Patrick Charles Kearney, Ph.D.

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SUMMARY PROFILE

Senior-level scientific researcher, medicinal chemist, entrepreneur, web developer, and life-long learner with strong interests in the advancement of new technologies for human and animal health, agriculture, and sustainable living. Highly proficient in developing and executing research initiatives at the strategic and tactical levels, building resilient high-performing teams, grant writing, and fostering successful collaborations in fast-paced environments.

Accomplishments include:

- Completed the Full-Stack Flex Coding Web-Development course offered by the University of Kansas.
- Founded a start-up company, HD Sciences, to develop technologies to help medicinal chemists take greater synthetic risks in early lead discovery efforts.
- Built a high-throughput chemistry department that created the majority of the 4.6 million compound collection at Exelixis and brought in over 5 million dollars ($U.S.) in revenue annually through successful chemistry collaborations with outside pharmaceutical, agricultural, and biotech companies.
- Led a medicinal chemistry group that discovered a development candidate for PI3Kδ inhibition that was licensed to Merck & Co. for 12 million dollars ($U.S.).
- Led a medicinal chemistry group that discovered an inhibitor of the Cdc7 kinase that was partnered to Bristol-Meyers Squibb for 20 million dollars ($U.S.) and advanced into the clinic.
- Led a medicinal chemistry group that discovered a development candidate for JAK2 inhibition that was moved internally at Exelixis into the clinic.

INDUSTRIAL EXPERIENCE

Founder & C.E.O. **2012 – 2017**
HD Sciences, Kansas City, Kansas

Founded a company to develop chemical methods and products that reduce the cost of conducting early-stage drug lead discovery and medicinal chemistry research.

- Researched, designed, and synthesized novel reagents for use in parallel synthesis that would enable chemists to synthesize hundreds of compounds for assay screening from only a few milligrams of a complex synthetic intermediate.
- Initiated collaborations with the University of Kansas and the Bioscience &Technology Business Center incubator to enable cost efficient proof of concept studies.
- Wrote and submitted Phase I SBIR grant applications to the NIH.

Senior Director, Medicinal Chemistry **2005 – 2011**
Exelixis, Inc., South San Francisco, California

Led a group of 15 researchers within the Medicinal Chemistry department with the primary mission of conducting lead optimization/lead validation studies of oncolytic, metabolic, and inflammation targets. Collaborated with members of other departments within discovery to shape the research directions and meet the timelines of those projects. Provided medchem library support for all teams within medicinal chemistry in South San Francisco.

- Led a team that discovered XL499, a potent inhibitor of PI3Kδ, which became a development candidate (DC). Contributed to the discovery of a route to largely unexplored purine-8-carboxamides that formed the initial leads for the project. The project was licensed to Merck in December of 2011.
- Led a team that discovered XL413, a potent inhibitor of Cdc7, which was partnered to Bristol-Meyers Squibb and moved into the clinic. Instituted a scaffold hopping research plan that enabled chemists and modelers to discover the benzofuropyrimidine core.

- Led a team that discovered XL019, a potent inhibitor of JAK2, which became a development candidate (DC). Worked to thoroughly cover the SAR of the pyrimidine core by augmenting traditional techniques with medchem quality library synthesis. Compound was moved into the clinic by Exelixis.
- Led a team that discovered a proof of concept compound, EXEL-04610346, for the inhibition of glucosoyl ceramide synthase (GCS), a promising target for the treatment of diabetes.
- Contributed compounds that led to the discovery of DC candidate XL518, a potent inhibitor of MEK1.
- Contributed library support that impacted the research directions of DC candidates XL147 (general PI3K inhibitor), XL888 (an HSP90 inhibitor), and XL541 (an S1P1R antagonist).
- Successfully reoriented the group to conducting medicinal chemistry research on multiple projects simultaneously from its previous mission of internal library growth.
- Collaborated with project team leaders from the Pharmacology, Molecular and Cellular Biology, and DMPK departments to set weekly research priorities for compound advancement and to present team research and a unified strategy to upper management.
- Worked with Structural Biology and Molecular Modeling to advance compound design for PIM, CK2 and other kinase projects.
- Met with members of the Discovery Informatics group to provide feedback on and suggest modifications to the internal XLerate enterprise reporting application for discovery research data.
- Began and implemented the program to generate medchem quality libraries for research projects in amounts that enabled smooth biochemical, cellular and pharmacologic testing within one week of submission.
- Worked with members of the Compound Repository to standardize the formats for compound submission to speed the testing of compounds.
- Developed Ph.D. group members to take on the additional responsibilities of lead-chemists on selected research project teams.
- Developed research associates to perform complex chemistries, take on roles in overall lab management, and to assist the Ph.D. scientists in the preparation of patent applications.

