

## **Michael D. Kane, Ph.D.**

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Lead Genomic Scientist, Bindley Bioscience Center at Discovery Park  
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### **Career Summary**

My professional interests involve aspects of genomics, biomedical informatics, healthcare technology, and higher education. My professional experience includes a doctoral degree in Molecular Pharmacology, preclinical and clinical research in the pharmaceutical industry, serving as the Vice President of research and development at an international genomics/biotechnology company, and co-founding biotechnology companies leveraging technology and methods developed/patented in my laboratory. My primary interests have involved the development and utilization of DNA detection and analysis systems, which have been applied to discovery and disease management projects in agricultural, ecological, preclinical and clinical studies. My publication involving the genomic and algorithmic methods, utilized for DNA probe design in DNA microarray detection, has been cited approximately once every week for the last 13 years, and has been internationally adopted as a standard method for DNA probe design and sequence analysis in genomics. In addition, data management tools in support of pharmacogenomics and personalized medicine have been developed by my team, which have been extensively utilized as a teaching tool for healthcare professionals, and serves as the basis for a seed-stage healthcare data management company (Genomic Guidance, LLC). Emerging interest in the deployment and adoption of clinical genotyping and personalized medicine has facilitated co-authoring a textbook entitled Pharmacogenetics, Kinetics, and Dynamics for Personalized Medicine, which was published in February, 2013. Providing service to the legal and business community, I routinely serve as an expert witness in criminal cases involving DNA evidence, as well as routinely serve as a consultant to the investment community to evaluate the commercial viability of new genomics and diagnostic technologies.

## **Professional Experience:**

### **Purdue University**

2008-Present **Associate Professor**, Biomedical Informatics and Genomics, Department of Computer and Information Technology, College of Technology, Purdue University, West Lafayette, Indiana.

My primary teaching interests lie in computational genomics and biomedical informatics. This emerging area of instruction integrates core computer and information technology skills applied to the development of computational and informational systems for scientific computing, bioinformatics, and clinical healthcare. In scientific computing and bioinformatics, one primary challenge in the field is overcoming large computational problems through the development and implementation of parallel processing systems inherent to cluster and grid computing. Hence I have developed and delivered a graduate-level course that provides students hands on training in the utilization of blade server-based parallel processing systems through applied scientific computing, a skill that extends beyond bioinformatics and addresses a growing need in virtually all aspects of modern computer and information technology. In addition, I have developed an upper undergraduate-level course in biomedical informatics to provide training on the integration of computer and information technology skills within data analysis and data management activities inherent to the pharmaceutical, biotechnology and healthcare industry. These courses have allowed me the opportunity to bring entrepreneurial and industry experience in scientific computing into the classroom to help students prepare for future careers in scientific computing and discovery support systems development.

Prior to my tenure at Purdue, my experience includes the design and development of computational tools applied to scientific computing and bioinformatics, including published methods for computationally designing gene-specific DNA sequences for the DNA microarray technology, which are now utilized in essentially all commercially available DNA probe design programs. During my time at Purdue University I established a partnership with Hewlett-Packard to set-up a Grid Computing Laboratory to provide students the opportunity to develop projects and experience on blade server systems. This has fostered the growth of this HPC initiative to the point where college-level and extramural resources have been procured, resulting in the construction of the High Performance Computing Center of Excellence. This includes a data center housing multiple blade server systems, as well as multiple new faculty position proposals, where I served as the search and screen chair for multiple position hires. The success of this emerging strategic area is marked by numerous student projects utilizing HPC resources for course directed projects and independent research projects. Furthermore, I developed the Bioinformatics and Discovery Systems laboratory through internal funds.

Prior to my tenure at Purdue, my experience includes scientific leadership positions in the pharmaceutical and biotechnology industry, which led to the founding a seed-stage biotechnology company capitalizing on his own patented scientific methods, procuring early stage capital investments, and leading the company as the Chief Scientific Officer. My entrepreneurial experience reflects my long standing interest in translating technological innovations to commercially viable products.

2004-2008     **Assistant Professor**, Biomedical Informatics and Genomics, Department of Computer and Information Technology, College of Technology, Purdue University, West Lafayette, Indiana.

2004-Present   **Lead Genomic Scientist**, Bindley Bioscience Center, Discovery Park, Purdue University, West Lafayette, Indiana.

