

Daniel P. Becker, Ph.D.

Work

Department of Chemistry
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Glenview, IL 60025
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EDUCATION

Ph.D. in Chemistry, Indiana University, Bloomington, IN 1982 - 1986
Research Advisor: Professor Philip D. Magnus, F.R.S.
Dissertation: "Studies of the Pauson-Khand Reaction: Progress toward the Synthesis of (+)-6a-Carbaprostaglandin I₂. Deprotonation of Hexacarbonyl (trimethylsilylethyne)-dicobalt."
Minor: Inorganic Chemistry

B.A. in Chemistry 1978 - 1982
Kalamazoo College, Kalamazoo, MI

Friedreich Alexander Universität Erlangen-Nürnberg 1980 - 1981
Erlangen, West Germany

ACADEMIC EXPERIENCE

Associate Professor, Organic & Medicinal Chemistry (tenured) 2008-present
Loyola University, Chicago, IL

- Teaching undergraduate and graduate-level courses in organic, advanced organic, medicinal chemistry, and green chemistry; directing graduate and undergraduate students in research in synthetic organic chemistry, medicinal chemistry, and supramolecular chemistry

Adjunct Associate Professor, Department of Microbiology and immunology 2005-present
Loyola University Medical Center, Maywood, IL

Associate Professor, Organic & Medicinal Chemistry (tenure track) 2004-2008
Loyola University, Chicago, IL

Adjunct Assistant Professor of Medicinal Chemistry 1993 - present
The University of Illinois at Chicago, Chicago, IL

- Team teaching of a graduate course in medicinal chemistry on selected topics including drug design, peptidomimetics, and enzyme inhibitors as therapeutics to treat diseases.

Guest Lecturer for Environmental Business Management graduate level Course 1998-2011
Stuart School of Business, The Illinois Institute of Technology (IIT), Chicago, IL

- Case studies of sustainable business development in industry including ecoefficiency, sustainable architecture and building design, whole-systems approach to design, and the GMO controversy.

INDUSTRIAL RESEARCH EXPERIENCE

Consultant to Pharmaceutical/Biotech corporations and Intellectual Property Firms 2003-present

- Advise companies on medicinal chemistry approaches, product development strategies, sustainable development strategies, and intellectual property and patent issues.

Senior Research Advisor & Research Fellow
Pharmacia Corporation, Skokie, IL

2002-2003

- Project leader for matrix metalloproteinase (MMP) project leading the design, synthesis and development for drugs to treat cancer, arthritis, cardiovascular diseases, and ophthalmologic diseases. Directly responsible for international team of 24 Ph.D. and B.S./M.S. medicinal chemists, and for coordination with discovery biology teams in multiple therapeutic areas plus pharmaceuticals, development chemistry, and legal.

Senior Research Scientist and Group Leader
G.D. Searle & Co., Skokie, IL

1996 - 2002

- Led research group of M.S./Ph.D. medicinal chemists in design and synthesis of novel small molecules for the treatment of cancer, arthritis and cardiovascular diseases.

Research Scientist I, Department of Medicinal Chemistry
G.D. Searle & Co., Skokie, IL

1992 - 1995

- Led group of M.S. level scientists in the design and synthesis of new assembly protease inhibitors as antivirals to treat infections in the herpes virus family including CMV and VZV.

Senior Research Investigator, Gastrointestinal Diseases Research
G.D. Searle & Co., Skokie, IL.

1989 - 1992

- Led group of M.S. level scientists in the design and synthesis of novel compounds for the treatment of gastrointestinal diseases.

Research Investigator, Gastrointestinal Diseases Research
G.D. Searle & Co., Skokie, IL.

1987 - 1989

- Responsible for the design and synthesis of novel medicinal agents for the treatment of gastrointestinal diseases

PROFESSIONAL ACTIVITIES

NIH Grant Review Study Sections Regular Member: Drug Discovery for the Nervous System and Molecular Probes

- June 15-16, 2012 Seattle, WA
- Oct 18-19, 2012 Washington, D.C.
- Feb 14-15, 2013 Baltimore, MD (scheduled)

Reviewer: ACS Petroleum Research Foundation (PRF), Czech Science Foundation (GA CR), Journal of the American Chemical Society (JACS), Journal of Medicinal Chemistry, Journal of Organic Chemistry (JOC), Bioorganic & Medicinal Chemistry Letters, Organic Letters, Tetrahedron, Tetrahedron Letters, European Journal of Medicinal Chemistry, Chemical Biology & Drug Design, Expert Opinion in Therapeutic Patents, Bioinorganic Chemistry and Applications, Synthesis, Current Organic Chemistry, Catalysis Today, SYNLETT, and the Organic Synthesis section of the journal Molecules.

Member: The American Chemical Society (ACS), Division of Organic Chemistry and Division of Medicinal Chemistry; The New York Academy of Sciences (NYAS); American Association for the Advancement of Science (AAAS)

PROFESSIONAL AWARDS AND FUNDING

- ACS PRF AC Grant, \$100,000 2008-2011
- Loyola University of Chicago Summer Research Stipend competitively awarded 2010
- Loyola University of Chicago Summer Research Stipend competitively awarded 2009
- NRHH Loyola University Chicago Teacher of the Month 2007
- Certificate of Recognition for demonstrated Excellence in Teaching, Mentoring, and Advising of Graduate Students 2006
- Loyola University of Chicago Summer Research Stipend competitively awarded 2006
- Loyola University of Chicago Summer Research Stipend competitively awarded 2005
- Research Fellow 2002
Pharmacia Corporation, Skokie, IL
- DuPont Associate Instructor Award for Excellence in Teaching 1984
Indiana University, Bloomington, IN
- Comprehensive Examinations in Chemistry: Passed with Distinction 1982
Kalamazoo College, Kalamazoo, MI
- German Language Fluency Examination: 800/800 1981
Kalamazoo College, Kalamazoo, MI

BOOK CHAPTERS

1. Daniel P. Becker, Bella Goldstin, Gary W. Gullikson, Richard Loeffler, Alan Moormann, Chaffiq Moumami, Roger Nosal, Dale Spangler, Clara I. Villamil, Dai-C. Yang, Daniel L. Zabrowski, and Daniel L. Flynn, "Design and Synthesis of Agonists and Antagonists of the Serotonin 5-HT₄ Receptor Subtype", in "Perspectives in Receptor Research", ed. D. Giardina et. al., *Pharmacochimistry Library, Vol. 24*, Elsevier Science B. V.: Amsterdam, **1996**, pp. 99-120.

