2014 - 2015 Biostatistics and Computational Biology Annual Newsletter

A message from the Chair, Robert Strawderman, Sc.D.

As I write this letter to you, I'm about to enter the second half of my third year as chair of this great department. It is hard to believe how quickly the time has gone – significant changes have occurred within the department, medical center and the university at large.

Over the past 3.5 years, and in chronological order, we successfully recruited three outstanding tenure track faculty: Tong Tong Wu, from the University of Maryland, as a tenured Associate Professor; Brent Johnson, from Emory University, as a tenured Associate Professor; and, Matt McCall, who was recruited from his Rochester postdoctoral position that he held after receiving his PhD from Johns Hopkins. However, we have experienced a net loss of faculty overall, with departures both in the tenure and research tracks. In addition to Jack Hall, who passed away shortly after I became chair, several tenure track faculty have left the department to pursue attractive opportunities elsewhere: Hua Liang, to Georgetown; Hulin Wu and Hongyu Miao, both to the University of Texas at Houston; Dongwen Wang, to Arizona State University; and, Hua He, who left for Tulane University. Several research track faculty have also taken advantage of other opportunities, mostly in private industry. The changes in department personnel have not been limited to faculty: senior accountant Jane Long retired in June 2014 after 32 years of service to the UR, senior accountant Pat Sale retired in December 2015 after 40 years here, and graduate program coordinator Cheryl-Bliss Clark resigned her position in December, moving to the Albany area in December 2015 for family reasons.

While change is inevitable and not always for the better, one positive of change is that the department has the opportunity to grow again and build strength in new areas. The department is actively searching for several faculty positions in order to grow the ranks of tenure track faculty in several areas of strategic importance. Areas of particular interest include clinical trial design, modeling and analysis of high-throughput – omics data, modeling and analysis of imaging data, clinical/biomedical applications of causal inference, and modeling and analysis of data derived from biological and social networks. Several of these focus areas are in alignment with areas of emphasis in URMC's research strategic plan as well as with the University's signature initiative in data science. The department is reasonably well represented in these initiatives: our faculty continue to serve on key steering and hiring committees, help lead the new interdisciplinary data science seminar series, and teach core classes in probability and inference to undergraduates and masters students in recently approved data science educational programs. We also continue to work with River Campus administration on engaging the department more deeply in these efforts as well as in the undergraduate major in Statistics.

Important developments in the graduate program have also occurred since I last wrote to you. The department has initiated a new (and increasingly successful) graduate student recruiting day; this event provides students potentially interested in graduate study in biostatistics and statistics with an opportunity to learn about our programs, to meet with current students, faculty, and program alumni, and to gain some perspective on the many career opportunities biostatistics has to offer. This event is part of a broader effort to recruit a more diverse pool of applicants into our programs. Our own Sally Thurston, whom I recently appointed as Director of Diversity for the department, is spearheading diversity recruiting efforts by traveling to conferences that focus on underrepresented minority students and faculty. Drs. Sally Thurston, David Oakes, Michael McDermott, and Ollivier Hyrien also recently applied to be, and in October were accepted as, mentors for the National Alliance for Doctoral Studies in the Mathematical Sciences (the "Math Alliance"). Found in 2001, the "Math Alliance" is a NSF-funded community of mathematical sciences faculty and students whose

goal is to ensure "that every underrepresented or underserved American student with the talent and the ambition has the opportunity to earn a doctoral degree in a mathematical science".   Another notable success this year includes the renewal of our long-held T32 NIEHS training grant. This training grant supports both graduate students and postdoctoral scholars interested in environmental science and related applications in health. The reins of leadership of this grant were also passed from David Oakes to Sally Thurston, both of whom did a truly outstanding job in getting this critical source of student support renewed.

Department faculty continue to be active in publishing a mix of methodological and collaborative research, pursuing research funding opportunities, teaching and advising our excellent graduate students, engaging in statistical consultation, and serving the profession in a variety of ways, including national committee work, appointments on NIH study sections and other grant review panels, and various editorial board positions. If you've been following the department's news page, you've no doubt observed that our faculty and students have also been honored in several ways. An important "first" in the department's history also occurred this past year. With the support of UR President Joel Seligman, Provost Peter Lennie and the Board of Trustees, Mark Taubman, SMD Dean and URMC CEO, used funds from the estate of SMD alum Donald M. Foster, M.D. to endow the first-ever professorship in Biostatistics at UR. This is a very strong statement of the value that the school and university places on the contributions of this department to research and education. I was humbled, and deeply honored, to have been selected as the inaugural Donald M. Foster M.D. Distinguished Professor in Biostatistics.

I would like to end this annual message by once again drawing your attention to the William Jackson Hall Graduate Student Fellowship that the department has successfully established in honor of Jack Hall. Since its inception, and through the generosity of many of you, the department has steadily raised private donations in excess of $115,000. The department has also invested $100,000 of its reserve funds, bringing the total endowment (including returns) to approximately $233,000. The department was exceptionally pleased to have been able to announce the inaugural recipient of this Fellowship early in 2015 (Tian Chen) and we will soon be announcing the second recipient of the Hall fellowship in early 2016. As you may recall, our goal is to reach a minimum endowment of $250,000; this amount should permit us to honor a deserving student in Jack's name each year with a full semester of financial support. The department is deeply appreciative of the donations made in support of this important fellowship – thank you for your donations and also for your continued support!

UR Collaborates on Nationwide Study for New Parkinson's Treatment
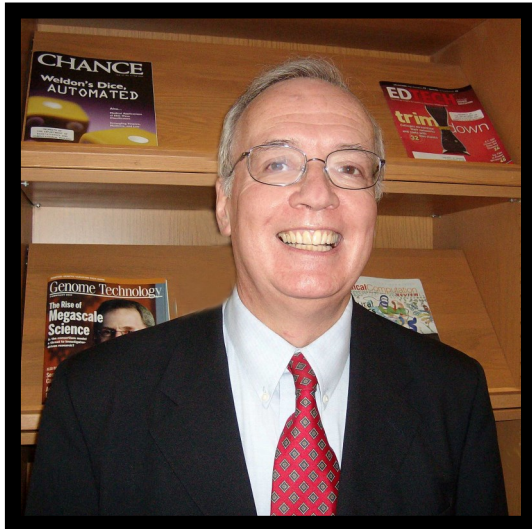
David Oakes, Ph.D

In a 60-site clinical study to investigate whether the drug inosine can slow early Parkinson's disease, the University of Rochester Medical Center was selected as the coordinating center for data collection and will receive a $6 million research award.

UR Professor **David Oakes, Ph.D.**, in the Department of Biostatistics and Computational Biology, will facilitate data coordination with study chair Michael A. Schwarzschild, M.D., Ph.D., a neurobiologist at Massachusetts General Hospital. The National Institute of Neurological Disorders and Stroke (NINDS) funded the five-year, $26 million project.

