



## Jeffrey D. Kittendorf, Ph.D.

### Education

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|--|---------------|
| <b>MBA Essentials &amp; Entrepreneurship Program</b>                                 | 2009          |
| University of Michigan, Ross School of Business                                      | Ann Arbor, MI |
| <b>Postdoctoral Fellow</b>   | 2004 – 2008   |
| University of Michigan, Life Sciences Institute                                      | Ann Arbor, MI |
| Advisor: David H. Sherman, Ph.D.   |               |
| <b>Ph.D., Medicinal Chemistry</b>  | 2004          |
| University of Michigan, College of Pharmacy  | Ann Arbor, MI |
| Dissertation: "Catalysis by the tRNA-Modifying Enzyme tRNA-Guanine Transglycosylase" |               |
| Advisor: George A. Garcia, Ph.D.   |               |
| <b>B.S., Biochemistry, Cum Laude</b>   | 1997          |
| Eastern Michigan University  | Ypsilanti, MI |
| Research Advisor: Ronald M. Scott, Ph.D.   |               |

### Positions

|  |                |
|--|----------------|
| <b>PharmaForensics Laboratories, LLC</b>   | Ann Arbor, MI  |
| <i>Co-Founder &amp; Managing Partner</i>   | 2009 – Present |
| <ul style="list-style-type: none"><li>• Provide technical litigation support services to intellectual property litigation attorneys in the areas of life sciences, pharmaceuticals, and biotechnology.</li><li>• Responsible for consulting and executing the technical evaluation of life science, biotechnology, and pharmaceutical products involved in patent infringement, patent invalidity, and international trade commission (ITC) litigation.</li><li>• Manage all operations of the company, including project work flow, financial planning, and customer service.</li></ul> |                |
| <b>Alluvium Biosciences Incorporated</b>   | Ann Arbor, MI  |
| <i>Co-Founder &amp; Vice President of Research</i>   | 2009 – Present |
| <ul style="list-style-type: none"><li>• In charge of day-to-day company operations including financial planning, project work flows, and employee management.</li><li>• Responsible for directing contract research projects pertaining to antimicrobial, anti-parasitic, and anti-cancer drug discovery.</li></ul>  |                |



- Authored successfully funded Phase I NIH (NCI) STTR proposal, successfully funded Phase I SBIR (NCI) to support anti-cancer compound development, successfully funded Phase I SBIR (NIAID) to support anti-helminthic drug development, and successfully funded Phase I SBIR (USDA) to support development of a novel biofuel production platform.

**University of Michigan, Life Sciences Institute**

Ann Arbor, MI

*Research Assistant Scientist*

2013 – Present

*Research Investigator*

2009 – 2013

- Responsible for development of a bacterial fermentation system for the production of a key chemical intermediate for use in the cryptophycin synthetic technology.
- Mentor undergraduate and graduate students and regularly consult on projects.
- Assist PI (Dr. David H. Sherman) with grant writing and teaching assignments.

**Parke-Davis/Warner-Lambert**

Ann Arbor, MI

*Laboratory Assistant, Analytical Development*

1996 – 1997

Group Leader: Scott A. Clipper, Ph.D.

- Performed HPLC analysis of drug samples to support clinical pharmacy operations and pathology/experimental toxicology.
- Isolated degradation products of bulk pharmaceuticals on a preparative scale for use as analytical standards in stability testing of bulk pharmaceuticals.

## Honors and Awards

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|--|-------------|
| N.I.H. Ruth L. Kirschstein NRSA Postdoctoral Fellowship                  | 2006 – 2008 |
| Rho Chi Honor Society  | 2004        |
| Horace H. Rackham Pre-doctoral Fellowship, University of Michigan        | 2002 – 2003 |
| American Foundation for Pharmaceutical Education Pre-doctoral Fellowship | 2001 – 2004 |
| N.I.H. Pre-doctoral Training Grant in the Pharmacological Sciences       | 2000 – 2002 |
| Eastern Michigan University Regents Scholar                              | 1992 – 1996 |



