

UNIVERSITY OF MINNESOTA

College of Pharmacy

Driven to Discover<sup>SM</sup>

# DEPARTMENT OF MEDICINAL CHEMISTRY

## 2008 ANNUAL REPORT



717 DELAWARE STREET SOUTHEAST  
MINNEAPOLIS, MINNESOTA 55414

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MINNEAPOLIS, MINNESOTA 55455

# Department of Medicinal Chemistry

## 2008 Annual Report

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**From the  
Department  
Head**

As we look back at the year 2008, we take pride in our many accomplishments in research, teaching and service. We are proud of exceptional teaching not only in graduate education but also in the professional pharmacy program. We are especially proud of our graduate students, who are at the center of the research and educational mission of the Department. In 2008 the Department had 65 graduate students, including twelve additional students from the Departments of Chemistry, Biochemistry, and Pharmacology and seven from the University of Kansas, and 53 research associates and postdoctoral fellows. In the fall of 2008 eleven first year graduate students joined our program. We had 30 faculty affiliated with the Department, eighteen of which were tenured or tenure track faculty.

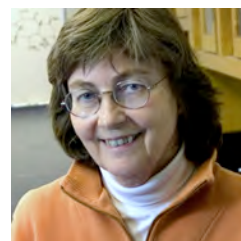
The excellence of a program comes from the reputation of its students and faculty and therefore we were very pleased that we were able to enhance drug discovery research and training in the Department by hiring Dr. Barry Finzel, a protein crystallographer with more than twenty years of industrial experience in structure-based drug design. He was recruited with the help of the Minnesota Partnership for Biotechnology and Medical Genomics initiative that seeks to promote joint research between the University of Minnesota and the Mayo Clinic. During 2008 the search for a junior faculty member with expertise in cancer experimental therapeutics was initiated and resulted in Dr. Daniel Harki joining the Department in 2009. Through the generosity of Professor Portoghese, in combination with contributions by the Department and the Dean of the College of Pharmacy, Marilyn Speedie, the Philip S. Portoghese Endowed Chair in Chemical Neuroscience was established. We anticipate that we will hire a senior faculty member for this position during 2010.

Several of our faculty received special recognition in 2008. Assistant Professor Shana Sturla was named a University of Minnesota McKnight Land Grant Professor, an honor given to the most promising assistant professors in the University. Assistant Professor Elizabeth Amin was invited as a speaker to a Gordon Research Conference in England. Faculty members Amin, Ferguson, and Wagner had articles published that were most cited over a certain time period. Rodney Johnson was the PI of an NIH instrumentation grant application that was funded, allowing us to purchase a new state-of-the-art 400 MHz NMR instrument. In 2008 the faculty members generated \$7.4M in external research funding. The published research results showcase the diversity of ongoing research in the Department, covering many therapeutic areas and diverse approaches in drug discovery and development research.

We look forward to the future and to continuing our mission in the years ahead.



Gunda I. Georg, Ph.D.  
Professor and Department Head  
Department of Medicinal Chemistry



**Mission Statement**

The mission of the Department of Medicinal Chemistry is to educate and train scientists of the highest caliber, to provide future pharmacy practitioners with the basis for understanding the relationships between molecular structure and drug action, and to achieve and perpetuate excellence in medicinal chemistry through chemical and biological research for the improvement of human health.

**Teaching and Service**

During 2008, Medicinal Chemistry faculty members offered professional and graduate courses and also gave of their time to numerous committees, representing service to the Department, the University, the College of Pharmacy, national and professional organizations and government agencies. Additionally, faculty served as reviewers for professional journals and as grant reviewers for governmental panels.

