



Biostatistics & Computational Biology 2009 Annual Newsletter



Dear Colleagues and Friends,

I am pleased to report that 2009 has been another successful year for the Department of Biostatistics and Computational Biology. Our big event of the year was the conference in memory of Andrei Yakovlev, which was held at the Strathallan Hotel on June 8 and 9. We were delighted that speakers came from as far afield as California, Washington State, Sweden, Germany and Bulgaria to honor Andrei. I must express my gratitude to Cheryl Bliss-Clark and Cheryl Cicero for their flawless organization of this event as well as to Jack Hall and Tony Almudevar for their help in planning the program and contacting speakers. Our thanks also go to Nina Yakovlev for hosting a magnificent reception at her home to begin the conference. See page 5 for more details about the event.

Speaking of Jack Hall, we had a modest birthday celebration for him in November. I would not wish to violate Jack's privacy by revealing his age, but he gave a little clue at the celebration by saying that he came to Rochester at age 40 and has now been here for half his life. See last page.

The search by the Medical School for a department Chair, to replace Andrei, continues. Meanwhile our expanded size is putting some pressure on space. This has led to temporary relocation of the Informatics group, led by Dongwen Wang, to space in the 3-8100 area of the Medical School. The entire department is scheduled to move in March 2011 to the new "Clinical and Translational Sciences Building", presently under construction next to Helen Wood Hall. In keeping with our lofty aspirations we will be housed on the top floor.

In the Medical Center as a whole, the year's news was dominated by the serious cycling accident sustained by our CEO, Dr. Brad Berk, and his remarkable recovery. It has just been announced that following months of rehabilitation, Dr. Berk will return to work full time in March. Dr. Mark Taubman will be appointed Dean of the School of Medicine and Dentistry, filling the position vacated by Dr. David Guzick, who moved to the University of Florida in July. I would like to express my sincere thanks to Dr. Guzick for his strong support of the department during his term as Dean and to Dr. Elizabeth McAnarney, who has continued that support as acting Dean.

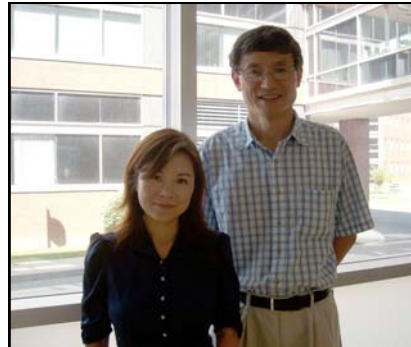
We look forward to further successes in 2010.

David Oakes

Doctorate Degrees Awarded in 2009



Haiyan Su, Ph.D., shown here with her mentor, **Dr. Hua Liang**, successfully defended her thesis on July 30th. Dr. Su has assumed an academic position as Assistant Professor in the Department of Mathematical Sciences at Montclair State University, N.J.



Qin Yu, Ph.D., shown here with her mentor, **Dr. Xin Tu**, successfully defended her thesis on August 10th. Dr. Yu has assumed an academic position as Research Associate in the Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania.



Abbie Stokes-Riner, Ph.D. shown here with her mentor, **Dr. Sally Thurston**, successfully defended her thesis on November 17. Abbie has taken a position as a biostatistician at The EMMES Corporation, a contract research organization in Rockville, MD. Abbie will work with their vaccine and infectious disease group.

The Statistics Graduate Program, now housed in our department, has awarded 77 Ph.D.'s since its inception 40 years ago with the enrollment of 7 students. This past semester marked the initiation of the 41st year of the PhD Program in Statistics - yes, it all started some 40 years ago this past fall!

Master's Degrees Completed

Master's student **Nick Rollins** completed his degree in August 2009. Nick, who had been working in Psychiatry, assumed a new position as a data analyst with Measured Progress, an educational testing company in Dover, N.H.



Master's student **Andrea Berry**, who completed her degree in August 2009, will continue as an information analyst in the Department of Community and Preventive Medicine working with Dr. BK Yoo on studies of flu vaccination effectiveness.



