

CURRICULUM VITAE

Timothy J. Hagen, Ph.D.

Department of Chemistry and Biochemistry
Northern Illinois University
Faraday 350
DeKalb, IL 60115
Phone: 815 753-1463
Email: thagen@niu.edu

Professional Interests:

Organic synthesis and synthetic strategy, Teaching of Chemistry, Pharmaceutical Research and Development, Drug Discovery, Medicinal Chemistry, Infectious Disease, non-mevalonate isoprenoid biosynthetic (MEP) pathway, MetAP2 inhibitors for infectious disease, Cardiovascular, Metabolic and Endocrine Diseases (CVMED): Ion channel modulators, GK activators, EP3 antagonists; Arthritis & Inflammation: PDE inhibitors, iNOS inhibitors, IKK-2 inhibitors; Central Nervous System Diseases: PDE4 modulators, Benzodiazepine receptors, PGE₂ antagonists.

Professional Experience:

2010- present Assistant Professor, Department of Chemistry and Biochemistry, Northern Illinois University, DeKalb IL

- Synthesis and structure-based design of small molecules that can modulate essential pathways of infectious disease organisms.
- Isolation and synthesis of tannins from quebracho/chestnut bark extract, that act as urease inhibitors.
- Courses taught: Chemistry, Introductory Organic Chemistry, General Organic Chemistry II, General Organic Laboratory I, Honors/Independent study, Physical Organic Chemistry, Organic Synthesis, Medicinal Chemistry.
- Research Rookie Mentor.
- Board Member of Center for Biochemical and Biophysical Studies (CBBS).
- Member of Departmental Executive Committee.

2009 - 2010 Visiting Assistant Professor, Department of Chemistry and Biochemistry, Northern Illinois University, DeKalb IL

- Adjunct position to teach Organic Synthesis and General Chemistry (Chem 431, Chem 631 and Chem 110).

2007-2009 Senior Research Scientist II, deCODE Chemistry

- Successfully advanced internal project (DG-071) and delivered on next milestone (IND).
- Displayed excellent Chemical and Medicinal Chemistry knowledge.
- Medicinal Chemistry team leader for an internal project and one external project
- Successfully delivered on external project and received additional projects from client.
- Effectively managed a group of eight chemists (five Ph.D. level, two MS level, one BS level).
- Write proposals for new projects and present to scientific and leadership team.
- Advanced new project; obtained hit compounds (Fragments of Life approach) and initiated chemistry and biology efforts.
- Championed responsibility for patent estate and delivered two patent applications.
- Collaborated closely with biologists, toxicologists, pharmaceutical scientists, formulation scientists others on the project team.
- Initiated evaluations of automated preparative chromatography systems, NMR processing tools,

- Spotfire software for data evaluation and presentation.
- Mentors and provides developmental opportunities for individuals.
- Initiated journal club in the medicinal chemistry department.
- Maintained productivity as a “bench chemist” delivering final compounds, intermediates and improvements to synthetic routes.
- Trained in Current Good Manufacturing practices (cGMP), Hazmat Tech. (CFR1910.120).

2003-2007 Associate Research Fellow, Chemistry and CVMED, Pfizer

- Successfully advanced project to Clinical Candidate Status for the treatment of hypertension and metabolic syndrome.
- Displayed excellent Chemical and Medicinal Chemistry knowledge.
- Single point of accountability for CVMED project team.
- Provided leadership to CVMED project team and contributed to the core project team.
- Successfully advanced CVMED project through stage gates and delivered milestones for TA.
- Identified alternate use for selective analogs and transferred knowledge that allowed another TA to reach Lead Development (LD) milestone.
- Collaborated closely with biologists, toxicologists, pharmaceutical scientists, formulation scientists, clinical, marketing and others on the project team.
- Presents to management technical information and plans for next steps to advance project.
- Contributes to the establishment of project milestones and goals through the core team.
- Champions responsibility of patent estate and closely collaborated with patent attorney for submission of patent applications.
- Extensive training in Discovery Gate and Spotfire tools for effective data analysis.
- Effectively manages a group of three chemists (one Ph.D. and two BS/MS level).
- Mentors and provides developmental opportunities for individuals.
- Proposed and evaluated new projects to CVMED new target team.

2002-2003 Research Advisor and Associate Fellow, Discovery Medicinal Chemistry, Pfizer (Pharmacia)

2001-2002 Principal Research Scientist, Pharmacia

- Provided leadership to IKK-2 team and constructively contributes to IKK-2 core project team.
- Collaborated closely with biologists, toxicologists, pharmaceutical scientists, formulation scientists others on the project team.
- Presented to management technical information and plans for next steps to advance project.
- Contributed to the establishment of project milestones and goals through the core team.
- Championed responsibility of patent estate and closely collaborated with patent attorney.
- Effectively managed a group of four chemists (one Ph.D. and three BS/MS level).
- Mentors and provides developmental opportunities for individuals.
- Design and syntheses of IKK-2 inhibitors for the treatment of inflammation.
- Parallel synthetic methods including the use of the “Quest” by Argonaut and “reaction carousel” by GeneVac.

2000-2001 Chemist Specialist, Discovery Medicinal Chemistry, Searle /Pharmacia

1997-1999 Research Scientist II, Department of Chemistry, Searle

1993- 1997 Research Scientist I, Department of Chemistry, Searle

- Designed and synthesized novel and selective iNOS inhibitors.
- Co-inventor on patent applications for iNOS inhibitors.
- Conceived and implemented scaleable syntheses of Xemilofiban.
- Patented a process for synthesis of Xemilofiban.
- Supervised a Research Chemist and Summer Intern.
- Mentored other chemists through a matrix environment.

- Presented external and internal seminars and posters.
- Co-inventor on patent applications for PGE₂ antagonists.
- 1991- 1993 Senior Research Investigator, Department of Chemistry, Searle
- Designed and synthesized PGE₂ antagonists.
- Investigated isosteres for the diacylhydrazide functionality of the PGE₂ antagonists.
- Continued collaboration with Drug Design that has led to publications on modeling of the benzodiazepine receptor.
- Presented external and internal seminars and posters.
- Co-inventor on patent applications for PGE₂ antagonists.