**2008 Graduate Courses**

Principles of Biomolecular Simulation (MEDC 5185)  
The New Drug Development Process (MEDC 5200)  
Research and Development Process of Pharmaceutical Products (MEDC 5202)  
Introduction to Drug Design (MEDC 5245)  
Advanced Methods in Quantitative Drug Analysis (MEDC 5494)  
Vistas in Medicinal Chemistry Research (MEDC 5495)  
General Principles of Medicinal Chemistry (MEDC 5700)  
General Principles of Medicinal Chemistry (MEDC 5710)  
Medicinal Chemistry Seminar (MEDC 8100)  
Design of Chemotherapeutic Agents (MEDC 8500)  
Chemical Aspects of Drug Metabolism and Bioactivation (MEDC 8600)  
Advanced Concepts in Drug Design (MEDC 8700)  
Design of Peptidomimetics (MEDC 8760)  
Medicinal Chemistry Laboratory Techniques (MEDC 8800)  
Research in Medicinal Chemistry (MEDC 8900)

**2008 Professional Courses**

Medical Microbiology and Immunizations (PHAR 6141)  
Biochemistry of Medicinals I (PHAR 6151)  
Biochemistry of Medicinals II (PHAR 6152)  
Medicinal Agents I (PHAR 6154)  
Medicinal Agents II (PHAR 6155)

Medicinal Agents III (PHAR 6156)  
Pharmaceutical Immunology and Biotechnology (PHAR 6159)  
PharmD Paper and Seminar (PHAR 6181)  
PharmD IV Seminar (PHAR 6182)  
PharmD IV Paper (PHAR 6183)  
Pharmacology I (PHCL 5101)  
Pharmacology II (PHCL 5102)

### **Progress and Transitions**

The Department expanded to eighteen tenure and tenure track faculty members after Dr. Barry Finzel joined us in September 2008. Dr. Finzel, a protein crystallographer, came to us from Pfizer in Ann Arbor, Michigan.

In 2008 the Department continued its expansion into renovated lab space in the 717 Delaware Building. The Department continued to grow in other ways as well. A total of 65 graduate students and 53 postdocs and research associates called Medicinal Chemistry home during 2008. Four full-time administrative assistants supported students and faculty.

This year the Department purchased a new 400 MHz NMR in Weaver-Densford, along with renovating the room where it was installed.

Recruiting weekend for 2008 graduate students was very successful. The Department changed tactics and brought all students in on the same weekend. The experience was both enjoyable and productive, and will serve as a model for the College of Pharmacy.

### **Institute for Therapeutics Discovery and Development**

A strategic plan for the Institute for Therapeutics Discovery and Development was expanded and a staffing plan developed. Research partnerships with the Mayo Clinic were established.

Several smaller specialty libraries for testing were purchased, such as a peptide and peptidomimetic library. The NIH collection of FDA approved drugs was obtained and added to the High Throughput Screening compound collection of over 200,000 compounds.

**Faculty Recognition**

Elizabeth Amin, David Ferguson, and Carston R. Wagner had articles published that were identified as most cited over a certain time period.

Earl Dunham was chosen as Professor of the Year by the PharmD Class of 2010, University of Minnesota at Duluth.

Robert Fecik received Professor of the Semester, Fall 2008 semester, Class of 2011; he also became a Member, Faculty of 1000 Biology, Pharmacology & Drug Discovery section.

Gunda Georg was invited to deliver an address as a Distinguished Lecturer in Pharmacological and Pharmaceutical Sciences at the University of Houston College of Pharmacy.

Rory Rimmel was chosen as PharmD Professor of the Year for 2007-2008.

Shana Sturla was named a University of Minnesota McKnight Land Grant Professor, which is an honor given to the most promising assistant professors in the University.

Chengguo (Chris) Xing won the Professor of the Semester, presented by the PD III class in the Fall of 2008.

**Editorial Activities**

Professor Philip Portoghese is the Editor-in-Chief of the *Journal of Medicinal Chemistry*. Professors Yusuf Abul-Hajj and Steven Hecht are serving as senior editors of the journal.

Professor Carston R. Wagner is Associate Editor of *Molecular Pharmaceutics*.