Grant Awards

Dr. Howard Federoff's (Georgetown) DOD grant on "Discovery and Validation of Peripheral Biomarkers of Traumatic Brain Injury" was awarded, with a 1/19/09 start date. This grant will provide substantial funding for our **Computational Biology** group over the next five years, with **Dr. Peterson** serving as the Rochester subcontract PI, in collaboration with **Drs. Almudevar, Glazko, and Qiu.**

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We are very pleased to announce that our training grant in Environmental Health Sciences Biostatistics, PI **David Oakes**, has been renewed for a further five years, starting July 1, 2009.

This program is a collaborative effort between the Department of Biostatistics and Computational Biology, the Environmental Health Sciences Center and the Department of Community and Preventive Medicine. The program was funded at the full requested level of two predoctoral and two postdoctoral trainees in each year. Trainees must be US citizens or permanent residents of the US.

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David Oakes was awarded a subcontract with Harvard University for "Urate as a Predictor of Parkinson's Disease Risk and Progression," funded

by the National Institutes of Health.

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Ha Youn Lee is the recipient of a \$1,530,340 grant awarded by the National Institute of Allergy and Infectious Diseases. The grant funds Dr. Lee's research on modeling the primary stage of HIV replication and sequence evolution, and on defining vaccine-inducible host immune functions that can be expected to lead to containment of infection and long-term protection from disease.

The research will be performed in collaboration with **Drs. Sally Thurston, Hua Liang, Stephen Dewhurst** (Microbiology and Immunology), and **Michael Keefer** (Medicine).

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Wan Tang was the recipient of 2 grant awards: a Developmental Center for AIDS Research Pilot Award, and an R21/R33 for "Analysis of Count Data with Structural Zeros."

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Anthony Almudevar was the recipient of a \$50,000 grant awarded by the Wilmot Cancer Center, with funding provided by the Sally Edelman and Harry Gardner Cancer Research Foundation. The grant will fund Dr. Almudevar's research on gene regulatory network modeling that is being carried out in col-

laboration with the laboratory of **Dr. Hartmut Land** (Biomedical Genetics).

The Edelman-Gardner Foundation is located in Hilton, New York, and since 1984 has partnered with the University of Rochester to fund numerous projects in cancer research.

For more information visit www.edelmancrf.org.

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Hulin Wu was awarded an ARRA-funded subcontract with the University of Delaware for "Analysis of Differential Resistance Emergence Risk for Differential Treatment Applications."

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Michael McDermott and **Rabi Tawil** (Neurology) were awarded an R01 from the National Institute of Neurological Disease and Stroke entitled "Biostatistics and Data Management for a Trial of Corticosteroid Regimens in Duchenne Muscular Dystrophy". The total budget is > \$3 million over a five-year period.

The study is an international randomized, double-blind clinical trial designed to compare the efficacy and safety of three different corticosteroid regimens in boys with Duchenne muscular dystrophy, with the aim of establishing standards of practice regarding corticosteroid treatment.

Center for Biodefense Immune Modeling (CBIM) News

The Center for Biodefense Immune Modeling (PI/Director: **Hulin Wu**) enters its fifth year. During the past 4 years, the Center has been very productive and successful. They have completed 38 publications, which include 16 papers in statistical journals (4 papers in *JASA*, 1 in *Annals of Statistics*, 1 in *Biometrika*, 2 in *Biometrics*, 8 in other statistical journals), 8 papers in biomathematical modeling journals, and 14 papers in biomedical journals. Their influenza modeling paper was selected as the spotlight paper in *Journal of Virology* and was reported by many scientific news media outlets and websites. Other products include a differential equation modeling and simulation software tool, DEDiscover. This multi-platform user-friendly software allows users to perform simulations and parameter estimation for differential equation models that are widely used in modeling immune responses, infectious diseases and other biomedical processes. A web-based immunology data management system is also under active development. The renewal proposal for this \$10 million Center project was submitted in December 2009. Information about the CBIM, including a list of publications and links to developed software, can be found at <https://cbim.urmc.rochester.edu/>.