1989-1991 Research Investigator, CNS Diseases Research, Searle

- Designed and synthesized substituted dibenzoxazepines and related compounds as PGE₂ antagonists that have utility as analgesic drugs.
- Followed the biological activities of the compounds.
- Developed a novel method to couple carbamoyl chlorides and vinyl stannanes to form α,β -unsaturated amides.
- Developed a procedure to incorporate tritium of high specific activity into a drug candidate.

1989-1990 and 1993-2001 Chairman of the Chemistry Coordinating Committee, Searle.

- Organized chemistry seminars both internal and external.
- Assisted in planning symposia, short courses and journal club.

1988- 1989 Postdoctoral Research Fellow, CNS & Drug Design, Searle

- Designed compounds in an exploratory project that interacted with the TBPS receptor, using modern principles of drug design and medicinal chemistry.
- Synthesized target compounds via practical synthetic routes.
- Synthesized a variety of fictionalized medium ring lactams (*Synlett* **1990** 1, 63.).

Additional Teaching Experience:

1999 - 2002 Adjunct Lecturer, Department of Chemistry, Northwestern University, Evanston IL

- | | |
|------------------------------|-------------|
| • Organic Reactions | 1999 - 2001 |
| • Physical Organic Chemistry | 2001- 2002 |

1982 - 1987 Teaching Assistant, University of Wisconsin – Milwaukee, WI

- | | |
|--|-------------|
| • General Chemistry | 1982 - 1983 |
| • Introductory Survey of Organic Chemistry | 1983 - 1985 |
| • Organic Chemistry | 1985 - 1987 |

Education:

1982-1988 University of Wisconsin-Milwaukee, Ph.D., Organic Chemistry.
Thesis advisor: Dr. James M. Cook, Thesis Title: I. The Synthesis of Benzodiazepine Receptor Antagonists and Inverse Agonists. II. The Total Synthesis of the Cytotoxic Indole Alkaloid: 1-Methoxycanthin-6-one.

- Synthesized β -carbolines and related heterocycles that bind to the benzodiazepine receptor (BzR).
- Developed a working model for the binding of ligands to the BzR; utilized this model to prepare the first β -carboline devoid of a substituent at the 3-position that bound at 100nM.
- Carried out the first synthesis of the cytotoxic indole alkaloid 1-methoxycanthin-6-one, utilizing a novel oxidative methylation reaction.
- Supervised and trained eight undergraduate students in independent research.

1978-1982 Illinois State University, B.S., Chemistry, 5/82.

1980-1982 Undergraduate Research, Illinois State University

- Studied the mechanism of photochemical and peroxide induced aromatic cyanomethylations.

Continuing Education:

2004 Managing for High Performance (Pfizer University, Ann Arbor)

2003 Medicinal Chemistry Workshop (Pfizer University, Ann Arbor)

1998 Situational Leadership Training (Searle University)

1998 Covey training: Seven Habits of Highly Effective People (Searle University)

1997 Molecular Biology & Biotechnology, Monsanto short course by Professor Ho.

1996 Heterocyclic Chemistry, Searle short course by Professors Padwa & Pearson.

1990 Basic Pharmacology, Extension Services in Pharmacy, Univ. of Wisconsin-Madison.

Awards:

- Pfizer Ann Arbor Team Award nominee (2007)
- Pfizer Individual Performance award (2006)
- Searle ACE award (1994)
- Medicinal Chemistry Division Travel Grant (April 1987).
- Illinois General Assembly Scholarship (1981-1982)

Affiliations:

- American Chemical Society
- Division of Medicinal Chemistry
- Division of Organic Chemistry
- International Society of Heterocyclic Chemistry
- Pfizer Fellow Program
- Pharmacia Fellow Program

Publications for Timothy J. Hagen (*published and in-press*):

1. "Advances in Bacterial Methionine Aminopeptidase Inhibition" Travis Helgren, Timothy J. Hagen *Current Topics in Medicinal Chemistry* **2015** Aug 13. [Epub ahead of print]
2. "The synthesis, antimalarial activity and CoMFA analysis of novel aminoalkylated quercetin analogs" Helgren, Travis R.; Sciotti, Richard J.; Lee, Patricia; Duffy, Sandra; Avery, Vicky M.; Igbino, Osayawemwen; Akoto, Matthew; Hagen, Timothy J. *Bioorg. Med. Chem. Lett.* **2015**, 25(2), 327-332.
3. "Phthalazines" Helgren, T. R. and Hagen T.J. *Science of Synthesis, Knowledge Updates* **2015**, in press.
4. "Discovery of triazines as selective PDE4B versus PDE4D inhibitors" Hagen, Timothy J.; Mo, Xuesheng; Burgin, Alex B.; Fox, David; Zhang, Zheng; Gurney, Mark E. *Bioorg. Med. Chem. Lett.* **2014**, 24(16), 4031-4034.
5. "Cytidine derivatives as IspF inhibitors of *Burkholderia pseudomallei*." Zhang, Z.; Jakkaraju, S.; Blain, J.; Gogol, K.; Zhao, L.; Hartley, R. C.; Karlsson, C. A.; Staker, B. L.; Edwards, T. E.; Stewart, L. J.; Myler, P. J.; Clare, M.; Begley, D. W.; Horn, J. R.; Hagen, T. J., *Bioorg. Med. Chem. Lett.* **2013**, 23, 6860-6863.
6. "Discovery of inhibitors of *Burkholderia pseudomallei* methionine aminopeptidase with antibacterial activity." P. Wangtrakuldee, M.S. Byrd, C.G. Campos, M.W. Henderson, Z. Zhang, A. Masoudi, P.J. Myler, J.R. Horn, P.A. Cotter, T.J. Hagen **2013**, *ACS Med. Chem. Lett.* **2013**, 699-703.
7. "A concise synthesis of biaryl PDE4D allosteric modulators." Dalby, A.; Mo, X.; Stoa, R.; Wroblewski, N.; Zhang, Z.; Hagen, T. J., *Tetrahedron Lett.* **2013**, 54 2737-2739.
8. "Triazoles and Tetrazoles" T.J. Hagen and Z. Zhang, *Heterocyclic Chemistry in Drug Discovery*, Ed. by Jie Jack Li, John Wiley & Sons, **2013**, 373-397, ISBN-13: 9781118148907
9. "Recent Trends in Biomarker Research and Development" T.J. Hagen *Biochem Anal Biochem* **2012**, 1:4 1-3.
10. "1,2-diselenins", Hagen, T.J. *Science of Synthesis* **2011**, 16, 93-97.
11. "1,4-diselenins", Hagen, T.J., *Science of Synthesis* **2011**, 16, 99-102.
12. "Optimization of a Pd-catalyzed intramolecular α -arylation synthesis of tricyclo-[7.3.1.0^{2,7}]-trideca-2,4,6-trien-13-ones." Powell, N.A.; Hagen, T.J.; Ciske, F.L.; Cai, C.; Duran, J.E.; Holsworth, D.D.; Leonard, D.; Kennedy, R.M.; Edmunds, J.J. *Tet. Lett.* **2010** 51: 4441-4444.
13. "Design of phosphodiesterase 4D (PDE4D) allosteric modulators for enhancing cognition with improved safety." Burgin, A.B.; Magnusson, O.T.; Singh, J.; Witte, P.; Staker, B.L.; Bjornsson, J.M.; Thorsteinsdottir, M.; Hrafnisdottir, S.; Hagen, T.J.; Kiselyov, A.S.; et al *Nature Biotechnology*, **2010** 28(1), 63-70.
14. "Chirality and Biological Activity" Jasbir Singh and Timothy J. Hagen, *Burger's Medicinal Chemistry and Drug Discovery, Volume 7*, Ed by Donald J. Abraham, John Wiley & Sons, **2010**, 127-166.
15. "The Barton Nitrite Photolysis" Hagen, Timothy J; *Name Reactions for Chain Extension*, Ed. by Jie Jack Li, John Wiley & Sons, **2009**, 633-647.