Utilize expertise in DNA microarray construction, utilization, and data analysis in collaboration with exploratory and discovery projects in the molecular sciences across and outside campus. Projects have included detection of allelic variations in clinical samples, screening for pathogens in support of food safety efforts, characterization of various disease states, novel biomarkers of aquatic contaminants, as well as novel assay development and utilization (e.g. utilizing the microarray format for the detection of protein-sugar interactions, protein-protein interactions, etc.).

#### **Pharmacy, Natural & Health Sciences, Manchester University**

2016           **Adjunct Assistant Professor of Pharmacology**.  
Pharmacogenomics Master's Degree Program,  
Fort Wayne, Indiana.

#### **College of Pharmacy, Ohio Northern University**

2011-2012     **Visiting Research Scientist (Academic Sabbatical)**, Department of Pharmaceutical and Biomedical Sciences, College of Pharmacy, Ohio Northern University, Ada, Ohio.

One year academic sabbatical; completed textbook entitled "Pharmacogenetics, Kinetics, and Dynamics for Personalized Medicine; co-developed a continuing education program in clinical genotyping and personalized medicine for practicing pharmacists; assisted in the establishment of the first student chapter (in the world) of the Personalized Medicine Coalition at ONU, assisted in the augmentation of their 6-year-long program (courses and curriculum, clinical internships) to include instruction in the emerging field of personalized medicine in every year of study; designed software system for utilizing patient-specific genotyping results in support of personalized medicine

1997-2013     **Adjunct Professor of Pharmacology**, Department of Pharmaceutical and Biomedical Sciences, College of Pharmacy, Ohio Northern University, Ada, Ohio.

Provide instruction each semester in the areas of (1) the genetic and molecular basis of neurological diseases, (2) the pathophysiology and treatment of Alzheimer's disease, and (3) pharmacogenomics and personalized medicine.

### **Dublin Institute of Technology**

2010, Summer **Visiting Faculty Member**, School of Manufacturing and Design Engineering, Dublin, Ireland.

Developed and delivered a 4-week graduate course entitled “Clinical and Non-Clinical Applications of Genomic Screening Technologies.”

### **Nucleico, LLC**

2002-2004 **Chief Scientific Officer and Co-Founder**, Nucleico, LLC, Ann Arbor, Michigan.

Co-developed a novel method for conducting gene expression profiling in non-sequenced organisms called “Spanscript”. Initially developed at Genomic Solutions, Inc., this technology was the catalyst for co-founding this seed-stage company, licensing the IP rights, raising capital, and utilizing spanscript both as a service-model biotechnology company, and a product biotechnology company. Designed and developed the “Spanscript user restriction fragment end recognition” (SURFER) software.

### **Genomic Solutions, Inc.**

2000-2002 **Vice President of Research and Development**, Genomic Solutions Inc., Ann Arbor, Michigan.

Oversight of the development of DNA microarray methods, products, and services; grew the R&D group from 6 to 12 personnel, developed the Spanscript method of enabling gene expression analysis in non-sequenced organisms, designed and developed two software packages. OLIGO designed oligo-probe sequences for the DNA microarray platform using parameters developed (and published) while at Pfizer. ArrayIQ carried out gene expression results analysis and data clustering in support of DNA microarray-based research. The projects included international collaborations with offices in England and Japan.

## **Pfizer Global Research and Development**

1998-2000     **Senior Scientist**, Molecular Technologies Group, Pfizer Global Research and Development, Ann Arbor, Michigan (formerly Parke-Davis Pharmaceuticals).

Developed and supervised the custom DNA microarray laboratory; developed methods in DNA attachment chemistries, oligo-probe design, sample isolation and labeling, hybridization, 2-color fluorescence imaging and image analysis, gene expression data analysis.

1996-1998     **Postdoctoral Research Fellow**, Neuroscience Therapeutics, Parke-Davis Pharmaceutical Research, Warner-Lambert Company, Ann Arbor, Michigan.

Conducted research on the pathophysiology of Alzheimer's disease (AD), developed a cell-based model of beta-amyloid neurotoxicity, discovered a class of naturally-occurring compounds that protect cultured neurons from beta-amyloid neurotoxicity, carried out post-mortem gene expression profiling in healthy vs. AD neocortical samples.