Director, High-Throughput Chemistry **2003 – 2005**
Exelixis, Inc., South San Francisco, California

Led the High-Throughput Chemistry department to complete the company's rapid compound library growth to over 4 million compounds and finished outside library collaborations with Schering-Plough, Merck, Elan Pharmaceuticals, Scios, Cytokinetics, and Bayer Crop Sciences. Managed all aspects of those collaborations from library scheme development, outsourcing, conducting quarterly JRC meetings, compound production and delivery. Oversaw a group of 28 researchers and managed multimillion dollar budgets.

- Successfully met compound deliverables (> 350,000 compounds annually) to outside partners and generated over 5 million dollars ($U.S.) annually.
- Added over 1 million compounds to the internal Exelixis compound library in both 2003 and 2004.
- Hired additional Ph.D. chemists and continued to work with the Ph.D. group to more quickly troubleshoot library scheme chemistries.
- Moved the selection of annual library schemes from late fall to mid-summer to allow for a more thorough research vetting before scheme selection and contracting CROs to begin work.
- Implemented earlier and more frequent communication with outside partners to discuss library scheme development that resulted in faster modifications to problematic chemistries and improved the delivery of final template materials for annual library production from December to October.
- Took over direct management of the operations with outside CROs in China, India, Europe and the United States. Instituted weekly updates from dozens of CROs for closer monitoring of library template chemistries.
- Completely redesigned the library production facility in collaboration with members of the group and the Facilities department to improve efficiency, productivity, and safety. The facility reached a capacity of greater then 360 plates of compounds per week without the need to run multiple shifts of workers.
- Improved automation by working with members of the Discovery Informatics group and the library production team to create the ACCLAIM program for automated library information management. The program saved researchers hours of time by automatically organizing production library data in specific locations on a central server, tracking plate labels, flagging duplicate synthetic efforts, moving electronic data files between instruments, and selecting the correct data for import into the Synthesis Workbook library software. Much learned from the ACCLAIM project was later used to build XLerate, an enterprise reporting application for all drug discovery research.
- Developed production team leaders within the group to take responsibility for final library production and shipment to enable me to focus on upstream problems in the library process.

Associate Director, High-Throughput Chemistry **2001 – 2003**
Exelixis, Inc., South San Francisco, California

Managed the high-throughput synthesis department as the company solidified its goal of building a diverse compound collection of several million compounds to aid its drug discovery efforts. In addition to in-house compound synthesis, was responsible for compound libraries being generated in collaboration with Schering-Plough, Elan Pharmaceuticals, Scios, and Cytokinetics. Oversaw a group of 20 researchers and managed multimillion dollar budgets.

- Successfully met all compound deliverables (> 300,000 compounds annually) with outside partners.
- Added over 700,000 compounds to the internal Exelixis library.
- Hired the initial Ph.D. chemists into the department and oversaw the troubleshooting of chemistries being used and to accelerate go/no go decisions on library projects.
- Designed library schemes as part of a group of scientists.
- Hired and trained the research associates for the library production teams.
- Co-invented the patented EX-Blok reaction block and resin dispensing technologies that improved productivity, efficiency and safety over other commercially available technologies.
- Expanded the range of chemistries available in our diversification process to include reductive aminations and nucleophilic aromatic substitutions.
- Improved automated analytic throughput through the combination of Micromass MUX LCMS systems with plate crane readers
- Worked with Discovery Informatics to improve lab automation through changes to the Synthesis Workbook software.

