell and molecular biology, spoke on the wide-ranging applications of genetics in careers within the health-care system and beyond. Jahn's presentation ranged from opportunities in genome research to the importance of genetics in pig farming.

Michael Kennedy, CGM's director of educational and research programs, organized the event with the help of Feinberg faculty and Sultan Farabee, assistant director of prehealth professions and coordinator of the summer program at Chicago State University. Chicago State's six-week summer program provides academic enrichment to high school students interested in science and careers in science and health care. It includes classroom-based learning and exposure to applied science and scientists through programs like Genetics Day.

For more information about CSU's High School Summer Enrichment program, please visit www.csu.edu/PreMed/summerenrichment.htm.

Events

Fall 2008 Silverstein Lecture Series

The fall Silverstein Lecture Series will feature Drew Endy, assistant professor at Stanford University. Endy will deliver his lecture, "Building a New Biology," in Evanston on October 27 and in Chicago on October 28.

Researchers recently have developed powerful new technologies that allow life to be built from scratch. New engineered organisms are being constructed to help cure cancer, produce renewable energy, and assemble living computers. Endy will discuss not only the science behind this new biology but also the many factors that must be considered as research progresses, from practical issues like patents and copyrights to the weighty implications of essentially creating life. Who will control these new biotechnologies? What good and bad possibilities seem likely to come true?

The Evanston lecture will be at 7 p.m. on Monday, October 27, in the McCormick Tribune Center, 1870 Campus Drive. The Chicago lecture will be at 7 p.m. Tuesday, October 28, in the Hughes Auditorium of the Robert H. Lurie Medical Research Center, 303 East Superior Street. A light reception will precede both events at 6:30 p.m.

The free lectures are open to the public. For more information call 312-503-5600 or visit www.cgm.northwestern.edu.

Funding for the Silverstein Lecture series is provided by the Herman M. and Bea L. Silverstein Medical Research Fund for Genetic Medicine.

Consumer Genomics Workshop

The Genomics Core will host a one-day workshop on Friday, October 31, that will discuss direct-to-consumer genetic testing and its consequences for translational research.

Current methods in design and execution of GWAS studies and their applications will be covered in the morning sessions. Personal genomics and its effect on geneticists, physicians, and industry and its ethical implications for society will be discussed in the afternoon.

All sessions are designed for scientists and health care professionals.

Speakers will include Nancy Cox, chief of genetic medicine at the University of Chicago; David Ewing Duncan, director of the Center for Life Science Policy and visiting researcher at the Graduate School of Journalism at the University of California, Berkeley; Peter Angelos, associate director of the MacLean Center for Clinical Medical Ethics and chief of endocrine surgery at the University of Chicago; Wentian Li, a researcher at the Feinstein Institute for Medical Research of the North Shore–Long Island Health System in Manhasset, New York; and Michael Cariaso, senior scientific consultant for BioTeam.

The conference will take place in Conference Room L South of the Prentice Women's Hospital, 250 East Superior Street, Chicago. Registration and continental breakfast will be at 8 a.m., with the workshops scheduled for 9 a.m. to 5 p.m. Discounted parking will be available.

Attendance is free but limited to 100 people. Please RSVP to genomics-core@cgm.northwestern.edu by October 27. Everyone registering by then will be entered to win an iPod Shuffle or an eight-week sample run by the Genomics Core using HumanCNV370-Quad v3 chips.

The workshop is sponsored by CGM's Genomics Core Facility, the Robert H. Lurie Comprehensive Cancer Center, and Illumina.

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