Parkinson's produces body tremors, rigidity, difficulty walking and other symptoms, and is caused by the degeneration of brain cells. Although some treatments can ease symptoms, no therapy has yet been shown to relieve the loss of brain cells or slow progression of the disease.

Previous research has shown that when Parkinson's patients have higher levels of the antioxidant urate in their blood, symptoms of the disease do not worsen as quickly as in patients who have lower urate levels. Therefore, scientists hypothesized that raising urate levels might protect against Parkinson's progression. Inosine (a pill), is a supplement that already has been tested in a phase 2 trial, funded by The Michael J. Fox Foundation for Parkinson's Research. It showed that inosine was safe, tolerable, and raised urate levels in people with the early stage Parkinson's disease.

The newly funded phase 3 study is double-blinded and placebo-controlled, with the goal of learning whether inosine will boost urate levels enough to delay the progression of Parkinson's disease over two years. Enrollment is expected to begin in mid-2016.

Schwarzschild's research team has also discovered that the protective effects of urate in the brain might extend beyond its own antioxidant properties. Investigators reported in the journal *Neurobiology of Disease*, that urate also stimulates brain cells called astrocytes to activate a major antioxidant pathway believed to have a role in several neurodegenerative disorders. While other antioxidants such as vitamin E have failed to show a benefit to patients with Parkinson's, the new evidence of a more nuanced molecular mechanism for urate boosts the researchers' enthusiasm, Schwarzschild said.

One potential drawback to inosine treatment is gout, an arthritic condition associated with people who have naturally high urate levels. No one with higher than normal levels of urate will be eligible to participate, Oakes said, and careful monitoring will take place during the study to look for other adverse complications. Only a few of the 75 participants in the earlier phase 2 trial developed side effects.

The phase 3 trial will closely track how patients report symptoms and outcomes, and will use brain images to support a diagnosis of Parkinson's, which can be difficult to establish in early stages, Oakes said.

Co-investigators at the University of Rochester include **Christopher Beck, Ph.D.**, also in the Department of Biostatistics and Computational Biology; Cynthia Casaceli, M.B.A., director of the Clinical Trials Coordination Center; and Cornelia Kamp, M.B.A., of the Clinical Materials Services Unit. The investigation is being conducted under the auspices of the Parkinson Study Group, a non-profit group of health-care professionals dedicated to finding better treatments for Parkinson's.

Contributed by Leslie Orr, Media Contact

Faculty Member Recognized with Endowed Professorship

From left: Joel Seligman (President and CEO, University of Rochester), Dirk Bohmann, Ph.D. (Biomedical Genetics), David Foster (brother of Donald Foster), **Robert Strawderman, Sc.D.** (Biostatistics) and Mark Taubman, M.D. (CEO of the University of Rochester Medical Center and UR Medicine)

Robert Strawderman, ScD, second from the right**,** was installed as the **Donald M. Foster, MD Distinguished Professor of Biostatistics** and Dirk Bohmann, Ph.D., second from the left, was installed to the Donald M. Foster, MD professorship in Biomedical Genetics, at an August ceremony.

Donald Foster '50M (MD) was a longtime supporter of the School of Medicine and Dentistry. He established a provision in his estate plan for the University to continue his support. After his death in 2013, the two professorships were created in recognition of his loyalty and generosity.

Dr. Strawderman has more than 20 years of experience working with interdisciplinary teams of scientists on projects focused on clinical research, health care delivery and evaluation, and various areas of public health. His research includes statistical methods for risk and outcome prediction in medicine and those for evaluating the cost and quality of health care.

This article can be seen in its entirety at:
https://www.rochester.edu/currents/V43/N01/endowed.html

Department and Faculty News

Renewal of the T32 Training Grant

Our T32 training grant "Training in Environmental Health Biostatistics" (T32ES007271) has just been renewed by the National Institute of Environmental Health Sciences at NIH for 5 years, starting September 30, 2015. **Dr. Sally Thurston** is the new Principal Investigator, taking over for **Dr. David Oakes** who successfully led this grant for 20 years. Trainers for the grant include **Drs. Thurston, Oakes, Brent Johnson, Tanzy Love, Michael McDermott** and **Rob Strawderman** from Biostatistics, and **Drs. Emily Barrett** from OB/GYN, **Deborah Cory-Slechta** from Environmental Medicine, and **David Rich** and **Edwin van Wijngaarden** from Public Health Sciences. The first 20 years of the grant supported 16 predoctoral students and 14 postdoctoral fellows. The grant will support three predoctoral students and one postdoctoral fellow each year.

Renewal of the Seychelles Child Development Second Nutrition Study (NC2)

The Seychelles Child Development Study (SCDS) is examining the impact of mercury exposure from fish consumption on development from childhood through young adulthood. The SCDS has enrolled four cohorts of mother-child pairs in the Republic of Seychelles, an island nation in the Indian Ocean. In the most recent cohort, the Second Nutrition Study (NC2), prenatal mercury and polyunsaturated fatty acid status along with childhood outcomes at 20 months have been measured. This year two applied papers by team members were published, including the first paper on the NC2 cohort. In addition two papers on statistical methodology inspired by the SCDS data were published this year, co-authored by **Dr. Tanzy Love** and **Dr. Sally Thurston**, and one co-authored by **Dr. Katie Evans** (alumna 2014). Several more papers are also in the works, which include department members research assistant, **Don Harrington**, programmer, **Joanne Janciuras**, alumna, **Dr. Van Tran,** and current graduate students, **Kathy Grzesik, Amit Chowdhry** and **Amy LaLonde**. This year the SCDS team was funded on their five year renewal application of the NC2 study. With a budget of about $3 million, this renewal aims to study nutritional and genetic modifiers of the toxicity of methylmercury from fish consumption. The Seychelles team looks forward to continuing their collaboration into a third decade.

Four Years of the ASA UpStat Conference

In April of 2015, the Rochester Chapter of the American Statistical Association organized the fourth annual conference of the upstate ASA chapters (UpStart 2015). This year two department faculty, **Dr. Mike McDermott** (UpStat 2015 Program Chair) and **Dr. Tanzy Love** (ASA Rochester President) were on the organizing committee. They worked with colleagues at RIT, SUNY Geneseo, Xerox, SAS, and other local statisticians to put together a conference with Dr. Kosuke Imai from Princeton University as a keynote speaker, 21 contributed talks, a poster session and a conference dinner. There were also several student competitions in which current PhD student, **Madhurima Majumder,** won $500 for placing second. Several department students, faculty and staff attended the 2015 meeting held on the campus of SUNY Geneseo. Next year, the meeting will be held at Canisius College in Buffalo on April 22 and 23, 2016.