16. "The Zaitsev Elimination" Hagen, Timothy J; *Name Reactions for Functional Group Transformations*, Ed. by Jie Jack Li and E. J. Corey, John Wiley & Sons, **2007**, 414-421.
17. "The Prilezhaev Reaction", Hagen, Timothy J; *Name Reactions for Functional Group Transformations*, Ed. by Jie Jack Li and E. J. Corey, John Wiley & Sons, **2007**, 274-281.
18. "5-Fluorinated L-Lysine Analogues as Selective Induced Nitric Oxide Synthase Inhibitors." Hallinan, E. Ann; Hagen, Timothy J.; Bergmanis, Arija; Moore, William M.; Jerome, Gina M.; Spangler, Dale P.; Stevens, Anna M.; Shieh, Huey S.; Manning, Pamela T.; Pitzele, Barnett S. *J. Med. Chem.* **2004**, 47(4), 900-906.
19. "3-Hydroxy-4-methyl-5-pentyl-2-iminopyrrolidine: A potent and highly selective inducible nitric oxide synthase inhibitor." Tsymbalov, Sofya; Hagen, Timothy J.; Moore, William M.; Jerome, Gina M.; Connor, Jane R.; Manning, Pamela T.; Pitzele, Barnett S.; Hallinan, E. Ann. *Bioorg. & Med. Chem. Lett.* **2002** 12(22), 3337-3339.
20. "Syntheses of new conformationally constrained S-[2-[(1-iminoethyl)amino]ethyl]homocysteine derivatives as potential nitric oxide synthase inhibitors." Wang, Lijuan J.; Grapperhaus, Margaret L.; Pitzele, Barnett S.; Hagen, Timothy J.; Fok, Kam F.; Scholten, Jeffrey A.; Spangler, Dale P.; Toth, Mihaly V.; Jerome, Gina M.; Moore, William M.; Manning, Pamela T.; Sikorski, James A. *Hetero. Chem.* **2002**, 13(1), 77-83.
21. "2,4-Disubstituted Oxazoles and Thiazoles as Latent Pharmacophores for Diacylhydrazine of SC-51089, a Potent PGE₂ Antagonist." Hallinan, E.A.; Hagen, T.J.; Tsymbalov, S.; Husa, Stapelfeld, A.; Savage, M.A. *Biorgan. and Med. Chem.*, **2001**, 1-6.
22. "Specific Inhibitors of Inducible Nitric Oxide Synthase: Efficacy in a Rodent Model of Sepsis." Fretland, D.J.; Widomski, D.L.; Anglin, C.P.; Moore, W.M.; Jerome, G.; Kornmeier, C.; Connor, J.; Branson, L.; Wyatt, P.; Manning, P.; Toth, M.; Webber, R.K.; Hansen, D.W.; Hallinan, E.A.; Hagen, T.J.; Bergmanis, A.; Pitzele, B.; and Currie, M.G.; *Inflamm. Res.* 48. Supplement 2 **1999**, 796-797.
23. "2-Iminopyrrolidines as Potent and Selective Inhibitors of Human Inducible Nitric Oxide Synthase." Hagen, T.J.; Bergmanis, A.A.; Kramer, S.W.; Fok, K.F.; Schmelzer, A.E.; Pitzele, B.S.; Swenton, L.; Jerome, G.M.; Kornmeier, C.M.; Moore, W.M.; Connor, J.R.; Branson, L.F.; Manning, P.T.; Currie, M.G. and Hallinan, E.A. *J. Med. Chem.* **1998**, 41, 3675-3683.
24. "Substituted 2-Iminopiperidines as Inhibitors of Human Nitric Oxide Synthase Isoforms." Webber, R.K.; Metz, S.; Moore, W.M.; Connor, J.R.; Currie, M.G.; Fok, K.F.; Hagen, T.J.; Hansen, Jr., D.W.; Jerome, G.M.; Manning, P.T.; Pitzele, B.S.; Toth, M.V.; Trivedi, M.; Zuppec, M.E.; Tjoeng, F. S. *J. Med. Chem.* **1998**, 41, 96-101.
25. "Aminoacetyl Moiety as a Potential Surrogate for Diacylhydrazine Group of SC-51089, a Potent PGE₂ Antagonist, and Its Analogs." Hallinan, E.A.; Hagen, T.J.; Tsymbalov, S.; Husa, R.K.; Lee, A.C.; Stapelfeld, A.; Savage, M.A. *J. Med. Chem.* **1996**, 39, 609-613.
26. "Structure-activity Relationships in Antagonist and Inverse Agonist ligands for the Benzodiazepine Receptor." Coddling, P.W.; Roszak, A.W.; Szkaradzinska, M.B.; Cook, J.M.; Hagen, T.J.; Allen, M.S. *Can. J. Chem.* **1995**, 73, 499-512.
27. "BZ₁ Receptor Selective Specific Ligands. Synthesis and Biological Properties of BCCT, a BZ₁ Receptor Subtype Specific Antagonist." Cox, E.D.; Hagen, T.J.; McKernan, R.M.; Cook, J.M. *Med. Chem. Res.* **1995**, 5, 710-718.
28. "Lithiation and Electrophilic Substitution of 8-Chlorodibenz[b,f][1,4]-oxazepine-10-tertbutylcarbamate: The preparation of Novel Fused Heterocyclic Derivatives of 8-Chlorodibenzoxazepine." Li, J.J.; Hagen, T.J.; Chrusciel, R.A.; Norton, M.B.; Tsymbalov, S.; Hallinan, E.A.; Reitz, D.B. *J. Heterocyclic Chem.*, 31, **1994**, 1689-96.
29. "The N-Boc Group as an Activator for the α -Lithiation of Carbamates: Synthesis of 11-Substituted Dibenzoxazepines." Hagen, T.J.; Rafferty, M.F.; Collins, J.T.; Garland, D.J.; Li,