## **Other Positions**

2006-present   **Co-Founder and Senior Consultant**, Broadband Antenna Tracking Systems, Inc, Indianapolis, Indiana.

1997-2004     **Adjunct Assistant Professor of Biological Sciences**, Department of Biology, Eastern Michigan University, Ypsilanti, Michigan.

Provided instruction for two courses; (1) Introduction to Cell Physiology (4 cr. hrs), and (2) Cell Biology (3 cr. hrs.).

1992-1996     **Graduate Research Fellowship**, School of Pharmacy and Pharmacal Sciences, Purdue University, West Lafayette, Indiana.

1988-1991     **Research Associate**, Department of Pharmacokinetics and Drug Metabolism, Abbott Laboratories, Abbott Park, Illinois.

## **Education:**

1996            Ph.D., Department of Medicinal Chemistry and Molecular Pharmacology, School of Pharmacy, Purdue University, West Lafayette, Indiana.

1988            B.S., Biological Sciences, Chemistry minor. Illinois State University, Normal, Illinois.

### **Executive Courses and Advanced Training:**

- 2005 Biomedical Informatics MBL/NLM Course Fellow - Marine Biological Laboratory, Woods Hole, MA. Sponsored by the National Library of Medicine. Certificate, FALL Course, 2005.
- 2000 Growing the Organization: Innovative Solutions to the Pressing Problems of Business. University of Michigan School of Business.
- 2000 Basic Management. University of Michigan School of Business.

### **Professional Affiliations:**

- 2008-present Honorary Editorial Board of *Pharmacogenomics and Personalized Medicine*
- 2007-2009 Scientific Advisory Board, Sensigen, LLC (acquired by Sequenom in 2009)
- 2001-2004 Editorial Advisory Board, *Genomics & Proteomics* Journal
- 1999-present International Society for Neurochemistry
- 1997-present Sigma Xi Scientific Research Society
- 1995-present Society for Neuroscience
- 1995-present Society of Toxicology

### **Funded Grant Proposals (2004-present)**

Over \$2.3 million in funded projects involving bioinformatics, genomics, and biotechnology.

<b>Granting Agency</b>	<b>Amount</b>	<b>Role</b>	<b>Title</b>
USDA	\$1,501,143	Co-PI	Center for Food Safety Engineering: Developing Biosensors to Detect Foodborne Microbial and Chemical Hazards
NSF	\$273,000	Co-PI	Genetic and Molecular Insights into Mechanisms Underlying a Maize Disease
Microsoft Research	\$101,677	PI	An Interactive Software System for Integrating Clinical Genotyping with Prescription Drug Safety Assurance.
Oracle Giving	\$260,000	Co-PI	Komen Virtual Tissue Bank
Showalter Trust	\$75,000	PI	Transcriptional Regulation Profiling of Genes Relevant to Prostate Cancer Progression
Showalter Trust	\$75,000	Co-PI	Development of Tools for Environmental Assessment and Real-Time Sensing of Contaminants
Purdue University	\$30,000	PI	Genomics and Biotechnology Laboratory Development and Utilization
Department of Energy	\$6,135,839	Key-P	Indiana Advanced Electric Vehicle Training and Education Consortium

### **Honors & Awards:**

2011	Good to Great Award, College of Technology, Purdue University
2010	Outstanding Tenured Faculty Award, Department of Computer and Information Technology, Purdue University.
2008	University Faculty Scholar, Purdue University
2007	Outstanding Non-Tenured Faculty Award, Department of Computer and Information Technology, Purdue University.
2006	Seed for Success Award, Purdue University.
2006	Outstanding Faculty in Discovery Award College of Technology, Purdue University.
2006	Best Research Poster Award, Faculty Convocation College of Technology, Purdue University.
2005	Biomedical Informatics Course Fellowship, National Library of Medicine.
2005	Best Research Poster Award, Faculty Convocation College of Technology, Purdue University.
1996	Jenkins/Knevel Excellence in Research Award Recipient, School of Pharmacy and Pharmacal Sciences, Purdue University.
1995	Purdue Research Foundation Fellowship Recipient.
1995	American Association of Pharmaceutical Scientists, Graduate Student Research Competition Award Recipient, Indianapolis Chapter.
1995	Sigma Xi Scientific Research Society, Purdue University Chapter, Graduate Student Research Award Recipient.
1989	Abbott Laboratories Presidential Award Recipient.