Dr. Love Elected SBSS Program Chair for 2017 Meeting in Baltimore, MD

This year, **Dr. Tanzy Love** won the election for Program Chair-Elect in the Section on Bayesian Statistical Science. This two year position includes organizing the section's student paper competition, round table discussions, and the contributed program for the 2016 JSM in Chicago, IL and the invited session and continuing education courses for the 2017 JSM in Baltimore, MD. This year she is working with the 2016 Program Chair, **Dr David Dahl** (who wrote the xtable library in R), a professor at Brigham Young University. **Dr. Hua He** was also nominated this year to stand for election as Program Chair Elect for the Mental Health Section of the ASA.

Department and Faculty News - continued

In September 2014 and again in September 2015, **Drs. Mike McDermott** and **Sally Thurston** participated in the week-long URMC Academic Core Curriculum for Junior Faculty, co-sponsored by the CTSI and the Office for Faculty Development. They gave a joint presentation on Making the Most of Statistical Collaboration as well as separate workshops on Reproducible Research and Evaluation of Clinical Trial Reports. The course was attended by approximately 50 URMC junior faculty each year.

Dr. Mike McDermott was the primary biostatistician for a multicenter randomized, double-blind, placebo controlled trial of acetazolamide in people with idiopathic intracranial hypertension (IIH, also known as pseudotumor cerebri) conducted by the Neuro-ophthalmology Research Disease Investigator Consortium (NORDIC). In IIH, increased pressure of the fluid that surrounds the brain (cerebrospinal fluid, or CSF) leads to significant headache and visual loss. The disease occurs predominantly in overweight women in their reproductive years. The trial showed that acetazolamide improved vision, papilledema, CSF pressure, and quality of life. The main trial results were published in the April 23, 2014 issue of JAMA. Nearly 20 additional papers from this study have been published or submitted for publication since the original trial report.

The NORDIC Idiopathic Intracranial Hypertension Study Group Writing Committee. Effect of acetazolamide on visual function in patients with idiopathic intracranial hypertension and mild visual loss: the idiopathic intracranial hypertension treatment trial. *JAMA* 2014; 311:1641-1651.

On September 9, 2015, at the SMD Convocation Ceremony, **Professor McDermott** was recognized as the Outstanding Graduate Program Director for his unwavering 15 years of commitment to the quality of our graduate program and the success of its students. Treating his students with respect, he is sensitive to their academic and personal concerns, while finding solutions to problems where needed in ways that address individual needs while maintaining academic integrity and program rigor. Mike is a very strong and effective advocate for students both within the department and in the University more broadly.

Drs. Sally Thurston, David Oakes, Mike McDermott, and **Ollivier Hyrien** are mentors for the National Alliance for Doctoral Studies in the Mathematical Sciences (the "Math Alliance", http://mathalliance.org/), an NSF-funded community of mathematical sciences faculty and students. Founded in 2001, one goal of the Math Alliance is to "be sure that every underrepresented or underserved American student with the talent and the ambition has the opportunity to earn a doctoral degree in a mathematical science". Membership in the Math Alliance has grown from 17 faculty mentors in 2007/08 to 514 faculty mentors from more than 175 colleges and universities in 2014/15, with the number of student scholars expanding from 120 to 1565 over this same period. **Drs. Thurston, Oakes, McDermott** and **Hyrien** recently applied to become a Graduate Program Group (GPG) of the Math Alliance, and their application was accepted in October 2015. A GPG is a group of Math Alliance graduate faculty in a mathematical sciences department that is of sufficient size and seniority to be able to mentor many underrepresented minority graduate students, and who have committed themselves to a set of best practices. As a result of becoming a GPG, a web page devoted to the Biostatistics graduate program has been added to the Math Alliance website (see http://mathalliance.org/?gpg=university-of-rochester-department-of-biostatistics-and-computational-biology), and the success of their GPG application was noted at the Alliance's upcoming annual Field of Dreams conference attended by **Dr. Thurston.**

Sally Thurston, Ph.D. was a co-author on a study of the effects of air pollution in Beijing, China on fetal growth and development (**Rich DQ, Liu K, Zhang J, Thurston SW, Stephens T**, et al. "Differences in birth weight associated with the 2008 Beijing Olympics air pollution reduction: results from a natural experiment", Environmental Health Perspectives, 2015, to appear). Using the natural experiment of air pollution declines during the 2008 Beijing Olympics, the authors evaluated whether having specific months of pregnancy during the 2008 Olympic period resulted in larger birth weights, compared to the same dates in 2007 or 2009. Babies in their 8th month of gestation during the 2008 Olympics were, on average, 23g larger than babies in their 8th month in 2007 or 2009. Further, increases in multiple pollutants during the 8th month of pregnancy were associated with significant 17g to 34g birth weight reductions, suggesting reduced air pollution exposure was driving this birth weight change. http://www.urmc.rochester.edu/news/story/index.cfm?id=4308

More Department and Faculty News

Dr. Derick Peterson was promoted to the rank of Full Professor, effective February 1, 2015. This followed a year of continued collaboration with Dr. Arthur Moss. Dr. Moss was successful in securing NIH funding for a new 5-year R01 "Clinical and Basic Science Studies in Long QT Syndrome Type e (LQT3)." This project will provide new insights into clinical, basic science, and therapeutic aspects of LQT3 and will lead to more effective prevention of sudden death for patients with this disorder –and for patients with other genetic and acquired cardiac rhythm disorders. This collaboration also included joint mentorship of Dr. Abu-Zeitone, the first person to earn a PhD in The University of Rochester's new Translational Biomedical Science program. Her work largely involved sophisticated survival analyses of Heart Research data (Cox models with time-dependent covariates, spline terms, interactions, left truncation, stratification, recurrent events, multiple time scales, and jackknife covariance estimation to account for dependencies due to family membership). We found interesting differences in efficacy between various beta-blocker drugs taken by high-risk Long QT Syndrome patients, whereas we found insufficient evidence that oral contraceptives impact risk.

Dr. Peterson is now working with his Ph.D. student, **Katherine Grzesik** as part of a new Rochester Viral Respiratory Pathogens Research Center (RPRC) Innovation Project Subaward to develop classifiers for bacterial infection among those infected with virus, bacteria, or both. Transcriptomic data from RNA-Seq will be combined with clinical data (white blood count, congestion, etc.) to develop the classifiers. If successful, such classifiers could be useful in aiding physicians to more appropriately prescribe antibiotics, possibly reducing serious adverse events associated with their over-use.

Matthew McCall, Ph.D., M.H.S. received an R00 Grant for Statistical Methods for Estimation of Gene Regulatory Networks. The overall goals of the proposed research are to: improve the estimation of gene regulatory networks from perturbation experiments, by using methods that explicitly model and incorporate uncertainty in each step of the process, and to use these estimated networks to predict cellular response to intervention.