- J.J.; Norton, M.B.; Reitz, D.B.; Tsymbalov, S.; Pitzele, B.S.; Hallinan, E.A. *Heterocycles* **1994**, *38*, 601-611.
30. "N-Substituted Dibenzoxazepines as analgesic PGE₂ Antagonists." Hallinan, E.A.; Hagen, T.J.; Husa, R.K.; Tsymbalov, S.; Rao, S.N.; vanHoeck, J.P.; Rafferty, M.F.; Stapelfeld, A.; Savage, M.A.; Reichman, M. *J. Med. Chem.* **1993**, *36*, 3293-9.
 31. "Predictive Binding of β -Carboline Inverse Agonists and Antagonists via the CoMFA Approach." Allen, M.S.; LaLoggia, J.; Dorn, L.J.; Martin, M.J.; Constantino, G.; Hagen, T.J.; Koehler, K.F.; Skolnick, P.; Cook, J.M. *J. Med. Chem.* **1992**, *35*, 4001-10.
 32. "Synthetic and Computer Assisted Analysis of the Pharmacophore for Agonists at Benzodiazepine Receptors." Diaz-Arauzo, H.; Koehler, K.F.; Hagen, T.J.; Cook, J.M. *Life Sci.* **1991**, *49*, 207-16.
 33. "Synthetic and Computer Assisted Approaches to the Pharmacophore of the Benzodiazepine Receptor Inverse Agonist Site." Allen, M.S.; Yun-C, T.; Trudell, M.L.; Narayanan, K.; Schindler, L.R.; Martin, M.; Hagen, T.J.; Koehler, K.F.; Codding, P.W.; Skolnick, P.; Cook, J.M. *J. Med. Chem.* **1990**, *33*, 2343-57.
 34. "Regioselective Functionalization of Medium Ring Lactams." Hagen, T.J. *Synlett* **1990**, *1*, 63.
 35. "DDQ Oxidations in the Indole Area; The Total Synthesis of 1-Methoxycanthin-6-one and an Improved Synthesis of Crenatine." Hagen, T.J.; Narayanan, K.; Cook, J.M. *J. Org. Chem.* **1989**, *54*, 2170-8.
 36. "Inhibition of Sleep and Benzodiazepine Receptor Binding by a β -Carboline Derivative." Martin, J.J.; Cook, J.M.; Hagen, T.J.; Mendelson, W.B. *Pharmacol. Biochem. Behav.* **1989**, *34*, 37-42.
 37. "Behaviorial effects of benzodiazepine antagonists in chlordiazepoxide tolerant and non-tolerant rats." Takada, K.; Suzuki, T.; Hagen, T.; Cook, J.M.; Katz, J.L. *Life Sci.* **1989**, *44*, 289-99.
 38. "Structure-activity Studies of β -Carbolines. 4. Crystal and molecular structures of t-butyl β -carboline-3-carboxylate and 2-(methoxycarbonyl)canthin-6-one. Codding, P.; Szkaradzinska, M.B.; Roszak, A.; Hagen, T.J.; Cook, J.M. *Can. J. Chem.* **1988**, *66*(12), 2981.
 39. "3-Ethoxy- β -Carboline: A High Affinity Benzodiazepine Receptor Ligand with Partial Inverse Agonist Properties." Trullas, R.; Ginter, H.; Jackson, B.; Skolnick, P.; Allen, M.; Hagen, T.; Cook, J.M. *Life Sci.* **1988**, *43*, 1189-97.
 40. "Synthesis of 1-Methoxycanthin-6-one." Hagen T.J.; Cook, J.M. *Tetrahedron Lett.* **1988**, *29*, 2421-4.
 41. " β -Carbolines as Antagonists of the Discriminative Stimulus Effects of Diazepam in Rats." Shannon, H.E.; Hagen, T.J.; Guzman, F.; Cook, J.M. *J. Pharm. Exp. Ther.* **1988**, *246*, 275-81.
 42. "Synthesis of Novel 3-Substituted β -Carbolines as Benzodiazepine Receptor Ligands: Probing the Benzodiazepine Receptor Pharmacophore." Cook, J.M.; Allen, M.S.; Hagen, T.J.; Trudell, M.L.; Codding, P.; Skolnick, P. *J. Med. Chem.* **1988**, *31*, 1854-61.
 43. "Discriminative Stimulus Effects of Intravenous Nicotine in Squirrel Monkeys." Takada, K.; Hagen, T.J.; Cook, J.M.; Goldberg, S.A.; Katz, J.L. *Pharmacol. Biochem. Behav.* **1988**, *30*, 243-7.
 44. "Synthesis of 6-substituted β -Carbolines That Behave as Benzodiazepine Receptor Antagonists and Inverse Agonists." Hagen, T.J.; Skolnick, P.; Cook, J.M. *J. Med. Chem.* **1987**, *30*, 750-3.
 45. "Synthesis of 3,6-Disubstituted β -Carbolines Which Possess Either Benzodiazepine Antagonist or Agonist Activity." Hagen, T.J.; Guzman, F.; Schultz, C.; Skolnick, P.; Cook, J.M. *Heterocycles* **1986**, *24*, 2845-55.