### **Entrepreneurial Experience:**

2008-present	Co-Founder and Director of Research and Development, Genomic Guidance, LLC. Ada, Ohio.
2005-present	Co-Founder and Director of Strategic Business Development, Broadband Antenna Tracking Systems, Inc. Zionsville, Indiana.
2002-2005	Co-Founder and Chief Scientific Officer, Nucleico, LLC, Ann Arbor, Michigan.

### **Commercial Bioinformatics Software Development (Genomic Solutions, Inc):**

1. SURFER: (Spanscript User Restriction Fragment End Recognition) software, designed to predict the identification of 3' cDNA fragments generated using the restriction enzyme-based method Spanscript, which is a method conceived, developed and commercialized by Dr. Kane.
2. ArrayIQ: DNA microarray results analysis program with two-color normalization, statistical analysis (gene and sample clustering by hierarchical, k-means, and SOM), and graphical results display.
3. OLIGO Design: DNA microarray oligonucleotide probe design system with predictive cross-hybridization analysis/avoidance.

### **Textbook:**

1. Kisor, D., **Kane, M.D.**, Sprague, J.E., and Talbot, J. Pharmacogenetics, Kinetics, and Dynamics for Personalized Medicine, publisher: Jones and Bartlett Learning (2013).

### **Patents:**

1. Smith, A.H., Bentley, L.D., **Kane, M.D.**, and Hansen, R.A. Antenna Aiming System for Broadband Wireless Access. 9,246,207 (approved Jan, 2016).
2. Kurnit, D.M. and **Kane, M.D.** Systems, Methods and Compositions for Detection of Human Papilloma Virus in Biological Samples 8,076,081 (approved Dec, 2011).
3. **Kane, M.D.**, Nagel, A.C., and Dombkowski, A.A. Compositions and Systems for Identifying and Comparing Expressed Genes (mRNAs) in Eukaryotic Organisms. 6,955,876 (approved Oct, 2005).

### **Patent Applications:**

1. **Kane, M.D.**, Duffy, P., Applegate, B., Savakhin, S., Walsh, P., and Woods, G. One-Step DNA Detection System (2011).
2. **Kane, M.D.**, Springer, J.A., Sprague, J.E., and Iannotti, N.V. Method for Utilizing Patient Genotyping for Drug Safety. 61/031,527 (2008).

### **Peer-Reviewed Publications:**

1. Magana, A.J., Taleyarkhan, M., Rivera-Alvarado, D., Springer, J., **Kane, M.**, & Clase, K. (2014). A survey of scholarly literature describing the field of bioinformatics education and bioinformatics educational research. *CBE-Life Sciences Education*, 13(4), 1-33.
2. Springer, J.A., Iannotti, N.V., Sprague, J.E., and **Kane, M.D.** Construction of a drug safety assurance information system based on clinical genotyping. *ISRN Bioinformatics*. (982737, 9 pages), 2012.
3. Johns, S.M., Denslow, N.D., **Kane, M.D.**, Watanabe, K.H., Orlando, E.F., and Sepúlveda, M.S. Effects of estrogens and antiestrogens on gene expression of fathead minnow (*Pimephales promelas*) early life stages. *Environmental Toxicology* 26(2): 195-206, 2011.
4. Yousef, A.F., Baggili, I.M., Bartlett, G., **Kane, M.D.**, and Mymryk, J. LINA: A laboratory inventory system for oligonucleotides, microbial strains, and cell lines. *Journal of the Association of Laboratory Automation* 16(1): 82-89, 2011.



