Christopher M. Holman

Present Employment

University of Missouri-Kansas City School of Law **August 2005-present**
Associate Professor

Teaching courses in Intellectual Property Law; Patent Law; Seminar in Law, Science & Technology; Food, Drug & Biotechnology Law; Antitrust and Competition Law and Drug and Medical Technology Torts.

Education

Boalt Hall School of Law, University of California, Berkeley
J.D., 1998

Honors Jurisprudence Award – Proprietary Rights in Biotech Industry

Prosser Prize – Criminal Law

Activities Associate Editor – Berkeley Technology Law Journal

Judicial extern in federal district court – Including substantive involvement in a major biotechnology patent interference trial

University of California, Davis
Ph.D., 1993 – Biochemistry and Molecular Biology

Research Investigated enzymatic reaction catalyzed by Δ^5-3-Ketosteroid Isomerase (KSI), focusing particularly on characterization of active site environment and the nature of the reaction transition state. The research entailed molecular cloning and site-directed mutagenesis, protein engineering, protein purification and kinetic characterization, organic synthesis of steroidal substrates and inhibitors of the enzyme, and structural studies using NMR and X-ray crystallography.

Honors NIH Molecular and Cellular Biology Training Grant Fellow

California State University, Hayward
B.A., 1987 - Chemistry

Honors Dean's List (1985-87)

Highest ranking biochemistry and organic chemistry student in graduating class

Legal and Scientific Experience

PhyNexus, Inc. **2003 - 2005**
Vice-President, Intellectual Property **San Jose, CA**
Management of all aspects of company's intellectual property program, including patent preparation, domestic and international patent filing strategy and implementation, freedom-to-operate analysis, product clearance, trademark and copyright filing and strategy, contracts, agreements and technology licensing.

Maxygen, Inc. **2001 – 2002**
Patent Counsel **Redwood City, CA**
Prepared and prosecuted patent applications in US and PCT relating to various biotechnology inventions, including novel genes and proteins, methods of directed molecular evolution and genetic engineering; managed international patent prosecution docket and directed intellectual property strategy for Verdia, Inc., a wholly-owned subsidiary of Maxygen; performed freedom-to-operate, patent infringement and validity analysis; managed outside counsel in patent prosecution and procurement of validity/infringement opinions; responsible for IP aspects of several collaborative research programs; prepared contracts and counseled client with respect to complex licensing agreements.

Transgenomic, Inc. **2000 – 2001**
Associate Patent Counsel **San Jose, CA**
Prepared and prosecuted patent applications in US and PCT relating to various biotechnology and chemistry inventions, including methods, reagents and apparatuses for the preparation and analysis of polynucleotides, diagnostic methods, and bioinformatic software; performed freedom-to-operate, patent infringement and validity analyses; performed due diligence analysis in connection with the successful acquisition of a small chemical company; performed patent and prior art searches, including chemical structure searches; prepared and evaluated contracts and participated in patent licensing negotiations.

Federal District Court, Northern District of California **1997**
Full-time Judicial Extern to Judge Claudia Wilken **Oakland, CA**

Pennie & Edmonds, LLP **Summer 1997 and 1998-1999**
Summer Associate and Associate **Palo Alto, CA**
Prepared and prosecuted patent applications in US and PCT relating to various biotechnology and chemistry inventions, including gene therapy, drug delivery, novel genes and proteins, immunology, and hybridization arrays; prepared validity/infringement opinions; some contract work, patent litigation and interference support.

Flehr Hohbach, LLP **1996-1997**
Patent Agent **San Francisco, CA**
Prosecuted patent applications, primarily involving biotechnology and pharmaceutical inventions, and conducted legal research to support litigation.

Somatix Therapy Corporation **1996**
Assistant to Director of Intellectual Property and Licensing **Alameda, CA**

Syntex Research/Roche Bioscience **1993- 1995**
NIH Post-doctoral Fellow **Palo Alto, CA**
Worked as part of group developing novel matrix metalloproteinase (MMP) inhibitors as potential therapeutics, particularly for the treatment of arthritis and cancer. Conceived and implemented an independent research project aimed at elucidating the structure and mechanism of human stromelysin-1, which included protein engineering to alter the enzymes substrate specificity, inhibition profile and pH dependence. Designed and synthesized novel fluorogenic peptide substrates, including one that became standard for measuring activity of stromelysin.

Teaching Experience

University of California, Santa Cruz Extension Program **2002-Present**
Instructor
Teach on an ongoing basis a course I developed for scientists and other non-patent professionals entitled "Intellectual Property Rights in the Biotechnology and Pharmaceutical Industries."

California State University, Hayward **1999-2000 Academic Year**
Assistant Professor, Dept. of Chemistry
Developed and taught classes in chemistry and biochemistry at undergraduate and graduate level, including advanced courses in instrumental analysis and bioinformatics. Supervised graduate student in independent research project studying catalytic mechanism of bacterial protease subtilisin, which resulted in publication in peer-reviewed journal. Served on University-wide committee.