46. "Cerebrovascular and Cerebral Metabolic Effects of Physostigmine, Midazolam, and a Benzodiazepine Agonist." Hoffman, W.E.; Albrecht, R.F.; Miletich, D.J.; Hagen, T.J.; Cook J.M. *Anesth. Analg.* **1986**, 65, 639-44.
47. "Biomimetic Approach to Potential Benzodiazepine Agonists and Antagonists." Guzman, F.; Cain, M.; Larschied, P.; Hagen, T.J.; Cook, J.M.; Schweri, M.; Skolnick, P.; Paul, S.M. *J. Med. Chem.* **1984**, 27, 564-70.
48. "Photochemical Aromatic Cyanomethylation: Aromatic substitution by way of radical cations." Kurz, M.E.; Lapin, S.C.; Miriam, K.; Hagen T.J.; Qain, X.Q. *J. Org. Chem.* **1984**, 49, 2728-33.

Patents and Patent Applications:

1. WO 2014066659, A1 "Heteroaryl compounds as inhibitors of PDE4 and their preparation" Gurney, Mark E.; Hagen, Timothy J.; Mo, Xuesheng; Vellekoop, A.; Romero, Donna L.; Campbell, Robert F.; Walker, Joel R.; Zhu, Lei May 01, 2014
2. PCT Int. WO2013163159A2
Design and synthesis of novel inhibitors of isoprenoid biosynthesis. Hagen, T. J.; Zhang, Z.; Lazowski, Z.; Clare, M.; Begley, D. W.
3. PCT Int. Appl. WO2009067600A2
Biaryls as PDE4 inhibitors for treating inflammation and their preparation and pharmaceutical compositions. Singh, Jasbir; Gurney, Mark E.; Burgin, Alex; Sandanayaka, Vincent; Kiselyov, Alexander; Motta, Adalie; Schultz, Gary; Hategan, Georgeta; Hagen, Timothy.
4. PCT Int. Appl. WO2009067621A1
Biaryls as PDE4 inhibitors for treating inflammatory and cardiovascular disorders and their preparation and pharmaceutical compositions. Singh, Jasbir; Gurney, Mark; Burgin, Alex; Kiselyov, Alexander; Rao, Munagala; Hagen, Timothy.
5. PCT Int. Appl. WO2009056934A1
Preparation of 1,4-dihydronaphthyridine derivatives as therapeutic calcium channel antagonists. Cai, Cuiman; Ciske, Fred Lawrence; Duran, Joseph Edward; Fors, Kristina Sean; Hagen, Timothy Joseph; Holsworth, Daniel Dale; Jalaie, Mehran; Kennedy, Robert Michael; Leonard, Daniele; Poel, Toni-Jo; Quin, John, III.
6. PCT Int. Appl. WO 2008050200A1
Preparation of piperazinylmethyloxadiazoles as calcium channel antagonists. Bornemeier, Dirk Alan; Cai, Cuiman; Fors, Kristina Sean; Hagen, Timothy Joseph; Holsworth, Daniel Dale; Jalaie, Mehran; Leonard, Daniele Marie; Moody, Thomas Shaw; Take, Yukinori.
7. PCT Int. Appl. WO2005040133A1
Preparation of pyrimidine derivatives as IKK-2 inhibitors. Clare, Michael; Hagen, Timothy J.; Houdek, Stephen C.; Lennon, Patrick J.; Weier, Richard M.; Xu, Xiangdong.
8. PCT Int. Appl. WO2004009582A1
Preparation of substituted thiophene carboxamide compounds for the treatment of inflammation. Hagen, Timothy J.; Weier, Richard M.; Xu, Xiangdong; Houdek, Stephen C.; Clare, Michael.
9. PCT Int. Appl. WO0324936A1
Preparation of pyrazolo[4,3-c]quinolines, chromeno[4,3-c]pyrazoles, and analogs for the treatment of inflammation. Metz, Suzanne; Clare, Michael; Crich, Joyce Z.; Hagen, Timothy

J.; Hanson, Gunnar J.; Huang, He; Houdek, Stephen J.; Stealey, Michael A.; Vazquez, Michael L.; Weier, Richard M.; Xu, Xiangdong

10. PCT Int. Appl. WO0324935A2
Preparation of 4,5-dihydro-1H-benzof[g]indazole-3-carboxamides for the treatment of inflammation. Bergmanis, Arija A.; Bonafoux, Dominique; Clare, Michael; Crich, Joyce Z.; Fletcher, Theresa R.; Geng, Lifeng; Hagen, Timothy J.; Hamper, Bruce C.; Hanson, Gunnar J.; Houdek, Stephen C.; Huang, He; Iula, Donna M.; Koszyk, Francis J.; Lennon, Patrick J.; Liao, Shuyuan; Liao, Subo; Metz, Suzanne; Mohler, Scott B.; Nguyen, Maria; Oburn, David S.; Owen, Thomas J.; Partis, Richard A.; Scates, Angela M.; Stealey, Michael A.; Tollefson, Michael B.; Vazquez, Michael L.; Weier, Richard M.; Wolfson, Serge G.; Xu, Xiangdong.
11. PCT Int. Appl. WO0222562 A1
Preparation of 2-amino-2-alkyl-5-heptenoic and -heptynoic acid derivatives useful as nitric oxide synthase inhibitors. Hansen, Donald, Jr.; Webber, Ronald Keith; Pitzele, Barnett S.; Sikorski, James; Massa, Mark A.; Hagen, Timothy J.; Grapperhaus, Margaret; Wang, Lijuan Jane; Bergmanis, Arija A.; Kramer, Steven W.; Hallinan, E. Ann.
12. US patent 6,403,830 6/11/02
"Amidino compound and salts thereof useful as nitric oxide synthase" Hansen Jr., D.W.; Bergmanis, A.A.; T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud
13. US Patent 6,344,483, 2/5/02
"Halogenated amidino amino acid deviratives useful as nitric oxide synthase" Hallinan, E.A.; Hagen, T.J.; A.A. Bergmanis, Toth, M.V.; Tsymbalov, S.; Pitzele, B.S.
14. US Patent 6,344,473, 2/5/02
"Imidazoles useful as nitric oxide synthase inhibitors" Hansen Jr., D.W.; Bergmanis, A.A.; T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud
15. US patent 6,207,708, 3/27/01
"Hydroxyamidino derivatives useful as nitric oxide synthase inhibitors" Hansen Jr., D.W.; Bergmanis, A.A.; T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud
16. U.S. Patent 6,143,790, 11/7/00
"L-N⁶-(1-iminoethyl)lysine Derivatives Useful as Nitric Oxide Synthase Inhibitors." Hallinan, E.A.; Tjoeng, F.S.; Fok, K.F.; Hagen, T.J.; Toth, M.V.; Tsymbalov, S.; Pitzele, B.S.
17. U.S. Patent 6,136,829, 10/24/00
"Oxathiadiazole derivatives as useful iNOS inhibitors". Hansen Jr., D.W.; Bergmanis, A.A.; T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud
18. U.S. Patent 6,071,906, 6/6/00
"Imidino Piperidine Derivatives Useful as Nitric Oxide Synthase Inhibitors". D.W. Hansen Jr., A.A. Bergmanis, T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud
19. U.S. Patent 6,046,21, 4/4/00
"Amidino Derivatives Useful as Nitric Oxide Synthase Inhibitors". D.W. Hansen Jr., A.A. Bergmanis, T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud.