Senior Scientist I, Medicinal Chemistry **1999 – 2001**
Exelixis, Inc., South San Francisco, California

Was one of the first chemists at Exelixis via its acquisition of MetaXen. Worked to set up the HT-chemistry lab and build internal compound collection through semi-automated solution-phase parallel synthesis, as the company made its initial steps in transforming itself from a genomics to a drug discovery company.

- Set up the initial automated library chemistry lab at Exelixis by working with scientists at Bristol-Myers Squibb to duplicate their technology in-house, as part of a technology transfer deal.
- Validated the general solution-phase reactions that would form the final steps of our library process.
- To increase throughput, replaced the initial block technology with one consisting of disposable off the shelf components.
- Collaborated in the design of a custom block technology to increase throughput.
- Oversaw a team that generated our first 100,000 compounds in two months using the modified technology.
- Oversaw the first full year of library production that added several hundred thousand compounds to the library with a group of 12 research associates.

Research Scientist II, Medicinal Chemistry **1998 – 1999**
MetaXen LLC, South San Francisco, California

Worked as a medicinal chemist as part of a multidisciplinary team of chemists, biologists and computational chemists working toward the discovery of inhibitors of PAI/TPA complex formation.

- Used solution-phase organic chemistry to synthesize heterocyclic compounds (quinolones, tetramic acids).
- Generated a library of β-ketoamides on the solid-phase.

Postdoctoral Research Fellow **1996 – 1998**
Tularik Inc., South San Francisco, California

Developed new methods for synthesizing organic compounds on the solid-phase for this startup company, which was later acquired by Amgen.

- Developed a new reagent (now commercially available) that enabled the solid-phase synthesis of 2-aminothiazoles and guanidine compounds.
- Prepared a new linker for immobilizing tertiary amines on resin.
- Generated compound libraries targeted at PPARγ.

ACADEMIC EXPERIENCE

Adjunct Research Faculty **2014 – 2018**
Department of Chemistry, University of Kansas, Lawrence, KS

Sponsored and conducted research in the laboratory of Professor Paul. R. Hanson on behalf of HD Sciences (see above). Guided the efforts of a postdoctoral researcher and provided informal scientific, research, and career advice to several graduate and postdoctoral researchers in the group.

Postdoctoral Research Fellow **1994 – 1996**
Division of Biology, Caltech (Henry Lester / Norman Davidson Group)

Co-developed methods for expressing membrane-bound proteins containing unnatural amino acids in intact cells. Utilized these methods, in conjunction with basic electrophysiological techniques (2-electrode voltage clamp, patch clamp), to study the structure/function relationships of ligand-gated ion channels.

- Studied the roles played by conserved amino acids in the ligand binding and pore regions the nicotinic acetylcholine receptor.

Graduate Research Assistant **1987 – 1994**
Division of Chemistry, Caltech (Laboratory of Dennis Dougherty)

Designed and chemically synthesized a variety of aromatic cyclophane host molecules. With the use of NMR and circular dichroic methods, studied the role of cation-π interactions in the molecular recognition events of these hosts in aqueous solutions with various organic compounds.

- Elucidated the effects of solvent exposed carboxylic acids on bound amine guest molecules.
- Helped determine the strength of the cation-p interactions of substituted aromatic ring systems.

