

## CURRICULUM VITAE

**Kim D. Janda, Ph.D.**

### **Current Status:**

Business Address: The Scripps Research Institute, Department of Chemistry  
The Skaggs Institute for Chemical Biology  
The Worm Institute of Research & Medicine

Maildrop: BCC 582  
10550 North Torrey Pines Road  
La Jolla, CA 92037

Business Telephone: (858) 784-2516

Business Fax: (858) 784-2595

Current Positions: Ely R. Callaway Jr., Professor of Chemistry,  
The Scripps Research Institute, Departments of Chemistry  
& Department of Immunology and Microbial Science  
Skaggs Scholar, The Skaggs Institute for Chemical Biology  
Director, Worm Institute of Research and Medicine (WIRM)

### **Education:**

University of South Florida, Clinical Chemistry; B.S., 1980.

University of Arizona, Organic Chemistry; Thesis title: Synthesis of Diphenyl Ethers as Related to the Anti-tumor Agent Deoxybouvardin; M.S., 1983.

University of Arizona, Major-Organic Chemistry, Minor-Medicinal Chemistry; Dissertation title: Progress Towards a Synthesis of Deoxybouvardin and Analogues: New Synthetic Methods; Ph.D., 1984.

### **Professional Record:**

*Postdoctoral Fellow*, Department of Molecular Biology, Research Institute of Scripps Clinic, La Jolla, CA, 1985-1986

*Adjunct Assistant Professor*, Department of Molecular Biology, Research Institute of Scripps Clinic, La Jolla, CA, 1987-1988

*Assistant Professor*, Department of Molecular Biology, Research Institute of Scripps Clinic, La Jolla, CA, 1989-1990

*Associate Professor*, Departments of Molecular Biology and Chemistry, The Scripps Research Institute, La Jolla, CA, 1991-1992

*Associate Professor* (tenured), Departments of Molecular Biology and Chemistry, The Scripps Research Institute, La Jolla, CA, 1993

*Associate Professor*, The Skaggs Institute for Chemical Biology (joint appointment), The Scripps Research Institute, La Jolla, CA, 1996

*Professor*, Department of Chemistry, The Scripps Research Institute, La Jolla, CA, 1996-present

*Ely R. Callaway Jr., Chair in Chemistry*, The Scripps Research Institute, La Jolla, CA, 1996-present.

*Skaggs Scholar*, The Skaggs Institute for Chemical Biology, La Jolla, CA, 1996-present  
*Professor*, Departments of Chemistry & Immunology and Microbial Science,

The Scripps Research Institute, La Jolla, CA, 2005-present.

*Director*, The Worm Institute of Research & Medicine (WIRM),

The Scripps Research Institute, La Jolla, CA, 2005-present.

*Associate Editor*, *Bioorganic & Medicinal Chemistry*, 2008-present.

### **Honorary, Professional Organizations and Awards:**

Molecule of the Week (3,4-Diaminopyridine), American Chemical Society, January 10, 2011

Harvey W. McFadden, Jr., M.D. Lecture, Department of Pathology & Microbiology, University of Nebraska Medical Center, 2010

Harold A. Iddles Lecture, Chemistry Department, University of New Hampshire, Durham, 2010

Doctor of Philosophy honoris causa, University of Helsinki, Finland, 2009

Discover magazine's "Top 100 Science Stories of 2006" for Obesity Vaccine work

Office of Life Sciences Distinguished Lecture, National University of Singapore, 2006

Elected Fellow of American Association for the Advancement of Science (AAAS), 2003

Biomolecular Student Lecture, Emory University, 2003

GSO Speaker, University of North Carolina, 2003

Keynote Speaker, Graduate Student Symposium, University of Michigan, 2003

Sigma-Aldrich Lecture, Milwaukee Section ACS, Milwaukee, WI, 2002

Rayson Huang Visiting Lecturer, University of Hong Kong, Hong Kong, China, 2002

Shire BioChem Lecture, Universite de Montreal, Montreal, Canada, 2002.

Outstanding Alumnus in Chemistry, University of South Florida, 2001

J. Clarence Karcher Lecture, University of Oklahoma, 2000

Arthur C. Cope Scholar Award, 1999

Alfred P. Sloan Fellowship, 1993-1995

NIH FIRST Award, 1990-1995

Fellow, American Institute of Chemists, 1986-present

Carl S. Marvel Fellowship, University of Arizona, 1984

American Chemical Society, 1981-present

Magna Cum Laude; Phi Beta Kappa, University of South Florida, 1980

Scholar Athlete of the Year, University of South Florida, 1979-1980

### **Previous External Committees and Boards:**

Investment Committee - The Skaggs Institute for Research, 2008-2010

Member of the Board of Trustees - The Skaggs Institute for Research, 2006-2010

### **Editorial Review Boards:**

*Beilstein Journal of Organic Chemistry*, Advisory Board, 2010-present

*Bioorganic & Medicinal Chemistry*, American Regional Editor, 2008-present

*Bioorganic & Medicinal Chemistry Letters*, Advisory Board, 2004 - present

*Chemical Reviews*, Advisory Board, 2002 - present

*Immunotherapy*, Advisory Board, 2009-present  
*Journal of Medicinal Chemistry*, Advisory Board, 2008 - present  
*PLoS ONE*, Associate Editor, 2010 - present  
*Tetrahedron Publications*, Executive Board of Editors, 2008-present  
*The Botulinum Journal*, Advisory Board, 2009-present

**Editorial Positions held previously:**

*Combinatorial Chemistry and High-Throughput Screening*  
*Combinatorial Chemistry Research and Applications*  
*Journal of Combinatorial Chemistry*

**Companies Founded:**

CombiChem  
Drug Abuse Sciences  
AIPartia

**Current Consulting Agreements:**

Sorrento Therapeutics, Inc.

**Scientific Advisory Boards:**

Materia, Inc.  
Singapore Ministry of Education (MOE), EP1 Physical Sciences  
Sorrento Therapeutics, Inc.

**Scientific Advisory Positions held previously:**

Drug Abuse Sciences  
Joint Scientific Council Committee, Novartis/TSRI  
Steering Committee, Novartis/TSRI  
EPIcyte Pharmaceutical, Inc.  
Chembiotek Research International (TAB)  
ProKinase Research Consortium  
EU Integrated Project: “Protein kinases – Novel drug targets of post genomic era”

**Peer Review Committees:**

Department of Energy (Materials Science Section), 1993  
National Science Foundation (Bioorganic Section), 1994  
National Institutes of Health (Bioorganic and Natural Products Section), 1994  
Long Range Planning Committee ACS Medicinal Chemistry, 1996-1999  
NIDA Special Emphasis Study Section, 1997-1999  
NIH Special Study Section B, 2001

NIAID Study Section: Partnerships for Novel Therapeutics, Diagnostic and Vector Control Strategies in Infectious Diseases, 2002

NIAID Study Section (Chairman): Collaborative Research for the Development of Vaccines, Adjuvants, Therapeutics, Immunotherapeutics, and Diagnostics for Biodefense, 2003

NIAID Study Section (Chairman): Regional Centers of Excellence for Biodefense And Emerging Infectious Diseases Research, 2003

NIAID Study Section: Enhancement Awards for Underrepresented Minority Scientists, 2004

NIH Special Emphasis Panel on Bacterial Pathogenesis, 2004

NIGMS Bio-organic and Natural Products Chemistry Study Section, 2004

NIDA Training and Career Development Study Section, 2005

Singapore Ministry of Education (MOE), Chairman, 2006

Breast Cancer Research Program (BCRP)- Concept-Clinical and Experm. Therapeutics, 2006

DOD Congressionally Directed Medical Research Program (CDMRP), 2007

NIH Study Section (Chairman): Cooperative Research into Therapeutics and Diagnostics for Category B Bacteria, Viruses, and Parasites, 2007

NIH Study Section: Myocardial Ischemia and Metabolism, 2007

NIDA Special Emphasis Panel Meeting for Members of the International Collaborations for HIV and Drug Abuse (R21) Review Committee, April 2, 2008

International Caner Stem Cell Workshop, Toronto, Canada, April 17-18, 2008

NIH Challenge Grants Panel 9, 2009

NIH Challenge Grant Panel 17, 2009

NIH Pilot-Scale Libraries for High-Throughput Screening, 2009

NIH Special Emphasis Panel on Countermeasures Against Chemical Threats, 2010

NIH Special Emphasis Panel on Countermeasures Against Chemical Threats, 2011

VWD Study Section: Vaccines Against Microbial Diseases, 2010-2012

Singapore Ministry of Education (MOE), Chairman, AcRF Tier 2 EP1 Meeting, 2010-2011

**Invited Lectures:**

1. Gordon Research Conf. on Proteolytic Enzymes and Their Inhibitors, New Hampshire, June 8, 1988.
2. European Molecular Biology Laboratory, Heidelberg, Germany, August 20, 1988.
3. 196th ACS National Meeting, Los Angeles, CA, September 5, 1988.
4. Lake Tahoe Symposium, Genetic Engineering/Immune System, Lake Tahoe, NV, October 3, 1988.
5. 1988 Pacific Conf. on Chemistry & Spectroscopy, San Francisco, CA, October 26, 1988.
6. 197th ACS National Meeting, Dallas, TX, April 9, 1989.
7. American Society for Microbiology Biotechnological Conference, Orlando, FL, June 22, 1989.
8. American Assc. of Pharmaceutical Scientists, Frontiers of Biotech., Atlanta, GA, October 22, 1989.
9. American Inst. of Chem. Eng., Prod. of Specialty Chemicals, San Francisco, CA, November 5, 1989.
10. University of Tokyo, Department of Agriculture, Tokyo, Japan, January 22, 1990.

11. Tokyo Institute of Technology, Tokyo, Japan, January 23, 1990.
12. Research Institute of Chemical Engineering, Tsukuba, Japan, January 24, 1990.
13. 9th Science and Technology Forum, Tsukuba, Japan, January 24, 1990.
14. Pan-Am. Assc/BioMed Soc, Protein Structure/Function, Novel Exp. Approaches, Brazil, Feb.18, 1990.
15. R.W. Johnson Pharmaceutical Research Institute, San Diego, CA, March 28, 1990.
16. George E. Hewitt Foundation for Medical Research, Irvine, CA, March 30, 1990.
17. Pharmaceutical Society of Japan, Kyushu University, Fukuoka, Japan, May 21, 1990.
18. Kanebo, Ltd., Pharmaceutical Research Center, Osaka, Japan, May 22, 1990.
19. The Green Cross Corporation, Osaka, Japan, May 23, 1990.
20. Unitika Research and Development Center, Kyoto, Japan, May 24, 1990.
21. Protein Engineering Research Institute, Osaka, Japan, May 25, 1990.
22. Bio Japan 90, Protein Engineering-Structure & Function, Osaka, Japan, May 23, 1990.
23. 1990 ASM Conference on Biotechnology, Chicago, IL, June 7, 1990.
24. Ciba Foundation Symposium, London, England, September 1-October 3, 1990.
25. American Institute of Chemical Engineers Meeting, Chicago, IL, November 11, 1990.
26. Annenberg Ctr./Frontiers in Biomedical Research 1991, Rancho Mirage, CA, February 17, 1991.
27. Osaka University, Department of Polymer Science, Osaka, Japan, March 24, 1991.
28. Kanebo, Ltd., Osaka, Japan, March 25, 1991.
29. Tanabe Seiyaku Co., Ltd., Osaka, Japan, March 26, 1991.
30. Sekisui Chemical Co., Osaka, Japan, March 27, 1991.
31. ABC Symposium, Kyoto, Japan, March 28, 1991.
32. Florida Conference on Catalysis, Daytona, FL, April 8, 1991.
33. Sterling Drug Co., Albany, NY, June 7, 1991.
34. New Zealand Inst. Chem./Biochemical Society/Jubilee Conf. Univ. Canterbury, August 26, 1991.
35. International Biotechnology Expo & Scientific Conference, San Francisco, CA, October 6, 1991.
36. University of Arizona, Department of Chemistry, October 28, 1991.
37. The Scripps Research Institute, Structure and Affinity Lecture Series, January 9, 1992.
38. Receptor Laboratories, Inc., Chicago, IL, January 20, 1993.
39. Shanghai Research Centre of Biotechnology, Shanghai, China, June 1, 1993.
40. Toyobo Pharmaceutical Co., Osaka, Japan, June 2, 1993.
41. Inter. Workshop on Chemistry/Biochemistry of Biocatalysis, Kyoto-Fu, Japan, June 3, 1993.
42. Inter. Un. of Pure & Applied Chem., 2nd Inter. Symp. on Bioorganic Chem, Japan, June 6, 1993.
43. Second International Symposium on Bioorganic Chemistry, Fukuoka, Japan, June 6, 1993.
44. Shanghai Institute of Cell Biology, Chinese Academy of Sciences, China, June 14, 1993.
45. Nat. Key Lab. Bioorg/Nat. Prod. Chem/Chinese Academy of Sciences, Shanghai, China, June 15, 1993.
46. Fudan University, Institute of Genetics, Shanghai, China, June 15, 1993.
47. Biochemical Society, Biological Chemistry, Sheffield, England, July 23, 1993.
48. NIH, NIAID, Rocky Mountain Laboratories, Hamilton, MT, August 11, 1993.

49. Monoclonal Antibodies From Combinatorial Libraries, Cold Spring Harbor, November 12, 1993.
50. Ab Eng/ Resch & Applic/Genes Encoding Immunoglobulins Symp., Lake Tahoe, CA, March 8, 1994.
51. University of British Columbia, Vancouver, Canada, Dept. of Chemistry, March 22, 1994.
52. Unilever Research Center, Edgewater, NJ, April 4, 1994.
53. Tokyo Institute of Technology, IMSC, PERI, Kanebo, Sankyo, Japan, April 7, 1994.
54. World Molecular Engineering Network-4th Conf., San Jose de Cabo, Mexico, April 24, 1994.
55. Enzymes/Coenzymes/Metabolic Pathways, Gordon Conference, New Hampshire, July 17, 1994.
56. Chemical Reaction Mechanisms Conference, plenary lecture, Helsinki, Finland, September 27, 1994.
57. University of Illinois, Department of Chemistry, October 26, 1994.
58. Oligonucleotide Selection and Molecular Diversity, Lake Tahoe, CA, October 29, 1994.
59. Time-Machine-Bio, Molecular Evolution Engineering, Tsukuba, Japan, November 7, 1994.
60. Monoclonal Antibodies from Combinatorial Libraries, Cold Spring Harbor, November 17, 1994.
61. Synthesis Symposium, plenary lecture, University of California Irvine, December 10, 1994.
62. Exploiting Molecular Diversity, Small Molecule Libraries for Drug Disc. San Diego, CA January 24, 1995.
63. Exploiting Biological Div. Libraries/Mutations for Research/Drug Dev., San Diego, CA, January 26, 1995.
64. Frontiers of Biomedical Research, Palm Springs, CA, February 19, 1995.
65. 10th Inter. Conf. Monoclonal Antibody Immunoconjugates for Cancer, San Diego, CA, March 10, 1995.
66. Brigham Young University, Department of Chemistry, Provo, UT, March 14, 1995.
67. Colorado State Univ., Dept. of Chemistry, Zeneca Distinguished Lecturer, April 20, 1995.
68. IBC's High Throughput Screening Conference, San Francisco, CA, May 17, 1995.
69. 5th Mtg French-Amer. Chem. Society (PACSV), Bordeaux, France, June 25, 1995.
70. Brandeis University, Department of Chemistry, Massachusetts, September 20, 1995.
71. MIT, Department of Chemistry, Massachusetts, September 21, 1995.
72. UCLA, Department of Chemistry, Los Angeles, CA, October 5, 1995.
73. Abbott Laboratories, Chicago, IL, October 11, 1995.
74. American Chemical Society, Western Regional Meeting, October 18, 1995.
75. Shanghai Research Centre of Biotechnology, China, November 5, 1995.
76. University of Southern California, Department of Chemistry, November 15, 1995.
77. Am. Chem. Soc. SE Reg. Mtg; Chem. Lib., Peptides/Peptidomimetics, Memphis, TN, Nov. 29, 1995.
78. Comb. Library Methods/Basic Research & Drug Disc., AZ Cancer Center, Tucson, AZ, December 2, 1995.
79. Inter. Chem. Cong/P. Basin Societies, Biocatalysis/Org. Synthesis, Honolulu, HA, December 17, 1995.
80. IBC USA Conf. on Mol. Diversity & Combinatorial Chemistry, San Diego, CA, January 24, 1996.

81. Cambridge Healthtech Inst., Solid Phase Synthesis Symposia, San Diego, CA, February 1, 1996.
82. TSRI/R.W. Johnson Pharm. Rsch. Inst. Collab. Resch. Projects Sci. Mtg, La Jolla, CA, Feb 13, 1996.
83. Frontiers in Biomedical Research, Indian Wells, CA, February 18, 1996.
84. Combinatorial Chemistry '96', San Diego, CA, March 21, 1996.
85. 211th ACS National Meeting, New Orleans, LA, March 24, 1996.
86. Drug Abuse Sciences, Inc., San Francisco, CA, April 3, 1996.
87. Bracco Research USA, Inc., Princeton, NJ, April 8, 1996.
88. ROHM & HAAS Co., Spring House, PA, April 10, 1996.
89. Merck Frost Centre for Therapeutic Research, Quebec, Canada, April 22, 1996.
90. World Mol. Engineering Network 6th Meeting/Structural Biology, del Cabo, April 28, 1996.
91. UCSD, Department of Chemistry & Biochemistry, La Jolla, CA, May 6, 1996.
92. NAPP Systems, Inc., San Marcos, CA, May 14, 1996.
93. Drug Abuse Sciences, Inc., San Francisco, CA, May 14, 1996.
94. 1996 National Medicinal Chemistry Symposium, Ann Arbor, MI, June 18, 1996.
95. Antibody-and Protein-based Therapies for Drug Abuse, Puerto Rico, June 22, 1996.
96. IBC USA Conference, Southborough, MA, August 19, 1996.
97. ETH, Eidgenossische Technische Hochschule, Zürich, Switzerland, September 9, 1996.
98. 18th Annual Princeton ACS Fall Org. Chem. Symp., Princeton, NJ, September 26, 1996.
99. 1st French Symposium on Combinatorial Chemistry, Rennes, France, October 29, 1996.
100. Inventor Showcase/Corp. Partnership, UCSD, San Diego, CA, Sheraton, November 12, 1996.
101. Loma Linda University, Loma Linda, CA, November 20, 1996.
102. Procter and Gamble, Cincinnati, OH, December 9, 1996.
103. Winter Conf./Med.& Bioorganic Chem., Steamboat Springs, CO, January 25, 1997.
104. Yale University, New Haven, CT, February 5, 1997.
105. CHI's (Cambridge Health Inst.) Solid Phase Synthesis, Coronado, CA, February 6, 1997.
106. American Assc. for Advancement of Science AMSIE, Seattle, WA, February 13, 1997.
107. Frontiers in Biomedical Research, Indian Wells, CA, Hyatt Grand Champions, February 16, 1997.
108. University of Chicago (Closs Lecture), February 28, 1997.
109. Ciba-Geigy Corp./Novartis, ACS, Summit, NJ, March 24, 1997.
110. University of Kentucky, 23rd Symposium on Chemistry & Molecular Biology, April 8, 1997.
111. University of Helsinki, Finland, April 11, 1997.
112. Lawrence Berkeley Nat. Lab., Structural Bio. Div. Rev. Com., Div. Director, April 20-21, 1997.
113. University of Toronto, Canada, April 25, 1997.
114. 31st European Symposium on Bioorganic Chem.(ESBOC) Gregynog, Wales, May 9, 1997.
115. 15th APS Frontiers of Peptide Science, Nashville, TN, June 14, 1997.
116. Joint Scientific Council, Novartis, Basel, Switzerland, June 26, 1997.
117. Comb. Approaches/Chem/Biology, Churchill Coll., Cambridge Univ., England, July 27, 1997.