20. U.S. Patent 6,136,829, 3/28/00
"Pyrrolidino Imidines Useful as Nitric Oxide Synthase Inhibitors." D.W. Hansen Jr., A.A. Bergmanis, T.J. Hagen, E.A. Hallinan, S.W. Kramer, S. Metz, K.B. Peterson, B.S. Pitzele, F.S. Tjoeng, M.V. Toth, M. Trivedi, R.K. Webber, S. Tsymbalov, R.E. Gapud.
21. U.S. Patent 6,011,028, 1/4/00
"Cyclic Amidino Agents Useful as Nitric Oxide Synthase Inhibitors". D.W. Hansen Jr., E.A. Hallinan, T.J. Hagen, S.W. Kramer, K.B. Peterson, D.P. Spangler, M.V. Toth, K.F. Fok, A.A. Bergmanis, R.K. Webber, M. Trivedi, F.S. Tjoeng, B.S. Pitzele
22. U.S. Patent 5,981,556, 11/9/99
"1,3-Diazolino and 1,3-Diazolidino Heterocycles as Useful Nitric Oxide Synthase Inhibitors". D.W. Hansen Jr., E.A. Hallinan, T.J. Hagen, S. Tsymbalov, S.W. Kramer, S.S. Metz, K.B. Peterson, M.V. Toth, A.A. Bergmanis, R.K. Webber, M. Trivedi, R.E. Gapud, F.S. Tjoeng, and B.S. Pitzele.
23. US Patent 5,981,511, 11/9/99
"Hydroxyamidino Derivatives Useful as Nitric Oxide Synthase Inhibitors." R.K. Webber, D.W. Hansen Jr., E.A. Hallinan, R.G. Gapud, T.J. Hagen, F.S. Tjoeng, S.S. Metz, M.V. Toth, B.S. Pitzele, A.A. Bergmanis, S. Tsymbalov, and R.E. Manning,
24. U.S. Patent 5,958,958, 9/28/99
"1,2,4--Oxa Diazolino and 1,2,4-Oxa Diazolidino Heterocycles as Useful Nitric Oxide Synthase Inhibitors." D.W. Hansen Jr., E.A. Hallinan, T.J. Hagen, S. Tsymbalov, S.W. Kramer, S.S. Metz, K.B. Peterson, M.V. Toth, A.A. Bergmanis, R.K. Webber, M. Trivedi, R.E. Gapud, F.S. Tjoeng, and B.S. Pitzele
25. U.S. Patent 5,883,251, 3/16/99
"Azepine Derivatives Useful as Nitric Oxide Synthase Inhibitors." D.W. Hansen, Jr., E. A. Hallinan, T.J. Hagen, S.W. Kramer, S. Metz, K. B. Peterson, D.P. Spangler, M.V. Toth, K.F. Fok, A.A. Bergmanis, R.K. Webber, M. Trivedi, F.S. Tjoeng, B.S. Pitzele.
26. U.S. Patent 5,854,234, 12/29/98
"Amidino Derivatives Useful as Nitric Oxide Synthase Inhibitors." D.W. Hansen, Jr., M.G. Currie, E. A. Hallinan, K.F. Fok, T.J. Hagen, A.A. Bergmanis, S.W. Kramer, L.F. Lee, S. Metz, K. B. Peterson, B.S. Pitzele, D.P. Spangler, R.K. Webber, M.V. Toth, M. Trivedi, F.S. Tjoeng.
27. U.S. Patent 5,719,140, 2/17/98
"2,3-,4-,5-,6-,7-,8-,9- and/or 10-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use." N. S. Chandrakumar, T. J. Hagen, B. S. Pitzele, S. Tsymbalov, E. A. Hallinan.
28. U.S. Patent No. 5,677,296, 10/14/97
"Carbamic Acid Derivatives of Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use" E. A. Hallinan, T. J. Hagen,
29. U.S. Patent No. 5,488,046, 5/20/97
"Process For The Preparation of 3S-[[4-[[4-(aminoiminoethyl)-phenyl]amino]-1,4-dioxobutyl] amino]-4-pentynoate." D.W. Hansen Jr., E.A. Hallinan, T.J. Hagen, K.B. Peterson, B.S. Pitzele, K. McLaughlin, S. Tsymbalov, J. Behling, J.M. Park, S.S. Babu, D. Konte, V. Orlouski, M. Boys, W. Doubleday, K.J. Cain-Janicki, J.R. Medich, P. Farid, K. Babiak, S. Nugent, and D. Pilipauskas.
30. U.S. Patent No. 5,576,315; 11/01/96
"Substituted Dibenzoxazepine Compounds and Methods for Treating Osteoporosis and Ischemia." E. A. Hallinan, T. J. Hagen, R. K. Husa, S. Tsymbalov, A. C. Lee, J-P Van Hoeck.