PUBLICATIONS

1. Philip Magnus and Daniel P. Becker, "Deprotonation of Hexacarbonyl (trimethylsilylethyne) dicobalt and Subsequent Single Electron Transfer Chemistry, Polyacetylene-Poly (cobaltcarbonyl) complexes," *J. Chem. Soc. Chem. Commun.* **1985**, 640.
2. Philip Magnus and Daniel P. Becker, "Stereospecific Dicobalt Octacarbonyl Mediated Enyne Cyclization for the Enantiospecific Synthesis of a 6a-Carbocycline Analogue", *J. Am. Chem. Soc.* **1987**, *109*, 7495.
3. D. Becker, P. Carter, J. Elliott, R. Lewis, P.D. Magnus, F.R.S., L. Principe and M. Slater, Organometallic Chemistry can Simplify the Synthesis of Important Biologically Active Natural Products", *Phil. Trans. Royal Soc. Lond. A* **1988**, *326*, 641.
4. Daniel L. Flynn, Daniel P. Becker, Roger Nosal, Clara I. Villamil, Daniel L. Zabrowski, Gary W. Gullikson, Chafiq Moumami, and Dai Yang, "SC-53116: The First Selective Agonist at the Newly Identified Serotonin 5-HT₄ Receptor Subtype", *J. Med. Chem.* **1992**, *35*, 1486.
5. Daniel L. Flynn, Clara I. Villamil, Daniel P. Becker, Gary W. Gullikson, Chafiq Moumami, and Dai-Chang Yang, "1,3,4-Trisubstituted Pyrrolidinones as Scaffolds for Construction of Peptidomimetic Cholecystokinin Antagonists," *Bioorg. and Med. Chem. Lett.* **1992**, *2*, 1251-1256.
6. Daniel P. Becker and Daniel L. Flynn, "A Short Synthesis of 1-Azaadamantan-4-one and the 4r and 4s Isomers of 4-Amino-1-azaadamantane", *Synthesis* **1992**, 1080.
7. Daniel L. Flynn, Daniel P. Becker, Roger Nosal, and Daniel L. Zabrowski, "Use of Atom-transfer Radical Cyclizations as an Efficient Entry into a New Serotonergic Norazaadamantane", *Tetrahedron Lett.* **1992**, *33*, 7283.
8. Daniel L. Flynn, Daniel P. Becker, Roger Nosal, Gary W. Gullikson, Chafiq Moumami, Dai-Chang Yang, and Dale P. Spangler, "New (Nor)Aza-Adamantanes Are Agonists at the Newly Identified Serotonin 5HT₄ Receptor and Antagonists at the 5HT₃ Receptor", *Bioorg. and Med. Chem. Lett.* **1992**, *2*, 1613.
9. Daniel P. Becker, Patricia M. Finnegan, and Paul W. Collins, "Isolation of a Highly Functionalized Troeger's Base Derivative via a Novel Reaction", *Tetrahedron Lett.* **1993**, *34*, 1889.
10. Daniel P. Becker and Daniel L. Flynn, "Studies of the Solid-Phase Pauson-Khand Reaction Selective in-situ Enone Reduction to 3-Azabicyclo[3.3.0]oct-anones", *Tetrahedron Lett.* **1993**, *34*, 2087.
11. Daniel P. Becker and Daniel L. Flynn, "Synthesis of N-BOC-3-Azabicyclo[3.3.0]octan-7-one via Reductive Pauson-Khand Cyclization and Subsequent Conversion to a Novel Diazatricyclic Ring System", *Tetrahedron*, **1993**, *49*, 5047.
12. Daniel P. Becker and Daniel L. Flynn, "Preparation of Trifluoromethyl Lactol Derivatives via Base-Initiated Cyclobutanol Ring-Opening to a Laterally-Lithiated Trifluoromethyl Ketone", *Synlett.*, **1996**, 57.
13. Daniel P. Becker, Hui Li, and Daniel L. Flynn, "One-Pot Preparation of 1,3-Dihydro-1-(Trifluoromethyl)isobenzofuran-1-ol Derivatives from 1,2-Dibromobenzene", *Synthetic Communications*, **1996**, *26*, 3127-35.

14. Daniel P. Becker, Roger Nosal, Daniel L. Zabrowski and Daniel L. Flynn, "Synthetic Strategies for the Construction of Enantiomeric Azanoradamantanes", *Tetrahedron*, **1997**, *53*, 1-20.
15. Daniel L. Flynn, Daniel P. Becker, Alan Moormann, Clara Villamil, Kathryn Houseman, Art Wittwer, Leanna Levine, M. Toth, Paul Hippenmeyer, Vickie Dilworth, Maureen Highkin, Anne Rankin and Barry Holwerda, "The Herpesvirus Protease: Mechanistic Studies and Discovery of Inhibitors of the Human Cytomegalovirus Protease" *Drug Design & Discovery*, **1997**, *15*, 3-15.
16. Daniel P. Becker, Roger Nosal, Clara I. Villamil, Gary Gullikson, Chafiq Moumami, Dai-Chang Yang and Daniel L. Flynn, "Serotonin 5-HT₄ Agonist Activity of a Series of Meso-Azanoradamantane Benzamides", *Bioorganic & Medicinal Chemistry Letters*, **1997**, *7*, 2149-2154.
17. Daniel P. Becker, Robert K. Husa, Alan E. Moormann, Clara I. Villamil, Daniel L. Flynn, "Enantioselective Synthesis of Dual 5-HT₃/5-HT₄ Serotonergic Azanoradamantane SC-52491", *Tetrahedron*, **1999**, *55*, 11787-11802.
18. Thomas E. Barta, Daniel P. Becker, Louis J. Bedell, Gary A. DeCrescenzo, Joseph J. McDonald, Grace E. Munie, Shashi Rao, Huey-Sheng Shieh, Roderick Stegeman, Anna M. Stevens and Clara I. Villamil, "Synthesis and Activity of Selective MMP Inhibitors with an Aryl Backbone", *Bioorganic & Medicinal Chemistry Letters*, **2000**, *10*, 2815-2817.
19. Thomas E. Barta, Daniel P. Becker, Louis J. Bedell, Gary A. DeCrescenzo, Joseph J. McDonald, Pramod Mehta, Grace E. Munie and Clara I. Villamil, "Selective, Orally Active MMP Inhibitors with an Aryl Backbone", *Bioorganic & Medicinal Chemistry Letters*, **2001**, *11*, 2481-2483.
20. Daniel P. Becker, Thomas E. Barta, Louis Bedell, Gary DeCrescenzo, John Freskos, Daniel P. Getman, Susan L. Hockerman, Madeleine Li, Pramod Mehta, Brent Mischke, Grace Munie, Craig Swearingen, Clara I. Villamil, " α -Amino- β -Sulphone Hydroxamates as Potent MMP-13 Inhibitors Which Spare MMP-1", *Bioorganic & Medicinal Chemistry Letters*, **2001**, *11*, 2719-2722.
21. Daniel P. Becker, Gary DeCrescenzo, John Freskos, Daniel P. Getman, Susan L. Hockerman, Madeleine Li, Pramod Mehta, Grace Munie, Craig Swearingen, " α -Alkyl- α -Amino- β -Sulphone Hydroxamates as Potent MMP Inhibitors Which Spare MMP-1", *Bioorganic & Medicinal Chemistry Letters*, **2001**, *11*, 2723-2725.
22. Daniel P. Becker, Daniel L. Flynn, Clara I. Villamil, "Bridgehead-Methyl SC-53116 as a 5-HT₄ Agonist", *Bioorganic & Medicinal Chemistry Letters*, **2004**, *14*, 3073-3075. PMID: 15149647
23. Daniel P. Becker, Daniel L. Flynn, Robert Shone and Gary Gullikson, "Azaadamantane Benzamide 5-HT₄ Agonists: Gastrointestinal Prokinetic SC-54750", *Bioorganic & Medicinal Chemistry Letters*, **2004**, *14*, 5509-5512. PMID: 15482914
24. Daniel P. Becker, Clara I. Villamil, Thomas E. Barta, Louis J. Bedell, Terri L. Boehm, Gary A. DeCrescenzo, John N. Freskos, Daniel P. Getman, Susan Hockerman, Robert Heintz, Susan Carol Howard, Madeleine H. Li, Joseph J. McDonald, Chris P. Carron, Chris L. Funckes-Shippy, Pramod P. Mehta, Grace E. Munie and Craig A. Swearingen. "Synthesis and Structure-Activity Relationships of β - and α -Piperidine Sulphone Hydroxamic Acid Matrix Metalloproteinase Inhibitors with Oral Antitumor Efficacy", *J. Med. Chem.* **2005**, *48*, 6713-6730. PMID: 16220987