FORMAL EDUCATION

Ph.D., Chemistry, California Institute of Technology, Pasadena CA **February 1994**
Thesis Title: Studies of Organic Molecule Recognition by Synthetic Cyclophane Receptors in Aqueous Media.
Thesis Advisor: Dennis A. Dougherty

B.S., Chemistry, Carnegie-Mellon University, Pittsburgh PA **May 1987**

CONTINUING EDUCATION

Full-Stack Web-Development Coding Bootcamp **Jan 2018 – July 2018**
University of Kansas, Edwards Campus in Overland Park

- Completed a six-month immersive course in full-stack web development. Study topics included: HTML5, CSS3, ES6, JavaScript, jQuery, Java, Bootstrap, Express.js, React.js, Node.js, database theory, Passport.js, MongoDB, MySQL, and Git. Course entailed 10 hours of formal instruction and 20-40 hours of self-study per week.

FastTrac TechVenture Entrepreneurial Training Program **April 2013**
Ewing Marion Kauffman Foundation & The American Chemical Society

- Completed this eight-week program designed to introduce entrepreneurs to the tools and concepts needed to start businesses in the life sciences or technology fields.

Clinical Trials Design and Management Certificate Program **November 2012 - August 2013**
University of California at San Diego

- Enrolled and completed six courses in an online program of study to gain a deeper understanding of the drug development process.

VOLUNTEER ACTIVITIES

American Chemical Society Division of Small Chemical Businesses **2013 – 2017**

- Served as both the Division Secretary and as a member of the Program Committee.
- Organized and chaired sessions at national meetings that highlighted the efforts early stage companies.

ADDENDUM

Published Patents and Applications:

"Inhibitors of PI3K-Delta and Methods of Their Use and Maufacture" Patrick Kearney PCT Int. Appl. (2010) WO 2012037226 A1.

"Arylacetamides as Inhibitors of Glucosylceramide Synthase and Their Preparation and Use in the Treatment of GCS-Mediated Diseases"; Aay, Naing; Aoyama, Ron G.; Arcalas, Arlyn; Chan, Wai Ki Vicky; Du, Hongwang; Kearney, Patrick; Koltun, Elena S.; Nachtigall, Jason August; Pack, Michael; Richards, Steven James; PCT Int. Appl. (2010) WO 2010091164 A1 20100812.

"Nicotinamides and Benzamides as Glucosylceramide Synthase Inhibitors and Their Preparation and Use in the Treatment of GCS-Mediated Diseases"; Chan, Wai Ki Vicky; Du, Hongwang; Kearney, Patrick; Koltun, Elena S.; Nachtigall, Jason August; Noson, Kevin; Pack, Michael; PCT Int. Appl. (2010), WO 2010091104 A1 20100812.

"Preparation of 1-Acylpyrrolidine-2-carboxamides and 2-(N-acylamino)alkanmaides as Sphingosine-1-phosphate Receptor Antagonists"; Ibrahim, Mohamed Abdulkader; Jeong, Joon Won; Johnson, Henry William Beecroft; Kearney, Patrick; Leahy, James W.; Lewis, Gary L.; Noguchi, Robin Tammie; Nuss, John M.; PCT Int. Appl. (2010), WO 2010045580 A1 20100422.

"Preparation of Benzofuropyrimidinones as Protein Kinase Inhibitors"; David S. Brown, Hongwang Du, Maurizio Franzini, Adam Antoni Galan, Ping Huang, Patrick Kearney, Moon Hwan Kim, Elena S. Koltun, Steven James Richards Amy L. Tsuhako, et al.; PCT Int. Appl. (2009) WO 2009086264 A1 20090709

"Preparation of 1H-Imidiazole-4,5-Dicarboxamides as JAK-2 Inhibitors"; Adam Antoni Galan, Jeff Chen, Hongwang Du, Timothy Forsyth, Tai Phat Huynh, Henry William Beecroft, Patrick Kearney, James W Leahy, Matthew Sangyup Lee, Grace Mann, et al.; PCT Int. Appl. (2008) WO 2008042282 A2 20080410.