118. Org. Reactions & Processes/Gordon Research Conference, New Hampshire, August 3, 1997.
119. Long Range Planning Committee, ACS Division of Medicinal Chemistry, September 8, 1997.
120. Drug Abuse Sciences, Inc., SAB Meeting, September 20, 1997.
121. Northwestern University, Evanston, IL, October 3, 1997.
122. University of Texas at San Antonio, TX, October 16, 1997.
123. Wenner-Gren/Chem/Bio Libraries/Ligand Design, Stockholm, Sweden, November 5, 1997.
124. IBC Conference/Antibody Engineering, San Diego, CA, December 3, 1997.
125. University of Texas, Southwestern Medical Center, January 22, 1998.
126. Lake Tahoe Center, 2nd Inter. Symp. on Mol. Diversity, Lake Tahoe, CA, January 24, 1998.
127. Frontiers of Biomedical Research Symposium, Indian Wells, CA, February 1, 1998.
128. ACS 14th Rocky Mtn. Reg. Mtg, Comb. Chem./Robotics, Tucson, AZ, March 15, 1998.
129. Pharmacia & Upjohn, Inc., Kalamazoo, MI, April 13, 1998.
130. University of Virginia, April 24, 1998.
131. NIDA, Rockville, MD, April 27, 1998.
132. University of California, Berkeley, CA, April 28, 1998.
133. Gilead Sciences, Foster City, CA, April 29, 1998.
134. NIH Review, Washington D.C., June 1, 1998.
135. Università Degli Studi Di Milano, Venice, Italy, June 28, 1998.
136. 12th Intern. Conf. on Organic Synthesis ICOS-12, Venice, Italy, June 28, 1998.
137. 14th Triennial Inter. Conf. in Phosphorus Chem., ICPC, Cincinnati, OH, July 12, 1998.
138. Ligand Pharmaceuticals, San Diego, CA, July 23, 1998.
139. Gordon Conference, New Hampshire, August 16, 1998.
140. ACS National Meeting, Boston, MA, August 23, 1998.
141. The Dupont Company, Wilmington, DE, September 14, 1998.
142. Hoechst Marion Roussel, Inc, September 29, 1998.
143. 3rd Aust. Pept. Conf "From Disc. to Therapeutics", Whitsunday Islands, October 4, 1998.
144. ASTA Medica, Schliersee Symp "Speeding Up Drug Discovery", Germany, October 14, 1998.
145. Exploiting Molecular Diversity, San Diego, CA, February 1, 1999.
146. Frontiers in Biomedical Research, February 7, 1999.
147. NIDA Med. Dev. Special Emphasis Panel (SEP), Washington, D.C., February 23, 1999.
148. University of Alberta, Edmonton, Canada, March 15, 1999.
149. UC Davis, Davis, Sacramento, CA, April 14, 1999.
150. Colledgeville, Pennsylvania, Visions Symposium, April 27, 1999.
151. Drug Abuse Sciences, Inc., New York, April 29, 1999.
152. University of Missouri-Columbia, April 30, 1999.
153. UCLA Seminar, Los Angeles, CA, May 5, 1999.
154. Hoechst Marion Roussel, Inc. (HMR) New Jersey, June 13, 1999.
155. Novartis (JSC), Basel, Switzerland, June 15, 1999.
156. ACS National Meeting, New Orleans, LA, August 22, 1999.
157. Cal State Fullerton, Department of Chemistry & Biochemistry, September 9, 1999.
158. Lincei Meeting, Rome, Italy, September 15, 1999.
159. Ohio State Fall Seminar Series, Ohio University, Biochemistry Dept., September 28, 1999.

160. Drug Abuse Sciences, Inc., Scientific Advisory Meeting (SAB), October 20, 1999.
161. Inter. Sym. on Molec. Library Technologies at the Millennium, San Francisco, CA, October 24, 1999.
162. The Role of Natural Products in Drug Discovery, Berlin, Germany, November 2, 1999.
163. Comb. Catalysis & Catalyst Opt. (CombiCat 99 Conf.) Philadelphia, PA, November 17, 1999.
164. Frontiers in Bioorganic Chemistry 2000, Taipei, Taiwan, November 29, 1999.
165. Engineered Catalysis Conference (CHI), New Orleans, LA, December 9, 1999.
166. Knowledge Foundation's Comb. Approaches to New Mat. Disc., San Diego, CA, January 23, 2000.
167. Frontiers in Biomedical Research Symposium, Palm Springs, CA, February 14, 2000.
168. Drug Abuse Sciences, Menlo Park, CA, SAB Meeting, February 17, 2000.
169. Bob Bates Retirement Symposium, Univ. of Arizona, Tucson, AZ, April 15, 2000.
170. Drug Abuse Sciences, Menlo Park, CA, SAB Meeting, April 19, 2000.
171. Aventis, Bridgewater, NJ, April 27 - 30, 2000.
172. Yale University, New Haven, CT, May 5, 2000.
173. Pennie & Edmonds, New York, May 17, 2000.
174. CSC 2000 Symposia "Solids & Separation Science in Synthesis", Canada, May 28, 2000.
175. University of Kansas, National Medicinal Symposium, June 13, 2000.
176. Kimball Union Academy, Gordon Conference, July 9-14, 2000.
177. University of Nottingham, London, England, July 11-13, 2000.
178. 2000 Gordon Research Conference on Green Chemistry, Connecticut, July 15-20, 2000.
179. UCSD 3<sup>rd</sup> Annual Combinatorial Chemistry Symposium, July 21, 2000.
180. University of Oklahoma, October 26, 2000.
181. PacificChem 2000, Hawaii, December 14-19, 2000.
182. Cheemspeed, Basel, Switzerland, January 18, 2001.
183. Combinatorial Approaches for New Materials Discovery, January 28-30, 2001.
184. 4<sup>th</sup> Winter Conference on Medicinal and Bio, Steamboat Springs, CO, January 29-February 2, 2001.
185. Frontiers in Biomedical Research Symposium, Palm Springs, CA, February 14, 2001.
186. University of Alabama, Huntsville, AL, March 16, 2001.
187. University of North Carolina, Charlotte, NC, March 19, 2001.
188. 221<sup>st</sup> ACS National Meeting, San Diego, CA, April 1-5, 2001.
189. Wyeth Ayerst, Pearl River site, Newark, NJ, April 9, 2001.
190. Wyeth Ayerst, Princeton, NJ, April 10, 2001.
191. CRP 1<sup>st</sup> Research Symposium, Sacramento, CA, April 19, 2001.
192. 12<sup>th</sup> Conference on Combinatorial Chemistry, Osaka, Japan, April 24, 2001.
193. Fujisawa Company, Osaka, Japan, April 25, 2001.
194. Takeda Pharmaceutical Company, Osaka, Japan, April 26, 2001.
195. Yale Chemical Biology Symposium, New Haven, CT, May 25, 2001.
196. ArQule, Woburn, MA, June 28, 2001.
197. Aventis, Bridgewater, NJ, November 13, 2001.
198. U.C.L.A., School of Medicine, Pharmacology Seminar, Los Angeles, CA, November 14, 2001.
199. TSRI Faculty Lecture Series, La Jolla, CA, January 16, 2002.

200. University of Minnesota Medicinal Chemistry, College of Pharmacy, Minneapolis, MN, April 2, 2002.
201. Carleton University, 32<sup>nd</sup> Spring Synthesis Symposium, Ottawa, Canada, May 7, 2002.
202. 28<sup>th</sup> National Medicinal Chemistry Symposium, Session Chair, San Diego, CA, June 7, 2002.
203. Polymers and Organic Chemistry Conference 2002, Session Chair, San Diego, CA, July 14-18, 2002.
204. University of Hawaii, HI, August 23, 2002.
205. Shire BioChem Lecture, Universite de Montreal, Montreal, Canada, September 10-11, 2002.
206. Rayson Huang Visiting Lecturer, University of Hong Kong, Hong Kong, China, Sep 30-Oct. 4, 2002.
207. Lecture to Faculty, University Wisconsin Milwaukee (UWM), Milwaukee, WI, October 17, 2002.
208. Milwaukee Section ACS / Marquette Dept. of Chem. Faculty, Milwaukee, WI, October 18, 2002.
209. Viikki Biocenter Lecture, Viikki Drug Discovery Tech. Center, Helsinki, Finland, November 11, 2002.
210. Finnish Chemical Congress, Drug Discovery Session, Helsinki, Finland, November 12, 2002.
211. Dept. of Pharmacy, Viikki Drug Discovery Tech. Center, Helsinki, Finland, November 13, 2002.
212. 23<sup>rd</sup> Graduate Student Symposium, Keynote Speaker, Univ. of Michigan, Detroit, MI, March 29, 2003.
213. Graduate Student Org., Invited Speaker, Univ. of North Carolina, Chapel Hill, NC, April 4, 2003.
214. Dept. of Chemistry, Biomolecular Student Seminar, University of Emory, Atlanta, GA, April 14, 2003.
215. Dept. of Chem., Chem. Society Symp. on Combi. Chem., Univ. of Basel, Switzerland, Sept. 12, 2003.
216. Dept. of Chem. & Biochem., Seminaire hors-ville, Univ. of Bern, Switzerland, Sept. 15-17, 2003.
217. BIOPHEX Conference on Cancer & Addiction, San Jose, CA, September 23, 2003.
218. Royal Netherlands Academy of Arts & Sciences, Amsterdam, November 17-19, 2003.
219. Dept. of Metal-Mediated Synthesis, Utrecht University, Utrecht, Netherlands, November 20, 2003.
220. Dept. of Chemistry, Univ. of Texas at San Antonio, San Antonio, Texas, December 1, 2003.
221. Cambridge Healthtech Institute Conference, Keynote Speaker, La Jolla, CA, February 23, 2004.
222. Prolexys Pharmaceuticals, Salt Lake City, UT, May 20, 2004.
223. Botulinum Neurotoxins & Ricin DMID NIAID Investigators Meeting, Bethesda, MD, October 25, 2004.
224. Interagency Botulism Research Coordinating Committee, Baltimore, WA, October 27, 2004.
226. Dept. of Chemistry, Univ. of Hong Kong, Hong Kong, China, December 20, 2004.

227. Dept. of Biomedical Science, Tufts Univ. School of Veterinary Medicine, N. Grafton, MA, March 1, 2005.
228. Alcohol Research Council, Directors Meeting, Plenary Lecturer, La Jolla, CA, March 15, 2005.
229. Sanofi-Aventis Pharmaceuticals, Bridgewater, NJ, April 20, 2005.
230. Hoffmann La-Roche, Inc., Nutley, NJ, April 21, 2005.
231. Dept. of Medicinal Chemistry, University of Minnesota, Minneapolis, MN, May 4, 2005.
232. Abbott Laboratories, Abbott Park, IL, July 14, 2005.
233. University of Glasgow, Organon Lecturer, Glasgow, United Kingdom, September 1, 2005.
234. Organon Labs, Motherwell, United Kingdom, September 2, 2005.
235. Dept. of Chemistry, University of Rochester, Rochester, New York, September 21, 2005.
236. National Institute of Health, Bethesda, MD, October 7, 2005.
237. Eisai Co., LLD, Tokyo, Japan, October 17, 2005.
238. Chugai-Roche Pharmaceutical Co., Ltd., Kajiwara, Kamakura-city, Japan, October 18, 2005.
239. Osaka University, Human Life Science Forum, Osaka, Japan, October 19, 2005.
240. Shionogi Pharmaceutical Co., Osaka-city, Japan, October 20, 2005.
241. 2<sup>nd</sup> Annual Immune Epitope Database & Discovery Workshop, Bethesda, Maryland, November 3, 2005.
242. McGill University, Dept. of Chemistry, Montreal, Quebec, Canada, November 8, 2005.
243. Merck Frosst Centre for Therapeutic Res., Montreal, Quebec, Canada, November 9, 2005.
244. Plenary Lecture, Singapore Intl. Chemical Conference, Singapore, December 8, 2005.
245. Chair of 2 meetings, Pacificchem 2005, Oahu, Hawaii, December 15-19, 2005.
246. 2<sup>nd</sup> Botulism Small Molecule Drug Discovery Meeting, Boston, MA, March 15, 2006.
247. Alnylam Pharmaceuticals Lecture, Cambridge, MA, March 16, 2006.
248. Homeland Security Meeting, Frederick, Maryland, March 17, 2006.
249. EISAI London Research Labs, LTD, London, UK, May 30, 2006.
250. Army Medical Research Inst. Of Chem. Defense, Hunt Valley, MD, June 7, 2006.
251. Antibody Engineering Conference, Kagoshima, Japan, June 16, 2006.
252. 9<sup>th</sup> Annual Medchem / Combichem Symposium, San Diego, California, July 21, 2006.
253. Korea Institute for Chemical Technology Symposium, Seoul, Korea, August 25, 2006.
254. Amylin Pharmaceuticals, Inc. San Diego, California, September 29, 2006.
255. Pathogenesis Affinity Group Retreat, Rancho Santa Fe, California, October 11, 2006.
256. Institute of Molecular & Cell Biology, Proteos, Singapore, October 25, 2006.
257. Institute of Bioengineering & Nanotechnology, The Nanos, Singapore, October 26, 2006.
258. The National University of Singapore, Singapore, October 27, 2006.
259. XVth Inter American Conf. on Onchocerciasis, Antigua, Guatemala, November 8, 2006.
260. Botulism Therapy, USAMRIID, Fort Detrich, Maryland, January 12, 2007.
261. Substance Abuse Continuing Education Lecture, California Bar Assoc., January 24, 2007.
262. University of Illinois at Urbana-Champaign, Champaign, Illinois, March 15, 2007.
263. Merck & Co., Inc. Medicinal Chemistry Seminar, Rahway, New Jersey, April 18, 2007.
264. 3<sup>rd</sup> Botulism Small Molecule Drug Development Coordination Meeting, Tufts Cummings School of Veterinary Medicine, Boston, Massachusetts, May 5, 2007.
265. Los Alamos National Laboratories, Bioscience Seminar Speaker, Los Alamos, New Mexico, May 31, 2007.
266. Expert Panel for Ministry of Education, Singapore, June 25-26, 2007.

267. Merial Limited, Duluth, Georgia, July 20, 2007.
268. GlaxoSmithLine Biologicals, Brussels, Belgium, August 20, 2007.
269. Strategies for Engineered Negligible Senescence (SENS) Conference, Queens College, Cambridge England, September 7, 2007.
270. BioJapan 2007 World Business Forum, Yokohama, Japan, September 21, 2007.
271. 57<sup>TH</sup> Annual Obesity & Associated Conditions Symposium, Las Vegas, Nevada, September 29, 2007.
272. TRDRP Biennial Conference on Nicotine Vaccines, Sacramento, Calif., October 9, 2007.
273. University of Nebraska, Colloquia Speaker, Lincoln, Nebraska, October 12, 2007.
274. Interagency Botulism Research Coordinating Committee (IBRCC) Meeting, Monterey, California, October 15, 2007.
275. Immune Epitope Database and Discovery Contracts Annual Meeting, La Jolla, California, November 15, 2007.
276. The Chinese University of Hong Kong, Hong Kong, China, April 22, 2008.
277. The City University of Hong Kong, Hong Kong, China, April 23, 2008.
278. The University of Hong Kong, Colloquium Lecture, Hong Kong, China, April 24, 2008.
279. Public Lecture (High School Students), Hong Kong, China, April 25, 2008.
280. The 15<sup>th</sup> Symposium of Chemistry, Keynote Lecture, Hong Kong, China, April 26, 2008.
281. 4<sup>th</sup> Botulism Small Molecule Drug development Coordination Meeting, Tufts University, North Grafton, Massachusetts, May 5, 2008.
282. Pfizer joint Scientific Meeting, Sandwich, England. May 23, 2008.
283. Toxins 2008 Conference, Baveno, Lake Maggiore, Italy, June 13, 2008.
284. Waseda University Department of Chemistry, Tokyo, Japan, July 3, 2008.
285. Mitsubishi-Tanabe, Tokyo, Japan, July 3, 2008.
286. "Practical Chemical Wisdom" Intl. Symposium, Waseda Univ., Tokyo, Japan, July 4, 2008.
287. Scripps Japan Olympic Year Symposium, Waseda Univ., Tokyo, Japan, July 5, 2008.
288. ACS DOC Symposium on Combinatorial Catalysis and Screening, Philadelphia, Pennsylvania, August 20, 2008.
289. 3<sup>rd</sup> International Conference on Paraoxonases, UCLA, Los Angeles, California, September 9, 2008.
290. Interagency Botulism Research Coordinating Committee (IBRCC), Philadelphia, Pennsylvania, September 17, 2008.
291. IBC's 19<sup>th</sup> Annual Antibody Engineering and Immunotherapeutics Conference, San Diego, California, December 10, 2008.
292. NIH National Cancer Institute, Bethesda, Maryland, January 5, 2009.
293. Frontiers in Biomedical Research Symposium, Indian Wells, California, February 17, 2009.
294. 7<sup>th</sup> ASM Bio-defense and Emerging Diseases Research Meeting, Baltimore, Maryland, February 24, 2009.
295. Immune Epitope Database and Discovery Contracts Annual Meeting, Silver Spring, Maryland, March 10, 2009.
296. Analytical Methods for Distributed Detection Networks Conference, Univ. of Texas, Austin, Texas, March 16, 2009.
297. New York University, New York, New York, March 30, 2009.
298. Frontiers in Science Lecture, California State University, Fullerton, April 15, 2009.
299. 17<sup>th</sup> Annual MSGSA Symposium, Calgary, Alberta – Canada, May 7, 2009.
300. University of Utah, College of Pharmacy, Salt lake City, Utah, May 21, 2009.

301. 10<sup>th</sup> Tetrahedron Symposium/Tetrahedron Letters 50<sup>th</sup> Anniversary, Paris, France, June 25, 2009.
302. Ben-Gurion University of the Negev, Be'er Sheva, Israel, June 30, 2009.
303. Eli Lilly Distinguished Lecturer for 2009, Organic Division at Colorado State University, Fort Collins, Colorado, July 30-31, 2009.
304. Session Chair for Division of Inorganic Chemistry, 238<sup>th</sup> ACS National Meeting, Washington, D.C., August 18, 2009.
305. American Chemical Society 238<sup>th</sup> National Meeting Lecture, Washington, D.C., August 18, 2009.
306. New England Biolabs, Ipswich, Massachusetts, September 24, 2009.
307. The Interagency Botulism Research Coordinating Committee (IBRCC) 46<sup>th</sup> Annual Meeting, Alexandria, Virginia, October 20, 2009.
308. University of South Carolina, Columbia, South Carolina, November 9, 2009.
309. Medical University of South Carolina, Charleston, South Carolina, November 10, 2009.
310. 48<sup>th</sup> Annual Meeting of American College of Neuropsychopharmacology, Hollywood, Florida, December 9, 2009.
311. University of Utah, Salt Lake City, Utah, February 8, 2010.
312. Scripps Florida, Palm Beach, Florida, April 14, 2010.
313. 2010 Harold A. Iddles Lecturer, University of New Hampshire, Durham, New Hampshire, April 27, 2010.
314. Colorado State University, Dept. of Chemistry, Fort Collins, Colorado, August 5, 2010.
315. Novartis Vaccines & Diagnostics Research Center, Siena, Italy, September 2, 2010.
316. Case Western Reserve University, Cleveland, Ohio, September 16, 2010.
317. University of Kansas, Dept. of Medicinal Chemistry, Lawrence, Kansas, October 1, 2010.
318. University of Nebraska, Dept. of Pathology/Microbiology, McFadden Lecturer, Omaha, Nebraska, October 29, 2010.
319. 47<sup>th</sup> Annual Interagency Botulism research Coordinating Committee Meeting, Atlanta, Georgia, November 3, 2010.
320. PacificChem 2010 Conference, Honolulu, Hawaii, December 15, 2010.
321. Sanford Center, Sioux Falls, South Dakota, February 9, 2011.
322. Ohio State Biochemistry Program, Columbus, Ohio, March 8, 2011.
323. Colorado State University, Dept. of Chemistry, Fort Collins, Colorado, August 4, 2011.
324. CONNECT Event, AMN Healthcare, San Diego, California, November 22, 2011.
325. Academia Sinica, Taipei, Taiwan, December 13, 2011.
326. St. Jude Children's Research Hospital, Memphis, Tennessee, January 12, 2012.
327. Bayer Pharma AG, Berlin, Germany, January 18, 2012.
328. Pfizer, Cambridge, Massachusetts, January 31, 2012.
329. University of Texas Medical Branch, Sealy Center for Vaccine Development, Cancer Center, Center for Addiction Research and Mitchell Center for Neurodegenerative Diseases, Galveston, Texas, February 8, 2012.
330. New York Academy of Sciences, New York, New York, February 9, 2012.