During the summer Dr. McCall mentored 4 undergraduates interested in Biostatistics and Computational Biology: 2 from the University of Rochester Data Science major, 1 from UNC Biostatistics, and 1 from SUNY Geneseo Biology.

On September 9, 2015 at the SMD Opening Convocation Ceremony Dr. McCall was recognized by receiving the Graduate Student Society Advocacy Award for his contributions to the organization and graduate student community. During the past year he hosted a workshop for graduate students on the challenges of transcriptional genomics and participated in the annual poster session as a judge.

Peter Salzman, Ph.D., received an award for "Novel Classification Method Modeling High-Level Interactions Between Variables". This award is funded by the University of Rochester Office of the Provost and the School of Medicine and Dentistry Dean's Office via the Health Sciences Center for Computational Innovation (HSCCI).

Brent Johnson, Ph.D. was granted tenure effective March 1, 2015.

More Department and Faculty News - continued

The Center for Biodefense Immune Modeling (CBIM) (**Hulin Wu, PI,** Martin Zand, PI) hosted the 2015 Summer School in Computational Biology, June 1st -4th. Twenty-five students from throughout the U.S. attended the 3.5 day summer school. Topics included basic concepts of mathematical and computational modeling to more specific lectures on ordinary differential equation models of immune response. A number of lectures focused on statistical concepts ranging from statistical inference and data analysis using R to bioinformatics data analysis and modeling using R. Morning classroom lectures by CBIM faculty were generally followed by afternoon hands-on computer lab tutorials. Travel awards were provided to 12 graduate students and postdocs. Overall, the summer school was reported as a success, with 90% reporting they would recommend this summer school if offered again.

Following the summer school, the CBIM hosted the 2015 Symposium on Immune Modeling in the Big Data Era, June 4th - 5th. Presentations by 14 (12 invited) speakers covered 5 major themes: immunological big data; mathematical modeling of immunity and pathogens; bioinformatics modeling in immunology; network modeling for systems immunology and biology; and modeling Ebola and other emerging viruses. Over 80 people attended the symposium coming from throughout the U.S. and abroad. During the lively poster session, speakers judged and selected 3 winners among the 15 posters. The poster session fostered engaging conversations not only between faculty and students/postdocs but between researchers with different backgrounds in statistics, immunology or computational modeling. Overall, the symposium was rated as a large success, with attendees reporting that they found new ideas for their research. The summer school and symposium were funded by the NIAID Modeling Immunity for Biodefense program.

Professor Hulin Wu accepted an endowed professorship and associate chair position at the Department of Biostatistics, School of Public Health, and Professor of Biomedical Informatics, University of Texas Health Science Center at Houston. He has moved to Houston and started his new job on September 1, 2015 where he will develop and lead the biomedical Big Data program at UT at Houston.

Hongyu Miao, Ph.D led a research project on statistical learning of big data and the work was recently published in the journal *Neurocomputing* recently. In this study, a novel pattern extraction method, called structure-constrained nonnegative matrix factorization (SCNMF), was proposed and successfully applied to human face images as well as electroencephalogram (EEG) data, showing superior performances over other state-of-the-art alternatives. Dr. Miao is now an associate professor in the Department of Biostatistics at the University of Texas Health Science Center in Houston.

Lu, N., Miao, H., "Structure Constrained Nonnegative Matrix Factorization for Pattern Clustering and Classification", Neurocomputing (in print, 2015)

Dr. Miao (co-I) with Dr. Jian Zhu (PI) from the Department of Microbiology and Immunology was recently funded by NIH/NIAID for a research project on host genes involved in HIV latency. The R01 grant title is "Investigation of Latency Promoting Genes (LPGs) in HIV Oral Reservoir Cells" with a total budget ~1.2 million for 5 years.

OPEN HOUSE

On September 26, 2015, the department held an open house for prospective graduate students. This event provided students potentially interested in graduate study in biostatistics and statistics with an opportunity to learn about our programs, to meet with current students, faculty, and program alumni, and to gain some per-spective on the many career opportunities this exciting field has to offer. Thank you to all faculty, students and staff who contributed to the success of this event!

Yu Han, Ph.D. (2014 alumnus and former student of **Changyong Feng, Ph.D** and **Xin Tu, Ph.D.**) was the guest alumni speaker. He is presently employed by Novartis Oncology in the Department of Biometrics and Data Management as a Senior Biostatistician. Yu spoke about how graduate study prepared him for a career. Faculty, staff and students were on hand to answer questions on program content, program requirements, the application process and financial support and Open House visitors were given a tour of the department.

William Jackson Hall Graduate Student Fellowship

The Department of Biostatistics and Computational Biology at the University of Rochester Medical Center has endowed the creation of the William Jackson Hall Graduate Student Fellowship in honor of Jack's lifetime achievements. Jack joined the University of Rochester faculty as professor and chair of the Department of Statistics in the College of Arts and Sciences in 1969. During his nearly 40 years here, he made highly significant contributions to several areas of mathematical statistics, recognized in part through honorary fellowship in the American Association for the Advancement of Science, the Institute of Mathematical Statistics and the American Statistical Association. Jack was also a major force behind the formation of the Division of Biostatistics in the School of Medicine and Dentistry, the forerunner of the present department, and he played an especially instrumental role in developing Rochester's doctoral program in Statistics.

Jack's dedication to the graduate program and its students, commitment to teaching, and collaboration in translational research is a testament to the significance of this legacy. His depth of care for his students and unparalleled effort to teaching has produced a loyal and grateful group of alumni from the program. Many of his students have gone on to prominent roles in academia and industry. Jack's impact on the program was formally recognized in his receipt of the first Lifetime Achievement in Graduate Teaching Award, bestowed upon him by the University of Rochester at the 2004 Commencement Ceremony. Common themes of the letters in support of his nomination for this award included Jack's commitment to teaching, the sheer breadth of his knowledge in the theory and applications of statistics, and the individual attention, hospitality and friendship that he freely gave to his students and their families. Siddartha Dalal, Jack's first Ph.D. student at Rochester and Chief Technology Officer at RAND Corporation, writes "He was a great teacher, his lectures were always thoughtful, and he challenged students to think about basic issues. He took great pride in their accomplishments and spoke highly about those to others. Jack's interests in his students also did not end with the completion of their thesis, but have continued to the extent that many students count him as part of their extended family." Jack has been involved in many clinical trials and other collaborative projects at the Medical Center, where the department sits at the core of all research and plays a pivotal role in planning for future research initiatives. Arthur J. Moss, Professor of Medicine (Cardiology) and Jack's collaborator for nearly 30 years, remarks that "Jack has been intimately involved in our longstanding research related to the Long QT Syndrome and more recently in our Multicenter Automatic Defibrillator Implantation Trial. His unique insights into statistical issues have been at the heart of the design of our programs. It is through these interactions that I myself became one of his students in the sense that I learned from each and every interaction with him."