Professor Thomas Shier is the Editor of *Toxins Review*.

**Research Highlights**

In 2008, the faculty produced 51 publications. In addition, the Department was represented at numerous conferences through oral and poster presentations. Professor Duane Miller from the Department of Medicinal Chemistry, University of Tennessee,

was this year's Taito O. Soine lecturer. He spoke about his work on selective androgen receptor modulators that have reached clinical trials (GTx and Merck).

### Seminars

- Dr. **Venkatram R. Mereddy**, Department of Pharmacy Practice and Pharmaceutical Sciences, University of Minnesota, Duluth. *Synthesis of Boronic Acid and Lactone/Lactam Based Small Molecules as Anti-Cancer Agents*, January 18 (Institute for Therapeutic Discovery & Development seminar – ITDD).
- Dr. **Anthony J. Berdis**, Department of Pharmacology, Case Western Reserve University. *Exploiting Pro-Mutagenic DNA Replication to Develop Novel Chemotherapeutic Agents*, February 5 (Medicinal Chemistry seminar – MC).
- Dr. **Greg Rutkowski**, Department of Pharmacy Practice and Pharmaceutical Sciences, University of Minnesota, Duluth. *A Biomimetic Hydrogel Drug Delivery Platform*, February 22 (ITDD).
- Dr. **R. Kiplin Guy**, Department of Chemical Biology and Therapeutics, St. Jude Children's Research Hospital. *Screening and Synthesis for Novel Antimalarials*, February 26 (MC).
- Dr. **David Potter**, School of Medicine and Cancer Center, University of Minnesota. *Ritonavir: From Drug to Pathways in Breast Cancer*, February 29 (ITDD).
- Dr. **Bongsup Cho**, Department of Medicinal Chemistry, University of Rhode Island. *Carcinogen-DNA Adducts: Sequence Effects on Repair and Replications*, March 4 (MC).
- Dr. **Stewart L. Fisher**, Cancer and Infection Research Area, AstraZeneca R & D. *Exploitation of Structural and Regulatory Diversity in Glutamate Racemases*, March 25 (MC).
- Dr. **David Kessel**, Department of Pharmacology, Wayne State University School of Medicine. *Eradication of Malignant Cells by Directing Photodynamic Therapy Against Bcl-2 Family Proteins*, April 1 (MC).
- Dr. **Haim Einat**, Department of Pharmacy Practice and Pharmaceutical Sciences, University of Minnesota, Duluth. *Different Strains and Different Behaviors: New Ways to Model Bipolar Disorder*, April 4 (ITDD).
- Dr. **Ramaswamy Iyer**, Department of Biotransformation, Bristol-Myers Squibb Pharmaceutical Research Institute. *Role of Metabolism in Drug Discovery and Development: A Personal Journey*, April 8 (MC).