25. Becker, Daniel P.; Flynn, Daniel L.; Moormann, Alan E.; Nosal, R.; Villamil, C.; Loeffler, R.; Gullikson, G. W.; Moumami, Chafiq, Yang, Dai-C. "Pyrrolizidine Esters and Amides as 5-HT₄ Receptor Agonists and Antagonists", *J. Med. Chem.* **2006**, *49*, 1125-1139. PMID: 16451077
26. Lutz Jr., Marlon R., French, David C., Rehage, Peter, & Becker, Daniel P. "Isolation of the saddle and crown conformers of cyclotrimeratrylene (CTV) oxime", *Tetrahedron Lett.* **2007**, *48*, 6368-6371.
27. Lutz Jr., Marlon R., Zeller, Matthias; Becker, Daniel P. "2,3,8,12,13-Pentamethoxy-5H-dibenzo[c,n]acridin-7(6H)-one", *Acta Cryst.* **2007**, E63, o3857–o3858.
28. Lutz Jr., Marlon R., Zeller, Matthias; Becker, Daniel P. "2,3,5',6,6',7-Hexamethoxy-3'H,10H-spiro[anthracene-9,1'-isobenzofuran]-3',10-dione", *Acta Cryst.* **2007**, 63 o4390-o4391.
29. Armoush, Nicola; Kataria, Preeti; Becker, Daniel P. "Synthesis of Substituted 2-Amino-Cyclobutanones", *Synthetic Communications* **2008**, *38*(11), 1679-1687.
30. Lutz Jr., Marlon R.; Zeller, Matthias; Becker, Daniel P. "Beckmann Rearrangement of Cyclotrimeratrylene (CTV) Oxime: Tandem Beckmann-Electrophilic Aromatic Addition", *Tetrahedron Letters* **2008**, *49*, 5003-5005.
31. Zeller, Matthias; Lutz Jr., Marlon R.; Becker, Daniel P. "An aza-cyclophane stacked in racemic columnar assemblies: Whole molecular disorder in a 2D solid solution" *Acta Cryst B: Structural Science* **2009**, *65*(2), 223-229. PMID: 19299878
32. French, David; Lutz, Marlon R.; Lu, Chichi; Zeller, Matthias; Becker, Daniel P. "A Thermodynamic and Kinetic Characterization of the Solvent Dependence of the Saddle-Crown Equilibrium of Cyclotrimeratrylene (CTV) Oxime, *J. Phys. Chem A.*, **2009**, *113*, 8258-8267.
33. Gillner, Danuta; Nicola Armoush, Holz; Richard C.; and Becker, Daniel P. "Inhibitors of Bacterial N-Succinyl-L,L-diaminopimelic Acid Desuccinylase (DapE) and Demonstration of in vitro Antimicrobial Activity" *Bioorganic & Medicinal Chemistry Letters*, **2009**, *19*, 6350-6352.
34. Hamed, Othman; Henry, Patrick; Becker, Daniel P. "Palladium(II)-Catalyzed Dicarboxymethylation of Chiral Allylic Alcohols: Chirality Transfer Affording Optically Active Diesters Containing Three Contiguous Chiral Centers" *Tetrahedron Lett.*, **2010**, *51*, 3514-3517.
35. Stephen A. Kolodziej, Susan L. Hockerman, Gary A. DeCrescenzo, Joseph J. McDonald, Debbie A. Mischke, Grace E. Munie, Theresa R. Fletcher, Nathan W. Stehle, Craig Swearingen and Daniel P. Becker "MMP-13 Selective Isonipecotamide α -Sulfone Hydroxamates" *Bioorganic & Medicinal Chemistry Letters*, **2010**, *20* 3561-3564.
36. Stephen A. Kolodziej, Susan L. Hockerman, Terri L. Boehm,, Joseph G. Rico, Jeffery N. Carroll, Gary A. De Crescenzo, Joseph J. McDonald, Debbie A. Mischke, Grace E. Munie, Theresa R. Fletcher, Nathan W. Stehle, Craig Swearingen and Daniel P. Becker, "Orally Bioavailable Dual MMP-1/MMP-14 Sparing MMP-13 Selective α -Sulfone Hydroxamates" *Bioorganic & Medicinal Chemistry Letters*, **2010**, *20*, 3557-3560.
37. Daniel P. Becker, Thomas E. Barta, Louis J. Bedell, Terri L. Boehm, Brian R. Bond, Jeffery Carroll, Chris P. Carron, Gary A. DeCrescenzo, Alan M. Easton, John Freskos, Chris L. Funckes-Shippy, Marcia Heron, Susan Hockerman, Susan Carol Howard, James R. Kiefer, Madeleine H. Li, Karl J. Mathis, Joseph J.