5. Springer, J.A., Iannotti, N.V., **Kane, M.D.**, Haynes, K., and Sprague, J.E. Teaching drug safety and pharmacogenomics: a practicum learning environment enabled by a dedicated personalized medicine instructional software system. *American Journal of Pharmaceutical Education*, 75(2):32-34, 2010.
6. Likovich, M., Derr, A., Kisor, D.F, **Kane, M.D.**, and Sprague, J.E. Personalized Medicine and the Future of Pharmacy Practice. *Pharmacy Times* April, 2010.
7. Patel, D.A., Shih, Y-J., Newton, D.W., Michael, C.W., Oeth, P.A., **Kane, M.D.**, Oipari, A.W., Ruffin, M.T., Kalikin, L.M., and Kurnit, D.M. Development of a PCR and mass spectrometry (PCR-MS)-based method for quantitative type-specific detection of human papillomavirus. *J Virological Methods* 160: 78–84, 2009.
8. Johns, S.M., **Kane, M.D.**, Denslow, N.D., Watanabe, K.H., Orlando, E.F., Villeneuve, D.L., Ankley, G.T. and Sepúlveda, M.S. Characterization of Ontogenetic Changes in Gene Expression in the Fathead Minnow (*Pimephales promelas*). *Environmental Toxicology and Chemistry* 28(4): 873-880, 2009.
9. **Kane, M.D.**, Springer, J.A., Iannotti, N.V., Gough, E.S., Johns, S.M., Schlueter, S.D. and Sepulveda, M.S. Identification of Development and Tissue-Specific Gene Expression in the Fathead Minnow *Pimephales promelas*, Rafinesque using Computational and DNA Microarray Methods. *Journal of Fish Biology* 72, 2341-2353, 2008.
10. Sprague, J.E., Sullivan, D.L., and **Kane, M.D.** Personalized Medicine: Pharmacogenetics as a Method for Improving Patient Outcomes. *Ohio Pharmacist* 57(11): 13-18, 2008.
11. **Kane, M.D.**, Springer, J.A., and Sprague, J.E. Drug Safety Assurance through Clinical Genotyping: Near-Term Considerations for a System-Wide Implementation of Personalized Medicine. *Personalized Medicine* 5(4): 387-397, 2008.
12. Zhang, M., Ouyang, Q., Stephenson, A., **Kane, M.D.**, Salt, D., Prabhakar, S., Burgner, J., Buck, C., and Zhang, X. Interactive analysis of systems biology molecular expression data. *BMC Systems Biology* 2:23, 2008.
13. **Kane, M.D.** and Summers, K.H. Challenges and opportunities in pharmacogenomics and therapeutics. *Journal of Managed Care Pharmacy* 13(7): 607-608, 2007.
14. **Kane, M.D.** and Brewer, J.L. An Information Technology Emphasis in Biomedical Informatics Education. *Journal of Biomedical Informatics* 40: 67-72, 2007.
15. Kim, H., **Kane, M.D.**, Kim, S., Dominguez, W., Applegate, B.M, and Savikhin, S. A Molecular Beacon DNA Microarray System for Rapid Detection of E. coli O157:H7 that Eliminates False Signal Risk. *Biosensors and Bioelectronics* 15:1041-1047, 2007.
16. Perry, L., Heard, P., **Kane, M.**, Kim, H., Savikhin, S., Dominguez, W., Applegate, B. Application of multiplex PCR to the detection of pathogens in food. *Journal of Rapid Methods and Automation in Microbiology* 15: 176-198, 2007.