- Dr. **Jeffrey P. Donohue**, CDC. *Chemometric Analysis of Pyrolysis/Chromatographic Data*, April 15 (MC).
- Dr. **Corinne Augelli-Szafran**, Harvard Medical School and Brigham and Women's Hospital. *From Industry to Academia? Alzheimer Disease Drug Discovery*, April 18 (ITDD).
- Dr. **Rob Jones**, Medicinal Chemistry, Arena Pharmaceuticals. *Agonists of GPR119/GDIR Mediate Glycemic Control via Glucose Dependent Insulin and Incretin Release*, April 22 (MC).
- Dr. **William L. Jorgensen**, Department of Chemistry, Yale University. *Efficient Drug Lead Optimization Guided by Free-Energy Calculations*, April 29 (MC).
- Dr. **Richard Larock**, Department of Chemistry, Iowa State University. *Adventures in Biopolymers, Iodine, Aryne and Palladium Chemistry*, May 2 (ITDD).
- Dr. **Mukund Sibi**, Department of Chemistry, North Dakota State University. May 23 (ITDD).
- Dr. **Naichen Yu**, Roche Applied Science. *Using Cell Sensor Impedance Technology for Cell-Based Assays*, July 29 (ITDD).
- Dr. **Yitzhak Tor**, Department of Chemistry & Biochemistry, University of California, San Diego. *Targeting and Exploiting Negatively Charged Biopolymers*, September 9 (MC).
- Dr. **Binghe Wang**, Department of Chemistry, Georgia State University. *Going after the "Sweet Spot" in Selecting Aptamers for Glycoproteins*, September 16 (MC).
- Dr. **Saul Rosenberg**, Cancer Research, Abbott Laboratories. *Bcl-2 Family Proteins as Anti-Tumor Targets*, October 7 (MC).
- Dr. **Kay Brummond**, Department of Chemistry, University of Pittsburgh. *Exploiting Allenes in the Synthesis of Challenging Functional Motifs*, October 14 (MC).
- Dr. **Duane D. Miller**, Department of Pharmaceutical Sciences, University of Tennessee. **Soine Lecture:** *Search for Selective Androgen Receptor Modulators (SARMS)*, October 28 (MC).
- Dr. **Brian O. Bachmann**, Department of Chemistry, Vanderbilt University. *Biosynthesis of Pharmacophores in Microorganisms*, November 4 (MC).
- Dr. **Magid Abou-Gharbia**, Chemical and Screening Sciences, Wyeth Research. *Strategies for Discovery of Small Molecule Therapeutics*, November 25 (MC).



|   |                               |                    |
|---|-------------------------------|--------------------|
| <b>Research Grants<br/>(Fiscal Year 2008)</b> | National Institutes of Health | \$5,262,801        |
|   | Other:                        | <u>\$2,262,801</u> |
|   | Total:                        | \$7,357,716        |

**New Faces**

**Barry Finzel**, Ph.D., joined the Department in June of 2008. He received a B.S. Cum Laude in Chemistry from Eastern Michigan University in 1979 and a Ph.D. in Chemistry in 1983 from the University of California, San Diego. Dr. Finzel's principal research interest is in providing a structural basis for discovering and optimizing chemical matter as potential drug candidates through the rapid determination of protein-ligand complex crystal structures using high-throughput protein crystallography. In addition to his research, Dr. Finzel will teach biochemistry to professional students and a graduate level course in structure-based drug design.

**Mary Crosson** joined the Department in August of 2008 as an Executive Office and Administrative Specialist. Mary is a native of St. Paul, and has been working at the University of Minnesota since 2000. Previously she was with the Forest Resources unit and the Department of Pediatrics. Mary brings a variety of skills with her and is an essential member of the administrative team.

**Philip S. Portoghese  
Chair in  
Medicinal  
Chemistry  
Established**

Since joining the Department faculty in 1961, Distinguished Professor **Philip Portoghese** has made significant contributions to the field of medicinal chemistry. His research focuses on the neurosciences, and has been critical to the understanding of pain management, addiction, and tolerance to morphine-like pain relievers. He is recognized around the world for his discoveries related to opioid receptors. In an effort to continue and expand on this type of research in the neurosciences within the Department, Dr. Portoghese pledged one million dollars to establish the Philip S. Portoghese Chair in Medicinal Chemistry. Dr. Portoghese has always been a role model within the department, and now we wish to thank Dr. Portoghese for this generous gift, which exemplifies his commitment to the Department, the College, and the University as a whole.