This merit-based fellowship intends to recognize one or more Statistics doctoral students in their last semester or year of study whose academic record reflects the major cornerstones of Jack's distinguished career. Recipients will have distinguished themselves through combination of outstanding performance in coursework and qualifying exams; excellence in their service as a graduate student teaching assistant; and timely completion of a dissertation containing work judged to be of particular significance in both its methodological contribution and potential impact in one or more application areas.

The department specifically intends for this fellowship to be an enduring tribute to Jack's legacy and enormous influence on the Statistics doctoral degree program and its students through his many outstanding contributions to research, graduate teaching, and doctoral student mentorship. Your generosity affords us the ability to continue to attract the best and brightest students, to train outstanding scientists of tomorrow, and to further elevate the department to new levels of prominence in education and research. To make a gift please contact Carmen Aiezza, Director of Advancement, 585-275-0808, carmen.aiezza@rochester.edu. Alternatively, you may also use the secure website www.rochester.edu/advancement by selecting **'Make an Online Gift'**.

Important: If you wish to make a gift and choose to do so online, please be sure to select **School of Medicine and Dentistry** as the gift designation and in the comment box add: **Hall Graduate Student Fellowship (A09765).**

Inaugural William Jackson Hall Student Fellowship Award

David Oakes, Ph.D. presenting the award to Tian Chen

In December 2014, graduate student **Tian Chen** was announced as the recipient of the inaugural William Jackson Hall Graduate Student Fellowship Award. A short ceremony to present the award followed by a reception took place on May 15, 2015.

After receiving the award, Tian spoke saying, "As the recipient of the inaugural William Jackson Hall Graduate Student Fellowship Award I want to thank the award committee for giving me this great honor. And I also want to thank my advisor, Dr. Xin M. Tu, for his support during my thesis research!

"I met Dr. Hall in 2012 when I took his class of large sample theory in the spring semester of that year. But I got to know him before that and it was an interesting story. I was at a workshop and when people asked me where I came from, I said University of Rochester. And right after I said this, I saw their eyes shining with admiration and began asking me many questions about his large sample class, such as "Have you ever been in his large sample class?" and "Can I borrow your large sample class notes?" It is clear that Large Sample Theory was his trademark course and everyone wanted a copy. Thus, even before I had Dr. Hall as my professor, I already knew him and his legendary class notes. I am so lucky to have him teach us large sample theory. He had this incredible ability to explain difficult concepts in Large Sample Theory. Perhaps this is the very reason why his class notes were so deeply loved by so many students. He also had a great sense of humor. He usually told us a joke at the end of each class and everyone left the classroom with a smile.

"I am very grateful to receive this award. It is not only an honor, but also serves a constant reminder to aim high, work hard and become the best you can be. I am going to be a tenure-track assistant professor at the University of Toledo and I hope that one day I would become as good a teacher to my students as Dr. Hall has been to me"!

Shown here to present the award from left to right: David Oakes, Ph.D., Nancy Hall, Tian Chen, Barbara Perkins (Nancy Hall's sister), Barbara Hufsmith, (Nancy's daughter) with her husband Gordon Britton.

Nancy Hall, Setta Odoroff, Barbara Perkins (Nancy Hall's sister), Peggy Oakes, and Barbara Hufsmith (Nancy's daughter).

Graduate Students

Sally Thurston (l), Setta Odoroff, David Oakes (r)

Student Activities
6th Annual Student Workshop - Friday, May 15, 2015

Front Row, left to right: Katherine Grzesik and Amy LaLonde
Back Row, left to right: Derick Peterson-faculty advisor, Tanzy Love-faculty advisor, Chang Liu, Sally Thurston-faculty advisor, Yun Zhang, and Juilee Thakar-faculty advisor. Not pictured: Chongshu Chen and Donnie Hebert, Ollivier Hyrien-faculty advisor and Mike McDermott, graduate program director.

Our annual Statistics Ph.D. Student Workshop was held on Friday, May 15, 2015. The workshop included presentations by Ph.D. students who had passed the Advanced Examination but had not yet taken their proposal examination. Each student presented on his/her dissertation topic, providing some background and an update on the progress of his/her research. For students who had not yet identified a dissertation topic, the presentation was on material covered in a recent reading course (ideally, a potential dissertation topic).

Student News

Tian Chen, Ph.D. was first author on two recent noteworthy papers: Rank regression: an alternative regression approach for data with outliers (2014), *Shanghai Archives of Psychiatry, 26*(5), 310; and Identification of significant B cell associations with undetected observations using a Tobit model (2015), *Statistics and Its Interface,* in press. Tian also was invited to present at an Invited Session of the 2015 JSM. The title of her talk was "Comparison of three longitudinal rank-based test with progression-free survival in randomized Phase II oncology studies when Phase III design is based on overall survival." She received the "University Dean's Travel Award." Tian was shown on a previous page, being awarded the **Inaugural William Jackson Hall Graduate Student Fellowship.**

On June 24, 2015, Tian successfully defended her thesis, "A New Class of Functional Response Models for Robust Regression Analysis."
Tian is now an Assistant Professor at the University of Toledo in the Department of Mathematics and Statistics.

Tian Chen, Ph.D. with her advisor, Xin M. Tu, Ph.D.

More Student News

Thanh (Van) Tran, Ph.D. was asked what her favorite thing in Biostatistics and Computational Biology was during the past year, to which she stated, "This past year, I enjoyed completing my thesis research and seeing all the parts come together. At times, a problem appears insurmountable, but somehow it always gets solved. I've truly enjoyed my time as a student in the department and am grateful to all of those who have helped me along the way."

On June 9, 2015 Van successfully defended her thesis, "Threshold Boolean Network Inference and Experimental Design." Van is shown here with her advisor **Anthony Almudevar, Ph.D.**.

Van is now a postdoctoral fellow at the National Cancer Institute.

Anthony Almudevar, Ph.D. (left) with
Van Tran, Ph.D.

Changming "Sherman" Xia successfully defended his thesis, "Generalized Semiparametric Linear Mixed-effect Models" on June 10, 2015. Over the past year, Changming spoke of how much he enjoyed working with **Sally Thurston, Ph.D.**, his mentor, on his dissertation and thinking about exciting things to do after graduation. Changming attended JSM Boston in August 2014 and presented, "Testing linearity versus smooth alternatives for mixed-effect models with generalized outcomes." He also attended ENAR Miami in March 2015 to present, "Modeling within-subject correlation for binary mixed-effect model."

Changming is now at Abbvie, Inc. as a Senior Research Statistician in the Biometrics group.