## **Bibliography:**

1. Bates, R.B., Janda, K.D. High-yield benzyne synthesis of diaryl ethers, *J. Org. Chem.* **47**, 4374 (1982).
2. Janda, K.D., McConnell, W.W., Nelson, G.O., Wright, M.E. Preparation and reactivity of the new cyclopentadienyl-bridged complex (Me<sub>2</sub>SiCH<sub>2</sub>CH<sub>2</sub>SiMe<sub>2</sub>) (C<sub>5</sub>H<sub>4</sub>Fe(CO)<sub>2</sub>)<sub>2</sub>, *J. Organomet. Chem.* **259**, 139 (1983).
3. Bates, R.B., Gin, S.L., Hassen, M.A., Hruby, V.J., Janda, K.D., Kriek, G.R., Michaud, J.-P., Vine, D.B. Synthesis of Cyclo-N-Methyl-L-Tyr-N-Methyl-L-Tyr-D-Ala-L-Ala-O,N-Dimethyl-L-Tyr-L-Ala, a cyclic hexapeptide related to the anti-tumor agent deoxybouvardin, *Heterocycles* **22**, 785 (1984).
4. Bates, R.B., Fletcher, F.A., Janda, K.D., Miller, W.A. A convenient synthesis of unsymmetrical acyclic imides, *J. Org. Chem.* **49**, 3038 (1984).
5. Bates, R.B., Janda, K.D. A convenient synthesis of  $\alpha$ -acyl amino alcohols from azlactones, *Synthesis* **4**, 310 (1984).
6. Bates, R.B., Janda, K.D., Wright, M.E. N-Isobutyrylbenzamide, C<sub>11</sub>H<sub>13</sub>NO<sub>2</sub>, *Acta. Cryst.* **C41**, 263 (1985).
7. Tramontano, A., Janda, K.D., Lerner, R.A. Chemical reactivity at an antibody binding site elicited by mechanistic design of a synthetic antigen, *Proc. Natl. Acad. Sci. USA* **83**, 6736 (1986).
8. Tramontano, A., Janda, K.D., Lerner, R.A. Catalytic antibodies, *Science* **234**, 1566 (1986).
9. Tramontano, A., Janda, K.D., Napper, A.D., Benkovic, S.J., Lerner, R.A. Catalytic antibodies, Cold Spring Harbor Symp., *Quant. Biol.* **52**, 91 (1987).
10. Janda, K.D., Lerner, R.A., Tramontano, A. Antibody catalysis of bimolecular amide formation, *J. Am. Chem. Soc.* **110**, 4835 (1988).
11. Janda, K.D., Schloeder, D., Benkovic, S.J., Lerner, R.A. Induction of an antibody that catalyzes the hydrolysis of an amide bond, *Science* **241**, 1188 (1988).
12. Sastry, L., Alting-Mees, M., Huse, W.D., Short, J.M., Sorge, J.A., Hay, B.N., Janda, K.D., Benkovic, S.J., Lerner, R.A. Cloning of the immunological repertoire in *E. coli* for generation of monoclonal catalytic antibodies: Construction of a heavy chain variable region-specific cDNA library, *Proc. Natl. Acad. Sci. USA* **86**, 5728 (1989).
13. Janda, K.D., Benkovic, S.J., Lerner, R.A. Catalytic antibodies with lipase activity and *R* and *S* substrate selectivity, *Science* **244**, 437 (1989).

14. Janda, K.D., Weinhouse, M.I., Schloeder, D.M., Lerner, R.A. Bait and switch strategy for obtaining catalytic antibodies with acyl-transfer capabilities, *J. Am. Chem. Soc.* **112**, 1274 (1990).
15. Janda, K.D., Ashley, J.A. Syntheses of the saturated analogues of 4-nitrophenol and 4-nitroaniline, *Synth. Commun.* **20**, 1073 (1990).
16. Janda, K.D. New strategies for the design of catalytic antibodies, *Biotechnol. Prog.* **6**, 178 (1990).
17. Benkovic, S.J., Adams, J.A., Borders, C.L. Jr., Janda, K.D., Lerner, R.A. The enzymic nature of antibody catalysis: Development of multistep kinetic processing, *Science* **250**, 1135 (1990).
18. Janda, K.D., Ashley, J.A., Jones, T.M., McLeod, D.A., Schloeder, D.M., Weinhouse, M.I. Immobilized catalytic antibodies in aqueous and organic solvents, *J. Am. Chem. Soc.* **112**, 8886 (1990).
19. Janda, K.D., Ashley, J.A., Jones, T.M., McLeod, D.A., Schloeder, D.M., Weinhouse, M.I., Lerner, R.A., Gibbs, R.A., Benkovic, P.A., Hilhorst, R., Benkovic, S.J. Catalytic antibodies with acyl-transfer capabilities: Mechanistic and kinetic investigations, *J. Am. Chem. Soc.* **113**, 291 (1991).
20. Janda, K.D., Benkovic, S.J., McLeod, D.A., Schloeder, D.M., Lerner, R.A. Substrate attenuation: An approach to improve antibody catalysis, *Tetrahedron* **47**, 2503 (1991).
21. Janda, K. Opportunities in organic synthesis for catalytic antibodies, *Proceedings of 15<sup>th</sup> ABC Symposium: Kyoto, Japan* **3**, 63 (1991).
22. Wirsching, P., Ashley, J.A., Benkovic, S.J., Janda, K.D., Lerner, R.A. An unexpectedly efficient catalytic antibody operating by ping-pong and induced fit mechanisms, *Science* **252**, 680 (1991).
23. Chen, Y.-C.J., Hansske, F., Janda, K.D., Robbins, M.J. Nucleic acid related compounds. 64. Synthesis of 2',3'-diazido-2',3'-dideoxyadenosine and 2',3'-diamino-2',3'-dideoxyadenosine from 9-( $\beta$ -D-Arabinofuranosyl) adenine, *J. Org. Chem.* **56**, 3410 (1991).
24. Kang, A.S., Barbas, C.F., Janda, K.D., Benkovic, S.J., Lerner, R.A. Linkage of recognition and replication functions by assembling combinatorial antibody Fab libraries along phage surfaces, *Proc. Natl. Acad. Sci. USA* **88**, 4363 (1991).
25. Janda, K.D., Weinhouse, M.I., Danon, T., Pacelli, K.A., Schloeder, D.M. Antibody bait and switch catalysis: A survey of antigens capable of inducing abzymes with acyl-transfer properties, *J. Am. Chem. Soc.* **113**, 5427 (1991).
26. Ikeda, S., Weinhouse, M.I., Janda, K.D., Lerner, R.A., Danishefsky, S.J. Asymmetric induction via a catalytic antibody, *J. Am. Chem. Soc.* **113**, 7763 (1991).

27. Fujii, I., Lerner, R.A., Janda, K.D. Enantiofacial protonation by catalytic antibodies, *J. Am. Chem. Soc.* **113**, 8528 (1991).
28. Harada, A., Janda, K.D., Lerner, R.A. Abzymes to enzymes, *Kagaku to Kogyo* (Japan) **44**, 1108 (1991).
29. Reymond, J.-L., Janda, K.D., Lerner, R.A. Antibody catalysis of glycosidic bond hydrolysis, *Angew. Chem. Int. Ed. Engl.* **30**, 1711 (1991).
30. Hein, M.B., Tang, Y., McLeod, D.A., Janda, K.D., Hiatt, A. Evaluation of immunoglobulins from plant cells, *Biotechnol. Prog.* **7**, 455 (1991).
31. McLeod, D.A., Brinkworth, R.I., Ashley, J.A., Janda, K.D., Wirsching, P. Phosphoramidates and phosphoramidate esters as HIV-1 protease inhibitors, *Bioorg. Med. Chem. Lett.* **1**, 653 (1991).
32. Benkovic, S.J., Adams, J., Janda, K.D., Lerner, R.A. A catalytic antibody uses a multistep kinetic sequence, *Ciba Foundation Symposium* **159**, 9 (1991).
33. Sastry, L., Mubarak, M., Janda, K.D., Benkovic, S.J., Lerner, R.A. Screening combinatorial antibody libraries for catalytic acyl transfer reactions, *Ciba Foundation Symposium* **159**, 145 (1991).
34. Chen, Y.-C.J., Janda, K.D. A new approach toward the inhibition of ribonucleases: A water stable ribonucleoside-technetium chelate, *J. Am. Chem. Soc.* **114**, 1488 (1992).
35. Reymond, J.-L., Janda, K.D., Lerner, R.A. Highly enantioselective protonation catalyzed by an antibody, *J. Am. Chem. Soc.* **114**, 2257 (1992).
36. Ikeda, S., Ashley, J.A., Wirsching, P., Janda, K.D.  $\psi$  [PO<sub>2</sub>CH<sub>2</sub>N<sup>+</sup>] A new amide bond replacement: Potent, slow-binding inhibition of the HIV-Protease, *J. Am. Chem. Soc.* **114**, 7604 (1992).
37. Ashley, J.A., Janda, K.D. Antibody catalysis in low water content media, *J. Org. Chem.* **57**, 6691 (1992).
38. Fernholz, E., Schloeder, D., Liu, K.-K.C., Bradshaw, C.W., Huang, H., Janda, K.D., Lerner, R.A., Wong, C.-H. Specificity of antibody-catalyzed transesterifications using enol esters: A comparison with lipase reactions, *J. Org. Chem.* **57**, 4756 (1992).
39. Gibbs, R.A., Benkovic, P.A., Janda, K.D., Lerner, R.A., Benkovic, S.J. Substituent effects on an antibody-catalyzed hydrolysis of phenyl esters; further evidence for an acyl intermediate, *J. Am. Chem. Soc.* **114**, 3528 (1992).
40. Weinhouse, M.I., Janda, K.D. A new methodology for the preparation of vinyl esters, *Synthesis* **1**, 81 (1993).

41. Janda, K.D., Shevlin, C.G., Lerner, R.A. Antibody catalysis of a disfavored chemical transformation, *Science* **259**, 490 (1993).
42. Chen, Y.-C.J., Danon, T., Sastry, L., Mubarak, M., Janda, K.D., Lerner, R.A. Catalytic antibodies from combinatorial libraries, *J. Am. Chem. Soc.* **115**, 357 (1993).
43. Ikeda, S., Janda, K.D. Recent development on the research of catalytic antibodies and their applications, *J. Synth. Org. Chem.*, (Japan) **51**, 284 (1993).
44. Janda, K.D. Book Review on "Studies in Organic Chemistry. 46. Biocatalysts in Organic Synthesis" by J. Halgas, pub: Elsevier (1992) *J. Am. Chem. Soc.* **115**, 8888 (1993).
45. Ashley, J.A., Lo, C.-H.L., McElhaney, G., Wirsching, P., Janda, K.D. A catalytic antibody model for PLP-dependent decarboxylases, *J. Am. Chem. Soc.* **115**, 2515 (1993).
46. Wade, W.S., Ashley, J.A., Jahangiri, G.K., McElhaney, G., Janda, K.D., Lerner, R.A. A highly specific metal-activated catalytic antibody, *J. Am. Chem. Soc.* **115**, 4906 (1993).
47. Na, J., Houk, K.N., Shevlin, C.G., Janda, K.D., Lerner, R.A. The energetic advantage of 5-*exo* versus 6-*endo* epoxide openings: A preference overwhelmed by antibody catalysis, *J. Am. Chem. Soc.* **115**, 8453 (1993).
48. Nielsen, J., Brenner, S., Janda, K.D. Synthetic methods for the implementation of encoded combinatorial chemistry, *J. Am. Chem. Soc.* **115**, 9812 (1993).
49. Janda, K.D. Catalytic antibodies: The rerouting of chemical reactions, *Biochem. Soc. Trans.* **21**, 1090 (1993).
50. Gouverneur, V.E., Houk, K.N., de Pascual-Teresa, B., Beno, B., Janda, K.D., Lerner, R.A. Control of the *exo* and *endo* pathways of the Diels-Alder reaction by antibody catalysis, *Science* **262**, 204 (1993).
51. Janda, K.D., Chen, Y.-C.J. "Chemical and Biological Approaches to Catalytic Antibodies" In: *Handbook of Experimental Pharmacology : The Pharmacology of Monoclonal Antibodies*, eds. M. Rosenberg and G. Moore, Vol. 113 pp. 209-241 (1994).
52. Shevlin, C.G., Hilton, S., Janda, K.D. Automation of antibody catalysis: A practical methodology for the use of catalytic antibodies in organic synthesis, *Bioorg. Med. Chem. Lett.* **4**, 297 (1994).
53. Janda, K.D., Lo, C.-H.L., Li, T., Barbas III, C.F., Wirsching, P., Lerner, R.A. Direct selection for a catalytic mechanism from combinatorial antibody libraries, *Proc. Natl. Acad. Sci. USA* **91**, 2532 (1994).
54. Nielsen, J., Janda, K.D. Toward chemical implementation of encoded combinatorial libraries, *Methods* **6**, 361 (1994).

55. Yli-Kauhaluoma, J., Janda, K.D. Twisted  $\alpha$ -keto amides as transition-state analogues for acyl-transfer reactions: Synthesis of the immunoconjugates, *Bioorg. Med. Chem.* **2**, 521 (1994).
56. Li, T., Janda, K.D., Ashley, J.A., Lerner, R.A. Antibody catalyzed cationic cyclization, *Science* **264**, 1289 (1994).
57. Yli-Kauhaluoma, J., Janda, K.D. An expedient synthesis of isopropyl anisoles and veratroles, *Tetrahedron Letters* **35**, 4509 (1994).
58. Cravatt, B.F., Ashley, J.A., Janda, K.D., Boger, D.L., Lerner, R.A. Crossing extreme mechanistic barriers by antibody catalysis: Syn elimination to a cis olefin, *J. Am. Chem. Soc.* **116**, 6013 (1994).
59. Janda, K.D. Catalytic antibodies and enzyme inhibitors, *Pure & Appl. Chem.* **66**, 703 (1994).
60. Erb, E., Janda, K.D., Brenner, S. Recursive deconvolution of combinatorial chemical libraries, *Proc. Natl. Acad. Sci. USA* **91**, 11422 (1994).
61. Janda, K.D. Tagged versus untagged libraries: Methods for the generation and screening of combinatorial libraries, *Proc. Natl. Acad. Sci. USA* **91**, 10779 (1994).
62. Li, T., Hilton, S., Janda, K.D. The potential application of catalytic antibodies to protecting group removal: Catalytic antibodies with broad substrate tolerance, *J. Am. Chem. Soc.* **117**, 2123 (1995).
63. Fenniri, H., Janda, K.D., Lerner, R.A. Encoded reaction cassette for the highly sensitive detection of the making and breaking of chemical bonds, *Proc. Natl. Acad. Sci. USA* **92**, 2278 (1995).
64. Li, T., Janda, K.D., Hilton, S., Lerner, R.A. An antibody-catalyzed nucleophilic substitution reaction at a primary carbon that appears to proceed by an ionization mechanism, *J. Am. Chem. Soc.* **117**, 2367 (1995).
65. Janda, K.D., Shevlin, C.G., Lerner, R.A. Oxepane synthesis along a disfavored pathway: The rerouting of a chemical reaction using a catalytic antibody, *J. Am. Chem. Soc.* **117**, 2659 (1995).
66. Li, T., Hilton, S., Janda, K.D. Remarkable ability of different antibody catalysts to control and diversify the product outcome of cationic cyclization reactions, *J. Am. Chem. Soc.* **117**, 3308 (1995).
67. Janda, K.D. Drug discovery and delivery: Exploiting biological diversity, libraries and mutations for research and drug development, *Molecular Medicine Today* **1**, 4 (1995).
68. Han, H., Wolfe, M.M., Brenner, S., Janda, K.D. Liquid-phase combinatorial synthesis, *Proc. Natl. Acad. Sci. USA* **92**, 6419 (1995).

69. Yli-Kauhaluoma, J.T., Ashley, J.A., Lo, C.-H., Tucker, L., Wolfe, M.M., Janda, K.D. Anti-metallocene antibodies: A new approach to enantioselective catalysis of the Diels-Alder reaction, *J. Am. Chem. Soc.* **117**, 7041 (1995).
70. Lavey, B.J., Janda, K.D. "Applying Antibody Catalysis to Organic Synthesis", In: *Antibody Expression and Engineering*, ACS Symposium Series 604, eds., H.Y. Wang, T. Imanaka, Chapter 10, p.123 (1995).
71. Li, T., Janda, K.D. Synthesis of a bifunctional hapten designed to mimic both transition state and to induce "bait and switch" catalysis, *Bio. Med. Chem. Lett.* **5**, 2001 (1995).
72. Rosenblum, J.S., Lo, L.-C., Li, T., Janda, K.D., Lerner, R.A. Antibody catalyzed phosphate triester hydrolysis, *Angew. Chem. Int. Ed. Engl.* **34**, 2275 (1995).
73. Lerner, R.A., Janda, K.D. "Catalytic Antibodies: Evolution of Protein Function in Real Time" In: *Interface Between Chemistry and Biology*, eds., P. Jollés and H. Jörnvall, Verlag, Berlin, p.121 (1995).
74. Wirsching, P., Ashley, J.A., Lo, C.-H.L., Janda, K.D., Lerner, R.A. Reactive immunization, *Science* **270**, 1775 (1995).
75. Carrera, M.R.A., Ashley, J.A., Parsons, L.H., Wirsching, P., Koob, G.F., Janda, K.D. Suppression of psychoactive effects of cocaine by active immunization, *Nature* **378**, 727 (1995).
76. Li, T., Janda, K.D., Lerner, R.A. Cationic cyclopropanation by antibody catalysis, *Nature* **379**, 326 (1996).
77. Han, H., Janda, K.D. Azatides: Solution and liquid phase syntheses of a new peptidomimetic, *J. Am. Chem. Soc.* **118**, 2539 (1996).
78. Gravert, D.J., Janda, K.D. Developing small molecule libraries for drug discovery, *Trends in Biotechnology (TIBTECH)* **14**, 110 (1996).
79. Sakurai, M., Wirsching, P., Janda, K.D. Synthesis of a nucleoside hapten with a [P(O)-O-N] linkage to elicit catalytic antibodies with phosphodiesterase activity, *Bioorg. Med. Chem. Lett.* **6**, 1055 (1996).
80. Yli-Kauhaluoma, J.T., Ashley, J.A., Lo, C.-H.L., Coakley, J., Wirsching, P., Janda, K.D. Catalytic antibodies with peptidyl-prolyl cis-trans isomerase activity, *J. Am. Chem. Soc.* **118**, 5496 (1996).
81. Gravert, D.J., Janda, K.D. "Liquid-Phase Combinatorial Synthesis" In: *Molecular Diversity and Combinatorial Chemistry: Libraries and Drug Discovery*, eds., I.M. Chaiken and K.D. Janda, A.C.S. Conference Proceedings, Chapter 11, p. 118 (1996).