**Commencement**

Ranganathan Balasubramanian ..... Ph.D., November 2008..... Advisor: Fecik  
 Jignesh Doshi ..... Ph.D., August 2008 ..... Advisor: Xing  
 Cory Kending ..... Ph.D., December 2008 ..... Advisor: Johnson  
 Rachel Loeber..... Ph.D., October 2008..... Advisor: Tretyakova

## New & Continuing Members



Faculty & Administrative Staff, Department of Medicinal Chemistry, Fall 2008

|                |                          |   |
|----------------|--------------------------|---|
| <b>Faculty</b> | Gunda Georg .....        | Department Head & Professor; Director, Institute for Therapeutics Discovery & Development (ITDD); Robert Vince Endowed Chair & McKnight Chair |
|                | Rodney Johnson .....     | Associate Department Head & Professor   |
|                | Rick Wagner .....        | Director of Graduate Studies & Professor  |
|                | Yusuf Abul-Hajj .....    | Professor   |
|                | Elizabeth Amin .....     | Assistant Professor   |
|                | Frank E. DiGangi .....   | Professor Emeritus  |
|                | Earl Dunham .....        | Associate Professor   |
|                | Robert Fecik .....       | Associate Professor   |
|                | David Ferguson .....     | Professor   |
|                | Barry Finzel .....       | Professor   |
|                | Vadim Gurvich .....      | Research Assistant Professor; Associate Director, ITDD; Director, ITDD Chemical Process Development   |
|                | Patrick Hanna .....      | Professor   |
|                | Derek Hook .....         | Research Professor; Director, ITDD High Throughput Screening  |
|                | Herbert Nagasawa .....   | Professor Emeritus  |
|                | Philip Portoghese .....  | Distinguished Professor   |
|                | Rory Rimmel .....        | Professor   |
|                | Thomas Shier .....       | Professor   |
|                | Marilyn Speedie .....    | Dean, College of Pharmacy; Professor  |
|                | E. John Staba .....      | Professor Emeritus  |
|                | Shana Sturla .....       | Assistant Professor   |
|                | Natalia Tretyakova ..... | Associate Professor   |
|                | Robert Vince .....       | Professor; Director, Center for Drug Design (CDD)   |
|                | Michael Walters .....    | Research Associate Professor; Director, ITDD Lead & Probe Discovery   |
|                | Chengguo Xing .....      | Assistant Professor   |

|                             |                                  |  |
|-----------------------------|----------------------------------|--|
| <b>Adjunct Faculty</b>      | Courtney Aldrich.....            | Research Associate Professor, CDD  |
|                             | Mark Distefano.....              | Professor, Department of Chemistry   |
|                             | Stephen Hecht.....               | Professor, Wallin Chair in Cancer Prevention                                 |
|                             | Thomas Hoye.....                 | Professor, Department of Chemistry   |
|                             | Krzysztof Pankiewicz.....        | Research Professor; Associate Director, CDD                                  |
|                             | Lisa Peterson.....               | Professor  |
| <b>Research Staff</b>       | Eyup Akgun.....                  | Research Associate, Portuguese Lab   |
|                             | Ramappa Chakrasali.....          | Research Associate, Georg Lab  |
|                             | Sudhakar Jakkraj.....            | Research Associate, Georg Lab  |
|                             | Sinthuja Kanagarajah.....        | Junior Scientist, Gurvich Lab  |
|                             | Lev Lis.....                     | Research Associate, Gurvich Lab  |
|                             | Mary Lunzer.....                 | Scientist, Portuguese Lab  |
|                             | Brock Matter.....                | Scientist, Tretyakova Lab  |
|                             | Michael Powers.....              | Scientist, Portuguese Lab  |
|                             | Aravind Ragipindi.....           | Research Associate, Finzel Lab   |
|                             | Subhashree Rangarajan.....       | Research Associate, Walters Lab  |
|                             | Mary Smart.....                  | Laboratory Manager, Georg Lab  |
|                             | Jonathan Solberg.....            | Assistant Scientist, Hook Lab  |
|                             | Jessica Strasser.....            | Assistant Scientist, Walters Lab   |
|                             | Defeng Tian.....                 | Research Associate, Hook Lab   |
|                             | Timothy Ward.....                | Research Associate, Georg Lab  |
| <b>Administrative Staff</b> | Caitlin Boley.....               | Office Assistant   |
|                             | Mary Crosson.....                | Executive Office & Administrative Specialist                                 |
|                             | Sandy Dewing.....                | Associate Administrator, Journal of Medicinal Chemistry                      |
|                             | Andrea Knickerbocker.....        | Administrative Coordinator   |
|                             | Joyce Reha.....                  | Executive Secretary  |
|                             | Marilee Tuite.....               | Executive Office & Administrative Specialist, Journal of Medicinal Chemistry |
|                             | Sara Wajeeh.....                 | Executive Office & Administrative Specialist                                 |
| <b>Graduate Students</b>    | Sadiya Noor Addo.....            | Advisor: Xing  |
|                             | Theresa Aliwarga.....            | Advisor: Rimmel  |
|                             | Ranganathan Balasubramanian..... | Advisor: Fecik   |
|                             | Sanaa Bardaweel.....             | Advisor: Wagner  |
|                             | Karen Beckman (KU).....          | Advisor: Georg   |
|                             | Adam Benoit.....                 | Advisor: Ferguson  |
|                             | Swapna Bhagwanth.....            | Advisor: Johnson   |
|                             | Lei (Luke) Bi (KU).....          | Advisor: Georg   |
|                             | Alexander Brandt.....            | Advisor: Wagner  |
|                             | Cindy Choy.....                  | Advisor: Wagner  |
|                             | Heidi Dahlmann (Chem).....       | Advisor: Sturla  |
|                             | Sonia Das.....                   | Advisor: Xing  |
|                             | Trinh (Amy) Doan.....            | Advisor: Georg   |
|                             | Hailey Gahlon.....               | Advisor: Sturla  |
|                             | Amit Gangar.....                 | Advisor: Wagner  |
| Bryant Gay.....             | Advisor: Georg                   |  |
| Melissa Goggin.....         | Advisor: Tretyakova              |  |