17. Kemp, M.Q., Liu, W., Thorne, P.A., **Kane, M.D.**, Selmin, O., Romagnolo, D.F. Induction of the transferrin receptor gene by benzo[a]pyrene in breast cancer MCF-7 cells: Potential as a biomarker of PAH exposure. *Environmental and Molecular Mutagenesis* 47: 518-526, 2006.
18. **Kane, M.D.** (invited) Technical Issues in DNA Microarray Production and Utilization: Impact on Clinical Research. *Expert Review of Molecular Diagnostics* 5(5): 649-654, 2005.
19. **Kane, M.D.** (invited) Aligning experimental design with bioinformatics analysis to meet research objectives. *Cytometry* 47: 50-51, 2002.
20. **Kane, M.D.** Screening for xenobiotic-mediated P450 induction using a dedicated DNA microarray protocol. *Journal of Clinical Ligand Assay* 24: 149-151, 2001.
21. Sprague, J.E., Worst, T.J., Haynes, K., Mosler, C.R., Nichols, D.E. and **Kane, M.D.** The pharmacodynamic characterization of an antisense oligonucleotide against monoamine oxidase-B (MAO-B) in rat brain striatal tissue. *Cellular and Molecular Neurobiology* 21: 53-64, 2001.
22. **Kane, M.D.**, Jatko, T.A., Stumpf, C.R., Lu, J., Thomas, J.D, and Madore, S.J. Assessment of the sensitivity and specificity of oligonucleotide microarrays. *Nucleic Acids Research* 28: 4552-4557, 2000.
23. **Kane, M.D.**, Lipinski, W.J., Callahan, M.J., Bian, F., Durham, R.A., Schwarz, R.D. Roher, A.E. and Walker, L.C. Evidence for seeding of  $\beta$ -amyloid by intracerebral infusion of Alzheimer brain extracts in  $\beta$ -amyloid precursor protein-transgenic mice. *Journal of Neuroscience* 20: 3606-3611, 2000.
24. **Kane, M.D.**, Schwarz, R.D., St. Pierre, L., Watson M.D., Emmerling, M.R., Boxer, P.A., and Walker, G.K. Inhibitors of V-type ATPases, bafilomycin A1 and concanamycin A, protect against  $\beta$ -amyloid-mediated effects on 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) reduction. *Journal of Neurochemistry* 72: 1939-1947, 1999.
25. Yan, S.D., Stern, D., **Kane, M.**, Kuo, Y-M., Lampert, H.C., and Roher, A.E. RAGE- $A\beta$  interactions in the pathophysiology of Alzheimer disease. *Restorative Neurology and Neuroscience* 12: 167-173, 1998.
26. **Kane, M.D.**, Vanden Heuvel, J.P., Isom, G.E., and Schwarz, R.D. Differential expression of group I metabotropic glutamate receptors (mGluRs) in PC12 cells: role of nerve growth factor and ras. *Neuroscience Letters* 252: 1-4, 1998.
27. **Kane, M.D.**, Yang, C.W., Gunasekar, G. and Isom, G.E. Trimethyltin stimulates protein kinase C translocation through receptor-mediated phospholipase C activation in PC12 cells. *Journal of Neurochemistry* 70: 509-514, 1998.
28. Pavlakovic, G., **Kane, M.D.**, Eyer, C.L., Kanthasamy, A., and Isom, G.E. Activation of protein kinase C by trimethyltin: relevance to neurotoxicity. *Journal of Neurochemistry* 65: 2338-2343, 1995.

29. Sun, P., Borowitz, J.L., Kanthasamy, A.G., **Kane, M. D.**, Gunasekar, P.G., and Isom, G.E. Antagonism of cyanide toxicity by isosorbide dinitrate: possible role of nitric oxide. *Toxicology* 104: 105-111, 1995.

**Refereed Conference Proceedings (2005-present):**

1. Pandey, S., **Kane, M.**, and Springer, J. GLASS: Genomic Literature Area Sequence Search. *2011 IEEE International Workshop on Biomedical and Health Informatics*, 2011.
2. Motevalli, V., Dietz, E., **Kane, M.**, Price, B., Richardson, J., Schmidt, J., and Zhang, H. Application of Electric Vehicle System Design to Grand Prix EV Kart. *SAE 2011 World Congress*, 2011.
3. Duffy, P., Woods, G., Walsh, J., and **Kane, M.D.** Online real-time water quality monitoring and control system. *8th International Conference on Computing, Communications and Control Technologies (CCCT 2010)*, 2010.
4. Hacker, T.J., Springer, J.A., Schlueter, S.D., and **Kane, M.D.** Developing a curriculum for high performance computing and cyberinfrastructure education. *Conference for Industry and Education Collaboration (CIEC), American Society for Engineering Education (ASEE)*, 2008.
5. **Kane, M.D.** and Sepulveda, M. Identification of development-specific gene expression in the fathead minnow (*P. promelas*) using computational cDNA subtraction and custom DNA microarray validation. *26<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC)*, 2007.
6. Johns, S.M., **Kane, M.D.**, Denslow, N.D., Watanabe, K.H., Orlando, E.F., Sepulveda, M.S. Characterization of growth, development, and gene expression patterns in the fathead minnow (*Pimephales promelas*). *26<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC)*, 2007.
7. Sanchez, B., Ochoa-Acuna, H.G., Porterfield, D.M., Ademec, J., Kane, M.D., Sepulveda, M.S. Integrating oxygen flux and genomics into the development of real-time biomarkers of fish egg contaminant exposure. *26<sup>th</sup> Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC)*, 2007.
8. **Kane, M.D.** & Springer, J.A. Integrating bioinformatics, distributed data management, and distributed computing for applied training in high performance computing. *Proceedings of the Association for Computing Machinery, Special Interest Group for Information Technology Education*, USA, New York: ACM, Inc. pp. 33-36, 2007.
9. Forney, P., Hazbun, T., Springer, J. and **Kane, M.D.** YDM: a Data Management Tool Supporting Yeast-2-Hybrid Research. *4th Annual Indianapolis Regional Bioinformatics Conference*, 2007.
10. Iannotti, N., Johns, S., Gough, E., Sepulveda, M. and **Kane M.D.** Identification of Development-Specific Gene Expression in *P. promelas* using Computational cDNA Subtraction and Experimental Validation. *4th Annual Indianapolis Regional Bioinformatics Conference*, 2007.