82. Janda, K.D., Han, H. "Combinatorial Chemistry: A Liquid-Phase Approach", In: *Methods in Enzymology*, eds., J.N. Abelson, Academic Press, San Diego/London, Vol. 267, p. 234 (1996).
83. Han, H., Janda, K.D. Soluble polymer-bound ligand-accelerated catalysis: Asymmetric dihydroxylation, *J. Am. Chem. Soc.* **118**, 7632 (1996).
84. Lavey, B.J., Janda, K.D. Antibody catalyzed hydrolysis of a phosphotriester, *Bioorg. Med. Chem. Lett.* **6**, 1523 (1996).
85. Yli-Kauhala, J.T., Janda, K.D. Catalytic antibodies: The rerouting of chemical reactions towards electrophilic aromatic substitution by carbon dioxide, *N.Y. Academy of Sciences* **799**, 26 (1996).
86. Jung, K.W., Zhao, X.-Y., Janda, K.D. A linker that allows efficient formation of aliphatic C-H bonds on polymeric supports, *Tetrahedron Letters* **37**, 6491 (1996).
87. Lo, L.-C., Lo, C.-H.L., Kassel, D.B., Raushel, F.M., Janda, K.D. A versatile mechanism based reaction probe for the direct selection of biocatalysis, *Bioorg. & Med. Chem. Lett.* **6**, 2117 (1996).
88. Jung, K.W., Sanfilippo, P.J., Wachter, M., Janda, K.D. Syntheses and biological evaluation of two new naproxen analogs, *Bioorg. Med. Chem. Lett.* **6**, 2281 (1996).
89. Han, H., Yoon, J., Janda, K.D. "Azatides: Solution and Liquid phase Syntheses", In: *Peptidomimetics*, Methods in Molecular Biology series, Humana Press, Inc., eds. W.M. Kazmierski (1996).
90. Janda, K.D., Shevlin, C.G., Lo, C.-H.L., "Catalytic Antibodies: Chemical and Biological Approaches" In: *Comprehensive Supramolecular Chemistry*, eds., J.M. Lehn, J.C. Atwood, J.E.D. Davies, D.D. MacNicol, F. Vogtle, Pergamon, UK, USA, Vol. 4, p. 43 (1996).
91. Sakurai, M., Wirsching, P., Janda, K.D. Design and synthesis of a cocaine-diamide hapten for vaccine development, *Tetrahedron Letters* **37**, 5479 (1996).
92. Wentworth, P. Jr., Janda, K.D. A facile and efficient route to 3',5'-diamino-3',5'-dideoxynucleosides, *Chem. Commun.* 2097 (1996).
93. Lavey, B.J., Janda, K.D. Catalytic antibody mediated hydrolysis of paraoxon, *J. Org. Chem.* **61**, 7633 (1996).
94. Vandersteen, A.M., Janda, K. D. A re-examination of two linear pentapeptides claimed to be serine protease mimics, *J. Am. Chem. Soc.* **118**, 8787 (1996).
95. Vandersteen, A.M., Han, H., Janda, K.D. Liquid phase combinatorial synthesis: In search of small-molecule enzyme mimics, *Molecular Diversity* **2**, 89 (1996).

96. Lo, C.-H.L., Gao, C., Mao, S., Matsui, K., Janda, K.D. Chain shuffling: Investigations into the specificity and selectivity of antibody catalysis, *Israel Journal of Chemistry* **36**, 195 (1996).
97. Hasserodt, J., Janda, K.D., Lerner, R.A. Antibody catalyzed terpenoid cyclization, *J. Am. Chem. Soc.* **118**, 11654 (1996).
98. Wentworth, P. Jr., Wiemann, T., Janda, K.D. A new class of pentacoordinate ribonuclease inhibitors: Synthesis, characterization and inhibition studies of ribonucleoside and anhydropentofuranose oxorhenium (V) complexes, *J. Am. Chem. Soc.* **118**, 12521 (1996).
99. Gravert, D.J., Janda, K.D. "Organic Reactions on Soluble Polymer Supports as an Alternative Methodology for Combinatorial Solid-Phase Synthesis", In: *Biotechnology International*, eds., T.H. Connor, and R.J. Hairi (1997).
100. Janda, K.D., Lo, L.-C., Lo, C.-H.L., Sim, M.-M., Wang, R., Wong, C.-H., Lerner, R.A. Chemical selection for catalysis in combinatorial antibody libraries, *Science* **275**, 945 (1997).
101. Zhao, X.-Y., Jung, K.W., Janda, K.D. Soluble polymer synthesis: An improved traceless linker methodology for aliphatic C-H bond formation, *Tetrahedron Letters* **38**, 977 (1997).
102. Li, T., Lerner, R.A., Janda, K.D. Antibody-catalyzed cationic reactions: The rerouting of chemical transformations via antibody catalysis, *Acc. Chem. Res.* **30**, 115 (1997).
103. Han, H., Janda, K.D. A soluble polymer-bound approach to the Sharpless catalytic asymmetric dihydroxylation (AD) reaction: Preparation and application of a [(DHQD)<sub>2</sub> PHAL-PEG-OMe] ligand, *Tetrahedron Letters* **38**, 1527 (1997).
104. Janda, K.D. Book Review on "Combinatorial Peptide and Nonpeptide Libraries. A Handbook" by G. Jung, pub: VCH (1996) *J. Amer. Chem. Soc.* **119**, 3848 (1997).
105. Wentworth, P. Jr., Vandersteen, A.M., Janda, K.D. Poly(ethylene glycol) (PEG) as a reagent support: The preparation and utility of PEG-triarylphosphine conjugate in liquid-phase organic synthesis (LPOS), *Chem. Commun.* 759 (1997).
106. Weiner, D.P., Wiemann, T., Wolfe, M.M., Wentworth, P. Jr., Janda, K.D. A pentacoordinate oxorhenium (V) metallochelate elicits antibody catalysts for phosphodiester cleavage, *J. Am. Chem. Soc.* **119**, 4088 (1997).
107. Jung, K.W., Zhao, X.-Y., Janda, K.D. Development of new linkers for the formation of aliphatic C-H bonds on polymeric supports, *Tetrahedron* **53**, 6645 (1997).
108. Gravert, D.J., Janda, K.D. Organic synthesis on soluble polymer supports: Liquid-phase methodologies, *Chemical Reviews* **97**, 489 (1997).

109. Wentworth, P. Jr., Janda, K.D. Synthesis of oxorhenium (V) and oxotechnetium (V) complexes as inhibitors of ribonucleases and for the generation of catalytic antibodies, *Synlett* **5**, 537 (1997).
110. Zhao, X.-Y., Janda, K.D. Syntheses of alkylated malonates on a traceless linker derived soluble polymer support, *Tetrahedron Letters* **38**, 5437 (1997).
111. Han, H., Janda, K.D. Multipolymer-supported substrate and ligand approach to the Sharpless asymmetric dihydroxylation, *Angew. Chem. Int. Ed.* **36**, 1731 (1997).
112. Hasserodt, J., Janda, K.D. Syntheses of octahydroquinoline-*N*-oxides: Haptens designed to elicit catalytic antibodies that control a terpenoid-like cascade cyclization, *Tetrahedron* **53**, 11237 (1997).
113. Hasserodt, J., Janda, K.D., Lerner, R.A. Formation of bridge-methylated decalins by antibody-catalyzed tandem cationic cyclization, *J. Am. Chem. Soc.* **119**, 5993 (1997).
114. Chen, S., Janda, K.D. Synthesis of prostaglandin E<sub>2</sub> methyl ester on a soluble-polymer support for the construction of prostanoid libraries, *J. Am. Chem. Soc.* **119**, 8724 (1997).
115. Lo, C.-H.L., Wentworth, P. Jr., Jung, K.W., Yoon, J., Ashley, J.A., Janda, K.D. Reactive immunization strategy generates antibodies with high catalytic proficiencies, *J. Am. Chem. Soc.* **119**, 10251 (1997).
116. Gao, C., Lin, C.-H., Lo, C.-H.L., Mao, S., Wirsching, P., Lerner, R.A., Janda, K.D. Making chemistry selectable by linking it to infectivity, *Proc. Natl. Acad. Sci. USA* **94**, 11777 (1997).
117. Lin, C.-H., Hoffman, T.Z., Wirsching, P., Barbas III, C.F., Janda, K.D., Lerner, R.A. On roads not taken in the evolution of protein catalysts: Antibody steroid isomerases that use an enamine mechanism, *Proc. Natl. Acad. Sci. USA* **94**, 11773 (1997).
118. Gravert, D.J., Janda, K.D. Soluble polyethylene glycol supports for liquid-phase combinatorial synthesis, *Drugs of the Future* **22**, 1147 (1997).
119. Janda, K.D., Gravert, D.J. Organic reactions on soluble polymer supports as an alternative methodology for combinatorial solid-phase synthesis, *Biotechnology Internl.* 169 (1997).
120. Han, H., Vandersteen, A., Janda, K.D. "Combinatorics, Peptide Mimetics and Combizymes." In: *Peptides: Frontiers of Peptide Science* (Proceedings of the 15th American Peptide Symposium) eds., J.P. Tam, T. Pravin, P. Kaumaya, Kluwer/Escom, Nashville, TN., p.22 (1997).
121. Gravert, D.J., Janda, K.D. Synthesis on soluble polymers: New reactions and the construction of small molecules, *Current Opinion in Chemical Biology* **1**, 107 (1997).
122. Wentworth, P. Jr., Janda, K.D. Generating and analyzing combinatorial chemistry libraries, *Current Opinion in Biotechnology* **9**, 109 (1998).

123. Han, H., Yoon, J., Janda, K.D. Investigations of azapeptides as mimetics of leu-enkephalin, *Bioorg. Med. Chem. Lett* **8**, 117 (1998).
124. Wentworth, P. Jr., Janda, K.D. Catalytic antibodies, *Current Opinion in Chemical Biology* **2**, 138 (1998).
125. Hori, M., Janda, K.D. A soluble polymer approach to the "Fishing Out" principle: Synthesis and purification of  $\beta$ -Amino alcohols, *J. Org. Chem.* **63**, 889 (1998).
126. Heine, A., Stura, E.A., Yli-Kauhaluoma, J.T., Gao, C. Deng, Q., Beno, B.R., Houk, K.N., Janda, K.D., Wilson, I.A. An antibody exo-Diels-Alderase inhibitor complex at 1.95 Angstrom resolution, *Science* **279**, 1934 (1998).
127. Gravert, D.J., Janda, K.D. Bifunctional initiators for free radical polymerization of non-crosslinked block copolymers, *Tetrahedron Letters* **39**, 1513 (1998).
128. Han, H., Yoon, J., Janda, K.D. An efficient asymmetric route to 2,3-diaminobutanoic acids, *J. Org. Chem.* **63**, 2045 (1998).
129. Gao, C., Lavey, B.J., Lo, C.-H.L., Datta, A., Wentworth, P. Jr., Janda, K.D. Direct selection for catalysis from combinatorial antibody libraries using a boronic acid probe: Primary amide bond hydrolysis, *J. Am. Chem. Soc.* **120**, 2211 (1998).
130. Yli-Kauhaluoma, J.T., Harwig, C.W., Wentworth, P. Jr., Janda, K.D. Unexpected 1,3-oxazolidine formation in the attempted oxidation of *N*-aryl-*N*-methyl substituted  $\beta$ -amino alcohols using pyridinium dichromate, *Tetrahedron Letters* **39**, 2269 (1998).
131. Berg, T., Vandersteen, A.M., Janda, K.D. High-throughput synthesis and direct screening for the discovery of novel hydrolytic metal complexes, *Bioorg. Med. Chem. Lett.* **8**, 1221 (1998).
132. Chen, S., Janda, K.D. Total synthesis of naturally occurring prostaglandin F<sub>2 $\alpha$</sub>  on a non-cross-linked polystyrene support, *Tetrahedron Letters* **39**, 3943 (1998).
133. Lerner, R.A., Barbas III, C.F., Janda, K.D. In: *Making Enzymes*, The Harvey Lectures, Series 92, Wiley-Liss, Inc. p. 1 (1998).
134. Lin, C.-H., Hoffman, T.Z., Xie, Y., Wirsching, P., Janda, K.D. An antibody transesterase derived from reactive immunization that utilizes a wide variety of alcohol substrates, *Chem. Commun.* 1075 (1998).
135. Wentworth, P. Jr., Liu, Y., Wentworth, A.D., Fan, P., Foley, M.J., Janda, K.D. A bait and switch hapten strategy generates catalytic antibodies for phosphodiester hydrolysis, *Proc. Natl. Acad. Sci. USA* **95**, 5971 (1998).
136. Gravert, D.J., Datta, A., Wentworth, P. Jr., Janda, K.D. Soluble supports tailored for organic synthesis: Parallel polymer synthesis *via* sequential normal/living free radical processes, *J. Am. Chem. Soc.* **120**, 9481 (1998).

137. Hori, M., Gravert, D.J., Wentworth, P. Jr., Janda, K.D. Investigating highly crosslinked macroporous resins for solid phase synthesis, *Bioorg. Med. Chem. Lett.* **8**, 2363 (1998).
138. Zhao, X.-Y., Metz, W.A., Sieber, F., Janda, K.D. Expanding on the purification methodology of polyethylene glycol (PEG) bound molecules: The synthesis of 3,5-Pyrazolidinediones, *Tetrahedron Letters* **39**, 8433 (1998).
139. Taylor, M.J., Hoffman, T.Z., Yli-Kauhaluoma, J.T., Lerner, R.A., Janda, K.D. A light-activated antibody catalyst, *J. Am. Chem. Soc.* **120**, 12783 (1998).
140. Yoon, J., Cho, C.-W., Han, H., Janda, K.D. Solution and soluble polymer synthesis of 3-aminoimidazoline-2,4-diones, *Chem. Commun.* 2703 (1998).
141. Zhao, X.-Y., Janda, K.D. Soluble polymer traceless linker investigations: Solvent effects on the desulfonylation of polyethylene glycol (PEG) substituted aryl alkyl sulfones with sodium amalgam, *Bioorg. Med. Chem. Lett.* **8**, 2439 (1998).
142. Berg, T., Simeonov, A., Janda, K.D. A combined parallel synthesis and screening of macrocyclic lanthanide complexes for the cleavage of phospho di- and triesters and double-stranded DNA, *J. Comb. Chem.* **1**, 96 (1999).
143. Harwig, C.W., Gravert, D.J., Janda, K.D. Soluble polymers: New options in both traditional and combinatorial synthesis, *Org. Chem. Chemtracts* **12**, 1 (1999).
144. Yoon, J., Han, H., Janda, K.D. "Solution and Soluble Polymer Syntheses of Azatides and Azapeptides." In: *Advances in Amino Acid Mimetics and Peptidomimetics*, ed., A. Abell, JAI Press, Inc., Stamford, CT., Vol. 2, p. 247 (1999).
145. Han, H., Yoon, J., Janda, K.D. "Azatides as Peptidomimetics / Solution and Liquid Phase Syntheses." In: *Peptidomimetics Protocols*, (Methods in Molecular Medicine series), ed. W.M. Kazmierski, Humana Press, Totowa, N.J., Vol. 23, p. 87 (1999).
146. Wentworth, P. Jr., Janda, K.D. "Catalytic Antibodies" In: *Comprehensive Asymmetric Catalysis*, eds., E.N. Jacobsen, A. Pfaltz, H. Yamamoto, Springer-Verlag, N.Y., Vol. III, p. 1403 (1999).
147. Han, H., Cho, C.-W., Janda, K.D. A substrate-based methodology that allows the regioselective control of the catalytic aminohydroxylation reaction, *Chem. Eur. J.* **5**, 1565 (1999).
148. Spivak, D.A., Hoffman, T.Z., Moore, A.H., Taylor, M.J., Janda, K.D. A comparison of flexible and constrained haptens in eliciting antibody catalysts for paraoxon hydrolysis, *Bioorg. Med. Chem.* **7**, 1145 (1999).
149. Paschall, C.M., Hasserodt, J., Jones, T., Lerner, R.A., Janda, K.D., Christianson, D.W. Convergence of catalytic antibody and terpene cyclase mechanisms: Polyene cyclization directed by carbocation- $\pi$  interactions, *Angew. Chem. Int. Ed.* **38**, 1743 (1999).

150. Brümmer, O., La Clair, J.J., Janda, K.D. A colorimetric ligand for mercuric ion, *Org. Lett.* **1**, 415 (1999).
151. Ashley, J.A., Lin, C.-H., Wirsching, P., Janda, K.D. Monitoring chemical warfare agents: A new method for the detection of methylphosphonic acid, *Angew. Chem. Int. Ed.* **38**, 1793 (1999).
152. Gao, C., Mao, S., Lo, C.-H.L., Wirsching, P., Lerner, R.A., Janda, K.D. Making artificial antibodies: A format for phage display of combinatorial heterodimeric arrays, *Proc. Natl. Acad. Sci. USA* **96**, 6025 (1999).
153. Taylor, M.J., Yli-Kauhaluoma, J.T., Ashley, J.A., Wirsching, P., Lerner, R.A., Janda, K.D. The  $\alpha$ -ketoamide group: A new motif for the elicitation of catalytic antibodies for acyl-transfer reactions, *J. Chem. Soc., Perkin Trans.* **1**, 1133 (1999).
154. Sieber, F., Wentworth, P. Jr., Toker, J.D., Wentworth, A.D., Metz, W.A., Reed, N.N., Janda, K.D. Development and application of a poly(ethylene glycol)-supported triarylphosphine reagent: Expanding the sphere of liquid-phase organic synthesis, *J. Org. Chem.* **64**, 5188 (1999).
155. Mao, S., Gao, C., Lo, C.-H.L., Wirsching, P., Wong, C.-H., Janda, K.D. Phage-display library selection of high-affinity human single-chain antibodies to tumor-associated carbohydrate antigens sialyl Lewis<sup>x</sup> and Lewis<sup>x</sup>, *Proc. Natl. Acad. Sci. USA* **96**, 6953 (1999).
156. Wentworth, P., Janda, K.D. Antibody catalysis of phosphodiester hydrolysis: A survey of hapten strategies, *Phosphorus, Sulfur and Silicon* **144-146**, 247 (1999).
157. Janda, K.D., Wentworth, A.D. A merging of chemistry and biology in terms of antibody catalysis, *Phosphorus, Sulfur and Silicon* **144-146**, 117 (1999).
158. Toy, P.H., Janda, K.D. New supports for solid-phase organic synthesis: Development of polystyrene resins containing tetrahydrofuran derived cross-linkers, *Tetrahedron Letters* **40**, 6329 (1999).
159. Garibay, P., Toy, P.H., Hoeg-Jensen, T., Janda, K.D. Application of a new solid-phase resin: Benzamide *ortho*-lithiation and the synthesis of a phthalide library, *Synlett* **9**, 1438 (1999).
160. Gao, C., Brümmer, O., Mao, S., Janda, K.D. Selection of human metalloantibodies from a combinatorial phage single-chain antibody library, *J. Am. Chem. Soc.* **121**, 6517 (1999).
161. Brümmer, O., Gao, C., Mao, S., Weiner, D.P., Janda, K.D. Design, synthesis and characterization of panning agents for the selection of metalloantibodies, *Letters in Peptide Science* **6**, 295 (1999).