31. U.S. Patent No. 5,488,046; 1/30/96
"Carbamic Acid Derivatives of Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use." E. A. Hallinan, T. J. Hagen
32. U.S. Patent No. 5,464,830; 11/7/95
"Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use." E. A. Hallinan, T. J. Hagen, R. K. Husa, S. Tsymbalov, A. C. Lee, J-P Van Hoeck.
33. US Patent No. 5,461,046; 10/24/95
"1-, 2-,3-,4-, 5- 6-, 7-, 8-, and/or 9-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods for Treating Pain." T.J. Hagen, E.A. Hallinan, M.F. Rafferty, R.K. Husa;
34. US Patent 5,449,674; 9/12/95
"2-,3-,5- and/or 8-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods for Treating Pain." T.J. Hagen, E.A. Hallinan, N.S. Chandrakumar, S.N. Rao, B.S. Pitzele
35. US Patent 5,449,673; 9/12/95
"10,11-Dihydro -10-(3-substituted-1-oxo-2-propyl, propenyl or propynyl) Dibenz[B,F] [1,4]oxazepine Prostaglandin Antagonists." N.S. Chandrakumar, T.J. Hagen, E.A. Hallinan, R.K. Husa.
36. US Patent No. 5,395,932; 3/7/95
"2,3,5,7,8 and/or 10-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use." N.S. Chandrakumar, T.J. Hagen, B.S. Pitzele, S. Tsymbalov, E.A. Hallinan
37. US Patent No. 5,382,578; 1/17/95
"Methods for Treating Convulsions and Ischemia with Substituted Dibenzoxazepine Compounds." R.K. Husa, T.J. Hagen, E.A. Hallinan
38. U.S. Patent No. 5,378,840; 1/3/95
"Substituted Dibenzoxazepine Compounds." E.A. Hallinan, T.J. Hagen, S. Tsymbalov, R.K. Husa, J.P. Van Hoeck, A.C. Lee
39. US Patent No. 5,324,722; 6/28/94
"1-, 2-,3-,5-,8-,10- and/or 11-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods for Treating Pain." T.J. Hagen, M. Clare, M.F. Rafferty, E.A. Hallinan
40. U.S. Patent No. 5,304,644; 4/19/94
"2-,3-,4-,5-,6-,7-,8- and or 9 Substituted Dibenzoxazepine compounds, Pharemaeaceutical Composititions and Methods for Treating Pain." R.K. Husa, M.F. Rafferty, T.J. Hagen, E.A. Hallinan
41. US Patent No. 5,288,719; 2/22/94
"2-3-,8- and/or 10-Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods for Treating Osteoporosis." R.K. Husa, T.J. Hagen, E.A. Hallinan
42. US Patent No. 5,212,169; 5/18/93
"Substituted Dibenzoxazepine Compounds, Pharmaceutical Compositions and Methods of Use." R.K. Husa, T.J. Hagen, E.A. Hallinan

Selected External Presentations:

"Design and Synthesis of Rickettsia prowazekii Methionine Aminopeptidase (MetAP) Inhibitors".
Invited lecture at Olivet Nazarene University on March 31, 2015.

"MetAP as a drug target" Invited to present project to NIH Program Directors at the CSGID/SSGCID Annual Programmatic Meeting, March 24, 2015

"Design of Burkholderia pseudomallei IspF Inhibitors as Antibacterial Agents" Invited lecture at Johns Hopkins University, Department of Pharmacology on February 11, 2015.

"Design, synthesis, and biological evaluation of Rickettsia prowazekii methionine aminopeptidase (MetAP) Inhibitors" Helgren, Travis R.; Chen, Congling; Wangtrakuldee, Phumvadee; Long, Christine; Hathuc, Mickey; Small, Ryan; Curran, Brendan; Horn, James R.; Hagen Timothy J. *ACS National Meeting & Exposition, Denver, CO, United States, March 22-26, 2015.*

"Methionine aminopeptidases (MetAPs) as promising targets toward discovery of novel anti-infective agents Wangtrakuldee, Phumvadee; Chen, Congling; Staker, Bart; Wilk, John M.; Horn, James R.; Hagen, Timothy J. *ACS National Meeting & Exposition, Denver, CO, United States, March 22-26, 2015.*

"Inhibitors of plasmodium falciparum methionine aminopeptidase 2 with antimalarial activities" Wangtrakuldee, Phumvadee; Sciotti, Richard J.; Miter, Gabriel A.; Zhang, Zheng; Horn, James R.; Hagen, Timothy J. *ACS National Meeting & Exposition, Dallas, TX, United States, March 16-20, 2014*

"Identification of METAP2 Inhibitors Using Fluorescence Based Enzymatic Assay". Flor Navarro, Phumvadee Wangtrakuldee, James Horn, and Timothy Hagen, Research and Artistry Northern Illinois University April 22, 2014

"Fragment Based Drug Discovery Analog Activity with respect to the MEP Pathway" Sterling Pollard, Zheng Zhang, James Horn, Timothy Hagen Research and Artistry Northern Illinois University April 22, 2014.

"IspD Inhibition Using a Fragment Approach for Antimalarial, Antibacterial, and Herbicidal Properties" Jeremy Troxell, Michael Thompson, Joy Blain, Timothy Hagen & James Horn, Research and Artistry Northern Illinois University April 22, 2014.

"Inhibitors of Isoprenoid Biosynthesis as Novel Anti-infective Agents" Chicago Innovation Showcase, Timothy J. Hagen, August 5, 2014

"Development of Novel Anti-Infective and Herbicidal Agents" Timothy Hagen, NIU Venture Grant Opportunity, April 23, 2014

Joy M. Blain, Zheng Zhang, Gashaw M. Goshu, Timothy J. Hagen, and James R. Horn. Investigation of Small Molecule-Enzyme Interactions of *B. pseudomallei* IspF. 28th Annual Gibbs Conference on Biothermodynamics, national meeting, September 20-23, 2014,

"Investigation of Small Molecule-Enzyme Interactions of *B. pseudomallei* IspF" Joy M. Blain, Zheng Zhang, Gashaw M. Goshu, Timothy J. Hagen, and James R. Horn, Center for Molecular Innovation and Drug Discovery's 19th Annual Drug Discovery Symposium October 9, 2014

"Discovery of Rickettsia prowazekii Methionine aminopeptidase Inhibitors" Phumvadee Wangtrakuldee, Congling Chen, Bart Staker, Travis Helgren, John M. Wilk, James R. Horn, and Timothy J. Hagen. October 9, 2014

"Investigation of Burkholderia pseudomallei IspF Small Molecule Inhibitors" Joy M. Blain, Zheng Zhang, Gashaw M. Goshu, Timothy Hagen, and James R. Horn, First annual MEPTogether, Washington University, Innsbrook, Missouri November 21-23 2014

"MEP-Pathway Inhibition" Timothy Hagen First annual MEPtogether, Washington University, Innsbrook, Missouri November 22, 2014 "Identification of METAP2 Inhibitors Using Fluorescence Based Enzymatic Assay". Flor Navarro, Phumvadee Wangtrakuldee, James Horn, and Timothy Hagen, Research and Artistry Northern Illinois University April 22, 2014

"Fragment Screening Hits to Lead Like Molecules for Infectious Drug targets: MEP Pathway." Invited lecture University of Illinois Chicago, Oct. 3, 2013.