11. Sepulveda, M., **Kane, M.**, Johns, S., and Denslow, N. Development of a Gene Microarray for the Study of Environmental Contaminant Effects on Early Life-Stages. *2007 American Water Research Association Conference*, 2007.
12. Zhang, M., **Kane, M.**, Salt, D., Prabhakar, S., Buck, C., Regnier, F. and Zhang, X. Interactive Visualization of 'Omics Molecular Expression Networks. *55th ASMS Conference on Mass Spectrometry*, 2007.
13. **Kane, M.D.**, Brewer, J.L, Goldman, J.E. and Moidu, K. Integrating Bioinformatics, Clinical Informatics, and Information Technology in Support of Interdisciplinary Curriculum Development. *Proceedings of the Association for Computing Machinery, Special Interest Group for Information Technology Education*, USA. New York: ACM, Inc. pp. 135-140; 2006.
14. Hansen, R. and **Kane, M.D.** Critical Performance Variables in Genomic Sequence Analysis in Cluster Computing Architectures. *TeraGrid '06: Advancing Scientific Discovery*, 2006.
15. Kim, H., **Kane, M.D.**, Kim, S., Dominguez, W., Applegate, B.M., and Savikhin, S. Development of False Signal Suppressing Biosensor Utilizing Color Changing Molecular Beacon on Microarray Platform for Rapid Detection of *Escherichia Coli* O157:H7. *Biannual 9th World Congress on Biosensors*, 2006.
16. Gough, E.S. and **Kane, M.D.** Evaluating Parallel Computing Systems in Bioinformatics. *Proceedings of the Third International Conference on Information Technology: New Generations (ITNG'06)*, pp. 233 – 238, 2006.
17. **Kane, M.D.** and Brewer, J.L. The Creation of Interdisciplinary Biomedical Informatics Education in an Information Technology Curriculum. *Proceedings of the Association for Computing Machinery, Special Interest Group for Information Technology Education*, USA. New York: ACM, Inc., pp. 25-29, 2005.

### **Book Chapters:**

1. Springer, J.A., Beever, J., Morar, N., Sprague, J.E. and **Kane, M.D.** Ethics, Privacy, and the Future of Genetic Information in Healthcare Information Assurance and Security. In: Dark, M (ed.), *Information Assurance and Security Ethics in Complex Systems: Interdisciplinary Perspectives*. Hershey, PA: IGI Global., p.186-205, 2011.
2. Farquhar, I., **Kane, M.D.**, Schaff, W., Summers, K.H., and Sorkin, A. Innovation in Health Research Infrastructure: Integrating Genomic, Clinical, Public Health, Safety and Bioinformatic Information. In: Farquhar, I., Summers, K., and Sorkin, A. (eds.) *Research in Human Capital and Development (Volume 16). The Value of Innovation: Impact on Health, Life Quality, Safety and Regulatory Research*, Emerald Group Publishing Ltd., p.329-404, 2008.
3. **Kane, M.D.** Introduction to Gene Expression Profiling with DNA Microarray Technology. In: Hardiman, G. (ed.) *Microarray Methods and Applications: Nuts & Bolts, Volume 2*. DNA Press, p.1-10, 2008.
4. **Kane, M.D.**, Lin, H-S, Dombkowski, A.A., Diakiw, A., Nagel, A.C., Flexon, A., Leifheit, M., Sprague, J.E. and Hollenberg, P.F. Accelerating Preclinical Drug Development Using a Microarray-Based Method for Detecting Oxidative Enzyme (P450) mRNA Induction and Other Metabolic Genes in the Rat. In: Hardiman, G., (ed.). *Microarray Methods and Applications: Nuts & Bolts*. DNA Press p.231-248, 2003.
5. Nagel, A.C., Thompson, J.D., Marino, M.A., and **Kane, M.D.** Spanscript: A Novel Method for Deriving Non-Redundant 3' cDNA Libraries for DNA Microarray Production. In Hardiman (ed.), *Microarray Methods and Applications: Nuts and Bolts*, DNA Press p.155-170, 2003.
6. **Kane, M.D.**, Dombkowski, A.A., and Madore, S.J. The Emerging Utility of Oligonucleotide Microarrays. In: Lu, Q. and Weiner, M. (eds.) *Gene Cloning and Expression Technologies*. Eaton Publishing. p.537-547, 2002.