- McDonald, Pramod P. Mehta, Grace E. Munie, Teresa Sunyer, Craig A. Swearingen, Clara I. Villamil, Dean Welsch, Jennifer M. Williams, Jun Yao, Ying Yu "Orally-Active MMP-1 Sparing α -Tetrahydropyranyl and α -Piperidinyl Sulfone Matrix Metalloproteinase (MMP) Inhibitors with Efficacy in Cancer, Arthritis, and Cardiovascular Disease" *Journal of Medicinal Chemistry*, **2010** 53 6653-6680. *Highlighted in SciBX: Science-Business eXchange September 2, 2010, Volume 3, number 34.*
38. Panagopoulos, Andria; Zeller, Matthias; Becker, Daniel P. "Synthesis of an ortho-Triazacyclophane, N,N',N''-Trimethyltribenzo-1,4,7-triazacyclononatriene" *J. Org. Chem.* **2010** 75, 7887-7892.
39. Barta, Thomas E.; Becker, Daniel P.; Bedell, Louis J.; Easton, Alan M.; Hockerman, Susan L.; Kiefer, James; Munie, Grace E.; Mathis, Karl J.; Li, Madeleine H.; Rico, Joseph G.; Villamil, Clara I.; Williams, Jennifer M. "MMP-13 Selective α -Sulfone Hydroxamates: A Survey of P1' Heterocyclic Amide Isosteres" *Bioorganic & Medicinal Chemistry Letters*, **2011**, 21 2820-2822.
40. Fobian, Yvette; Freskos, John N.; Barta, Thomas E.; Heintz, Robert; Kiefer, James R.; Mischke, Brent V.; Mullins, Patrick; Munie, Grace E.; Becker, Daniel P. "MMP-13 Selective α -Sulfone Hydroxamates Identification of selective P1' Amides" *Bioorganic & Medicinal Chemistry Letters*, **2011**, 21 2823-2825.
41. Osner, Zachary; Nyamjav, Dorjderem; Holz, Richard; Becker, Daniel P. "Direct Patterning of a Cyclotrimeratrylene (CTV) Derivative for Directed Self-Assembly of C60". *Nanotechnology*, **2011**, 22, 275611.
42. Othman A. Hamed, Arab El-Qisairi, Hanan Qaseer, Emad M. Hamed, Patrick M. Henry, and Daniel P. Becker, Asymmetric α -Hydroxy Ketone Synthesis by Direct Ketone Oxidation Using a Bimetallic Palladium(II) Complex", *Tetrahedron Lett.*, **2012**, 53, 2699-2701, 10.1016/j.tetlet.2012.03.066.
43. Marlon R. Lutz Jr., Matthias Zeller, Samuel Sarsah, Artur Filipowicz, Hailey Wouters, and Daniel P. Becker, "Synthesis, Crystal Structure, and Rearrangements of *ortho*-Cyclophane Cyclotetrameratrylene (CTTV) Tetraketone", *Supramolecular Chemistry*, **2012**, 24, 803-809. DOI:10.1080/10610278.2012.719081.
44. Danuta M. Gillner, Daniel P. Becker, and Richard C. Holz, "Lysine Biosynthesis in Bacteria: A Metallodesuccinylase as a Potential Antimicrobial Target", *Journal of Biological Inorganic Chemistry (JBIC)* **2012**, *in press*, DOI 10.1007/s00775-012-0965-1.
44. Samuel R.S. Sarsah, Marlon R. Lutz Jr., Matthias Zeller, David S. Crumrine, and Daniel P. Becker, "Rearrangement of Cyclotrimeratrylene (CTV) Diketone: 9,10-Diarylanthracenes with OLED Applications" *J. Org. Chem.* **2012**, *in press*, dx.doi.org/10.1021/jo302139w.
46. Ekaterina I. Filippova, Leigh A. Weston, Misty L. Kuh², Brett Geissler³, Alexandra M. Gehrin¹, Nicola Armoush, Chinessa T. Adkins, George Minasov, Ievgeniia Dubrovskaya, Ludmilla Shuvalova, James R. Winsor, Luke D. Lavis, Karla J. F. Satchell, Daniel P. Becker, Wayne F. Anderson, and R. Jeremy Johnson, "Large-scale structural rearrangement of a serine hydrolase from *Francisella tularensis* facilitates catalysis" *J. Biol. Chem.*, **2013**, *submitted*, JBC/2012/446625.
47. Andria M. Panagopoulos, Doug Steinman, Alexandra Goncharenko, Kyle Geary, Carlene Schleisman, Elizabeth Spaargaren, Matthias Zeller, and Daniel P. Becker, "Alkyl Transfer and Phenazine Formation via an Aryne Intermediate", *J. Org. Chem.*, **2013**, *submitted*, jo-2012-02795w.

SESSIONS CHAIRED

1. American Chemical Society (ACS) Great Lakes Regional Meeting (GLRM), full-day session entitled "Frontiers in Medicinal Chemistry", May 14, 2009.

RECENT INVITED LECTURES

1. "Design, synthesis and efficacy of selective MMP inhibitors" May 13, 2002, at Proteinase 2002: Opportunities for New Therapies, London, England.
2. "Approaches to Sustainable Development in Business" October 30, 2002, invited topic for business graduate course in Environmental Business Management, Stuart School of Business, Illinois Institute of Technology, Chicago, Illinois.
3. "Design, Synthesis and Efficacy of Matrix Metalloproteinase Inhibitors for the Treatment of Cancer and Cardiovascular Diseases" November 8, 2002, Howard University, Washington, D.C.
4. "The Discovery and Development of Selective Matrix Metalloproteinase Inhibitors" April 26, 2003 at the 16th Annual Organic Chemistry Day at the University of Missouri-Columbia, Columbia, MO.
8. "Medicinal Chemistry to Supramolecular Chemistry", March 23, 2006, Loyola University, Chicago, Illinois.
9. "The Journey from Medicinal Chemistry to Supramolecular Chemistry", April 6, 2006, University of Wisconsin, Platteville.
10. "From Medicinal Chemistry to Supramolecular Chemistry", October 23, 2006, Loyola University Chicago Stritch School of Medicine, Maywood, Illinois.
12. "From Medicinal Chemistry to Supramolecular Chemistry", March 5, 2007, Northern Illinois University, DeKalb, IL.
13. "Molecular Recognition in Pharmaceuticals and Supramolecular Scaffolds", March 8, 2007, Andrews University, Berrien Springs, MI.
14. "Medicinal Chemistry to Supramolecular Chemistry", May 10, 2007, University of Kansas, Lawrence, KA.
15. "Pharmaceutical Drug Design and Discovery", October 9, 2007, Indiana University at Kokomo, Kokomo, IN.
16. "Intermolecular Interactions: Drug Discovery to Supramolecular Chemistry", October 22, 2007, Kalamazoo College, Kalamazoo, MI.
18. "Host-Guest Chemistry: From Medicinal Chemistry to Supramolecular Scaffolds", Dec. 12, 2008, Regis Corporation, Morton Grove, IL.
19. "Strategies for Drug Discovery and Development", May 4, 2009, University of Chicago, Chicago, IL.