162. Brümmer, O., Wentworth, P. Jr., Weiner, D.P., Janda, K.D. Phosphorodithioates: Synthesis and evaluation of new haptens for the generation of antibody acyl transferases, *Tetrahedron Letters* **40**, 7307 (1999).
163. Córdova, A., Reed, N.N., Ashley, J.A., Janda, K.D. Convenient synthesis of *L*-proline benzyl ester, *Bioorg. Med. Chem. Lett.* **9**, 3119 (1999).
164. Wentworth, P. Jr., Janda, K.D. Liquid-phase chemistry: Recent advances in soluble polymer-supported catalysts, reagents and synthesis, *Chem. Commun.* 1917 (1999).
165. Lee, K.J., Angulo, A., Ghazal, P., Janda, K.D. Soluble-polymer supported synthesis of a prostanoid library: Identification of antiviral activity, *Org. Lett.* **1**, 1859 (1999).
166. Datta, A., Wentworth, P. Jr., Shaw, J.P., Simeonov, A., Janda, K.D. Catalytically distinct antibodies prepared by the reactive immunization versus transition state analogue hapten manifolds, *J. Am. Chem. Soc.* **121**, 10461 (1999).
167. Sieber, F., Wentworth, P. Jr., Janda, K.D. Exploring the scope of poly(ethylene glycol) (PEG) as a soluble matrix for the Stille cross-coupling reaction, *J. Comb. Chem.* **1**, 540 (1999).
168. Hasserodt, J., Janda, K.D., Lerner, R.A. Antibodies mimic natural oxidosqualene-cyclase action in steroid ring A formation, *J. Am. Chem. Soc.* **122**, 40 (2000).
169. Wentworth, A.D., Wentworth, P. Jr., Mansoor, F.U., Janda, K.D. A soluble polymer-supported triflating reagent: A high-throughput synthetic approach to aryl and enol triflates, *Org. Lett.* **2**, 477 (2000).
170. Toker, J.D., Wentworth, P. Jr., Hu, Y., Houk, K.N., Janda, K.D. Antibody catalysis of a bimolecular asymmetric 1,3-Dipolar cycloaddition reaction, *J. Am. Chem. Soc.* **122**, 3244 (2000).
171. Reed, N.N., Janda, K.D. Stealth star polymers: A new high-loading scaffold for liquid-phase organic synthesis, *Org. Lett.* **2**, 1311 (2000).
172. Lopez-Pelegrín, J.A., Janda, K.D. Solution- and soluble-polymer supported asymmetric syntheses of six-membered ring prostanoids, *Chem. Eur. J.* **6**, 1917 (2000).
173. Carrera, M.R.A., Ashley, J.A., Zhou, B., Wirsching, P., Koob, G.F., Janda, K.D. Cocaine vaccines: Antibody protection against relapse in a rat model, *Proc. Natl. Acad. Sci. USA* **97**, 6202 (2000).
174. Reger, T.S., Janda, K.D. Polymer-supported (Salen)Mn catalysts for asymmetric epoxidation: A comparison between soluble and insoluble matrices, *J. Am. Chem. Soc.* **122**, 6929 (2000).
175. Toy, P.H., Janda, K.D. Soluble polymer-supported organic synthesis, *Acc. Chem. Res.* **33**, 546 (2000).

176. Brümmer, O., Clapham, B., Janda, K.D. Recent developments and applications of polymer-supported reagents in synthetic organic chemistry, *Current Opinion in Drug Discovery & Dev.* **3**, 462 (2000).
177. Toy, P.H., Reger, T.S., Janda, K.D. Soluble polymer bound cleavage reagents: A multipolymer strategy for the cleavage of tertiary amines from REM resin, *Org. Lett.* **2**, 2205 (2000).
178. Vaino, A.R., Janda, K.D. Euclidean shape-encoded combinatorial chemical libraries, *Proc. Natl. Acad. Sci. USA* **97**, 7692 (2000).
179. Janda, K.D. "New Directions in Immunopharmacotherapy" In: *The Role of Natural Products in Drug Discovery* (Ernest Schering Research Foundation Workshop 32) eds., J. Mulzer, R. Bohlmann, Springer-Verlag, Berlin, Heidelberg, New York (2000).
180. Vaino, A.R., Goodin, D.B., Janda, K.D. Investigating resins for solid phase organic synthesis: The relationship between swelling and microenvironment as probed by EPR and fluorescence spectroscopy, *J. Comb. Chem.* **2**, 330 (2000).
181. Harwig, C.W., Hoffman, T.Z., Wentworth, A.D., Janda, K.D. A one-pot multistep approach to  $\alpha$ -azido-phosphonate and phosphonothioate diesters: Key intermediates in the synthesis of haptens for the generation of antibody ligases, *Bioorg. Med. Chem. Lett.* **10**, 915 (2000).
182. Hasserodt, J., Janda, K.D., Lerner, R.A. A class of 4-aza-lithocholic acid-derived haptens for the generation of catalytic antibodies with steroid synthase capabilities, *Bioorg. Med. Chem.* **8**, 995 (2000).
183. Reed, N.N., Janda, K.D. A one step synthesis of monoprotected polyethylene glycol ethers, *J. Org. Chem.* **65**, 5843 (2000).
184. Manzotti, R., Janda, K.D. Solid and liquid phase chemistry: Development of new supports for solid phase organic synthesis and for liquid phase chemistry, *Chimica Oggi/Chemistry Today* **18**, 14 (2000).
185. Wentworth, P. Jr., Janda, K.D. A tool-box of polymer matrices for the combinatorial chemist / biotechnologist, *International Convention on Agriculture, Biotechnology and Chemistry*; Rome, Italy, p. 211 (2000).
186. Vaino, A.R., Janda, K.D. Solid phase organic synthesis: A critical understanding of the resin, *J. Comb. Chem.* **2**, 579 (2000).
187. Manzotti, R., Tang, S.-Y., Janda, K.D. Improved synthesis of prostanoids on a non-cross-linked polystyrene soluble support, *Tetrahedron* **56**, 7885 (2000).
188. Wentworth, A.D., Jones, L.H., Wentworth, P. Jr., Janda, K.D., Lerner, R.A. Antibodies have the intrinsic capacity to destroy antigens, *Proc. Natl. Acad. Sci. USA* **97**, 10930 (2000).

189. Simeonov, A., Matsushita, M., Juban, E.A., Thompson, E.H.Z., Hoffman, T.Z., Beuscher IV, A.E., Taylor, M.J., Wirsching, P., Rettig, W., McCusker, J.K., Stevens, R.C., Millar, D.P., Schultz, P.G., Lerner, R.A., Janda, K.D. Blue-fluorescent antibodies, *Science* **290**, 307 (2000).
190. Sieber, F., Wentworth, P. Jr., Janda, K.D. Exploiting poly(ethylene glycol) as a matrix for liquid-phase organic synthesis, *Molecules* **5**, 1018 (2000).
191. Tremblay, M.R., Wentworth, P. Jr., Lee, G.E. Jr., Janda, K.D. Parallel solid-phase synthesis and structural characterization of a library of highly substituted chiral 1,3-oxazolidines, *J. Comb. Chem.* **2**, 698 (2000).
192. Lopez-Peegrín, J.A., Wentworth, P. Jr., Sieber, F., Metz, W.A., Janda, K.D. Soluble polymer-supported chemoenzymatic synthesis of the C<sub>21</sub>-C<sub>27</sub> fragment of the Bryostatins, *J. Org. Chem.* **65**, 8527 (2000).
193. Manzotti, R., Reger, T.S., Janda, K.D. Improved synthesis of (4-ethenylphenyl)diphenyl methanol and its application in the preparation of trityl functionalized polystyrene resin containing tetrahydrofuran derived cross-linker, *Tetrahedron Letters* **41**, 8417 (2000).
194. Toy, P.H., Reger, T.S., Janda, K.D. Tailoring polystyrene solid-phase synthesis resins: Incorporation of flexible cross-linkers, *Aldrichimica Acta* **33**, 87 (2000).
195. Brümmer, O., Hoffman, T.Z., Chen, D.-W., Janda, K.D. Antibody-catalyzed hydrolysis of oligomeric esters: A model for the degradation of polymeric materials, *Chem. Commun.* **1**, 19 (2001).
196. Toy, P.H., Reger, T.S., Garibay, P., Garno, J.C., Malikayil, J.A., Liu, G.-Y., Janda, K.D. Polytetrahydrofuran cross-linked polystyrene resins for solid-phase organic synthesis, *J. Comb. Chem.* **3**, 117 (2001).
197. Clapham, B., Cho, C.-W., Janda, K.D. A polymer-supported proline-based diamine catalyst for the kinetic resolution of racemic secondary alcohols, *J. Org. Chem.* **66**, 868 (2001).
198. Carrera, M.R.A., Ashley, J.A., Wirsching, P., Koob, G.F., Janda, K.D. A second-generation vaccine protects against the psychoactive effects of cocaine, *Proc. Natl. Acad. Sci. USA* **98**, 1988 (2001).
199. Matsushita, M., Hoffman, T.Z., Ashley, J.A., Zhou, B., Wirsching, P., Janda, K.D. Cocaine catalytic antibodies: The primary importance of linker effects, *Bioorg. Med. Chem. Lett.* **11**, 87 (2001).
200. Chen, D.-W., Beuscher IV, A.E., Stevens, R.C., Wirsching, P., Lerner, R.A., Janda, K.D. Preparation of stilbene-tethered nonnatural nucleosides for use with blue-fluorescent antibodies, *J. Org. Chem.* **66**, 1725 (2001).

201. Córdova, A., Janda, K.D. A highly chemo- and stereoselective synthesis of  $\beta$ -keto esters via a polymer-supported lipase catalyzed transesterification, *J. Org. Chem.* **66**, 1906 (2001).
202. Wen, K., Han, H., Hoffman, T.Z., Janda, K.D., Orgel, L.E. The synthesis of  $\beta$ -peptides containing guanidino groups, *Bioorg. Med. Chem. Lett.* **11**, 689 (2001).
203. Jones, L.H., Harwig, C.W., Wentworth, P. Jr., Simeonov, A., Wentworth, A.D., Py, S., Ashley, J.A., Lerner, R.A., Janda, K.D. Conversion of enediynes into quinones by antibody catalysis and in aqueous buffers: Implications for an alternative enediyne therapeutic mechanism, *J. Am. Chem. Soc.* **123**, 3607 (2001).
204. Brümmer, O., Clapham, B., Janda, K.D. Solid-phase synthesis of oligoesters using a JandaJel resin, *Tetrahedron Letters* **42**, 2257 (2001).
205. Clapham, B., Reger, T.S., Janda, K.D. Polymer-supported catalysis in synthetic organic chemistry, *Tetrahedron* **57**, 4637 (2001).
206. Brümmer, O., La Clair, J.J., Janda, K.D. Practical screening of mercury contamination in fish tissues, *Bioorg. Med. Chem. Lett.* **9**, 1067 (2001).
207. Wentworth, P. Jr., Janda, K.D. Catalytic antibodies: Structure and function, *Cell Biochem. Biophys.* **35**, 63 (2001).
208. Isomura, S., Wirsching, P., Janda, K.D. An immunotherapeutic program for the treatment of nicotine addiction: Hapten design and synthesis, *J. Org. Chem.* **66**, 4115 (2001).
209. Dickerson, T., Reed, N.N., Janda, K.D. Regio-reactive resin: A platform for orthogonal loading using the polymer backbone and cross-linker, *Bioorg. Med. Chem. Lett.* **11**, 1507 (2001).
210. Lee, K.J., Janda, K.D. Traceless solid-phase synthesis of 5-Benzoylbenzimidazoles, *Can. J. Chem.* **79**, 1556 (2001).
211. Córdova, A., Janda, K.D. Synthesis and catalytic antibody functionalization of dendrimers, *J. Am. Chem. Soc.* **123**, 8248 (2001).
212. Clapham, B., Spanka, C., Janda, K.D. Solid-phase rhodium carbenoid reactions: An N-H insertion route to a diverse series of oxazoles, *Org. Lett.* **3**, 2173 (2001).
213. Córdova, A., Tremblay, M.R., Clapham, B., Janda, K.D. A sequential application of kinetic resolution and polymer-supported scavenging for the isolation of chiral secondary alcohols, *J. Org. Chem.* **66**, 5645 (2001).
214. Tremblay, M.R., Dickerson, T.J., Janda, K.D. Advances in antibody catalysis of cycloaddition reactions, *Adv. Synth. Catal.* **343**, 577 (2001).

215. Chen, D.-W., Kubiak, R.J., Ashley, J.A., Janda, K.D. Reactive immunization elicits catalytic antibodies for polyester hydrolysis, *J. Chem. Soc., Perkin Trans.* **1**, 2796 (2001).
216. Brümmer, O., Hoffman, T.Z., Janda, K.D. Metalloantibodies: Mercury(II)-dependent acyl transferases, *Bioorg. Med. Chem.* **9**, 2253 (2001).
217. Kozlov, I.A., Mao, S., Xu, Y., Huang, X., Lee, L., Sears, P.S., Gao, C., Coyle, A.R., Janda, K.D., Wong, C.-H. Synthesis of solid-supported mirror-image sugars: A novel method for selecting receptors for cellular-surface carbohydrates, *ChemBioChem* **2**, 741 (2001).
218. Wentworth Jr., P., Jones, L.H., Wentworth, A.D., Zhu, X., Larsen, N.A., Wilson, I.A., Xu, X., Goddard III, W.A., Janda, K.D., Eschenmoser, A., Lerner, R.A. Antibody catalysis of the oxidation of water, *Science* **293**, 1806 (2001).
219. Larsen, N.A., Zhou B., Heine, A., Wirsching P., Janda, K.D., Wilson, I.A. Crystal structure of a cocaine-binding antibody, *J. Mol. Bio.* **9**, 311 (2001).
220. Moss, J.A., Dickerson, T.J., Janda, K.D. Solid phase peptide synthesis on JandaJel resin, *Tetrahedron Letters* **43**, 37 (2002).
221. Matsushita, M., Janda, K.D. Histidine kinases as targets for new antimicrobial agents, *Bioorg. Med. Chem.* **10**, 855 (2002).
222. Delgado, M., Spanka, C., Kerwin, L.D., Wentworth, Jr., P., Janda, K.D. A tunable hydrogel for encapsulation and controlled release of bioactive proteins, *Biomacromolecules*, **3**, 262 (2002).
223. Nicholas, K.M., Wentworth, Jr., P., Harwig, C.W., Wentworth, A.D., Shafton, A., Janda, K.D. A cofactor approach to copper-dependent catalytic antibodies, *Proc. Nat. Acad. Sci. USA* **99**, 2648 (2002).
224. Dickerson, T.J., Janda, K.D. Aqueous aldol catalysis by a nicotine metabolite, *J. Amer. Chem. Soc.* **124**, 3220 (2002).
225. Isomura, S., Hoffman, T.Z., Wirsching, P., Janda, K.D. Synthesis, properties, and reactivity of cocaine benzoylthio ester possessing the cocaine absolute configuration, *J. Amer. Chem. Soc.* **124**, 3661 (2002).
226. Kim, G.-T., Wenz, M., Park, J.-I., Hasserodt, J., Janda, K.D. Polyene substrates with unusual methylation patterns to probe the active sites of three catalytic antibodies, *Bioorg. Med. Chem.* **10**, 1249 (2002).
227. Reger, T.S., Janda, K.D., Parallel suspension polymerization for high-throughput resin synthesis, *Bioorg. Med. Chem.* **12**, 837 (2002).
228. Isomura, S., Ashley, J.A., Wirsching, P., Janda, K.D. Antibody-catalyzed cleavage of the D-Ala-D-Lac depsipeptide: An immunological approach to the problem of vancomycin resistance, *Bioorg. Med. Chem. Lett.* **12**, 861 (2002).

229. Zhou, B., Wirsching, P., Janda, K.D. Human antibodies against spores of the genus *Bacillus*: A model study for the detection of and protection against anthrax and the bioterrorist threat, *Proc. Nat. Acad. Sci.* **99**, 5421 (2002).
230. Boyle, N.A., Janda, K.D. Formats for combinatorial synthesis: solid-phase, liquid-phase and surface, *Current Opinion in Chemical Biology* **6**, 339 (2002).
231. Spanka, C., Clapham, B., Janda, K.D. Preparation of new microgel polymers and their application as supports in organic synthesis, *J. Org. Chem.* **67**, 3045 (2002).
232. Delgado, M., Lee, K.J., Altobelli, III, L., Spanka, C., Wentworth, Jr., P., Janda, K.D. A parallel approach to the discovery of carrier delivery vehicles to enhance antigen immunogenicity, *J. Amer. Chem. Soc.* **124**, 4946 (2002).
233. Spanka, C., Wentworth, Jr., P., Janda, K.D. Developing soluble polymers for high-throughput synthetic chemistry, *Combinatorial Chemistry and High Throughput Screening* **5**, 233 (2002).
234. Janda, K.D. (Preface) Polymer supported catalysts and reagents in synthetic organic chemistry, *Bioorg. Med. Chem. Lett.* **12**, vii (2002).
235. Reed, N.N., Delgado, M., Hereford, K., Clapham, B., Janda, K.D. Preparation of soluble and insoluble polymer supported IBX reagents, *Bioorg. Med. Chem. Lett.* **12**, 2047 (2002).
236. Delgado, M., Janda, K.D. Polymeric supports for solid phase organic synthesis, *Current Organic Chemistry* **6**, 1031 (2002).
237. Sun, C., Wirsching, P., Janda, K.D. Syntheses of dendritic linkers containing chlorambucil residues for the preparation of antibody-multidrug immunoconjugates, *Bioorg. Med. Chem. Lett.* **12**, 2213 (2002).
238. Ahn, J.-M., Boyle, N.A., MacDonald, M.T., Janda, K.D. Peptidomimetics and peptide backbone modifications, *Mini Reviews in Medicinal Chemistry* **2**, 463 (2002).
239. Clapham, B., Lee, S.-H., Koch, G., Zimmermann, J., Janda, K.D. The preparation of polymer bound  $\beta$ -ketoesters and their conversion into an array of oxazoles, *Tetrahedron Letters* **43**, 5407 (2002).
240. Shimomura, O., Clapham, B., Spanka, C., Mahajan, S., Janda, K.D. Application of microgels as polymer supports for organic synthesis: Preparation of a small phthalide library, a scavenger, and a borohydride reagent, *J. Comb. Chem.* **4**, 436 (2002).
241. Gao, C., Mao, S., Kaufmann, G., Wirsching, P., Lerner, R.A., Janda, K.D. A method for the generation of combinatorial antibody libraries using pIX phage display, *Proc. Natl. Acad. Sci. USA* **99**, 12612 (2002).
242. Dickerson, T.J., Reed, N.N., Janda, K.D. Soluble polymers as scaffolds for recoverable catalysts and reagents, *Chem. Rev.* **102**, 3325 (2002).