Hua Liang, Ph.D., co-advisor (left), Changming Xia (center), Sally Thurston, Ph.D., co-advisor (right)

Student Internships

- **Yun Zhang** had an internship in Novartis Oncology, East Hanover, NJ this summer for 12 weeks. Her supervisor was our Rochester alumnus **Dr. William Mietlowski**. She also received great help and supervision from our alumnus **Dr. Fei Ma** (intern in 2013 and currently full-time Novartis Oncology Biostatistician). Yun worked on a new rank-based randomized Phase II design, and compared this to a Phase II design using progression free survival in terms of which design best predicts success in a Phase III design based on overall survival. **Drs. Mietlowski** and **Ma** also supported our alumnus **Dr. Tian Chen** (intern 2014) for her invited talk in JSM 2015. Yun's work will lead to a publication in JSM Proceedings 2015, a poster presentation in Novartis Biostatistics Conference 2015, a manuscript in preparation for submission to Clinical Trials, and a potential second paper to International Biometric Conference 2016. Yun would also like to thank our alumnus **Dr. Yu Han** (currently full-time Novartis Oncology Biostatistician) for his referral to **Dr. William Mietlowski**.
- **Amy LaLonde** did her internship with EY (rebranded from its earlier name, Ernst & Young). from June 5-August 21, 2015. Amy worked in their Quantitative Advisory Services group within their Financial Services Office Advisory (QAS FSO Advisory). Amy's summer was particularly busy, as she got married in mid-August. Congratulations, Amy!
- **Shiyang Ma** had two internships during summer 2015, each for one month. From June to July, she had an internship in the New Product Center at Gloria Pharmaceuticals. She also was an assistant working on marketing research, using Thomson Reuter and IMS databases. From July to August, she worked as a sales assistant in LAN HU TANG, a Traditional Chinese Medicine Company in China.

Student News—continued

The students were asked, "What was your favorite thing from this past year in Biostatistics and Computational Biology." It could have been a favorite project, paper, homework, seminaror something else.

Amy LaLonde wrote that her favorite thing was presenting at the student workshop. She said it was such a great experience to present in front of her peers and the faculty because often times that can be the most difficult. The opportunity to both give and receive commentary is especially helpful in this stage of the program. Amy attended the Conference on Statistical Practice in New Orleans, LA , February 19-21, 2015.

 Joe Ciminelli wrote, "I absolutely enjoyed working on our Twitter cluster analysis project this year. Movies and pop culture surrounding the Academy Awards has always been a great personal interest of mine, and being able to incorporate this pop culture into a statistical model to get first-hand exposure to the methodology I have been studying proved to be an invaluable experience. There were many programming frustrations along the way, but the journey to getting where I am now was quite beneficial and was a very interesting exercise in learning the fundamentals of Latent Dirichlet Allocation in a setting of interest to me. By looking at Tweets relating to the Academy Awards in order to find various clusters of Oscars-related topics, I gained experience that will be beneficial as I pursue further research toward my dissertation in the upcoming years."

"I also found the prospective student open house in November to be a great event. I absolutely love talking to students interested in pursuing statistics graduate studies, since I feel that my experiences can offer good insight into what the future may hold for them. To get to talk with potential students who were interested enough in statistics to come in on a Saturday morning was great. There is so much talent out there, and as a proud UR student, I love seeing students who are excited about the curriculum we offer here."

Chang Liu said his favorite thing was workings as a TA for two classes last semester, one from our department and the other from Computer Science. He stated it was interesting to see different programming styles from people with different backgrounds and how non-stats students interpret and solve these stats problems. It was a great experience.

Hongyi Kang wrote in to say, In the Fall of 2014, I took the course Bioinformatics and did a final project on microarray data analysis. I chose the time course analysis paper published by Storey et al and tried to replicate what they did on a separate microarray dataset. It was my first time trying to understand something I had never encountered before mathematically. The natural cubic spline model they used for the time course data was very intriguing. I was able to understand most of what they were doing after some background reading, but its application on another dataset through R still seemed clueless. I read their code (which was hidden within their software package called EDGE) multiple times and also the Elements of Statistical Learning by Hastie et al. Finally I was able to carry out their analysis. There was still a part where they used matrix to solve for the coefficient estimates that I couldn't understand, most likely because of my limited linear algebra knowledge. Nonetheless, this experience was my most favorite one throughout my journey in the biostats field."

Yun Zhang wrote that, "giving a Ph.D. Workshop presentation in front of all the faculty at the end of my second year was challenging and stressful. However, the feedback from our audience and the presentation itself was such a rewarding experience."

Front Row: Left to Right—Ph.D. students Katherine Grzesik and Kyra Singh. Back Row: Left to Right—Ph.D. students Donnie Hebert, Madhurima Majumder and Amy LaLonde
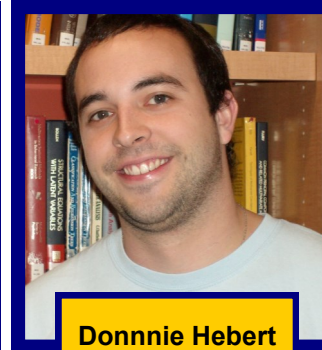
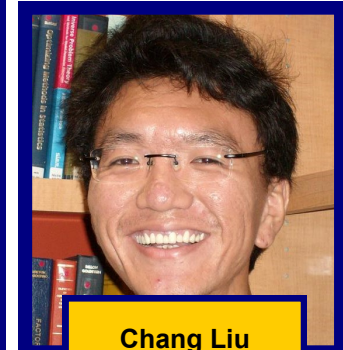# The Students of Biostatistics and Computational Biology
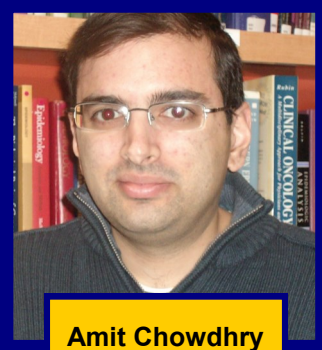
Amit Chowdhry
5th year Ph.D. student

Katherine Grzesik
5th year Ph.D. student

Donnnie Hebert
5th year Ph.D. student

Chang Liu
5th year Ph.D. student
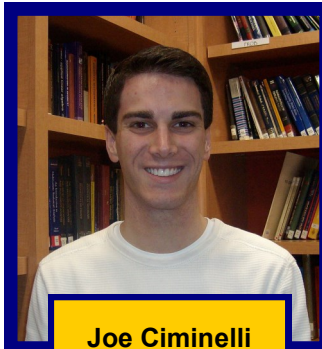
Kyra Singh
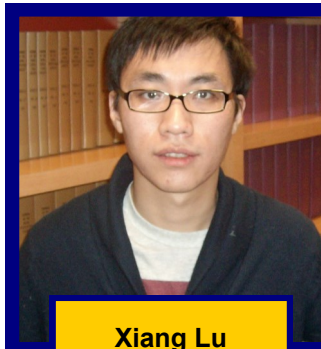5th year Ph.D. student