Xingxian (Wayne) Gu (KU)..... Advisor: Georg  
Becky Guza (Biochem) ..... Advisor: Tretyakova  
David Hermanson..... Advisor: Xing  
Kwon Ho (John) Hong ..... Advisor: Georg  
Yan Jia (Chem)..... Advisor: Wagner  
Thomas Johnson ..... Advisor: Xing  
Annapurna (Anu) Kamineni ..... Advisor: Shier  
Cory Kending ..... Advisor: Johnson  
Kriangsak Khownum (KU) ..... Advisor: Georg  
An Na Kim ..... Advisor: Georg  
Jinwoo Kim ..... Advisor: Georg  
Yook Wook Kim (Chem)..... Advisor: Georg  
Srikanth Kotapati..... Advisor: Tretyakova  
Rahul Lad ..... Advisor: Sturla  
Eric Leggans (Chem)..... Advisor: Fecik  
Matthew Leighty (KU)..... Advisor: Georg  
Anja Lesaja..... Advisor: Wagner  
Wei Li (Chem)..... Advisor: Georg  
Qing Li (Chem) ..... Advisor: Wagner  
Li Liu ..... Advisor: Hanna  
Xiodan (Kathy) Liu ..... Advisor: Sturla  
Rachel Loeber..... Advisor: Tretyakova  
Frank Maistrovich ..... Advisor: Ferguson  
Lei Meng ..... Advisor: Hecht  
Erin Michaelson-Richie..... Advisor: Tretyakova  
Kathryn Michalski..... Advisor: Aldrich  
Xun Ming ..... Advisor: Tretyakova  
Micah Niphakis (KU)..... Advisor: Georg  
Jolanna Norton ..... Advisor: Sturla  
Satish Patil (Chem)..... Advisor: Georg  
Michael Peterson ..... Advisor: Fecik  
Martin Phillips ..... Advisor: Peterson  
Kathryn Pietsch ..... Advisor: Sturla  
Adwait Ranade ..... Advisor: Georg  
Christopher Schneider (KU)..... Advisor: Georg  
Hajime Seki (Chem)..... Advisor: Georg  
Uthpala Seneviratne (Chem) ..... Advisor: Tretyakova  
Vivek Srinivasan ..... Advisor: Georg  
Jaeson Steele..... Advisor: Fecik  
Aaron Teitelbaum..... Advisor: Rimmel  
Sreedhar Tummalapalli ..... Advisor: Georg  
Brian White ..... Advisor: Wagner  
Ajay Yekkirala (Pharmacol)..... Advisor: Portoghese  
Yiyun Yu (Chem)..... Advisor: Georg  
Siyi Zhang ..... Advisor: Hecht  
Xia Zhang..... Advisor: Amin  
Jin Zhou..... Advisor: Rimmel  
Xin (Cece) Zhou..... Advisor: Wagner