243. Jones, L.H., Altobelli III, L.J., MacDonald, M.T., Boyle, N.A., Wentworth, Jr., P., Lerner, R.A., Janda, K.D. Active immunization with a glycolipid transition state analogue protects against endotoxic shock, *Angew. Chem. Int. Ed.* **41**, 4241 (2002).
244. Lee, K.J., Mao, S., Sun C., Gao, C., Blixt, O., Arrues, S., Hom, L.G., Kaufmann, G.F., Hoffman, T.Z., Coyle, A.R., Paulson, J., Felding-Habermann, B., Janda, K.D. Phage-display selection of a human single-chain Fv antibody highly specific for melanoma and breast cancer cells using a chemoenzymatically synthesized G<sub>M3</sub>-carbohydrate antigen, *J. Amer. Chem. Soc.* **124**, 12439 (2002).
245. Dickerson, T.J., Janda, K.D. A previously undescribed chemical link between smoking and metabolic disease, *Proc. Natl. Acad. Sci. USA* **99**, 15084 (2002).
246. Gao, C., Mao, S., Ditzel, H.J., Farnaes, L., Wirsching, P., Lerner, R.A., Janda, K.D. A cell-penetrating peptide from a novel pVII-pIX phage-displayed random peptide library, *Bioorg. Med. Chem.* **10**, 4057 (2002).
247. Wentworth, Jr., P., McDunn, J.E., Wentworth, A.D., Takeuchi, C., Nieva, J., Jones, T., Bautista, C., Ruedi, J.M., Gutierrez, A., Janda, K.D., Babior, B.M., Eschenmoser, A., Lerner, R.A. Evidence for antibody-catalyzed ozone formation in bacterial killing and inflammation, *Science* **298**, 2195 (2002).
248. Dickerson, T., Córdova, A., Chen, D.-W., Janda, K.D. "The Use of Enzymes and Catalytic Antibodies in the Asymmetric Aldol Reaction" In: *Encyclopedia of Catalysis*, ed. I.T. Horvath, Wiley, N.Y., (2002) (In Press).
249. Wang, Q., Krishnaswami, S.R., Janda, K.D., Lin, T., Finn, M.G. Blue fluorescent antibodies as reporters of steric accessibility in virus conjugates, *Bioconjugate Chem.* **14**, 38 (2003).
250. Lee, S.-H., Clapham, C., Koch, G., Zimmermann, J., Janda, K.D. Rhodium carbenoid N-H insertion reactions of primary ureas: Solution and solid-phase synthesis of imidazolones, *Org. Lett.* **5**, 511 (2003).
251. Cannizzaro, C.E., Ashley, J.A., Janda, K.D., Houk, K.N. Experimental determination of the absolute enantioselectivity of an antibody-catalyzed Diels-Alder reaction and theoretical explorations of the origins of stereoselectivity, *J. Amer. Chem. Soc.* **125**, 2489 (2003).
252. Ahn, J.-A., Wentworth, Jr., P., Janda, K.D. Soluble polymer-supported convergent parallel library synthesis, *Chem. Commun.*, 480 (2003).
253. Wentworth, Jr., P., Wentworth, A.D., Zhu, X., Wilson, I.A., Janda, K.D., Eschenmoser, A., Lerner, R.A. Evidence for the production of trioxxygen species during antibody-catalyzed chemical modification of antigens, *Proc. Natl. Acad. Sci. USA* **100**, 1490 (2003).

254. Gao, C., Mao, S., Ronca, F., Zhuang, S., Quaranta, V., Wirsching, P., Janda, K.D. De novo identification of tumor-specific internalizing human antibody-receptor pairs by phage-display methods, *Journal of Immunological Methods* **274**, 185 (2003).
255. Sun, C., Wirsching, P., Janda, K.D. Enabling ScFvs as multi-drug carriers: A dendritic approach, *Bioorg. Med. Chem.* **11**, 1761 (2003).
256. Zhu, X., Heine, A., Monnat, F., Houk, K.N., Janda, K.D., Wilson, I.A. Structural basis for antibody catalysis of a cationic cyclization, *J. Mol. Biol.* **329**, 69 (2003).
257. Redwan, E-R.,M., Larsen, N.A., Zhou, B., Wirsching, P., Janda, K.D., Wilson, I.A. Expression and characterization of a humanized cocaine-binding antibody, *Biotechnology and Bioengineering* **82(5)**, 612 (2003).
258. Gambs, C., Dickerson, T.J., Mahajan, S., Pasternack, L.B., Janda, K.D. High-resolution diffusion-ordered spectroscopy to probe the microenvironment of JandaJel and Merrifield resins, *J. Org. Chem.* **68(9)**, 3673 (2003).
259. Liu C., Sun, C., Huang, H., Janda, K., Edgington, T. Overexpression of legumain in tumors is significant for invasion/metastasis and a candidate enzymatic target for prodrug therapy, *Cancer Research* **63**, 2957 (2003).
260. Meijler, M.M., Matsushita, M., Altobelli, III, L.J., Wirsching, P., Janda, K.D. A new strategy for improved nicotine vaccines using conformationally constrained haptens, *J. Amer. Chem. Soc.* **125(24)**, 7164 (2003).
261. Dickerson, T.J., Janda, K.D. Glycation of the amyloid  $\beta$ -protein by a nicotine metabolite: A fortuitous chemical dynamic between smoking and Alzheimer's disease, *Proc. Natl. Acad. Sci. USA* **100(14)**, 8182 (2003).
262. Dickerson, T.J., Reed, N.N., Janda, K.D. "Soluble polymers as catalyst and reagent platforms: Liquid-phase methodologies" In: *Polymeric Materials in Organic Synthesis and Catalysis* ed. M.R. Buchmeiser, Wiley-VCH Verlag GmbH, Weinheim, Germany, pp 241-276 (2003).
263. Hasserodt, J., Janda, K.D. Catalytic Antibodies" In: *Encyclopedia of Catalysis*, ed. I.T. Horvath, Wiley, N.Y. pp. 440-476 (2003).
264. Fujimori, T., Wirsching, P., Janda, K.D. Preparation of a Krohnke pyridine combinatorial library suitable for solution-phase biological screening, *J. Comb. Chem.* **5**, 625 (2003).
265. Lee, S.-H., Clapham, B., Koch, G., Zimmerman, J., Janda, K.D. Solid-phase rhodium carbenoid N-H insertion reactions: the synthesis of a diverse array of indoles, *J. Comb. Chem.* **5**, 188 (2003).
266. Chen, Y., Gambs, C., Abe, Y., Wentworth, P., Jr., Janda, K.D. Total synthesis of the depsipeptide FR-901375, *J.Org. Chem.* **68**, 8902 (2003).

267. Wentworth, Jr., P., Nieva, J., Takeuchi, C., Galve, R., Wentworth, A.D., Dilley, R.B., DeLaria, G.A., Saven, A., Babior, B.M., Janda, K.D., Eschenmoser, A., Lerner, R.A. Evidence for ozone formation in human atherosclerotic arteries, *Science* **302**, 1053 (2003).
268. Moss, J.A., Coyle, A.R., Ahn, J.-A., Meijler, M.M., Offer, J., Janda, K.D. Tandem IMAC-HPLC purification of a cocaine-binding scFv antibody, *Journal of Immunological Methods* **281**, 143 (2003).
269. Dickerson, T.J., Tremblay, M.R., Hoffman, T.Z., Ruiz, D.I., Janda, K.D. Catalysis of the Photo-Fries reaction: Antibody-mediated stabilization of high energy states, *J. Amer. Chem. Soc.* **125**, 15395 (2003).
270. Matsushita, M., Yoshida, K., Yamamoto, N., Wirsching, P., Lerner, R.A., Janda, K.D. High-throughput screening by using a blue-fluorescent antibody sensor, *Angew. Chemie, Int. Ed.* **42**, 5984 (2003).
271. Zorrilla, E., Fekete, E., Mason, B.J., Wirsching, P., Janda, K.D., Koob, G.F. CRF<sub>1</sub> antagonists for anxiety, *European Neuropsychopharmacology* **13(Suppl. 4)**, S130 (2003).
272. Carrera, M.R.A., Ashley, J.A., Hoffman, T.Z., Isomura, S., Wirsching, P., Koob, G.F., Janda, K.D. Investigations using immunization to attenuate the psychoactive effects of nicotine, *Bioorg. Med. Chem.* **12**, 563 (2004).
273. Matsushita, H., Lee, S.-H., Joung, M., Clapham, B., Janda, K.D. Smart cleavage reactions: the synthesis of benzimidazoles and benzothiazoles from polymer-bound esters, *Tetrahedron Lett.* **45**, 313 (2004).
274. Ahn, J.-M., Wentworth, Jr., P., Janda, K.D. Probing lipase/esterase libraries for lipid A hydrolysis - discovery of biocatalysts for the detoxification of bacterially-expressed recombinant protein, *Chem. Commun.* 364 (2004).
275. Meijler, M.M., Matsushita, M., Wirsching, P., Janda, K.D. Development of immunopharmacotherapy against drugs of abuse, *Current Drug Discovery Technologies* **1**, 77 (2004).
276. Lee, S.-H., Matsushita, H., Clapham, B., Janda, K.D. The direct conversion of carbamates to ureas using aluminum amides, *Tetrahedron* **60**, 3439 (2004).
277. Lee, B.-S., Mahajan, S., Clapham, B., Janda, K.D. Suspension ring-opening metathesis polymerization: The preparation of norbornene-based resins for application in organic synthesis, *J. Org. Chem.* **69**, 3319 (2004).
278. Meijler, M.M., Hom, L.G., Kaufmann, G.F., McKenzie, K.M., Sun, C., Moss, J.A., Matsushita, M., Janda, K.D. Synthesis and biological validation of a ubiquitous quorum-sensing molecule, *Angew. Chem. Int. Ed.* **43**, 2106 (2004).
279. Chen, D.-W., Janda, K.D., Catalytic Antibodies, *Encyclopedia of Supramolecular Chemistry*, Marcel Dekker, New York, NY, p. 193 (2004).

280. Lee, S.-H., Matsushita, H., Koch, G., Zimmermann, J., Clapham, B., Janda, K.D. Smart cleavage reactions: the synthesis of an array of ureas from polymer-bound carbamates, *J. Comb. Chem.* **6**, 822 (2004).
281. Carrera, M.R.A., Kaufmann, G.F., Mee, J.M., Meijler, M.M., Koob, G.F., Janda, K.D. Treating cocaine addiction with viruses, *Proc. Natl. Acad. Sci. USA*, **101**, 10416 (2004).
282. Lillo, A.M., Sun, C., Gao, C., Ditzel, H., Parrish, J., Gauss, C.-M., Moss, J., Felding-Habermann, B., Wirsching, P., Boger, D.L., Janda, K.D. A human single-chain antibody specific for integrin  $\alpha_3\beta_1$  capable of cell internalization and delivery of antitumor agents, *Chemistry & Biology* **11**, 897 (2004).
283. Dickerson, T.J., Yamamoto, N., Ruiz, D.I., Janda, K.D. Immunological consequences of methamphetamine protein glycation, *J. Am. Chem. Soc.* **126**, 11446 (2004).
284. Carrera, M.R.A., Meijler, M.M., Janda, K.D. Cocaine pharmacology and current pharmacotherapies for its abuse, *Bioorg. Med. Chem.* **12**, 5019 (2004).
285. Dickerson, T.J., Lovell, T., Meijler, M.M., Noodleman, L., Janda, K.D. Nicotinic aqueous aldol reactions: Synthetic and theoretical investigations into origins of catalysis, *J. Org. Chem.* **69**, 6603 (2004).
286. Dickerson, T.J., Yamamoto, N., Janda, K.D. Antibody-catalyzed oxidative degradation of nicotine using riboflavin, *Bioorg. Med. Chem.* **12**, 4981 (2004).
287. Xu, Y., Yamamoto, N., Janda, K.D. Catalytic antibodies: hapten design strategies and screening methods, *Bioorg. Med. Chem.* **12**, 5247 (2004).
288. McDunn, J.E., Dickerson, T.J., Janda, K.D. "Antibody Catalysis of Disfavored Chemical Reactions" In *Catalytic Antibodies* ed. Ehud Keinan, Wiley-VCH Verlag GmbH & Co., Weinheim, Germany, pp. 184-216 (2004).
289. Qi, L., Meijler, M.M., Lee, S.-H., Sun, C., Janda, K.D. Solid-phase synthesis of anandamide analogues, *Organic Lett.* **6**, 1673 (2004).
290. Kim, Y.S., Moss, J.A., Janda, K.D. Biological tuning of synthetic tactics in solid-phase synthesis: Application to A $\beta$ (1-42), *J. Org. Chem.* **69**, 7776 (2004).
291. Matsushita, H., Lee, S.-H., Yoshida, K., Clapham, B., Koch, G., Zimmermann, J., Janda, K.D. N-H insertion reactions of Boc-amino acid amides: Solution- and solid-phase synthesis of pyrazinones and pyrazines, *Org. Lett.* **6**, 4627 (2004).
292. Lee, S.-H., Yoshida, K., Matsushita, H., Clapham, B., Koch, G., Zimmermann, J., Janda, K.D. N-H insertion reactions of primary ureas: The synthesis of highly substituted imidazolones and imidazoles from diazocarbonyls, *J. Org. Chem.* **69**, 8829 (2004).
293. Dickerson, T.J., Reed, N.N., La Clair, J.J., Janda, K.D. A precipitator for the detection of thiophilic heavy metals in aqua, *J. Am. Chem. Soc.* **126**, 16582 (2004).

294. Felding-Habermann, B., Lerner, R.A., Lillo, A., Zhuang, S., Weber, M.R., Arrues, S., Gao, C., Mao, S., Saven, A., Janda, K.D. Combinatorial antibody libraries from cancer patients yield ligand mimetic Arg-Gly-Asp-containing immunoglobulins that inhibit breast cancer metastasis, *Proc. Natl. Acad. Sci. USA* **101**, 17210 (2004).
295. Kaufmann, G.F., Sartorio, R., Lee, S.-H., Rogers, C.J., Meijler, M.M., Moss, J.A., Clapham, B., Brogan, A.P., Dickerson, T.J., Janda, K.D. Revisiting quorum sensing: Discovery of additional chemical and biological functions for 3-oxo-N--acylhomoserine lactones, *Proc. Natl. Acad. Sci. USA* **102**, 309 (2005).
296. Lee, B.S., Mahajan, S., Janda, K.D. Novel method for catalyst immobilization using an ionic polymer: A case study using recyclable ytterbium triflate, *Tetrahedron Letters* **46**, 807 (2005).
297. Moss, J.A., Lillo, A., Kim, Y.S., Gao, C., Ditzel, H., Janda, K.D. A dimerization "switch" in the internalization mechanism of a cell-penetrating peptide, *J. Am. Chem. Soc.* **127**, 538 (2005).
298. Reed, N.N., Dickerson, T.J., Boldt, G.E., Janda, K.D. Enantio reversal in the Sharpless asymmetric epoxidation reaction controlled by the molecular weight of a covalently appended achiral polymer, *J. Org. Chem.* **70**, 1728 (2005).
299. Lee, B.S., Mahajan, S., Janda, K.D. Cross-linked poly(4-vinylpyridine/styrene) copolymers as a support for immobilization of ytterbium triflate, *Tetrahedron* **61**, 3081 (2005).
300. Kaufmann, G.F., Meijler, M.M., Sun, C., Chen, D.-W., Kujawa, D.P., Mee, J.M., Hoffman, T.Z., Wirsching, P., Lerner, R.A., Janda, K.D. Enzymatic incorporation of an antibody-activated blue fluorophore into DNA, *Angew. Chem. Int. Ed.* **44**, 2144 (2005).
301. Rogers, C.L., Dickerson, T.J., Brogan, A.P., Janda, K.D. Hammett correlation of Nornicotine analogues in the aqueous Aldol reaction: Implications for green organocatalysis, *J. Org. Chem.* **70(9)**, 3705 (2005).
302. Lowery C.A., McKenzie, K.M., Qi, L., Meijler, M.M., Janda, K.D. Quorum sensing in *Vibrio harveyi*: probing the specificity of the LuxP binding site, *Bioorg. Med. Chem. Lett.* **15**, 2395 (2005).
303. Dickerson, T. J., Kaufmann, G. F., Janda, K. D. Bacteriophage-mediated protein delivery into the central nervous system and its application in immunopharmacotherapy, *Expert Opin. Biol. Ther.* **5**, 773 (2005).
304. Lee, B. S., Mahajan, S., Janda, K. D. Asymmetric dihydroxylation catalyzed by ionic polymer-supported osmium tetroxide, *Tetrahedron Lett.* **46**, 4491 (2005).
305. Lee, B. S., Mahajan, S., Janda, K. D. Molecular iodine-catalyzed imine activation for three-component nucleophilic addition reactions, *Synlett* **8**, 1325 (2005).

306. Brogan, A.P., Dickerson, T.J., Boldt, G.E., Janda, K.D. Altered retinoid homeostasis catalyzed by a nicotine metabolite: Implications in macular degeneration and normal development, *Proc. Natl. Acad. Sci., U.S.A.* **102(30)**, 10433 (2005).
307. Rogers, C.J., Mee, J.M., Kaufmann, G.F., Dickerson, T.J., Janda, K.D. Toward cocaine esterase therapeutics, *J. Amer. Chem. Soc.* **127(28)**, 10016 (2005).
308. Yamashita, M., Lee, S.-H., Koch, G., Zimmermann, J., Clapham, B., Janda, K.D. Solid-phase synthesis of oxazolones and other heterocycles via Wang resin-bound diazocarbonyls, *Tetrahedron Lett.* **46**, 5495 (2005).
309. Xu, Y., Yamamoto, N., Ruiz, D.I., Kubitz, D.S., Janda, K.D. Squaric monoamide monoester as a new class of reactive immunization hapten for catalytic antibodies, *Bioorg. Med. Chem. Lett.* **15**, 4304 (2005).
310. Toker, J.D., Tremblay, M.R., Yli-Kauhaluoma, J., Wentworth, A.D., Zhou, B., Wentworth, Jr., P., Janda, K.D. Exploring the scope of the 29G12 antibody catalyzed 1,3-dipolar cycloaddition reaction, *J. Org. Chem.* **70**, 7810 (2005).
311. McKenzie, K.M., Meijler, M.M., Lowery, C.A., Boldt, G.E., Janda, K.D. A furanosyl-carbonate autoinducer in cell-to-cell communication of *V. harveyi*, *Chem. Commun.*, 4863 (2005).
312. Carrera, M.R.A., Trigo, J.M., Wirsching, P., Roberts, A.J., Janda, K.D. Evaluation of the anticocaine monoclonal antibody GNC92H2 as an immunotherapy for cocaine overdose, *Pharmacology, Biochemistry and Behavior* **81**, 709 (2005).
313. Eubanks, L.M., Dickerson, T.J., Janda, K.D. Vitamin B2-mediated cellular photoinhibition of botulinum neurotoxin A, *FEBS Letters* **579**, 5361 (2005).
314. Matsushita, M., Meijler, M.M., Wirsching, P., Lerner, R.A., Janda, K.D. A blue fluorescent antibody-cofactor sensor for mercury, *Org. Lett.* **7**, 4943 (2005).
315. Shute, T.S., Matsushita, M., Dickerson, T.J., La Clair, J.J., Janda, K.D., Burkart, M.D. A site-specific bifunctional protein labeling system for affinity and fluorescent analysis, *Bioconjugate Chem.* **16**, 1352 (2005).
316. Dickerson, T.J., Beuscher IV, A.E., Rogers, C.J., Hixon, M.S., Yamamoto, N., Xu Y., Olson, A.J., Janda, K.D. Discovery of acetylcholinesterase peripheral anionic site ligands through computational refinement of a directed library, *Biochemistry* **44**, 14845 (2005).
317. Qi, L., Yamamoto, N., Meijler, M.M., Altobelli, III, L.J., Koob, G.F., Wirsching, P., Janda, K.D.  $\Delta^9$ -Tetrahydrocannabinol immunochemical studies: Haptens, monoclonal antibodies, and a convenient synthesis of radiolabeled  $\Delta^9$ -tetrahydrocannabinol, *J. Med. Chem.* **48**, 7389 (2005).