21. "Molecular Intimacy: Host-Guest Relationships of Drugs and Synthetic Receptors" April 7, 2011, University of Illinois at Chicago (UIC), Chicago, IL.
22. "Molecular Intimacy: Host-Guest Relationships of Drugs and Synthetic Receptors" April 24, 2011, Manchester College, North Manchester, IN.
23. "Drug Discovery – Serendipity and Design", ACS-Sponsored Symposium entitled "Chemistry—Our Health, Our Future", October 22, 2011, Columbia College, Chicago, IL

RECENT PRESENTATIONS AT SCIENTIFIC MEETINGS

1. Payman Farid, Marlon Lutz, Andria Panagopoulos, and Daniel P. Becker, "Progress Toward Amino Acid Cyclobutanone Derivatives as Potential Serine Protease Inhibitors via a Ketene [2+2] Cycloaddition Strategy", Medicinal Chemistry Gordon Conference, September 7-11, 2006.
2. Marlon Lutz, Payman Farid, Andria Panagopoulos, and Daniel P. Becker, "Synthesis of Amino Acid Cyclobutanone Derivatives as Potential Serine Protease Inhibitors via a Ketene [2+2] Cycloaddition Strategy", Poster presentation at the XXVI Midwest Enzyme Chemistry Conference (MECC), Northwestern University, Evanston, IL, September 31, 2006.
3. Preeti Kataria, Nicola Armoush and Daniel P. Becker, "Synthetic Approaches to Amino Acid Cyclobutanone Derivatives", Poster presentation at the 233rd National ACS Meeting, Chicago, IL, March 25-29, 2007, MEDI 335.
4. Marlon Lutz, Payman Farid, Andria Panagopoulos, and Daniel P. Becker, "Progress Toward Amino Acid Cyclobutanone Derivatives as Potential Serine Protease Inhibitors via a Ketene [2+2] Cycloaddition Strategy", poster presentation at the 233rd National ACS Meeting, Chicago, IL, March 25-29, 2007.
5. Marlon Lutz, Dave French, Peter Rehage and Daniel P. Becker, "Cyclotrimeratrylene Oxime and Derivatives: Synthesis and Conformation", Poster presentation at the 233rd National ACS Meeting, Chicago, IL, March 25-29, 2007.
6. Preeti Kataria, Nicola Armoush and Daniel P. Becker, "Synthetic Approaches to Amino Acid Cyclobutanone Derivatives", Poster presentation at the 234rd National ACS Meeting, Boston, MA, August 19-23, 2007, MEDI 71.
7. Nicola Armoush and Daniel P. Becker, "Synthetic Approaches to Amino Acid Cyclobutanone Derivatives", Poster presentation at the the XXVII Midwest Enzyme Chemistry Conference (MECC), Illinois Institute of Technology (IIT), Chicago, IL, September 29, 2007.
8. Andria Panagopoulos and Daniel P. Becker, "Toward the Synthesis of New CTV Derivatives" ABSTRACTS OF PAPERS OF THE AMERICAN CHEMICAL SOCIETY Volume: **235** Meeting Abstract: **387-ORGN** Milwaukee, WI, USA. Published: **APR 6 2008**.
9. Andria Panagopoulos and Daniel P. Becker, "Toward the Synthesis of New CTV Derivatives" Poster presentation at the 236th National ACS Meeting, Philadelphia, PA, August 17-21, 2008.
10. Lilia F. Santos , Andria Panagopoulos, Nicola Armoush, Danuta Gillner, Richard Holz, Daniel Becker, "Novel Antibiotics for Resistant Bacterial Strains" The Joint Meeting of the 19th Annual Argonne

Symposium for Undergraduates in Science, Engineering and Mathematics, the Computer Information Science & Engineering (CISE) Education Stakeholder's Summit, and the Central States Universities Incorporated (CSUI) Research Conference, Argonne National Laboratory, Nov. 7, 2008.

11. Holz, Richard C.; Gillner, Danuta; Becker, Daniel, "Unraveling the catalytic mechanism of dinuclear hydrolases." Abstracts of Papers, 237th ACS National Meeting, Salt Lake City, UT, United States, March 22-26, 2009 (2009), INOR-612.
12. Hailey Wouters, Marlon R. Lutz Jr., Matthias Zeller, and Daniel P. Becker, "Synthesis of Cyclotriveratrylene (CTTV) Tetraketone", ACS GLRM, Lincolnshire, IL, May 13-16, 2009.
13. Zachary Osner, Richard Holz, Daniel P. Becker and Dorjderem Nyamjav, "Direct Patterning of a Cyclotrimeratrylene (CTV) Derivative on a Gold Surface for Host-Guest Applications", ACS GLRM, Lincolnshire, IL, May 13-16, 2009.
14. Andria Panagopoulos and Daniel P. Becker, "Toward the Synthesis of New CTV Derivatives", ACS GLRM, Lincolnshire, IL, May 13-16, 2009.
15. Nicola Armoush and Daniel P. Becker, "Synthesis and Characterization of Novel Disubstituted Cyclobutanone Derivatives", ACS GLRM, Lincolnshire, IL, May 13-16, 2009, GLRM-162.
16. Andria Panagopoulos and Daniel P. Becker, "The Synthesis of N3-CTV", 238th ACS National Meeting, Washington, D.C., August 16-20, 2009, ORGN-787.
17. Osner, Zachary; Holz, Richard C.; Becker, Daniel; Nyamjav, Dorjderem, "Direct patterning of a cyclotrimeratrylene (CTV) derivative on a gold surface for host-guest applications ." Abstracts of Papers, 238th ACS National Meeting, Washington, DC, United States, August 16-20, 2009, ORGN-695.
18. Nicola Armoush and Daniel P. Becker, "Synthesis and characterization of novel disubstituted cyclobutanone derivatives" 238th ACS National Meeting, Washington, D.C., August 16-20, 2009, ORGN-193.
19. Elizabeth Ernst, Marlon Lutz, and Daniel P. Becker, "The Synthesis of Synthetic Receptor Molecules for Biological Sensors", poster presentation at the Iota Sigma Pi Research Symposium, March 27 2010, DePaul University, Chicago, IL.
20. "Direct Asymmetric Catalytic Oxidation of Ketones to α -Hydroxy Ketones Using a Chiral Bimetallic Pd(II) Complex", Othman A. Hamed, Emad M. Hamed, Patrick M. Henry, and Daniel P. Becker*, 5th PICC-2011, January 6-7, 2011, An-Najah National University, Jordan.
21. Samuel Sarsah, Marlon R. Lutz Jr, Daniel P. Becker, Highly Functionalized Anthracenes from Cyclotrimeratrylene (CTV) With Potential OLED Applications", 3rd Annual Chicago Organic Symposium, February 11, 2011, University of Illinois Chicago, Chicago, IL.
22. Artur Fillipowicz, Marlon R. Lutz, Jr., Hailey Wouters, Matthias Zeller, and Daniel P. Becker, "Preparation of Cyclotriveratrylene (CTTV) Tetraketone", 3rd Annual Chicago Organic Symposium, February 11, 2011, University of Illinois Chicago, Chicago, IL.
23. P. Long, Z. Osner, R. Holz, D. Becker, J.J. Kelly, "Development of Carbohydrate-Based Nanoarrays for the Detection and Capture of Pathogenic Bacteria" Life Sciences 2011.