Ziji Yu
5th year Ph.D. student

Chongshu Chen
4th year Ph.D. student

Amy LaLonde
4th year Ph.D. student

Joe Ciminelli
3rd year Ph.D. student

Xiang Lu
3rd year Ph.D. student

Yun Zhang
3rd year Ph.D. student

Yu Gu
2nd year Ph.D. student

Madhurima Majumder
2nd year Ph.D. student

Valeriia Sherina
2nd year Ph.D. student

Bokai Wang
2nd year Ph.D. student

Shiyang Ma
1st year Ph.D. student

The Students of Biostatistics and Computational Biology—continued
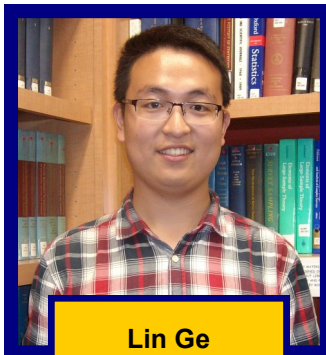
Rebecca Stefano
1st year Ph.D. student

Hao Sun
1st year Ph.D. student

Erika Wilson
1st year Ph.D. student
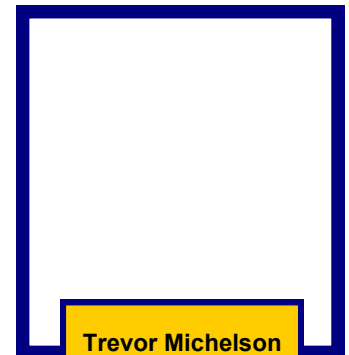
Guanqing Chen
2nd year MA student

Lin Ge
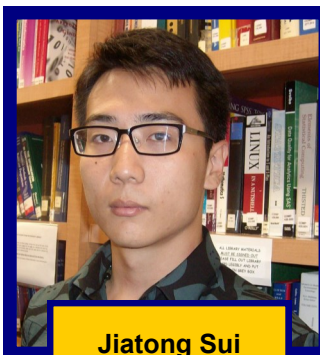1st year MA student

Tong Lei
1st year MA student

Jinyuan Liu
1st year MA student

Trevor Michelson
1st year MS student

Jing Peng
1st year MA student

Jiatong Sui
1st year MA student

Kejia Wang
1st year MA student

Hongnan Wang
1st year MA student

Take a look at your academic genealogy!

Hosted by the math department of North Dakota State University, the project aims to map the genealogy of Ph.D. (and similar) degrees in all branches of mathematics. Until recently, the graduates of the Department of Biostatistics and Computational Biology were not recorded in the database. Now we believe they are nearly all there. You can see lists of your academic grandparents and siblings; possibly trace your lineage back to Fisher or Pearson.

http://genealogy.math.ndsu.nodak.edu

2014 Yakovlev Fall Colloquium

On September 18, 2014 the Department hosted **Daniel O. Scharfstein, Sc.D.**, Professor in the Department of Biostatistics at the Johns Hopkins University, Bloomberg School of Public Health, as the guest speaker for the 2014 Yakovlev Fall Colloquium - seventh in the series. Professor Scharfstein lectured on "Global Sensitivity Analysis for Repeated Measures with Informative Dropout: A Semi-Parametric Approach".

Pictured here from the left are **Robert Strawderman**, Department Chair, **Nina Yakovlev,** and **Daniel Scharfstein.**

27th Charles L. Odoroff Memorial Lecture

Left to Right: David Oakes, Ph.D., Setta Odoroff, Marie Davidian, Ph.D., and Robert Strawderman, Sc.D.

Dr. Marie Davidian, William Neal Reynolds Professor, in the Department of Statistics at North Carolina State University, spoke on April 30, 2015 at the 2015 Charles L. Odoroff Memorial Lecture about "The Right Treatment for the Right Patient (at the Right Time): Personalized Medicine and Dynamic Treatment Regimes."

Marie Davidian, Ph.D. signs a copy of her book, "Nonlinear Models for Repeated Measurement Data" for the Odoroff Library.

2015 Yakovlev Fall Colloquium

The eighth Yakovlev Fall Colloquium was held on September 24, 2015. **Heping Zhang, Ph.D.**, Susan Dwight Bliss Professor of Public Health (Biostatistics) and Professor in the Child Study Center and Statistics in the Department of Statistics at Yale University, Yale School of Public Health, spoke on "Decision Trees for Precision Medicine."

Pictured from left to right: Heping Zhang, Ph.D., Nina Yakovlev and Robert Strawderman, Sc.D.

2014 and 2015 Colloquia - continued

In addition to the Yakovlev Fall Colloquium and the Charles L. Odoroff Memorial Lecture, the department has hosted the following invited speakers:

- On March 27, 2014, **Jacob Bien, Ph.D.**, an assistant professor with the Department of Biological Statistics and Computational Biology at Cornell University, spoke on "Convex Banding of the Covariance Matrix."

- **Jim Ramsay, Ph.D.** visited the department on April 10, 2014. A professor emeritus in the Psychology Department at McGill University, Jim spoke on "Linear Differential Equations: Their statistical history, their roles in dynamic systems, and some new tools."

- On May 15, 2014, **Brian S. Caffo, Ph.D.,** presented a talk on "Teaching Statistics for the Future, the MOOC Revolution and Beyond." Brian is a professor in the Department of Biostatistics at the Johns Hopkins University.

- On October 2, 2014, **Scott R. Evans, Ph.D., MS,** senior research scientist in the Department of Biostatistics at the Harvard T. H. Chan School of Public Health, spoke on "Transforming Antibiotic Stewardship Using Response Adjusted for Duration of Antibiotic Risk (RADAR): Using Endpoints to Analyze Patients Rather than Patients to Analyze Endpoints."

- **Keith A. Baggerly, Ph.D.**, a professor in the Department of Bioinformatics and Computational Biology, Division of Quantitative Sciences at the University of Texas, MD Anderson Cancer Center, spoke about "The Importance of Simple Tests in High-Throughput Biology: Case Studies in Forensic Bioinformatics" on October 16, 2014.

- On October 30, 2014, **John Staudenmayer, Ph.D.**, a professor in the Department of Mathematics and Statistics at the University of Massachusetts, Amherst, spoke on "Estimating Physical Activity with an Accelerometer".

- On November 13, 2014, **John Fricks, Ph.D.**, an associate professor in the Department of Statistics at Penn State University, spoke on "Walking, Sliding and Detaching: Time Series Analysis for Kinesin."

- **Hongyu Miao, Ph.D.**, an assistant professor in the Department of Biostatistics and Computational Biology at the University of Rochester, spoke about "Clustering Tree-structured Data on Manifold" on December 4, 2014.