"Preparation of 6-Phenylpyrimidinones as PIM Modulators"; Elena S. Koltun, Amy L Tsuhako, Naing Aay, David S. Brown, Wai Ki Vicky Chan, Hongwang Du, Ping Huang, Brian Kane, Patrick Kearney, Moon Hwan Kim, et al; PCT Int. Appl. (2008) WO 2008133955 A1 20081106.

"Preparation of Pyrimidinones as Casein Kinase II (CK2) Modulators"; Elena S. Koltun, Patrick Kearney, Naing Aay, Arlyn Arcalas, Wai Ki Vicky Chan, Jeffry Kimo Curtis, Hongwang Du, Ping Huang, Brian Kane, Moon Hwan Kim, et al.; PCT Int. Appl. (2008) WO 2008143759 A1 20081127.

"2-Amino-3-Sulfonylaminoquinoxaline Derivatives as Phosphatidylinositol 3-Kinase Inhibitors and Their Preparation, Pharmaceutical Compositions and Use in the Treatment of Cancer"; William Bajjalieh, Lynne Canne Bannen, David S. Brown, Patrick Kearney, Morrison Mac, Charles K. Marlowe, John M. Nuss, Zerom Tesfai, Yong Wang, Wei Xu; PCT Int. Appl. (2007) WO 2007044729 A2 20070419.

"4-Aryl-2-Aminopyrimidines or 4-Arylalkylpyrimidines as JAK-2 Modulators and Their Preparation Pharmaceutical Compositions and Their Use in the Treatment of Diseases"; Grace Mann, Naing Aay, Arlyn Arcalas, David S. Brown, Wai Ki Vicky Chan, Jeff Chen, Hongwang Du, Sergey Epshteyn, Timothy Forsyth, Adam Galan, Patrick Kearney, et al.; PCT Int. Appl. (2007) WO 2007089768 A2 20070809.

"Preparation of N-Tetrazoylphenyl Carboxamides as Pim-1 and/or Pim-3 inhibitors."; Patrick Kearney, Samuel David Brown, Elena S. Koltun; PCT Int. Appl. (2007) WO 2007044724 A2 20070419.

"Preparation of Pyrimidinones as Casein Kinase II (CK2) Modulators for the Treatment of Cancer"; Kenneth D. Rice, Neel Kumar Anand, Arlyn Arcalas, Charles M. Blazey, Joerg Bussenius, Wai Ki Vicky Chan, Hongwang Du, Sergey Epshteyn, Mohamed Abdulkader Ibrahim, Patrick Kearney, et al.; PCT Int. Appl. (2007) WO 2007048065 A2 20070426.

"Multi-well Apparatus"; David Clarence Hager, Jeffrey D. Donaldson, Patrick Kearney, Douglas O. Keller, James William Leahy, Robert D. Mercer, Michael Morrissey, Troy M. Swartwood. U.S. Pat. Appl. Publ. (2005), US 2005226786 A1 20051013.

"Tao Kinase Inhibitors for Pharmaceutical Use and for Screening for Kinase Modulators"; Wei Xu, Wentao Zheng; Deborah Lynn Baly; Adam Antoni Galan, Mohamed Ibrahim Abdulkader, Christopher Jaeger, Patrick Kearney; James William Leahy, Gary Lee Lewis, Kirk McMillan et al.; PCT Int. Appl. (2005) WO 2005040355 A2 20050506.

"Apparatus for Pipeting Powders"; David C. Hager, Patrick Kearney, Troy M. Swartwood; PCT Int. Appl. (2004) WO 2004024329 A1 20040325

"Multi-well Apparatus", David Clarence Hager, Jeffrey D. Donaldson, Patrick Kearney, Douglas O. Keller, James William Leahy, Robert D. Mercer, Michael Morrissey, Troy M. Swartwood; PCT Int. Appl. (2002) WO 2002072269 A1 20020919.

"Preparation of Phenyl and Aryl-fused Thiazole Derivatives as Antiviral Agents for Suppression and Treatment of Herpes Family Viral Infections and Sexually Transmitted Viral Diseases"; John A. Flygare, Juan C. Jaen, Patrick C. Kearney, Julio C. Medina, Mohanram Sivaraja; PCT Int. Appl. (1999) WO 9942455 A1 19990826.