University of California, Davis **1987-1991**
Teaching Assistant
Taught a variety of undergraduate biochemistry course for a total of six quarters.

Activities, Certifications and Affiliations

California State Bar (No. 197517 – inactive status)

U.S. Patent and Trademark Office (No. 40,021)

American Intellectual Property Law Association – Former Chair of the Biotechnology in the Courts Subcommittee

American Bar Association, Section of Intellectual Property

UMKC Intellectual Property Advisory Committee

UMKC Health and Life Sciences Commission

Publications

Christopher M. Holman, "The Impact of Human Gene Patents on Innovation and Access: A Survey of Human Gene Patent Litigation," 76 UMKC L. Rev. 295 (2007).

Christopher M. Holman, "Patent Border Wars: Defining the Boundary Between Scientific Discoveries and Patentable Inventions," Trends in Biotechnology, 25: 539-43 (2007).

Christopher M. Holman, "Is Lilly Written Description a Paper Tiger?: A Comprehensive Assessment of the Impact of Eli Lilly and Its Progeny in the Courts and PTO," 17 Alb. L.J. Sci. & Tech. 1 (2007).

Christopher M. Holman, "Do Reverse Payment Settlements Violate The Antitrust Laws?," 23 Santa Clara Computer & High Tech. L.J. 489 (2007).

Christopher M. Holman, "Biotechnology's Prescription for Patent Reform," 5 J. Marshall Rev. Intell. Prop. L. 318 (2006).

Chris Holman, "Clearing a Path through the Patent Thicket," *Cell*, 125: 629-633 (2006).

Christopher M. Holman "Protein Similarity Score: A Simplified Version of the BLAST Score as a Superior Alternative to Percent Identity for Claiming Genuses of Related Protein Sequences" 21 Santa Clara Computer & High Tech. L.J. 55 (2004).

Christopher M. Holman, Chen-Chen Kan, Michael R. Gehring and Harold E. Van Wart (1999) "Role of His-224 in the Anomalous pH Dependence of Human Stromelysin-1" *Biochemistry* **38**:677-81.

Christopher M. Holman and William F. Benisek (1995) "Insights into the Catalytic Mechanism and Active Site Environment of *C. testosteroni* Δ^5-3-Ketosteroid Isomerase as Revealed by Site-Directed Mutagenesis of the Catalytic Base Aspartate-38" *Biochemistry* **34**:14245-53.

Christopher M. Holman and William F. Benisek (1994) "Extent of Proton Transfer in the Transition States of the Reaction Catalyzed by the Δ^5-3-Ketosteroid Isomerase of *Comamonas (Pseudomonas) testosteroni*: Site-Specific Replacement of the Active Site Base, Asparate 38, by the Weaker Base Alanine-3-sulfinate" *Biochemistry* **33**:2672-81.

Anthony R. Welch, Christopher M. Holman, Martin Huber, Mitchell C. Brenner, Michelle F. Browner and Harold E. Van Wart (1996) "Understanding the P_1' Specificity of the Matrix Metalloproteinases: Effect of S_1' Pocket Mutations in Matrilysin and Stromelysin-1" *Biochemistry* **35**:10103-109.

Anthony R. Welch, Christopher M. Holman, Michelle F. Browner, Michael R. Gehring, Chen-Chen Kan and Harold E. Van Wart (1995) "Purification of Human Matrilysin Produced in *E. coli* and Characterization Using a New Optimized Fluorogenic Peptide Substrate" *Archives of Biochemistry and Biophysics* **324**:59-64.

Presentations

Invited Speaker, "Human Gene Patent Litigation in the United States: Past, Present and Future," 2008 Intellectual Property Scholars Roundtable, Drake University Law School, Des Moines, IA (February 22, 2008).

Podcast, Commentary on Oral Arguments before Supreme Court in the Case of *Quanta Computer v. LG Electronics*, Federalist Society SCOTUScast, available at http://www.fed-soc.org/publications/pubID.487/pub_detail.asp (January 23, 2008).

Invited Speaker, Session Title: Biolaw and Socio-Economics: Are Market Incentives a Bane or a Boon to Biodiversity, Presentation Title: The Impact of *Quanta* on Agricultural Biotechnology and Biodiversity, Association of American Law Schools Annual Meeting, New York, NY (January 3, 2008).

Speaker, Moderator and Organizer, Hot Topics in Intellectual Property Law, Continuing Legal Education Program, UMKC School of Law (November 2, 2007).

Speaker, Intellectual Property Scholars Conference, DePaul School of Law, "The Impact of Human Gene Patents on Innovation and Access: A Survey of Human Gene Patent Litigation," Chicago, IL (August 10, 2007).

Invited Speaker, Southeastern Association of Law Schools Annual Meeting, "Do Reverse Payment Settlements Violate the Antitrust Law?," Amelia Island, FL (August 2, 2007).

Invited Speaker, "Reverse Payment Settlements to Generic Drug Patent Challenges," Kansas Bar Association 2006 Intellectual Property Institute (May 4, 2007).