"Discovery of imidazole based IspF inhibitors", Zhang, Z.; Goshu, G. M.; Ahern, A. D.; Kostka, A. A.; Jakkaraju, S.; Ruettiger, A.; Clare, M.; Sciotti, R.; Lee, P. J.; Horn, J. R.; Begley, D. W.; Hagen, T. J. American Chemical Society National meeting Indianapolis IN September 8-12 2013; pp MEDI-56.

"Discovery of inhibitors of Burkholderia pseudomallei methionine aminopeptidase with antibacterial activity," Wangtrakuldee, P.; Byrd, M. S.; Campos, C. G.; Henderson, M. W.; Masoudi, A.; Myler, P. J.; Cotter, P. A.; Horn, J. R.; Hagen, T. J. American Chemical Society National meeting Indianapolis IN September 8-12 2013; pp MEDI-49.

Zeller, W. E.; Powell, J. M.; Hagen, T. J.; Helgren, T. R.; Lindquist, S. J. In Impacts of flavanoid monomers and simple hydrolyzable tannins on ammonia emissions from dairy manure, American Chemical Society National meeting New Orleans LA April 7-11 2013; pp AGFD-328.

"Discovery of new anti-infective agents using organic synthesis and structural biology". Roosevelt University, March 5, 2012.

"Design and synthesis of phosphodiesterase 4D (PDE4D) allosteric modulators and MEP pathway inhibitors" Invited lecture at NIH on November 16, 2011

"Concise synthesis of a PDE4 partial modulator" 16th Annual Drug Discovery Symposium at Northwestern University Wednesday, October 12, 2011

"Discovery and Synthesis of IspF Inhibitors" 42nd National Organic Symposium June 8, 2011

"Design of MEP Pathway Inhibitors" Invited presentation at Argonne National Labs / Center for Molecular Design and Drug Discovery March 29, 2011

"Design and synthesis of phosphodiesterase 4D (PDE4D) allosteric modulators", Invited Lecture Indiana University Northwest, February 28, 2011

Discovery and Synthesis of IspF Inhibitors" 3rd Annual Chicago Organic Symposium. University of Illinois Chicago, February 11, 2011

"Design and synthesis of phosphodiesterase 4D (PDE4D) allosteric modulators", Invited Lecture Knox College, November 4, 2010

2-Imino-pyrrolidine amino acids as inhibitors of human nitric oxide synthase. Hagen, Timothy J.; Invited lecture, Loyola University, Chicago IL. September 13, 2001.

2-Imino-pyrrolidine amino acids as inhibitors of human nitric oxide synthase. Hagen, Timothy J.; Bergmanis, Arijia A.; Tsymbalov, Sofya; Kramer, Steven W.; Spangler, Dale; Moore, William M.; Jerome, Gina; Manning, Pamela T.; Kornmeier, Christina; Connor, Jane R.; Pitzele, Barnett S.; Hallinan, E. Ann. Abstracts of Papers, MEDI-249 222nd ACS National Meeting, Chicago, IL, August 26-30, 2001.

Inhibitors of Human Nitric Oxide Synthase from Substituted Cyclic Amidinium Salts. D.W. Hansen, K.B. Peterson, F.S. Tjoeng, T.J. Hagen, M.V. Toth, S.S. Metz, K.F. Fok, Zupec, M.E., B.S. Pitzele,

W.M. Moore, G.M. Jerome, P.T. Manning, M.G. Currie, R.K. Webber, 5th Chemical Congress of North America, Cancun, Mexico, 11/12/97.

Alternative Successful Syntheses of a Beta-ethynyl Amino Acid Ester Critical to the Preparation of a Clinically Effective Antiplatelet Agent. D.W. Hansen Jr., K.B. Peterson, E.A. Hallinan, T.J. Hagen, B.S. Pitzele, S. Tsymbalov, S.S. Babu, P.N. Farid, K.A. Babiak, and S.T. Nugent, 79th Canadian Society of Chemistry (CSC) Conference, St. Johns, Newfoundland, Canada 6/23/96.

The t-Boc Group as an Activator for α' -Lithiation: Synthesis of 11-Substituted Dibenzoxazepines. ACS 25th Great Lakes Regional Meeting, Marquette University, Milwaukee, Wisconsin, June 2, 1992.

Synthetic and Computer Assisted Approaches to the Pharmacophore of the Benzodiazepine Receptor Inverse Agonist Site; Invited Lecture, Department of Chemistry, Illinois State University, Normal II, January 24, 1992.

The Synthesis of Novel 6-Substituted β -Carbolines Which Behave as Benzodiazepine Receptor Antagonists or Inverse Agonists; ACS National Meeting, Denver, Colorado, April 5, 1987.

A New Class of Norharman Derivatives Which Potently Bind to Benzodiazepine receptors: 6-Substituted Derivatives That Bind at 100 nM; ACS 20th Great Lakes Regional Meeting, Marquette University, Milwaukee, Wisconsin, June 2, 1986; Abstr. 262.

Synthesis of 3,6-Disubstituted β -Carbolines Which Possess Either Benzodiazepine Antagonist or Agonist Activity; 191st ACS National Meeting, New York, New York, April 13, 1986; Medi. Abstr. 51.

Synthesis of β -Carbolines: Search for New and More Stable Valium Antagonists; ACS National Meeting, Chicago, Illinois, Sept. 28, 1985; Medi. Abstr. 86.

Synthesis of β -Carbolines: Search for New and More Stable Valium Antagonists; ACS 19th Great Lakes Regional Meeting, Purdue University, West Lafayette, Indiana, June 10, 1985.

Synthesis of β -Carbolines: Preparation of "Active" Antagonists of the Benzodiazepines; ACS Joint Regional Meeting, Western Michigan University, Kalamazoo, Michigan, May 23, 1984; Abstr. 238.

Photochemical Aromatic Cyanomethylation: Electron-Transfer versus Homolytic Substitution; 184th ACS National Meeting, Kansas City, Missouri, Sept. 12, 1982; Orgn. Abstr. 99.