24. Nicola Armoush, Misty L. Kuhn, James Winsor, Wayne F. Anderson, and Daniel P. Becker, "Cyclobutanone Amino Acid Derivatives as Protease Inhibitors", 31st Midwest Enzyme Chemistry Conference (MECC), October 15, 2011, University of Chicago, Chicago, IL.
25. Othman A Hamed, Partrick M Henry, and Daniel P Becker, "Stereochemical and mechanistic probes for understanding the stereoselectivity of addition to alkenes in the Wacker reaction" oral presentation at the 243rd ACS National Meeting, San Diego, CA, March 25-29, 2012, ORGN-55.
26. Daniel P. Becker, Othman A. Hamed, Arab El-Qisairi, Hanan Qaseer, Emad M. Hamed, and Patrick M. Henry "Asymmetric α -Hydroxy Ketone Synthesis by Direct Ketone Oxidation Using a Bimetallic Palladium(II) Catalyst", 4th Annual Chicago Organic Symposium, April 30, 2012, University of Illinois Chicago, Chicago, IL.
27. Samuel Sarsah, Marlon R. Lutz Jr., and Daniel P. Becker "Highly Functionalized Anthracenes from CTV with OLED Applications", 4th Annual Chicago Organic Symposium, April 30, 2012, University of Illinois Chicago, Chicago, IL.
28. Samuel Sarsah, Marlon R. Lutz Jr., and Daniel P. Becker "Intramolecular Tandem Beckmann Cascade: Synthesis of Benzophenone Derivatives, Arylamines, Imines and Quinazolines", 4th Annual Chicago Organic Symposium, April 30, 2012, University of Illinois Chicago, Chicago, IL.
29. Douglas H. Steinman, Carlene Schleisman, Andria Panagopoulos, Elizabeth Spaargaren, and Daniel P. Becker "Synthesis of N3-CTV via an Intramolecular Thermal Buchwald-Hartwig Reaction", 4th Annual Chicago Organic Symposium, April 30, 2012, University of Illinois Chicago, Chicago, IL.

SPECIAL TOPICS INVITED LECTURES

1. "Bizarre and Beautiful Bats", January 21, 1998 presentation to the Golf-Glenview Gardening Club, Glenview Village Hall, Glenview, Illinois.
2. "Bats!", October 28, 1998 presentation in the after-school student education series at the Glenview Public Library, Glenview, Illinois.
3. "Bizarre and Beautiful Bats", September 7, 1999 to the Gardeners of the North Shore, Chicago Botanic Garden, Glencoe, Illinois.
4. "Bats: Essential Allies", September 9, 1999 presentation to the Asherwood Nature Study Group, Asherwood Environmental Science Center, Wabash, Indiana.
5. "Sustainability: What it is and Why it is Important", March 8, 2001, Presentation to the Golf-Glenview Gardening Club, Trinity Lutheran Church, Glenview, Illinois.
5. "Sustainable Development Searle/Monsanto, Genetically-Modified Organisms, and Sustainable Development as a Competitive Advantage" November 12, 2003, Illinois Institute of Technology, Chicago, Illinois.
6. "A Retrospective Analysis of Monsanto's GM Approach to Sustainable Development" May 24, 2004,

Illinois Institute of Technology, Chicago, Illinois.

7. "A Retrospective on Sustainable Development and a Glance at the Future" May 17, 2005, Illinois Institute of Technology, Chicago, Illinois.
8. "An Analysis of Genetically Modified Crops as a Potential Sustainable Development Strategy" October 25, 2006, invited topic for business graduate course in Environmental Business Management, Stuart School of Business, Illinois Institute of Technology, Chicago, Illinois.
9. "Sustainable Development in Industry" October 29, 2007, invited topic for business graduate course in Environmental Business Management, Stuart School of Business, IIT, Chicago.
10. "Biotechnology and Genetically-Modified Organisms—A Strategy for Sustainable Business Development?" November 11, 2010, Stuart School of Business, IIT, Chicago.
11. "Bizarre and Beautiful Bats", March 14, 2011 to a survey course sponsored by the Center for Urban and Environmental Research and Policy (CUERP), Loyola University Chicago.
12. "The Global Ecological and Economic Importance of Chiroptera With Striking Morphological Diversity" January 31, 2012 at the Patty Turner Center, Deerfield, IL.

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Parallel Text Immersion, Registration Number TXu-804-266, effective April 2, 2012, describing a new method of learning second languages.

ISSUED U.S. PATENTS

1. Daniel P. Becker, Paul W. Collins, Daniel L. Flynn, "N6-Substituted Adenosine Compounds". **US 5,055,569**, issued 10/8/91.
2. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "Pharmaceutically Useful Meso-Azacyclic Amides of Imidazopyridine Carboxylic Acids and Analogs Thereof". **US 5,137,893**, issued 8/11/92
3. Daniel L. Flynn, Daniel P. Becker, Roger Nosal, Dale Spangler, and Daniel L. Zabrowski. "Azatetracycle Compounds". **US 5,140,023**, issued 8/18/92; USRE35218, issued 4/23/96.
4. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "New Imidazopyridines as Serotonergic 5-HT₃ Antagonists". **US 5,196,547**, issued 3/23/93.
5. Daniel L. Flynn, Daniel P. Becker, and Clara I. Villamil. "N-Substituted Lactams Useful As Cholecystokinin Antagonists", **US 5,202,344**, issued 4/13/93.
6. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "Pharmaceutically Useful Meso-Azacyclic Amides of Imidazopyridine Carboxylic Acids and Analogs Thereof". **US 5,219,850**, issued 6/15/93.