## Publications

1. Hansen, D.A., Rath, C.M., Eisman, E.B., Narayan, A.R.H., **Kittendorf, J.D.**, Mortison, J.D., Joon, Y.J., Sherman, D.H., "Biocatalytic synthesis of pikromycin, mehtymycin, neomethymycin, novamethymycin, and ketomethymycin"; *Journal of the American Chemical Society*, 135(30), 11232-11238 (2013).
2. Sherman, D.H., Rath, C.M., Mortison, J., Scaglione, J.B., **Kittendorf, J.D.** "Biosynthetic principles in marine natural product systems"; *Chapter in Handbook of Marine Natural Products*. (eds) E. Fattorusso, O. Tagliatela-Scafati, and W.H. Gerwick. Springer Science (2012).
3. Chen, Y.C., Brooks, A., Goodenough-Lashua, D., **Kittendorf, J.D.**, Showalter, H.D., Garcia, G. "Evolution of the eukaryal tRNA-guanine transglycosylase: Insight gained from the heterocyclic substrate recognition by the wild-type and mutant human and *E. coli* tRNA-guanine transglycosylases"; *Nucleic Acids Research*. 39(7), 2834-2844 (2011).
4. Scaglione J.B., Akey D.L., Sullivan R., **Kittendorf, J.D.**, Rath C.M., Kim E.S., Smith J.L., Sherman D.H., "Biochemical and structural characterization of the tautomycin thioesterase: Analysis of a stereoselective polyketide hydrolase"; *Angew. Chem. Int. Ed. Engl.* 49(33), 5726-5730 (2010).
5. Garcia, G.A., Chervin, S.M., and **Kittendorf, J.D.**, "Identification of the rate-determining step of tRNA-guanine transglycosylase from *E. coli*"; *Biochemistry*, 48(47), 11243-11251 (2009).
6. Mortison, J.D., **Kittendorf, J.D.**, and Sherman D.H., "Synthesis and biochemical analysis of complex chain-elongation intermediates for interrogation of the erythromycin and pikromycin modular polyketide synthases"; *Journal of the American Chemical Society*, 131(43), 15784-15793 (2009).
7. Rath, C.M., Scaglione, J.B, **Kittendorf, J.D.**, and Sherman, D.H., "NRPS/PKS hybrid enzymes and their natural products"; *In Comprehensive Natural Products II: Chemistry and Biology*; Lew Mander, Hung Wend Liu Editors; Elsevier: Oxford 2010; volume 1: 453-492
8. **Kittendorf, J.D.** and Sherman, D.H., "The methymycin/pikromycin biosynthetic pathway: a model for metabolic diversity in natural product biosynthesis"; *Bioorganic and Medicinal Chemistry*, 17, 2137-2146 (2009).
9. Buchholz, T.J., **Kittendorf, J.D.**, and Sherman, D.H., "Polyketide biosynthesis, modular polyketide synthases"; *Wiley Encyclopedia of Chemical Biology*, 1-14, (2008).



## Publications [cont.]

10. **Kittendorf, J.D.**, Beck, B.J., Buchholz, T.J., Seufert, W., and Sherman, D.H., "Interrogating the molecular basis for multiple macrolactone ring formation by the pikromycin polyketide synthase"; *Chemistry and Biology*, 14(8), 944-954 (2007).
11. Chervin, S.M., **Kittendorf, J.D.**, and Garcia, G.A., "Probing the intermediacy of covalent RNA•enzyme complexes in RNA modification enzymes"; *Methods in Enzymology*, 425, 121-137 (2007).
12. **Kittendorf, J.D.** and Sherman, D.H., "Developing tools for engineering hybrid polyketide synthetic pathways"; *Current Opinion in Biotechnology*, 17(6), 597-605 (2006).
13. Akey, D.L., **Kittendorf, J.D.** (co-first author), Giraldes, J.W., Fecik, R.A., Sherman, D.H., and Smith, J.L., "Structural basis for macrolactonization by the pikromycin thioesterase"; *Nature Chemical Biology*, 2(10), 537-542 (2006).
14. Giraldes, J.W., Akey, D.L., **Kittendorf, J.D.**, Sherman, D.H., Smith, J.L., and Fecik, R.A., "Structural and mechanistic insights of polyketide macrolactonization from polyketide-based affinity labels"; *Nature Chemical Biology*, 2(10), 531-536 (2006).
15. Garcia, G.A. and **Kittendorf, J.D.**, "Transglycosylation: A mechanism for RNA modification (and editing?)"; *Bioorganic Chemistry*, 33(3), 229-251 (2005).
16. **Kittendorf, J.D.**, Sgraja, T., Reuter, K., Klebe, G., and Garcia, G.A., "An essential role for aspartate 264 in catalysis by tRNA-guanine transglycosylase from *Escherichia coli*"; *The Journal of Biological Chemistry*, 278(43), 42369-42376 (2003).
17. Brenk, R., Gerber, H.D., **Kittendorf, J.D.**, Garcia, G.A., Reuter, K., and Klebe, G., "From hit to lead: De novo design based on virtual screening hits of inhibitors of tRNA-guanine transglycosylase, a putative target of shigellosis therapy"; *Helvetica Chimica Acta* 86(5): 1435-1452 (2003).
18. Kittendorf, J.D., Barcomb, L.M., Nonekowski, S.T., and Garcia, G.A., "tRNA-guanine transglycosylase from *E. coli*: Molecular mechanism and role of aspartate 89"; *Biochemistry* 40(47): 14123-14133 (2001).