Symposium Organizer, Moderator and Speaker, "Restrictions on Access to Technology That Extend Beyond IP Law," American Association for the Advancement of Science (AAAS) Annual Meeting, San Francisco, CA (February 18, 2007).

Invited Speaker, "Influence of Intellectual Property on Basic Research," American Association of Pharmaceutical Scientist Annual Meeting, San Antonio, TX (November 2, 2006).

Invited Speaker, "Biotechnology Patents: Issues/Exemptions from Infringement," American Association of Pharmaceutical Scientist Annual Meeting, San Antonio, TX (October 29, 2006).

Invited Panelist, "*FTC v. Schering-Plough* and the Controversy Surrounding Reverse Payment Settlements," Conference on Patent Policy in the Supreme Court and Congress, Santa Clara University School of Law (October 27, 2006).

Invited Speaker, "Biotechnology Patents: Issues/Exemptions from Infringement," Association of Politics and the Life Sciences Annual Meeting, Indiana University (October 25, 2006).

Speaker, Works in Progress IP Conference at the University of Pittsburgh, "Making a Case for Eliminating (or at Least Modifying) 180-Day Generic Exclusivity" (October 6, 2006).

Speaker, Intellectual Property Scholars Conference, Boalt Hall School of Law, "Do Exclusionary Settlements of Hatch-Waxman Patent Suits Violate Antitrust Law?" Berkeley, CA (August 10, 2006).

Invited Speaker, "Primer on Intellectual Property," National Research Council, National Academies Workshop on Intellectual Property Concerns for Toxicogenomics**,** Washington, D.C. (June 29, 2006).

Invited Speaker, "Selected Topics in Patent Law of Relevance to Biotech and Pharma," American Association of Pharmaceutical Scientist National Biotechnology Conference, Boston, MA (June 19, 2006).

Invited Speaker, "Recent Developments in the Inequitable Conduct Defense," Kansas State Bar Association's 2006 Intellectual Property Institute (May 12, 2006).

Symposium Organizer, Moderator and Speaker, "The Dichotomy of Intellectual Property as Both an Incentive and an Impediment to Innovation: Are There Better Alternatives?," American Association for the Advancement of Science (AAAS) Annual Meeting, Saint Louis, MO (February 19, 2006).

Invited Speaker, "Drug Discovery and Development: Using Patented Technology without Infringement," American Association of Pharmaceutical Scientist Annual Meeting, Nashville, TN (November 9, 2005).

Invited Speaker, "Biotechnology's View on Patent Reform Legislation," Markey Symposium on "Innovation and its Discontents: Patents and Innovation Policy in the 21st Century," John Marshall Law School, (October 14, 2005).

Speaker and work-in-progress paper, Works-In-Progress Intellectual Property Colloquium, Washington University in St. Louis., "UC v. Eli Lilly after Eight Years: An Empirical Study of the Impact of the Lilly doctrine on the Patenting of Biotechnology and Chemical Inventions (October 7, 2005).

Speaker and work-in-progress paper, Intellectual Property Scholars Conference, Cardozo School of Law, "UC v. Eli Lilly after Eight Years: An Empirical Study of the Impact of the Lilly doctrine on the Patenting of Biotechnology and Chemical Inventions (August 2005).

Report, Biotechnology in the Courts Subcommittee Report: Summaries of Recent Decisions of Interest to the Biotechnology Community (editor and primary contributor), Presented at AIPLA Spring Meeting, Dallas TX, May 13-15, 2004. (Available to AIPLA members online at www.aipla.org Biotechnology Committee Website).

Report, Biotechnology in the Courts Subcommittee Report: Summaries of Recent Decisions of Interest to the Biotechnology Community (editor and primary contributor), Presented at AIPLA Mid-Winter Meeting, La Quinta, CA (January 2004).

Report, Biotechnology in the Courts Subcommittee Report: Summaries of Recent Decisions of Interest to the Biotechnology Community (editor and primary contributor), Presented at AIPLA Annual Meeting, Washington, DC (October 2003).

Speaker, University of California Goldman School of Public Policy, Science and Public Policy Course, "Public policy issues relating to the patenting of genes and biotechnology" (March 11, 2003).

Speaker, California State University Hayward, Noon Seminar in Biology entitled "Intellectual Property 101 for the Life Scientist" (October 2003).

Christopher M. Holman, Anthony R. Welch, Chen-Chen Kan, Michael R. Gehring and Harold E. Van Wart (1995) "An Attempt to Engineer the S_1' Binding Pocket of Matrilysin into Stromelysin -1" FASEB Journal **9**:A1345.

Christopher M. Holman and William F. Benisek (1993) "Mechanism of Δ^5-3-Ketosteroid Isomerase: Effects of the Replacement of the Catalytic Base, D38, by Alanine-3-Sulfinic Acid" FASEB Journal **7**:A1173.

Christopher M. Holman and William F. Benisek (1991) "Preparation and Properties of an Oxidized derivative of the Δ^5-3-Ketosteroid Isomerase mutant, D38C" FASEB Journal **5**:A1520.