"Preparation of PPAR-Gamma Modulators on Treatment of Type II Diabetes and Obesity"; Fabienne De La Brouse-Elwood, Juan C. Jaen, LawrenceR McGee, Shi-Chang Miao; Steven Marc Rubenstien, Long Cheng, Timothy D. Cushing, John A. Flygare, Jonathan B. House, Patrick C. Kearney; PCT Int. Appl. (1999) WO 9938845 A1 19990805.

Publications in Print:

"Discovery of XL413, a Potent and Selective CDC7 Inhibitor"; Elena S. Koltun, Amy Lew Tsuhako, David S. Brown, Naing Aay, Arlyn Arcalas, Vicky Chan, Hongwang Du, Stefan Engst, Kim Ferguson, Maurizio Franzini, Adam Galan, Charles R. Holst, Ping Huang, Brian Kane, Moon H. Kim, Jia Li, David Markby, Manisha Mohan, Kevin Noson, Arthur Plonowski, Steven J. Richards, Scott Robertson, Kenneth Shaw, Gordon Stott, Thomas J. Stout, Jenny Young, Peiwen Yu, Cristiana A. Zaharia, Wentao Zhang, Peiwen Zhou, John M. Nuss, Wei Xu, Patrick C. Kearney, *Bioorg. and Med. Chem. Lett.* **2012** 22, 3727-3731.

"The Design, Synthesis, and Biological Evaluation of PIM Kinase Inhibitors"; Tsuhako, Amy Lew; Brown, David S.; Koltun, Elena S.; Aay, Naing; Arcalas, Arlyn; Chan, Vicky; Du, Hongwang; Engst, Stefan; Franzini, Maurizio; Galan, Adam; Huang, Ping; Johnston, Stuart; Kane, Brian; Kim, Moon H.; Douglas Laird, A.; Lin, Rui; Mock, Lillian; Ngan, Iris; Pack, Michael; Stott, Gordon; Stout, Thomas J.; Yu, Peiwen; Zaharia, Cristiana; Zhang, Wentao; Zhou, Peiwen; Nuss, John M.; Kearney, Patrick C.; Xu, Wei, *Bioorg. and Med. Chem. Lett.* **2011** 22, 3732-3738.

"Discovery and Characterization of an Inhibitor of Glucosylceramide Synthase"; Richards, Steven; Larson, Christopher J.; Koltun, Elena S.; Hanel, Art; Chan, Vicky; Nachtigall, Jason; Harrison, Amanda; Aay, Naing; Du, Hongwang; Arcalas, Arlyn; Galan, Adam; Zhang, Jeff; Zhang, Wentao; Won, Kwang-Ai; Tam, Danny; Qian, Fawn; Wang, Tao; Finn, Patricia; Ogilvie, Kathy; Rosen, Jon; Aoyama, Ron; Plonowski, Artur; Cancilla, Belinda; Bentzien, Frauke; Yakes, Michael; Mohan, Raju; Lamb, Peter; Nuss, John; Kearney, Patrick, *J. Med. Chem.*, **2012**, *55*, 4322-4335.

"Discovery of a New Class of Glucosylceramide Synthase Inhibitors"; Koltun, E.; Richards, S.; Chan, V.; Nachtigall, J.; Du, H.; Noson, K.; Galan, A.; Aay, N.; Hanel, A.; Harrison, A.; Zhang, J.; Won, K.; Qian, F.; Wang, T.; Finn, P.; Ogilvie, K., Rosen, J.; Mohan, R.; Larson, C.; Lamb, P.; Nuss, J.; Kearney, P. *Bioorg. and Med. Chem. Lett.* **2011** 22, 6773-6777.