## Mentoring and Teaching

### University of Michigan

2004 – 2007

*Research Project Manager, Life Sciences Institute*

Ann Arbor, MI

- Directed the research projects of five undergraduate students in the Sherman laboratory. Projects involved cloning, expression, purification, characterization, and crystallization of enzymes involved in polyketide biosynthesis.

### University of Michigan

1997 – 1998

*Graduate Student Instructor, College of Pharmacy*

Ann Arbor, MI

- Taught the analytical drug assay laboratory course in the PharmD graduate program. Responsible for presenting pre-laboratory lectures, supervising laboratory activities, and grading lab reports.

## Affiliations

Rho Chi Pharmacy Honors Society

American Chemical Society

American Association for the Advancement of Sciences

## Summary of Litigation Support/Consulting Services Provided By Dr. Kittendorf/PF Labs (Completed Engagements)

Type of Matter: Patent Infringement: Abbott Laboratories and Surmodics, Inc. v. Church & Dwight Co., Inc.  
 Case: 07-cv-3428  
 Law Firm: Winston & Strawn LLP  
 Services Provided: Biochemical Analysis  
 Date: 2009

Type of Matter: Patent Infringement: Allergan v. Barr Laboratories/Teva and Sandoz  
 Case: 09-333-slr-lps  
 Law Firm: Winston & Strawn LLP and Brinks Hofer Gilson and Lione  
 Services Provided: Biochemical Analysis  
 Date: 2010

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
 Law Firm: Hennan Blaikie  
 Services Provided: Literature and document retrieval and due diligence review  
 Date: 2010



## Summary of Litigation Support/Consulting Services Provided By Dr. Kittendorf/PF Labs (Completed Engagements) [cont.]

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Sidley Austin LLP  
Services Provided: Chemical Analysis: Compound Structural Determination of Active Pharmaceutical Ingredients  
Date: 2011

Type of Matter: Patent Infringement: Monsanto Company et al. v. E.I. Dupont De Nemours and Company et al.  
Case: 09-cv-00686  
Law Firm: Winston & Strawn LLP  
Services Provided: Technical Consultant and Genetic Analysis  
Date: 2011 – 2012

Type of Matter: International Trade Commission: Kaneka Co. v. Zhejiang Medicine Co., Xiamen Kingdomway Group Co., Shenzhou Biology & Tech Co., et al.  
Case: "Certain Coenzyme Q10 Products and Methods Making Same" ITC 337-TA-790  
Law Firm: Adli Law Group & DNL Zito LLP  
Services Provided: Technical Consultant & Chemical Analysis: Chromatography  
Disposition: ITC Trial  
Date: 2012

Type of Matter: Patent Infringement: Genzyme Corp v. Impax Labs, Inc., & Sandoz Inc., and Endo Pharma., Inc., and Watson Labs., Inc.  
Case: 0-9-cv-653, 09-cv-846, 10-cv-1791, 09-cv-1750, 10-cv-1715, 09-cv-2589, 11-cv-1103, 10-cv-2589, 11-cv-1323, 10-cv-1863  
Law Firm(s): Winston & Strawn LLP & Axin, Veltrop & Harkrider LLP and Steptoe & Johnson LLP and Kasowitz, Benson, Torres, & Friedman LLP  
Services Provided: Chemical Analysis  
Date: 2012

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Winston & Strawn LLP  
Services Provided: Chemical Analysis: Water Content and Residual Solvent Analysis of Active Pharmaceutical Ingredients  
Date: 2012

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Winston & Strawn LLP  
Services Provided: Strategic Consulting: Pharmacological Studies in Animal Models  
Date: 2012



## Summary of Litigation Support/Consulting Services Provided By Dr. Kittendorf/PF Labs (Completed Engagements) [cont.]

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Merchant & Gould LLP  
Services Provided: Chemical Analysis: Residual Solvent Analysis of an Anti-cancer Drug  
Date: 2013

Type of Matter: Patent Infringement: Purdue Pharma L.P., the P.F. Laboratories, Inc.,  
Purdue Pharmaceuticals L.P., Rhodes Technologies, Board of Regents of the  
University of Texas System, and Grünenthal GmbH v. Impax Labs.

Case: 1:13-cv-03188  
Law Firm: Winston & Strawn LLP  
Services Provided: Chemical Analysis: Dissolution Testing  
Date: 2013

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Winston & Strawn LLP  
Services Provided: Chemical Synthesis of an Active Pharmaceutical Ingredient  
Date: 2013

Type of Matter: Pharmaceutical Patent Infringement Pre-litigation Research and Consulting  
Law Firm: Winston & Strawn LLP  
Services Provided: Chemical Analysis of Formulated Active Pharmaceutical Ingredient  
Date: 2014