318. Meijler, M.M., Kaufmann, G.F., Qi, L., Mee, J.M., Coyle, A.R., Moss, J.A., Wirsching, P., Matsushita, M., Janda, K.D. Fluorescent cocaine probes: A tool for the selection and engineering of therapeutic antibodies, *J. Amer. Chem. Soc.* **127**, 2477 (2005).
319. Kim, Y., Lillo, A., Moss, J.A., Janda, K.D. A contiguous stretch of methionine residues mediates the energy-dependent internalization mechanism of a cell-penetrating peptide, *Molecular Pharmaceutics* **2(6)**, 528 (2005).
320. Rogers, C.J., Dickerson, T.J., Wentworth, Jr., P., Janda, K.D. A high-swelling reagent scaffold suitable for use in aqueous and organic solvents, *Tetrahedron* **61**, 12140 (2005).
321. Shimomura, O., Lee, B.S., Meth, S., Suzuki, H., Mahajan, S., Nomura, R., Janda, K.D. Synthesis and application of polytetrahydrofuran-grafted polystyrene (PS-PTHF) resin supports for organic synthesis, *Tetrahedron* **61**, 12160 (2005).
322. Dickerson, T.J., Janda, K.D. Recent advances for the treatment of cocaine abuse: Central nervous system immunopharmacotherapy, *The AAPS Journal* **7(3)**, Article 59, E579 (2005).
323. Lillo, A.M., McKenzie, K.M., Janda, K.D. "Phage-Displayed Antibody Libraries" *In: Cell Biology: A Laboratory Handbook*, ed. J.E. Celis, Elsevier Academic, USA, Chapter 59, pp. 491-496 (2006).
324. Wu, W., Luo, Y., Sun, C., Liu, Y., Kuo, P., Varga, J., Xiang, R., Reisfeld, R., Janda, K.D., Edgington, T.S., Liu, C. Targeting cell-impermeable prodrug activation to tumor microenvironment eradicates multiple drug-resistant neoplasms, *Cancer Res.* **66(2)**, 1 (2006).
325. Zhang, L., Long, H., Boldt, G.E., Janda, K.D., Schatz, G.C., Lewis, F.D.,  $\alpha$ - and  $\beta$ - Stilbenosides as base-pair surrogates in DNA hairpins, *Org. Biomol. Chem.* **4**, 314 (2006).
326. Rogers, C.J., Dickerson, T.J., Janda, K.D. Kinetic isotope and thermodynamic analysis of the normicotine-catalyzed aqueous aldol reaction, *Tetrahedron* **62**, 352 (2006).
327. Boldt, G.E., Dickerson, T.J., Janda, K.D. Emerging chemical and biological approaches for the preparation of discovery libraries, *Drug Disc. Today* **11**, 143 (2006).
328. Moss, J.A., Stokols, S., Hixon, M.S., Ashley, F.T., Chang, J.Y., Janda, K.D. Solid-phase synthesis and kinetic characterization of fluorogenic enzyme-degradable hydrogel cross-linkers, *Biomacromolecules* **7**, 1011 (2006).
329. Shigenaga, A., Moss, J.A., Ashley, F.T., Kaufmann, G.F., Janda, K.D. Solid-phase synthesis and cyclative cleavage of quorum sensing depsipeptide analogues by acylphenyldiazene activation, *SYNLETT* **4**, 551 (2006).
330. Zhu, X., Dickerson, T.J., Rogers, C.J., Kaufmann, G.F., Mee, J.M., McKenzie, K.M., Janda, K.D., Wilson, I.A. Complete reaction cycle of a cocaine catalytic antibody at atomic resolution, *Structure* **14**, 205 (2006).

331. McAllister, L.A., Hixon, M.S., Kennedy, J.P., Dickerson, T.J., Janda, K.D. Superactivation of the botulinum neurotoxin serotype A light chain metalloprotease: A new wrinkle in botulinum neurotoxin, *J. Am. Chem. Soc.* **128**, 4176 (2006).
332. Kaufmann, G.F., Sartorio, R., Lee, S.-H., Mee, J.M., Altobelli, III, L.J., Kujawa, D.P., Jeffries, E., Clapham, B., Meijller, M.M., Janda, K.D. Antibody interference with N-acetyl homoserine lactone-mediated bacterial quorum sensing, *J. Am. Chem. Soc.* **128**, 2802 (2006).
333. Xu, Y., Shi, J., Yamamoto, N., Moss, J.A., Vogt, P.K., Janda, K.D. A credit-card library approach for disrupting protein-protein interactions, *Bioorg. Med. Chem.* **14**, 2660 (2006).
334. Boldt, G.E., Kennedy, J.P., Janda, K.D. Identification of a potent botulinum neurotoxin A protease inhibitor using in situ lead identification chemistry, *Org. Lett.* **8**, 1729 (2006).
335. Xu, Y., Lu, H., Kennedy, J.P., Yan, X., McAllister, L.A., Yamamoto, N., Moss, J.A., Boldt, G.E., Jiang, S., Janda, K.D. Evaluation of "credit-card" libraries for inhibition of HIV-1 gp41 fusogenic core formation, *J. Comb. Chem.* **8**, 531 (2006).
336. Boldt, G.E., Kennedy, J.P., Hixon, M.S., McAllister, L.A., Barbieri, J.T., Tzipori, S., Janda, K.D. Synthesis, characterization and development of a high-throughput methodology for the discovery of botulinum neurotoxin A inhibitors, *J. Comb. Chem.* **8**, 513 (2006).
337. Fu, Z., Chen, S., Baldwin, M.R., Boldt, G.E., Crawford, A., Janda, K.D., Barbieri, J.T., Kim, J.-J.P. Light chain of botulinum neurotoxin serotype A: Structural resolution of a catalytic intermediate, *Biochemistry (ASAP)* (2006).
338. Ma, H., Zhou, B., Kim, Y., Janda, K.D. A cyclic peptide-polymer probe for the detection of *Clostridium botulinum* neurotoxin serotype A, *Toxicon* **47**, 901 (2006).
339. Boldt, G.E., Eubanks, L.M., Janda, K.D. Identification of a botulinum neurotoxin A protease inhibitor displaying efficacy in a cellular model, *Chem. Commun.* 3063 (2006).
340. Dickerson, T.J., Janda, K.D. The use of small molecules to investigate molecular mechanisms and therapeutic targets for treatment of botulinum neurotoxin A intoxication, *ACS Chemical Biology* **1**(6), 359 (2006).
341. Kim, Y., Lillo, A.M., Steiniger, S.C.J., Liu, Y., Ballatore, C., Anichini, A., Mortarini, R., Kaufmann, G.F., Zhou, B., Felding-Habermann, B., Janda, K.D. Targeting heat shock proteins on cancer cells: Selection, characterization, and cell-penetrating properties of a peptidic GRP78 ligand, *Biochemistry* **45**, 9434 (2006).
342. Zorilla, E.P., Iwasaki, S., Moss, J.A., Chang, J., Otsuji, J., Inoue, K., Meijler, M.M., Janda, K.D. Vaccination against weight gain, *PNAS* **103**(35), 13226 (2006).
343. Brogan, A.P., Dickerson, T.J., Janda, K.D. Enamine-based aldol organocatalysis in water: Are they really "all wet"?, *Angew. Chem. Int. Ed.* **45**, 8100 (2006).

344. Eubanks, L.M., Rogers, C.J., Beuscher IV, A.E., Koob, G.F., Olson, A.J., Dickerson, T.J., Janda, K.D. A molecular link between the active component of marijuana and Alzheimer's disease pathology, *Molecular Pharmaceutics* **3(6)**, 773 (2006).
345. Kravchenko, V.V., Kaufmann, G.F., Mathison, J.C., Scott, D.A., Katz, A.Z., Wood, M.R., Brogan, A.P., Lehmann, M., Mee, J.M., Iwata, K., Pan, Q., Fearn, C., Knaus, U.G., Meijler, M.M., Janda, K.D., Ulevitch, R.J. N-(3-Oxo-acyl)homoserine lactones signal cell activation through a mechanism distinct from the canonical pathogen-associated molecular pattern recognition receptor pathways, *Journal of Biological Chemistry* **281(39)**, 28822 (2006).
346. McKenzie, K.M., Mee, J.M., Rogers, C.J., Hixon, M.S., Kaufmann, G.F., Janda, K.D. Identification and characterization of single chain anti-cocaine catalytic antibodies, *J. Mol. Biol.*, **365**, 722 (2006).
347. Rogers, C.J., Eubanks, L.M., Dickerson, T.J., Janda, K.D. Unexpected acetylcholinesterase activity of cocaine esterases, *J. Am. Chem. Soc.*, **128**, 15364 (2006).
348. Eubanks, L.M., Hixon, M.S., Jin, W., Hong, S., Clancy, C.M., Tepp, W.H., Baldwin, M.R., Malizio, C.J., Goodnough M.C., Barbieri, J.T., Johnson, E.A., Boger, D.L., Dickerson, T.J., Janda, K.D. An in-vitro and in vivo disconnect uncovered through high-throughput identification of botulinum neurotoxin A antagonists, *PNAS* **104(8)**, 2602 (2007).
349. Steiniger, S.C.J., Altobelli III, L.J., Zhou, B., Janda, K.D. Selection of human antibodies against cell surface-associated oligomeric anthrax protective antigen, *Molecular Immunology*, **44**, 2749 (2007).
350. Xu, Y., Hixon, M.S., Yamamoto, N., McAllister, L.A., Wentworth, A.D., Wentworth, Jr., P., Janda, K.D. Antibody-catalyzed anaerobic destruction of methamphetamine, *PNAS*, **104(10)**, 3681 (2007).
351. McAllister, L.A., Hixon, M.S., Schwartz, R., Kubitz, D.S., Janda, K.D. Synthesis and application of a novel ligand for affinity chromatography based removal of endotoxin from antibodies, *Bioconjugate Chem.*, **18**, 559 (2007).
352. De Lamo Marin, S., Xu, Y., Meijler, M.M., Janda, K.D. Antibody catalyzed hydrolysis of a quorum sensing signal found in Gram-negative bacteria, *Bioorg. Med. Chem. Lett.*, **17**, 1549 (2007).
353. Brogan, A.P., Eubanks, L.M., Koob, G.F., Dickerson, T.J., Janda, K.D. Antibody-catalyzed oxidation of delta-9-tetrahydrocannabinol, *J. Am. Chem. Soc.*, **129**, 3698 (2007).
354. Liu, Y., Steiniger, S.C.J., Kim, Y., Kaufmann, G.F., Felding-Habermann, B., Janda, K.D. Mechanistic studies of a peptidic GRP78 ligand for cancer cell-specific drug delivery, *Molecular Pharmaceutics*, **4(3)**, 435 (2007).

355. Eubanks, L.M., Dickerson, T.J., Janda, K.D. Technological advancements for the detection of and protection against biological and chemical warfare agents, *Chem. Soc. Rev.*, **36**(3), 441 (2007).
356. Silvaggi, N.R., Boldt, G.E., Hixon, M.S., Kennedy, J.P., Tzipori, S., Janda, K.D. Structures of Clostridium botulinum neurotoxin serotype A light chain complexed with small-molecule inhibitors highlight active-site flexibility, *Chemistry & Biology*, **14**, 533 (2007).
357. Debler, E., Kaufmann, G.F., Kirchdoefer, R.N., Mee, J.M., Janda, K.D., Wilson, I.A. Crystal structures of a quorum-quenching antibody, *J. Mol. Biol.*, **368**(5), 1392 (2007).
358. Dickerson, T.J., Janda, K.D. The use of small molecules to investigate molecular mechanisms and therapeutic targets for treatment of botulinum neurotoxin A intoxication, *Chem. Biol.*, **2**(4), 359 (2007).
359. Ino, A., Dickerson, T.J., Janda, K.D. Positional linker effects in haptens for cocaine immunopharmacotherapy, *Bioorg. Med. Chem. Lett.*, **17**, 4280 (2007).
360. Treweek, J., Wee, S., Koob, G.F., Dickerson, T.J., Janda, K.D. Self-vaccination by methamphetamine glycation products chemically links chronic drug abuse and cardiovascular disease, *PNAS*, **104**(28), 11580 (2007).
361. Xu, Y., Hixon, M.S., Dawson, P.E., Janda, K.D. Development of a FRET assay for monitoring of HIV gp41 core disruption, *J. Org. Chem.*, **72**(18), 6700 (2007).
362. Capkova, C., Yoneda, Y., Dickerson, T.J., Janda, K.D. Synthesis and structure-activity relationships of second-generation hydroxymate botulinum neurotoxin A protease inhibitors, *Bioorg. Med. Chem. Lett.*, **17**, 6463 (2007).
363. Park, J., Jagasia, R., Kaufmann, G.F., Mathison, J.C., Ruiz, D.I., Moss, J.A., Meijler, M.M., Ulevitch, R.J., Janda, K.D. Infection control by antibody disruption of bacterial quorum sensing signaling, *Chemistry & Biology*, **14**, 1119 (2007).
364. Zhou, H., Zhou, B., Ma, H., Carney, C., Janda, K.D. Selection and characterization of human monoclonal antibodies against Abrin by phage display, *Bioorg. Med. Chem. Lett.*, **17**, 5690 (2007).
365. Dickerson, T.J., McKenzie, K.M., Hoyt, A.S., Wood, M.R., Janda, K.D., Brenner, S.B., Lerner, R.A. Phage escape libraries for checkmate analysis, *PNAS*, **104**(31), 12703 (2007).
366. Brogan, A.P., Dickerson, T.J., Janda, K.D. Nornicotine-organocatalyzed aqueous reduction of alpha, beta-unsaturated aldehydes, *Chem. Commun.*, **46**, 4952 (2007).
367. Richardson, H.N., Zhao, Y., Fekete, E.M., Funk, C.K., Wirsching, P., Janda, K.D., Zorrilla, E.P., Koob, G.F. MPZP: A novel smallmolecule corticotropin-releasing factor type 1 receptor (CRF<sub>1</sub>) antagonist, *Pharmacology, Biochemistry and Behavior*, **88**, 497 (2008).

368. Zarebski, L.M., Vaughan, K., Sidney, J., Peters, B., Grey, H., Janda, K.D., Casadevall, A., Sette, A. Analysis of epitope information related to *Bacillus anthracis* and *Clostridium botulinum*, *Expert Rev. Vaccines*, **7**(1), 55 (2008).
369. Willis, B., Eubanks, L.M., Wood, M.R., Janda, K.D., Dickerson, Lerner, R.A.L. Biologically templated organic polymers with nanoscale order, *PNAS*, **105**(5), 1416 (2008).
370. Zhou, B., Carney, C., Janda, K.D. Selection and characterization of human antibodies neutralizing *Bacillus anthracis* toxin, *Bioorg. Med. Chem.*, **16**, 1903 (2008).
371. Yoneda, Y., Steiniger, S.C.J., Capkova, K., Mee, J.M., Liu, Y., Kaufmann, G.F., Janda, K.D. A cell-penetrating peptidic GRP78 ligand for tumor cell-specific prodrug therapy, *Bioorg. Med. Chem. Lett.*, **18**, 1632 (2008).
372. Kaufmann, G.F., Park, J., Mee, J.M., Ulevitch, R.J., Janda, K.D. The quorum quenching antibody RS2-1G9 protects macrophages from the cytotoxic effects of the *Pseudomonas aeruginosa* quorum sensing signaling molecule *N*-3-oxo-dodecanoyl-homoserine lactone, *Molecular Immunology*, **45**, 2710 (2008).
373. Zhou, B., Pellett, S., Tepp, W.H., Zhou, H., Johnson, E.A., Janda, K.D. Delineating the susceptibility of botulinum neurotoxins to denaturation through thermal effects, *FEBS Letters*, **582**, 1526 (2008).
374. Kaufmann, G.F., Park, J., Janda, K.D. Bacterial quorum sensing: a new target for anti-infective immunotherapy, *Expert Opin. Biol. Ther.*, **8**(6), 719 (2008).
375. Debler, E.W., Kaufmann, G.F., Meijler, M.M., Heine, A., Mee, J.M., Pljevaljcic, G., Di Bilio, A.J., Schultz, P.G., Millar, D.P., Janda, K.D., Wiilson, I.A., Gray, H.B., Lerner, R.A. Deeply inverted electron-hole recombination in a luminescent antibody-stilbene complex, *Science*, **319**(5867), 1232 (2008).
376. Kravchenko, V.V., Kaufmann, G.F., Mathison, J.C., Scott, D.A., Katz, A.Z., Grauer, D.C., Lehmann, M., Meijler, M.M., Janda, K.D., Ulevitch, R.J. Modulation of gene expression via disruption of NF- $\kappa$ B signaling by a bacterial small molecule, *Science*, **321**, 259 (2008).
377. Lowery, C.A., Dickerson, T.J., Janda, K.D. Interspecies and interkingdom communication mediated by bacterial quorum sensing, *Chem. Soc. Rev.*, **37**(7), 1337 (2008).
378. Lowery, C.A., Park, J., Kaufmann, G.F., Janda, K.D. An unexpected switch in the modulation of AI-2-based quorum sensing discovered through synthetic 4,5-Dihydroxy-2,3-pentanedione analogues, *J. Amer. Chem. Soc.*, **130**(29), 9200 (2008).
379. Park, J., Kaufmann, G.F., Bowen, J.P., Arbiser, J.L., Janda, K.D. Solenopsin A, a venom alkaloid from the fire ant *Solenopsis invicta*, inhibits quorum-sensing signaling in *Pseudomonas aeruginosa*, *JID*, **198**, 1198 (2008).
380. Capkova, K., Hixon, M.S., McCallister, L.A., Janda, K.D. Toward the discovery of potent inhibitors of botulinum neurotoxin A: development of a robust LC MS based assay

- operational from low to subnanomolar enzyme concentrations, *Chem. Commun.*, 3525 (2008).
381. Park, J., Dickerson, T.J., Janda, K.D. Major sperm protein as a diagnostic antigen for onchocerciasis, *Bioorg. Med. Chem.*, **16**, 7206 (2008).
382. Steiniger, S.C.J., Coppinger, J.A., Kruger, J.A., Yates III, J., Janda, K.D. Quantitative mass spectrometry identifies drug targets in cancer stem cell containing side population, *Stem Cells*, **26(12)**, 3037 (2008).
383. Mayorov, A.V., Amara, N., Chang, J.Y., Moss, J.A., Hixon, M.S., Ruiz, D.I., Meijler, M.M., Zorilla, E.P., Janda, K.D. Catalytic antibody degradation of ghrelin increases whole-body metabolic rate and reduces refeeding in fasting mice, *PNAS*, **105(45)**, 17487 (2008).
384. Willis, B., Eubanks, L.M., Dickerson, T.J., Janda, K.D. The strange case of the Botulinum neurotoxin: Using chemistry and biology to modulate the most deadly poison, *Angew. Chem. Int. Ed.*, **47**, 8360 (2008).
385. Treweek, J.B., Sun, C., Mayorov, A.V., Qi, L., Levy, C.L., Roberts, A.J., Dickerson, T.J., Janda, K.D. Prevention of drug-induced memory impairment by immunopharmacotherapy, *J. Med. Chem.*, **51**, 6866 (2008).
386. Brogan, A.P., Dickerson, T.J., Janda, K.D. Catalytic Antibodies (Abzymes), Synthetic, book chapter in *Wiley Encyclopedia of Chemical Biology*, Ed. T. Begley, online (2008), in print (2009).
387. Sheng, J., Oyler, G., Zhou, B., Janda, K., Shoemaker, C.B. Identification and characterization of a novel cell-penetrating peptide, *Biochemical and Biophysical Research Communications*, **382**, 236 (2009).
388. Zhou, H., Zhou, B., Pellett, S., Johnson, E.A., Janda, K.D. Selection and characterization of a human monoclonal neutralizing antibody for *Clostridium Botulinum* neurotoxin serotype B, *Bioorg. Med. Chem. Lett.*, **19**, 662 (2009).
389. Nakai, Y., Tepp, W.H., Dickerson, T.J., Johnson, E.A., Janda, K.D. Function-oriented synthesis applied to the anti-botulinum natural product toosendanin, *Bioorg. Med. Chem.*, **17**, 1152 (2009).
390. Moreno, A.Y., Janda, K.D. Immunopharmacotherapy: Vaccination strategies as a treatment for drug abuse and dependence, *Pharmacology, Biochemistry and Behavior*, **92**, 199 (2009).
391. Frederick, M.O., De Lamo Marin, S., Janda, K.D., Nicolaou, K.C., Dickerson, T.J. Monoclonal antibodies with orthogonal azaspiracid epitopes, *ChemBioChem*, **10**, 1625 (2009).