"Design, Synthesis and in-vitro Evaluation of Potent Novel Small Molecule Inhibitors of Plasminogen Activator Inhibitor-1"; Adrian Folks, David S. Brown, Lynne E. Canne, Jocelyn Chan, Erin Engelhardt, Sergey Epshteyn, Richard Faint, Julian Go, Art Hanel, Patrick Kearney, et al., *Bioorg. Med. Chem. Lett*, **2002**, *12*, 1063-1066.

"2-Aminothiazoles"; Patrick C. Kearney, Monica Fernandez, John Flygare, et al. *Solid-Phase Organic Synthesis.*, **2001**, *1*, 1-8.

"A Selective Receptor for Arginine Derivatives in Aqueous Media. Energetic Consequences of Salt Bridges That Are Highly Exposed to Water."; Sarah M. Ngola, Patrick C. Kearney, Sandro Mecozzi, Keith Russell and Dennis A. Dougherty, *J. Am. Chem. Soc.* ,**1999**, *121*, 1192-1201.

"Solid-Phase Synthesis of Disubstituted Guanidines"; Patrick C. Kearney, Monica Fernandez, and John Flygare, *Tetrahedron Lett.*, **1998**, *39*, 2663-2666.

"Traceless Solid-Phase Synthesis of 2-Aminothiazoles"; Patrick C. Kearney, Monica Fernandez, and John Flygare, *J. Org. Chem.*, **1998**, *63*, 198-201.

"Determinants of Nicotinic Receptor Gating in Natural and Unnatural Side Chain Structures at the M2 9' Position"; Patrick C. Kearney, Haiyun Zhang, Wenge Zhong, Dennis A. Dougherty, and Henry A. Lester, *Neuron*, **1996**, *17*, 1221-1229.

"Dose-Response Relations for Unnatural Amino Acids at the Agonist Binding Site of the Nicotinic Acetylcholine Receptor: Tests with Novel Side Chains and Several Agonists"; Patrick C. Kearney, Mark W. Nowak, Wenge Zhong, Scott K. Silverman, Henry, A. Lester, and Dennis A. Dougherty, *Molecular Pharmacology*, **1996**, *50*, 1401-1412.

"An Engineered *Tetrahymena* tRNA-Gln for *in Vivo* Incorporation of Unnatural Amino Acids into Proteins by Nonsense Suppression"; Margaret E. Saks, Jeffrey R. Sampson, Mark W. Nowak, Patrick C. Kearney, Fangyong Du, John N. Abelson, Henry A. Lester and Dennis A. Dougherty, *J. Biol. Chem.*, **1996**, *271*, 23169-23175.

"Nicotinic Receptor Binding Site Probed with Unnatural Amino Acid Incorporation in Intact Cells"; M.W. Nowak, P.C. Kearney, J.R. Sampson, M.E. Saks, C.G. Labarca, S.K. Silverman, W. Zhong, J. Thorson, J.N. Abelson, N. Davidson, P.G. Schultz, D.A. Dougherty, and H.A. Lester, *Science*, **1995**, *268*, 439-442.

"Molecular Recognition in Aqueous Media. New Binding Studies Provide Further Insights into the Cation-π Interaction and Related Phenomena"; P.C. Kearney, L.S. Mizoue, R.A. Kumpf, J.E. Forman, A. McCurdy, and D.A. Dougherty, *J. Am. Chem. Soc.* ,**1993**, *115*, 9907-9919.

"Molecular Recognition: Multipoint Contacts with New Sizes and Shapes"; J.S. Lindsey, P.C. Kearney, R.J. Duff, P.T. Tjivikua, and J. Rebek Jr., *J. Am. Chem. Soc.*, **1988**, *110*, 6575-6577.

"Rothemund and Adler-Longo Reactions Revisited: Synthesis of Tetraphenylporphyrins under equilibrium Conditions"; J.S. Lindsey, I.C. Screiman, H.A. Hsu, P.C. Kearney, and A.M. Marguerettaz, *J. Org. Chem.* ,**1987**, *52*, 827-836.