7. Daniel P. Becker, Daniel L. Flynn, Roger Nosal, Dale P. Spangler, and Daniel L. Zabrowski. "Azatetracycle Compounds and Process of Preparing Same" **US 5,223,613**, issued 6/29/93.
8. Daniel L. Flynn, Alan E. Moormann, Daniel P. Becker, Roger Nosal, Clara I. Villamil, "Imidazopyridines as Serotonergic 5-HT₃ Antagonists" **US 5,260,303**, issued 11/9/93.
9. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, and Clara I. Villamil. "Meso-Azacyclic Amides of Imidazopyridine Carboxylic Acids and Analogs Thereof". **US 5,280,029**, issued 1/18/94.
10. Daniel L. Flynn, Daniel P. Becker, and Clara I. Villamil. "N-Substituted Lactams Useful As Cholecystokinin Antagonists", **US 5,314,886**, issued 5/24/94.
11. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "New Meso-Azacyclic Aromatic Acid Amides and Esters as Novel Serotonergic Agents". **US 5,318,977**, issued 6/7/94.
12. Daniel P. Becker, Daniel L. Flynn, Clara I. Villamil, "Indolones Useful as Serotonergic Agents". **US 5,399,562**, issued 3/21/95.
13. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, and Clara I. Villamil. "New Meso-Azacyclic Amides of Imidazopyridine Carboxylic Acids and Analogs Thereof". **US 5,430,040**, issued 7/4/95.
14. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "Imidazopyridines as Serotonergic 5-HT₃ Antagonists". **US 5,434,161**, issued 7/18/95.
15. Daniel L. Flynn, Daniel P. Becker, Alan E. Moormann, Roger Nosal, and Clara I. Villamil. "New Meso-Azacyclic Aromatic Acid Amides and Esters as Novel Serotonergic Agents". **US 5,516,782**, issued 5/14/96.
16. Daniel L. Flynn, Alan E. Moormann, Daniel P. Becker, Michael S. Dappen, Roger Nosal, Robert L. Shone, Clara I. Villamil. "Benzimidazole Compounds". **US 5,521,193**, issued 5/28/96.
17. Daniel P. Becker, Daniel L. Flynn, Clara I. Villamil, "Meso-azanoradamantanes". **US 5,530,018**, issued 6/25/96.
18. Daniel L. Flynn, Alan E. Moormann, Daniel P. Becker, Michael S. Dappen, Roger Nosal, Robert L. Shone, Clara I. Villamil. "Benzimidazole Compounds". **US 5,534,521**, issued 7/9/96.
19. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, and Clara I. Villamil, "Intermediates Useful in a Process for the Preparation of Azanoradamantane Benzamides", **US 5,541,344**, issued 7/30/96.
20. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, Roger Nosal, Clara I. Villamil, "Imidazopyridines as Serotonergic 5-HT₃ Antagonists", **US 5,591,749**, issued 1/7/97.
21. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, Roger Nosal, Clara I. Villamil, "Imidazopyridines as serotonergic 5-HT₃ antagonists", **US 5,604,239**, issued 1/18/97.
22. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, Roger Nosal, Clara I. Villamil, "Meso-azacyclic aromatic acid amides and esters as novel serotonergic agents", **US 5,612,366**, issued 3/18/97.

23. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, Clara I. Villamil, "Meso-azacyclic amides of imidazopyridine carboxylic acids and analogs thereof", **US 5,627,190**, issued 5/6/97.
24. Daniel P. Becker, Daniel L. Flynn, Alan E. Moormann, and Clara I. Villamil, "Process for the Preparation of Azanoradamantane Benzamides", **US 5,717,098**, issued 2/10/98.
25. Alan E. Moormann , Daniel P. Becker, Daniel L. Flynn, Madeleine Li and Clara I. Villamil, "Method of using (H+/K+)-ATPase Inhibitors as Antiviral Agents", **US 5,945,425**, issued 8/31/99.
26. Norman Abood, Daniel Flynn, Daniel Becker, Brian Bax, Hui Li, Roger Nosal, Lori Schretzman, Clara Villamil, Michael Bennett, Lou Bedell, John Wendt, Kenneth Williams. "2- Aminobenzoxazinones for the Treatment of Viral Infections", **US 5,985,872**, issued 11/16/99.
27. Getman, Daniel P.; Becker, Daniel P.; Barta, Thomas E.; Villamil, Clara I.; Hockerman, Susan L.; Bedell, Louis J.; Li, M. H.; Freskos, John N.; Heintz, Robert M.; Mcdonald, Joseph J.; DeCrescenzo, Gary A. "Thioaryl sulfonamide hydroxamic acid compounds." **US 6,087,359**, issued 7/11/2000.
28. Norman Abood, Daniel Flynn, Daniel Becker, Brian Bax, Hui Li, Roger Nosal, Lori Schretzman, Clara Villamil, "2-Amino benzoxazinones for the treatment of viral infections" **US 6,380,189**, issued 4/30/02.
29. Bedell, Louis J.; McDonald, Joseph J.; Barta, Thomas E.; Becker, Daniel P.; Rao, Shashidhar N.; Joseph J.; Freskos; Mischke, Brent V.; Getman, Daniel P.; DeCrescenzo, Gary A., "Sulfonyl divalent aryl or heteroaryl hydroxamic acid compounds" **US 6,380,258**, issued 4/30/02.
30. Villamil, Clara, John N. Freskos, Brent V. Mischke, Patrick B. Mullins, Robert M. Heintz, Daniel P. Getman, Joseph J. McDonald; DeCrescenzo, Gary A., Thomas E. Barta; Daniel P. Becker "N-Hydroxy 4-Sulfonyl Butanamide Compounds" **US 6,476,027**, issued 11/5/02.
31. Barta, Thomas E.; Becker, Daniel P.; Boehm, Terri L.; DeCrescenzo, Gary A.; Villamil, Clara I.; McDonald, Joseph J.; Freskos, John N.; Getman, Daniel P. "Aromatic Sulfone Hydroxamic Acid Metalloprotease Inhibitors." **US 6,541,489**, issued 4/1/03.
32. Hockerman, Susan L.; Becker, Daniel P.; Bedell, Louis J.; DeCrescenzo, Gary A.; Freskos, John, N.; Getman, Daniel P.; Heintz, Robert M.; Li, Madeleine H.; Mischke, Brent V.; Villamil, Clara I.; Barta, Thomas E.; "Alpha-Amino-beta-Sulfonyl Hydroxamic Acid Compounds." **US 6,583,299**, issued 6/24/03.
33. Li, Hui; Becker, Daniel P.; Villamil, Clara I.; Boehm, Terri L.; Getman, Daniel P.; Mcdonald, Joseph J.; DeCrescenzo, Gary A. "Aromatic sulfonyl alpha-cycloamino hydroxamic acid compounds." **US 6,638,952**, issued 10/28/03.
34. Bedell, Louis J.; Mcdonald, Joseph J.; Barta, Thomas E.; Becker, Daniel P.; Rao, Shashidhar N.; Freskos, John N.; Mischke, Brent V.; Getman, Daniel P.; DeCrescenzo, Gary, "Sulfonyl divalent aryl or heteroaryl hydroxamic acid compounds." **US 6,656,954**, issued 12/2/03.
35. Norman Abood, Daniel Flynn, Daniel Becker, Brian Bax, Hui Li, Roger Nosal, Lori Schretzman, Clara Villamil, Michael Bennett, Lou Bedell, John Wendt, Kenneth Williams. "2- Aminobenzoxazinones for the Treatment of Viral Infections", **US 6,683,077**, issued 1/27/04.

36. Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffery N.; DeCrescenzo; Gary A.; Fobian; Yvette M.; Freskos; John N.; Getman; Daniel P.; McDonald; Joseph J.; Li; Madeleine H.; Hockerman; Susan L.; Howard; Carol Percy; Kolodziej; Steve A.; Mischke; Deborah A.; Rico; Joseph G.; Stehle; Nathan W.; Tollefson; Michael B.; Vernier; William F.; Villamil; Clara I.; Kassab; Darren J. "Aromatic sulfone hydroxamic acids and their use as protease inhibitors", **US 6,683,093**, issued 1/27/04.
37. Freskos; John N.; Fobian; Yvette M.; Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffery N.; DeCrescenzo; Gary A.; Hockerman; Susan L.; Kassab; Darren J.; Kolodziej; Steve A.; McDonald; Joseph; Mischke; Deborah A.; Norton; Monica B.; Rico; Joseph G.; Talley; John J.; Villamil; Clara I.; Wang; Lijuan Jane, "Aromatic Sulfone Hydroxamates and Their Use as Protease Inhibitors", **US 6,689,794**, issued 2/10/04.
38. Barta, Thomas E; Becker, Daniel P.; Bedell, Louis J.; DeCrescenzo, Gary A.; Freskos, John N.; Getman, Daniel P.; McDonald, Joseph J.; Mischke, Brent V.; Rao, Shashidhar N.; Villamil, Clara I., "Sulfonyl Aryl Hydroxamates and Their Use as Matrix Metalloprotease Inhibitors" **US 6,696,449**, issued Feb. 24, 2004.
39. Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffrey N.; DeCrescenzo; Gary A.; Fobian; Yvette M.; Freskos; John N.; Getman; Daniel P.; McDonald; Joseph J.; Li; Madeleine H.; Hockerman; Susan L.; Howard; Susan C.; Kolodziej; Steve A.; Mischke; Deborah A.; Rico; Joseph G.; Stehle; Nathan W.; Tollefson; Michael B.; Vernier; William F.; Villamil; Clara I. "Aromatic sulfone hydroxamic acid metalloprotease inhibitors", **US 6,750,228**, issued 6/15/04.
40. Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffrey N.; DeCrescenzo; Gary A.; Fobian; Yvette M.; Freskos; John N.; Getman; Daniel P.; McDonald; Joseph J.; Li; Madeleine H.; Hockerman; Susan L.; Howard; Susan C.; Kolodziej; Steve A.; Mischke; Deborah A.; Rico; Joseph G.; Stehle; Nathan W.; Tollefson; Michael B.; Vernier; William F.; Villamil; Clara I. "Aromatic sulfone hydroxamic acid metalloprotease inhibitors" **US 6,750,233**, issued 6/15/04.
41. Bedell, Louis J.; McDonald, Joseph J.; Barta, Thomas E.; Becker, Daniel P.; Rao, Shashidhar N.; Freskos, John N.; Mischke, Brent V.; Getman, Daniel P.; DeCrescenzo, Gary A.; Villamil, Clara I. "Sulfonyl Aryl or Heteroaryl Hydroxamic Acid Compounds." **US 6,794,511**, issued 9/21/04.
42. Becker; Daniel P.; DeCrescenzo; Gary A.; Malecha; James W.; Miyashiro; Julie M.; Van Camp; Jennifer Ann; Collins; Joe T.; "Sulfone liver X-receptor modulators", **US 6,822,120**, issued 11/23/04.
43. Freskos; John N.; Fobian; Yvette M.; Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffrey N.; DeCrescenzo; Gary A.; Hockerman; Susan L.; Kassab; Darren J.; Kolodziej; Steve A.; McDonald; Joseph; Mischke; Deborah A.; Norton; Monica B.; Rico; Joseph G.; Talley; John J.; Villamil; Clara I.; Wang; Lijuan Jane "Aromatic sulfone hydroxamic acids and their use as protease inhibitors", **US 6,890,928**, issued 5/10/05.
44. Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Carroll; Jeffrey N.; DeCrescenzo; Gary A.; Fobian; Yvette M.; Freskos; John N.; Getman; Daniel P.; McDonald; Joseph J.; Li; Madeleine H.; Hockerman; Susan L.; Howard; Susan C.; Kolodziej; Steve A.; Mischke; Deborah A.; Rico; Joseph G.; Stehle; Nathan W.; Tollefson; Michael B.; Vernier; William F.; Villamil; Clara I. "Aromatic sulfone hydroxamic acid metalloprotease inhibitor", **US 6,890,937**, issued 5/10/05.
45. Moorman; Alan E.; Becker; Daniel P.; Flynn; Daniel L. "Method of using (H+/K+) ATPase inhibitors as antiviral agents", **US 6,906,078**, issued 6/14/05.

46. Bedell; Louis J.; McDonald; Joseph J.; Barta; Thomas E.; Becker; Daniel P.; Shashidhar; Rao N.; Freskos; John N.; Mischke; Brent V.; Getman; Daniel P.; DeCrescenzo; Gary A.; Villamil; Clara I. "Sulfonyl aryl or heteroaryl hydroxamic acid compounds", **US 7,115,632**, issued 10/3/06.
47. Barta; Thomas E.; Becker; Daniel P.; Bedell; Louis J.; Boehm; Terri L.; Brown; David L.; Carroll; Jeffery N.; Chen; Yiyuan; Fobian; Yvette M.; Freskos; John N.; Gasiecki; Alan F.; Grapperhaus; Margaret L.; Heintz; Robert M.; Hockerman; Susan L.; Kassab; Darren J.; Khanna; Ish K.; Kolodziej; Stephen A.; Massa; Mark A.; McDonald; Joseph J.; Mischke; Brent V.; Mischke; Deborah A.; Mullins; Patrick B.; Nagy; Mark A.; Norton; Monica B.; Rico; Joseph G.; Schmidt; Michelle A.; Wynn; Thomas A. "Piperidinyl- and piperazinyl-sulfonylmethyl hydroxamic acids and their use as protease inhibitors", **US 7,119,203**, issued 10/10/06.
48. Andria Marie Panagopoulos, Marlon Ray Lutz Jr, Daniel P. Becker, "Supramolecular Scaffolds and Methods of Making the Same" **US 8,173,803**, issued 5/8/12.

RECENT U.S. PATENT APPLICATIONS

1. "Heterocyclic Inhibitors of Histamine Receptors for the Treatment of Disease" PCT International Application Number 13/044,906, filed 3/10/11.