- On December 12, 2014, **Haiyan Yu, Ph.D.**, an assistant professor in the Department of Biological Statistics and Computational Biology at Cornell University, spoke of "Understanding Molecular Mechanisms of Human Disease Mutation through 3D Protein Networks". This was a co-sponsored lecture with the Wilmot Cancer Center Colloquium series.

- "Bayesian Models for Multiple Outcomes in Domains with Applications to the Seychelles Child Development Study" was the lecture given by **Sally W. Thurston, Ph.D.**, an associate professor in the Department of Biostatistics and Computational Biology from the University of Rochester, on January 22, 2015.

- On February 12, 2015, **Elizabeth L. Ogburn, Ph.D.**, an assistant professor in the Department of Biostatistics at Johns Hopkins Bloomberg School of Public Health, spoke on "Causal and Statistical Inference with Social Network Data: Massive Challenges and Meager Progress."

- **Daniel Francis Heitjan, Ph.D.,** a professor in the Department of Statistical Science at Southern Methodist University, adjunct professor in the Department of Clinical Sciences (Southwest Medical School), and Director of the SMU/University of Texas Southwestern Joint Ph.D. Program in Biostatistics, spoke about "Real-Time Prediction in Clinical Trials: A Statistical History of REMATCH" on March 26, 2015.

- On April 9, 2015, **Cheng Yong Tang, Ph.D.,** an associate professor in the Department of Statistics at the Fox School of Business at Temple University, spoke on "Joint Modeling Approaches for Longitudinal Studies."

On November 23, 2015 a farewell was said to two very special members of the department. Senior Accountant, **Pat Sale** retired on December 4, 2015 after 40 years with the University of Rochester and **Cheryl Bliss-Clark**, Administrator and Graduate Program Advisor moved to Albany, NY to start a new chapter in her life. We wish them all the best and we will also miss them both very much.

Just for Fun...   2015 JP Morgan Corporate Challenge

On Tuesday, May 26, 2015 at 7:00 p.m., a crowd of 10,371 runners and walkers from 421 companies started the Rochester's 25th annual JP Morgan Corporate Challenge at the RIT Campus. Four members from the Department of Biostatistics and Computational Biology participated in the event. In total, the University of Rochester had 481 participants. Before the race started, it poured rain for about 10 to 15 minutes and then stopped abruptly, which made it very muggy. Maybe for the 2016 race we can gather a few more participants.

Pictured here from left to right are department members Joanne Janciuras, Deb Perno, Sue DiVincenzo, and Christine Brower.

#Show Your Stripes

Friends of Strong, Golisano Children's Hospital, and Ronald McDonald House Charities (RMHC) of Rochester invited everyone to #ShowYourStripes by purchasing an official pair of Ronald's red and white striped socks and wearing them on Oct. 15 to support the programs of RMHC of Rochester. All proceeds directly benefit the RMHC of Rochester. *Throughout the past 25 years, RMHC of Rochester has served our community by providing a home away from home for more than 10,000 families of hospitalized children—more than 900 last year alone.*

Shown here from left to right: Shan Gao, Kim Kaukeinen, Christine Brower, Susan Messing, Deb Perno and Sue DiVincenzo

UNIVERSITY *of* ROCHESTER

NEWS FROM AROUND THE WORLD

William (Bill) Mietlowski, Ph.D. (1974 alumnus) wrote a note saying, "My advisor was Govind Mudholkar. It is very amazing to me that Govind is still supervising Ph.D. candidates 40 years after I received my Ph.D. I celebrated my 35th anniversary at Novartis Pharmaceuticals on August 27th, 2014. I am the organizer and will be the chair at an invited session at the 2015 Joint Statistical Meetings in Seattle. The session title is "Differential and biased missingness: myths, methods, and manifestations." Two of the speakers will be Professor Xin Tu and Ph.D. candidate Tian Chen. Tian was my 2014 summer intern. Co-authors of her JSM 2015 abstract include Fei Ma, Ph.D., my 2013 summer intern and current Novartis Oncology employee, and myself. (3 U of R co-authors, 2 others)".

Mark Espeland, Ph.D. (1981 alumnus and student of the late **Charles L. Odoroff, Ph.D.**), professor at Wake Forest University School of Medicine, was elected a 2014 Fellow of the American Association for the Advancement of Science (AAAS) in the Section of Statistics.

Saria S. Awadalla, Ph.D. (2012 alumnus and student of **Govind Mudholkar, Ph.D.** and **Mike McDermott, Ph.D.**), Clinical Assistant Professor of Biostatistics, Division of Epidemiology & Biostatistics at the School of Public Health with the University of Illinois Chicago, was awarded the 2015 Benard H. Baum Golden Apple Award. The Golden Apple Award is presented each year to a faculty member in recognition of outstanding teaching and unusual service to students at the School of Public Health. The awardee is recognized during commencement ceremonies.

Kelly Zou, Ph.D. (1997 alumna and student of the late **W. Jackson Hall, Ph.D.**), Director of Statistics at Pfizer, Inc., has been promoted to the position of Senior Director in recognition of her outstanding contribution to the Urology and Respiratory franchises, her exemplary leadership and visibility in internal initiatives and external professional activities, and her significant methodological accomplishments in diverse areas of statistics. Kelly has agreed to serve as the next Chair of the Statistics Partnerships in Academe, Industry and Government (SPAIG) Committee (as well as being reappointed as a committee member). Her Chair term will be the same as her new member term and run from January 1, 2016 through December 31, 2018. In addition to her accomplishments, Kelly has set up a scholarship fund at the University of Rochester's Eastman School of Music named the Kelly George Eastman Circle Scholarship Fund.

Aiyi Liu, Ph.D. (1997 alumnus and student of the late **W. Jackson Hall, Ph.D.**), Senior Investigator, Biostatistics and Bioinformatics Branch, NICHD/NIH, shared the link below from the Chinese Students and Scholars Association at the University of Rochester (CCSAUR) web page posted on October 16, 2015—Kelly H. Zou-Alumna in Excellence. Kelly was interviewed by **Shiyang Ma,** 1st year Ph.D. student in the Department of Biostatistics and Computational Biology.

http://cssaur.net/main/2015/10/alumna-in-excellence/

Hui Zhang, Ph.D. (2010 alumnus and student of **Xin Tu, Ph.D.**) wrote to say, "Some of our department alumni have built a WeChat group for better communications. As attached (see at right) is the QR code, by which a WeChat user can scan and join". Hui asked to share it with our alumni email group and believes it will help a lot for communications and this type of events. For questions about the QR code, please email Hui at Hui.Zhang@STJUDE.org

Siddhartha Dalal, Ph.D. (1975 alumnus and student of the late **W. Jackson Hall, Ph.D.**) was the esteemed luncheon speaker at JSM 2015 in Seattle, WA