**Postdocs and  
Fellows**

Dennis Brown..... Advisor: Fecik  
Padma Chittepu ..... Advisor: Ferguson

|                                  |   |
|----------------------------------|---|
| Ting-Lan Chiu .....              | Advisor: Amin   |
| Rebecca Cuellar.....             | Advisor: Georg  |
| Matthew Cuellar.....             | Advisor: Wagner   |
| Minghua Dai.....                 | Advisor: Hook   |
| Xiaochun Dong.....               | Advisor: Johnson  |
| Jignesh Doshi.....               | Advisor: Portoghese   |
| Adrian Fegan.....                | Advisor: Wagner   |
| Rawle Francis.....               | Advisor: Hook   |
| Todd Geders.....                 | Advisor: Finzel   |
| Brahmananda Ghosh.....           | Advisor: Wagner   |
| Rajan Giri.....                  | Advisor: Ferguson   |
| Oliver Hutt.....                 | Advisor: Georg  |
| Vishweshwer Rao Katta.....       | Advisor: Georg  |
| Harneet Kaur.....                | Advisor: Ferguson   |
| Brandie Kovaleski.....           | Advisor: Wagner   |
| Sidath Kumarapperuma.....        | Advisor: Wagner   |
| Morgan Le Naour.....             | Advisor: Portoghese   |
| Jae Chul Lee.....                | Advisor: Georg  |
| Bhaskar Malayappan.....          | Advisor: Tretyakova   |
| José Mejia.....                  | Advisor: Georg  |
| Matthew Metcalf.....             | Advisor: Portoghese   |
| Krishnaveni Neelam.....          | Advisor: Georg  |
| Amber Onorato.....               | Advisor: Fecik  |
| Antonella Pepe.....              | Advisor: Georg  |
| Bhooma Raghavan.....             | Advisor: Fecik  |
| Subhashree Rangarajan.....       | Advisor: Georg  |
| Ahmad Ari Shaik.....             | Advisor: Xing   |
| Rohit Singh.....                 | Advisor: Vince  |
| Ravindranadh Somu.....           | Advisor: Johnson  |
| Anastassia Sorkin.....           | Advisor: Amin   |
| Balasubramanian Srinivasan.....  | Advisor: Xing   |
| Murali Subramanian.....          | Advisor: Rimmel   |
| Shameem Sultana Syeda.....       | Advisor: Georg  |
| Marina Tanasovia.....            | Advisor: Sturla   |
| Ye Tang.....                     | Advisor: Portoghese   |
| Defeng Tian.....                 | Advisor: Hook   |
| Richard Wood.....                | Advisor: Amin   |
| <b>Summer</b><br><b>Scholars</b> |   |
| Christopher Glenski.....         | University of Minnesota Undergraduate Research<br>Opportunities Program, Amin Lab |
| Rebecca Gunther.....             | University of Minnesota, Georg Lab  |
| Susie Krzmarzick.....            | University of Minnesota, Georg Lab  |
| Kyung Mee (Janice) Lee.....      | University of Minnesota, Georg Lab  |
| Abrajeet Roy.....                | University of Pennsylvania, Amin Lab  |

## Ways to Give

Private support of our activities is important to maintain the quality of our program and the continuation of the mission of the department. Even small contributions add up over time and can have a significant impact. Additionally, the University has an income matching policy of making a 1:1 match of the income generated by any gift to a fellowship of over 25 thousand dollars. For example, a \$25,000 fellowship fund that earns 4% per year and therefore produces \$1,000 in annual spendable income, will additionally receive a \$1,000 income match to double the annual spendable benefit, to \$2,000 per year.