392. Treweek, J.B., Dickerson, T.J., Janda, K.D. Drugs of abuse that mediate advanced glycation end product formation: A chemical link to disease pathology, *Accounts of Chemical Research*, **42(5)**, 659 (2009).
393. Treweek, J.B., Moreno, A.Y., Janda, K.D. SLEEPLESS-ness and insomnia in fruit flies, *Angew. Chem. Int. Ed.*, **48**, 438 (2009).
394. Fischer, A., Nakai, Y., Eubanks, L.M., Clancy, C.M., Tepp, W.H., Pellet, S., Dickerson, T.J., Johnson, E.A., Janda, K.D., Montal, M. Bimodal modulation of the botulinum neurotoxin protein-conducting channel, *PNAS*, **106**, 1330 (2009).
395. Pires-Alves, M., Ho, M., Aberle, K.K., Janda, K.D., Wilson, B.A. Tandem fluorescent proteins as enhanced FRET-based substrates for botulinum neurotoxin activity, *Toxicon*, **53**, 392 (2009).
396. Capkova, K., Salzameda, N.T., Janda, K.D. Investigations into small molecule non-peptidic inhibitors of the botulinum neurotoxins, *Toxicon*, **54**, 575 (2009).
397. Steiniger, S., Janda, K.D. The good, the bad, and the very bad: A new platform strategy to identify drug targets in cancer stem cells, *BIOforum Europe*, **6**, 25 (2009).
398. Salzameda, N.T., Barbieri, J.T., Janda, K.D. Synthetic substrate for application in both high and low throughput assays for botulinum neurotoxin B protease inhibitors, *Bioorg. Med. Chem. Lett.*, **19**, 5848 (2009).
399. Lowery, C.A., Abe, T., Park, J., Eubanks, L.M., Sawada, D., Kaufmann, G.F., Janda, K.D. Revisiting AI-2 quorum sensing inhibitors: Direct comparison of alkyl-DPD analogues and a natural product Fimbrilide, *J. Am. Chem. Soc.*, **131**, 15584 (2009).
400. Lowery, C.A., Park, J., Gloeckner, C., Meijler, M.M., Mueller, R.S., Boshoff, H.I., Ulrich, R.L., Barry III, C.E., Bartlett, D.H., Kravchenko, V.V., Kaufmann, G.F., Janda, K.D. Defining the mode of action of tetramic acid antibacterials derived from *Pseudomonas aeruginosa* quorum sensing signals, *J. Am. Chem. Soc.*, **131**, 14473 (2009).
401. Capkova, K., Hixon, M.S., Pellet, S., Barbieri, J.T., Johnson, E.A., Janda, K.D. Benzylidene cyclopentenediones: First irreversible inhibitors against botulinum neurotoxin A's zinc endopeptidase, *Bioorg. Med. Chem. Lett.*, **20**, 206 (2010).
402. Fukuchi, K., Steiniger, S.C.J., Deryungina, E., Liu, Y., Lowery, C.A., Gloeckner, C., Zhou, B., Kaufmann, G.F., Quigley, J.P., Janda, K.D. Inhibition of tumor metastasis: Functional immune modulation of the CUB domain containing protein 1, *Molecular Pharmaceutics*, **7(1)**, 245 (2010).
403. Nakai, Y., Pellett, S., Tepp, W.H., Johnson, E.A., Janda, K.D. Toosendanin: Synthesis of the AB-ring and investigations of its anti-Botulinum properties (part II), *Bioorg. Med. Chem.*, **18**, 1280 (2010).

404. Stowe G.N., Silhar, P., Hixon, M.S., Silvaggi, N.R., Allen, K.N., Moe, Jacobson, A.R., A.R., Barbieri, J.T., Janda, K.D. Chirality holds the key for potent inhibition of the Botulinum Neurotoxin serotype A protease, *Org. Lett.*, **12(4)**, 756 (2010).
405. Silhar, P., Capkova, K., Salzameda, N.T., Barbieri, J.T., Hixon, M.S., Janda, K.D. Botulinum neurotoxin A protease: Discovery of natural product exosite inhibitors, *J. Am. Chem. Soc.*, **132**, 2868 (2010).
406. Gloeckner, C., Garner, A., Mersha, F., Oksov, Y., Tricoche, N., Eubanks, L., Lustigman, S., Kaufmann, G., Janda, K.D. Repositioning of an old drug for the neglected tropical disease Onchocerciasis, *PNAS*, **107(8)**, 3424 (2010).
407. Staflin, K., Krueger, J.S., Hachmann, J., Forsyth, J.S., Lorger, M., Steiniger, S.C. J., Mee, J., Pop, C., Salvesen, G.S., Janda, K.D., Felding-Habermann, B. Targeting activated integrin  $\alpha v \beta 3$  with patient-derived antibodies impacts late-stage multiorgan metastasis, *Clin. Exp. Metastasis*, **27(4)**, 217 (2010).
408. Moreno, A.Y., Azar, M.R., Warren, N.A., Dickerson, T.J., Koob, G.F., Janda, K.D. A critical evaluation of a nicotine vaccine within a self-administration behavioral model, *Molecular Pharmaceutics*, **7(2)**, 431 (2010).
409. Thyagarajan, B., Potian, J.G., Garcia, C.C., Hognason, K., Capkova, K., Moe, S.T., Jacobson, A.R., Janda, K.D., McArdle, J.J. Effects of hydroxamate metalloendoprotease inhibitors on botulinum neurotoxin A poisoned mouse neuromuscular junctions, *Neuropharmacology*, **58**, 1189 (2010).
410. Lowery, C.A., Salzameda, N.T., Sawada, D., Kaufmann, G.F., Janda, K.D. Medicinal chemistry as a conduit for the modulation of quorum sensing, *J. Med. Chem.*, **53**, 7467 (2010).
411. Steiniger, S.C., Janda, K.D. The good, the bad and the very bad: A new platform strategy to identify drug targets in cancer stem cells, *Laboratory-Journal.com*, (2010).
412. Eubanks, L.M., Silhar, P., Salzameda, N.T., Zakhari, J.S., Xiaochuan, F., Barbieri, J.T., Shoemaker, C.B., Hixon, M.S., Janda, K.D. Identification of a natural product antagonist against the Botulinum neurotoxin light chain protease, *ACS Med. Chem. Lett.*, **1**, 268 (2010).
413. Mayorov, A.V., Willis, B., Di Mola, A., Adler, D., Borgia, J., Jackson, O., Wang, J., Luo, Y., Tang, L., Knapp, R.J., Natarajan, C., Goodnough, M.C., Zilberberg, N., Simpson, L.L., Janda, K.D. Symptomatic relief of Botulinum Neurotoxin/A intoxication with aminopyridines: A new twist on an old molecule, *ACS Chem. Bio.*, **5(12)**, 1183 (2010).
414. Garner, A.L., Janda, K.D. cat-ELCCA: A robust method to monitor the fatty acid acyltransferase activity of Ghrelin O-Acyltransferase (GOAT), *Angew. Chem. Int. Ed.*, **49(50)**, 9630 (2010).

415. Treweek, J.B., Roberts, A.J., Janda, K.D. Superadditive effects of ethanol and flunitrazepam: Implications of using immunopharmacotherapy as a therapeutic, *Mol. Pharm.*, **7(6)**, 2056 (2010).
416. Denery, J.R., Nunes, A.A., Hixon, M.S., Dickerson, T.J., Janda, K.D. Metabolomics-based discovery of diagnostic biomarkers for onchocerciasis, *PLoS Negl. Trop. Dis.*, **4(10)**, e834 (2010).
417. Stowe, G.N., Janda, K.D. A Diels-Alder reaction conducted within the parameters of aqueous organocatalysis: Still just smoke and mirrors, *Tetrahedron Letters*, **52**, 2085 (2011).
418. Lowery C.A., Kaufmann, G.F., Janda, K.D. Determination of acyl homoserine lactone and tetramic acid concentrations in biological samples, *Methods Mol. Bio.*, **692**, 101-111 (2011).
419. Kaufmann, G.F., Park, J., Mayorov, A.V., Kubitz, D.M., Janda, K.D. Generation of quorum quenching antibodies, *Methods Mol. Biol.*, **692**, 299-311 (2011).
420. Garner, A.L., Janda, K.D. Protein-protein interactions and cancer: Targeting the central dogma, *Curr. Top. Med. Chem.*, **11**, 258 (2011).
421. Pier, C.L., Chen, C., Tepp, W.H., Lin, G., Janda, K.D., Barbieri, J.T., Pellett, S., Johnson, E.A. Botulinum neurotoxin subtype A2 enters neuronal cells faster than subtype A1, *FEBS Letters*, **585**, 199 (2011).
422. Garner, A.L., Yu, J., Struss, A.K., Lowery, C.A., Zhu, J., Kim, S.K., Park, J., Mayorov, A.V., Kaufmann, G.F., Kravchenko, V.V., Janda, K.D. Synthesis of 'clickable' acylhomoserine lactone, quorum sensing probes: Unanticipated effects on mammalian cell activation, *Bioorg. Med. Chem. Lett.*, **21**, 2702 (2011).
423. Hicks, M.J., Bishnu, P.D., Rosenberg, J.B., Davidson, J.T., Moreno, A.Y., Janda, K.D., Wee, S., Koob, G.F., Hackett, N.R., Kaminsky, S.M., Worgall, S., Toth, M., Mezey, J.G., Crystal, R.G. Cocaine analog coupled to disrupted adenovirus: A vaccine strategy to evoke high-titer immunity against addictive drugs, *Molecular Therapy*, **19(3)**, 612 (2011).
424. Salzameda, N.T., Eubanks, L.M., Zakhari, J.S., Tsuchikama, K., DeNunzio, N.J., Allen, K.N., Hixon, M.S., Janda, K.D. A cross-over inhibitor of the botulinum neurotoxin light chain B: A natural product implicating an exosite mechanism of action, *Chem. Commun.*, **47**, 1713 (2011).
425. Garner, A.L., Janda, K.D. Shedding light on the Ghrelin/GOAT metabolism saga, *ChemBioChem*, **12**, 523 (2011).
426. Treweek, J.B., Roberts, A.R., Janda, K.D. Immunopharmacotherapeutic manifolds and modulation of cocaine overdose, *Pharmacol. Biochem. Behav.*, **98**, 474 (2011).

427. Zakhari, J.S., Kinoyama, I., Struss, A.K., Pullanikat, P., Lowery, C.A., Lardy, M., Janda, K.D. Synthesis and molecular modeling provide insight into a *Pseudomonas aeruginosa* quorum sensing conundrum, *J. Am. Chem. Soc.*, **133**(11), 3840 (2011).
428. Silhar, P., Alakurtti, S., Capkova, K., Xiaochuan, F., Shoemaker, C.B., Yli-Kauhaluoma, J., Janda, K.D. Synthesis and evaluation of library of betulin derivatives against the botulinum neurotoxin A protease, *Bioorg. Med. Chem. Lett.*, **21**, 2229 (2011).
429. Janda, K.D., Editor's Note, *Bioorg. Med. Chem.*, **19**(1), 20 (2011).
430. Uckun, F.M., Qazi, Z.O., Garner, A.L., Pitt, J., Ma, H., Janda, K.D. Inducing apoptosis in chemotherapy-resistant B-lineage acute lymphoblastic leukemia cells by targeting HSPA5, a master regulator of the anti-apoptotic unfolded protein response signaling network, *British Journal of Haematology*, doi:10.1111/j.1365-2141.2001.08671.x (2011).
431. Moreno, A.Y., Mayorov, A.V., Janda, K.D. Impact of distinct chemical structures for the development of a methamphetamine vaccine, *J.A.C.S.*, **133**, 6587 (2011).
432. Garner, A.L., Gloeckner, C., Trioche, N., Zakhari, J.S., Samje, M., Cho-Ngwa, F., Lustigman, S., Janda, K.D. Design, synthesis, and biological activities of Clostentel analogues: Structural promiscuity and its impact on *Onchocerca volvulus*, *J. Med. Chem.*, **54**, 3963 (2011).
433. Garner, A.L., Janda, K.D. A small molecule antagonist of ghrelin O-acyltransferase (GOAT), *Chem. Commun.*, **47**, 7512 (2011).
434. Stowe, G.N., Vendruscolo, L.F., Edwards, S., Schlosburg, J.E., Misra, K.K., Schulteis, G., Mayorov, A.V., Zakhari, J.S., Koob, G.F., Janda, K.D. A vaccine strategy that induces protective immunity against heroin, *J. Med. Chem.*, **54**(14), 5195 (2011).
435. Tsuchikama, K., Lowery, C.A., Janda, K.D. Probing autoinducer-2 based quorum sensing: the biological consequences of molecules unable to traverse equilibrium states, *J. Org. Chem.*, **76**(17), 6981 (2011).
436. Liu, Y., Jiang, P., Capkova, K., Xue, D., Ye L., Sinha, S.C., Mackman, N., Janda, K.D., Liu, C. Tissue factor activated coagulation cascade in the tumor microenvironment is critical for tumor progression and an effective target for therapy, *Cancer Res.*, **71**(20), 6492 (2011).
437. Garner, A.L., Park, J., Zakhari, J.S., Lowery, C.A., Struss, A.K., Sawada, D., Kaufmann, G.F., Janda, K.D. A multivalent probe for AI-2 quorum sensing receptors, *J. Am. Chem. Soc.*, **133**, 15934 (2011).
438. Wee, S., Hicks, M.J., De, B.P., Rosenberg, J.B., Moreno, A.Y., Kaminsky, S.M., Janda, K.D., Crystal, R.G., Koob, G.F. Novel cocaine vaccine linked to a disrupted adenovirus gene transfer vector blocks cocaine psychostimulant and reinforcing effects, *Neuropsychopharmacology*, **1** (2011).

439. Eubanks, L.M., Stowe, G.N., De Lamo Marin, S., Mayorov, A.V., Hixon, M.S., Janda, K.D. Identification of a alpha(2) macroglobulin as a major serum ghrelin esterase, *Angew. Chem. Int. Ed. Engl.*, **50**, 10699 (2011).
440. Zakhari, J.S., Kinoyama, I., Hixon, M., Di Mola, A., Globisch, D., Janda, K.D. Formulating a new basis for the treatment against botulinum neurotoxin intoxication: 3,4-Diaminopyridine prodrug design and characterization, *Bioorg. Med. Chem.*, **19**, 6203 (2011).
441. Moreno, A.Y., Janda, K.D. Current challenges for the creation of effective vaccines against drugs of abuse, *Expert Rev. Vaccines*, **10(12)**, 637 (2011).
442. Romano, A.A., Hahn, T., Davis, N., Lowery, C.A., Struss, A.K., Janda, K.D., Bottger, L.H., Matzanke, B.F., Carrano, C.J. The Fe(III) and Ga(III) coordination chemistry of a 3-(1-hydroxymethylidene) and 3-(1-hydroxydecylidene)-5-(2-hydroxyethyl)pyrrolidine-2,4-dione: Novel tetramic acid degradation products of homoserine lactone bacterial quorum sensing molecules, *Journal of Inorganic Biochemistry*, **107**, 96 (2012).
443. Zhiru, L., Garner, A.L., Gloeckner, C., Janda, K.D., Carlow, C.K. Targeting the *Wolbachia* cell division protein FtsZ as a new approach for antifilarial therapy, *PLoS Neglected Tropical Diseases*, **5(11)**, e1411 (2011).

#### Patents:

1. "Lipase catalyzed synthesis of  $\beta$ -keto esters" Janda, K.D.; Cordova, A. US 6642035
2. "Preparation and antigenicity of nicotine haptens" Janda, K.D.; Wirsching, P. WO 2002058635
3. "Cocaine haptens for the development of catalytic monoclonal antibodies" Janda, K.D.; Wirsching, P. WO 2002046234
4. "Soluble polymer supports for organic synthesis" Janda, K.D.; Gravert, D.J. US 2002055124
5. "Preparation and use of anti-stilbene antibodies" Wirsching, P.; Janda, K.D.; Lerner, R.A. WO 2002022629
6. "Methods and compositions using antioxidant for reducing antibody-mediated generation of hydrogen peroxide and superoxide and oxidative stress" Wentworth, P.; Wentworth, A.D.; Jones, L.H.; Janda, K.D.; Lerner, R.A. WO 2002022573
7. "Methods for display of heterodimeric proteins on filamentous phage using pVII and pIX and the screening of combinatorial antibody libraries" Janda, K.D.; Wirsching, P.; Lerner, R.A.; Gao, C. WO 2000071694

8. "Preparation of amino acid- and peptide-based epoxides as HIV-1 protease inhibitors" Janda, K.D.; Wirsching, P. US 5827827
9. "Preparation of PEG-bound alkaloid ligands and their use in Sharpless asymmetric dihydroxylations" Janda, K.D.; Han, H. WO 9835927
10. "Azatide peptidomimetics" Janda, K.D.; Han, H. WO9735199
11. "Preparation of cocaine derivatives as an anti-cocaine vaccine" Wirsching, P.; Janda, K.D. WO 9721451
12. "Panning of protein libraries with immobilized suicide substrate to identify catalytically active proteins" Janda, K.D. US 5985626
13. "Reaction cassette comprising primer-linker substrates on solid phase matrix, assaying enzymic bond cleavage or formation, and potential use for clinical diagnosis" Janda, K.D.; Fenniri, H.; Lerner, R.A. WO 9622391
14. "Process for antibody combining site-catalyzed syn elimination in the formation of a cis olefin" Cravatt, B.F.; Ashley, J.A.; Janda, K.D.; Boger, D.L.; Lerner, R.A. US 5478728
15. "Methylenephosphinate linking unit and its use in aspartyl proteinase-inhibiting peptide analogs" Janda, K.D.; Wirsching, P.; Ikeda, S. WO 9314114
16. "Preparation of molecules with antibody combining sites that exhibit catalytic properties and of ligand analogs as immunogens" Tramontano, A.; Janda, K.D.; Lerner, R.A. EP 260939
17. "Methods for display of heterodimeric proteins of filamentous phage using pVII and pIX compositions, vectors and combinatorial libraries" Janda, K.D., Wirsching, P., Lerner, R.A., Gao, C. AU 782349
18. "Subnanomolar precipitator of thiophilic metals" Janda, K.D., Dickerson, T.J., La Clair, J.J. WO 2006055883
19. "MPZP: A small molecule corticotropin-releasing factor type-1 receptor (CRF<sub>1</sub>) antagonist" Koob, G.F., Zorrilla, E.P., Mason, B., Janda, K.D., Wirsching, P. US 12/677,770, AU 2008298657