“DEDiscover” Modeling Software Released

The scientific programming team of the UR Center for Biodefense Immune Modeling recently released DEDiscover version 2.0. DEDiscover is a cross platform software tool for development, exploration, and application of systems of differential equations to biological systems. With a clear workflow-

based graphical user interface, DEDiscover's real-time simulation and clear graphical displays allow efficient development and exploration of models containing both ordinary and delay differential equations. DEDiscover version 2.0 introduces estimation tools for fitting these models to observed data, and provides confidence intervals in addition to point estimates.

DEDiscover also allows storage and visualization of multiple sets of parameter values for each model, permitting visual comparison of alternative parameter settings, including “pre-specified” versus “estimated” parameter values. For maximum flexibility, DEDiscover allows models to be specified using standard mathematical notation, and provides a variety of differential equation solvers, numerical maximization algorithms, statistical estimation techniques, and confidence interval calculation methods. DEDiscover includes several models (including experimental data) of host-virus interaction for HIV and influenza, allowing users to immediately begin exploring differential-equation based disease models.

The DEDiscover software development team is led by Greg Warnes, and includes Alain Leblanc, Hongyu Miao, Canglin Wu, Shenghua Li, and Fookchin Chiang.

DEDiscover may be downloaded without charge from <https://cbim.urmc.rochester.edu/software/dediscover/>.

Inquiries, comments, suggestions, and example models are welcome and should be sent to dediscover@bst.rochester.edu.

Statistical Modeling for Biological Systems: A Conference in Memory of Andrei Yakovlev

On June 8th and 9th, our department hosted a conference dedicated to the memory of **Andrei Yakovlev**. The conference featured many of Andrei's collaborators and friends, and reflected the breadth of interests for which he was well known and the international scope of his collaborations. Speaker affiliations included Chalmers University of Technology (Sweden), the University of Würzburg (Germany), the Institut Curie (France), the German Cancer Research Center, the Bulgarian Academy of Sciences, as well as many leading American universities. A number of our department members who collaborated with Andrei also gave talks and a poster session was held. The proceedings of the conference will be published as part of the Institute of Mathematical Statistics (IMS) collections series.



Guest Speakers of the Conference in Memory of Andrei Yakovlev

Front Row (left to right) - Suresh Moolgavkar, Linlin Chen, Aniko Szabo, Leonid Hanin, David Oakes, Ollivier Hyrien, Nick Yanev.

Back Row (left to right) - Nick Jewell, Anthony Almudevar, Alexander Tsodikov, Marvin Zelen, Bernard Asselain, Mark Noble, John Storey.

Missing from photo: Marianthi Markatou, Hucky Land, Peter Jagers, Xing Qiu, Lutz Edler, Alexander Gordon, Yuriy Gusev, Elart von Collani.

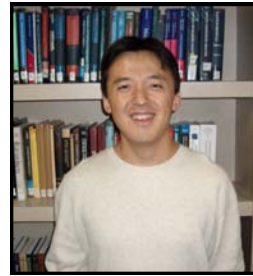
Promotions and Appointments



David Oakes has been appointed a permanent member of the "EPIC" (Epidemiology of Cancer) NIH Study Section, serving from 2009 through 2013.



Hua Liang was promoted to Professor with tenure effective February 12, 2009.



Rui Hu was appointed to Research Assistant Professor effective October 1, 2009.



Ollivier Hyrien was promoted to Associate Professor effective December 1, 2009.



Hongyu Miao was promoted to Assistant Professor effective March 10, 2009.



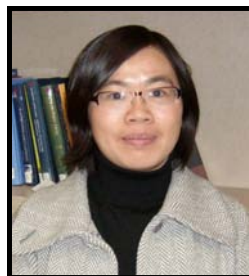
Sung Yong Park was appointed to Research Assistant Professor effective October 1, 2009.



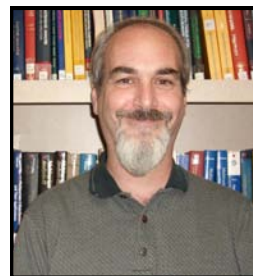
Michael McDermott was promoted to Professor effective December 1, 2009.



Li-Shan Huang was promoted to Associate Professor with tenure effective February 1, 2009.



Hua He was promoted to Assistant Professor effective July 2009.



Anthony Almudevar was promoted to Associate Professor effective November 1, 2009.