Giving opportunities include:

- Medicinal Chemistry Alumni Graduate Student Fellowship
- MIKI Meeting Fund
- Ole Gisvold Fellowship in Medicinal Chemistry
- Philip S. Portoghese Fellowship in Medicinal Chemistry
- Remmel and Zimmerman Fellowship in Drug Metabolism and Pharmacokinetics
- Robert Vince Graduate Student Fellowships
- Soine Lectures in Medicinal Chemistry
- Yusuf J. Abul-Hajj Fellowship in Medicinal Chemistry

Our Development Director Robert Busch will work with you and will answer any questions that you might have. He can be reached by e-mail, busch110@umn.edu, or phone, 1-866-437-0012.

## Faculty Publications, 2008

1. Abbas, H.K.; Accinelli, C.; Zablutowicz, R.M.; Abel C.A.; Bruns, H.A.; Dong, Y.; **Shier, W.T.**, Dynamics of Mycotoxin and *Aspergillus flavus* Levels in Aging Bt and Non-Bt Corn Residues under Mississippi No-Till Conditions, *J. Agric. Food Chem.*, 56, 7578-7585 2008.
2. Adams, T.B.; Gavin, C. Lucas; Taylor, S.V.; Waddell, W.J.; Cohen, S.M.; Feron, V.J.; Goodman, J.; Rietjens, I.M.; Marnett, L.J.; **Portoghese, P.S.**; Smith, R.L., The FEMA GRAS Assessment of  $\alpha,\beta$ -unsaturated Aldehydes and Related Substances Used as Flavor Ingredients, *Food Chem. Toxicol.*, 46, 2935-2967 2008.
3. **Amin, E.A.**; Truhlar, D.G., Zn Coordination Chemistry: Development of Benchmark Suites for Geometries, Dipole Moments, and Bond Dissociation Energies and Their Use to Test and Validate Density Functionals and Molecular Orbital Theory, *J. Chem. Theory Comput.*, 4, 75-85 2008.

4. Balasubramanian, R.; Raghavan, B.; Sackett, D.L.; **Fecik, R.A.**, Tubulysin Analogs Incorporating Desmethyl and Dimethyl Tubophenylalanine Derivatives, *Bioorg. Med. Chem. Lett.*, 18, 2996-2999 2008.
5. Chen, L.; Petrelli, R.; Felczak, K.; Gao, G.; Bonnac, L.; Yu, J.S.; Bennett, E.M.; **Pankiewicz, K.W.**, Nicotinamide Adenine Dinucleotide Based Therapeutics, *Curr. Med. Chem.*, 15, 650-670 2008.
6. Chen, L.; Petrelli, R.; Felczak, K.; Olesiak, M.; Bennet, E.M.; Magni, G.; **Pankiewicz, K.W.**, Novel Cofactor-type Inhibitors of NAD-dependent Enzymes, *Coll. Czech. Chem. Commun.*, 10 (Chemistry of Nucleic Acid Components), 71-79 2008.
7. Chen, L.; Petrelli, R.; Olesiak, M.; Wilson, D.J.; Labello, N.P.; **Pankiewicz, K.W.**, Bis(sulfonamide) Isosters of Mycophenolic Adenine Dinucleotide Analogues: Inhibition of Inosine Monophosphate Dehydrogenase, *Bioorg. Med. Chem.*, 16, 462-469 2008.
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