Department Projects and News

Jack Hall writes:

A major clinical study organized by the Heart Research and Follow-up Group - which shares our floor of the MRBX Building, with statistical support from Biostatistics, was completed this year. It was a four-and-a-half year clinical trial of the use of cardiac resynchronization therapy in conjunction with an implanted cardioverter defibrillator to reduce risk of heart failure and mortality. The prestigious *New England Journal of Medicine* invited submission of a paper documenting the primary results of this highly successful study, with publication occurring last October 1. Jack Hall was the chief statistician, with important participation also by David Oakes, Chris Beck, Hongyue Wang, Hui Zhang and Jan Bausch from the Department.

Of special note, the *NEJM* went on to highlight this paper in their fall advertising of the Journal to cardiologists worldwide!

Dongwen Wang :

1) We have a newly funded contract (starting date: July 1, 2009) from New York State (NYS) Department of Health (DOH) AIDS Institute to develop a NYS HIV Clinical Education Initiative (CEI) Resource and Referral Center. This project is the second contract awarded by NYS DOH to us, following the first one to develop a NYS HIV CEI Online Education and Technology Center. The Tech Center, now in its second year, has been a huge success. Our online education resources have been serving 7000+ healthcare providers from 40+ countries around the world. The CEI website (www.ceitraining.org) is consistently ranked by Google as one of the top online training resources for HIV clinical education.

2) With the reorganized CTSI Biomedical Informatics Key Function and the enhanced resources through the newly funded CEI projects, we are now consolidating informatics staff and resources under the Biomedical Informatics Research & Development Center. Informatics staff from the General Clinical Research Center are now in a new office at 3-8103. Once the Clinical & Translational Sciences Building is finished, we will move to the new building together with the Department of Biostatistics and Computational Biology.

Hulin Wu :

The Novel Methodology Project funded by the UR Clinical and Translational Science Institute, "Development of Objective Gating Methods for High-Dimensional Flow Cytometry Data for Translational Research," (Co-PIs: Dr. Tim Mosmann and Dr. Hulin Wu), was successfully completed in 2009. Dr. Wu and his postdoctoral fellow (Dr. Kaja Abbas) received a Multidisciplinary Pilot Award from the University of Rochester Developmental Center for AIDS Research in 2009. In addition, Dr. Wu's R01 grant proposal, "Estimation Methods for Nonlinear ODE Models in AIDS Research," received a priority score of 4 percentile, and was funded January 15, 2010 for 4 years by NIAID/NIH with a total budget of \$1,383,254.



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The **2009 Charles L. Odoroff Memorial Lecture** was held on Thursday, April 2, 2009 with guest speaker Terry Therneau, Professor of Biostatistics at Mayo Clinic, Rochester, MN. This was the 21st lecture in the series. Dr. Therneau was an Assistant Professor with our department from 1983-1985. The lecture topic was "*Random Effects Models and Survival Data*".

The **2009 Spring Colloquium Series** hosted speakers **Martin Meier-Schellersheim** from the National Institutes of Health, **Hongzhe Li** from the University of Pennsylvania, **Lili Tian** from the University of Buffalo, and **Jeremy Taylor** from the University of Michigan.

The **2009 Fall Colloquium Series** started with the **Yakovlev Colloquium**, which is the first Fall colloquium each year to honor the late **Dr. Andrei Yakovlev**. The speaker for the **Yakovlev Colloquium** was **Dean Follmann** from the National Institute of Allergy and Infectious Diseases. Dr. Follmann spoke on "*Crossover Trials for Survival and Recurrent Event Endpoints*".

Other speakers for the **Fall 2009 Series** were **Ruiguang Song** from the Centers for Disease Control and Prevention, **Hui Zou** from the University of Minnesota, **Chris Coffey** from the University of Iowa, **Rustom Antia** from Emory University, and **Minge Xie** from Rutgers University.

Another "landmark" was Professor Jack Hall's birthday. In a little department celebration of this milestone, David Oakes said it would be inappropriate to point out which birthday it was, but that ten years ago the department hosted a research conference to honor Jack's 70th Birthday.

Draw your own conclusion.... and congratulations and thanks to Jack for his 40 years with the University.