### **Conference Proceedings (1998-present):**

1. **Kane, M.D.**, Springer, J.A., Iannotti, N., and Sprague, J.E. PGRx: An Interactive Software System for Integrating Clinical Genotyping with Prescription Drug Safety Assurance. *Microsoft External Research Summit* (2009).
2. Sanchez, B., Ochoa-Acuña, H.G., Porterfield, D.M., Adamec, J., **Kane, M.D.**, and Sepúlveda, M.S. Incorporating Oxygen Flux and Genomics into the Development of Real-time Biomarkers of Fish Egg Contaminant Exposure. *Latino Scholars Forum at Purdue University* (2007).
3. Henne, K.L., **Kane, M.D.**, Giometti, C.S., Nakatsu, C., and Konopka, A., Genomic and Proteomic Evaluation of the Chromate Response In *Arthrobacter* Sp. Fb24. *Center for the Environment (C4E) Graduate Research Showcase*, Purdue University (2006).
4. Henne, K.L., F. Beasley, F., **Kane, M.D.**, Nakatsu, C., and Konopka, A. Chromium Resistance in *Arthrobacter* sp. FB24. *Annual Meeting of the American Society for Microbiology* (2005).

5. Dominguez, W., Kim, S., Kim, H., Savikhin, S., **Kane, M.**, Applegate, B.M. Multiplex PCR for the Simultaneous Detection of the Foodborne Pathogens: *Escherichia coli* O157:H7, *Salmonella enterica*, and *Listeria monocytogenes*. *American Society for Microbiology* (2005).
6. **Kane, M.D.**, Lin, H., Diakiw, A., Sprague, J. and Hollenberg, P. Screening for Xenobiotic-Dependent P450 Induction in the Rat Using a Dedicated DNA Microarray System. *American Association of Pharmaceutical Sciences Annual Conference* (2002).
7. Seeley, K.A., Rudner, X., and **Kane, M.D.** Vivid GeneArray Slides are Compatible with a Variety of Detection Systems. SmallTalk 2002; the Microfluidics, *Microarrays and BioMEMS Conference of the Association for Laboratory Automation*. TP-045, (2002).
8. Galt, J., Kuchumov, A., Sahay, N., Flexon, A., and **Kane, M.D.** Normalization of microarray data using bacterial spiked transcripts (BSTs). *Microarray Gene Expression Data Conference 3 (MGED)* (2001).
9. Banks, M.L., Hall, C.R., **Kane, M.D.**, and Sprague, J.E. Antisense regulation of *mdr1a* and *mrp1* gene expression in the blood brain barrier: effects on CNS drug concentrations. *Annual Pfizer Fellowship Seminars Meeting*. (2001).
10. Syu, L-J., Kaplan, D.J., Ranganathan, R., Sahay, N., **Kane, M.D.**, DeWitt, D.L., and Kim, H. Characterization of human prostaglandin H2 synthase form 2 (PGHS-2) overexpressed in human fibroblast cells: quantitative PCR of mitochondrial DNA and microarray analysis. *7<sup>th</sup> International Conference on Eicosanoids & Other Bioactive Lipids in Cancer, Inflammation and Related Diseases*. (2001).
11. Li, Z., Cui, M., **Kane, M.**, Madore, S., and Chung, F.Z. Expression of fractalkine receptor, CX3CR1 mRNA in humans. *Society for Neuroscience Abstracts 26* (2000).
12. Sprague, J.E, Worst, T.J., Kanthasamy, A., Nichols, D.E., and **Kane, M.D.** Effects of antisense oligonucleotide alteration of MAO-B gene expression on MDMA-induced serotonergic neurotoxicity. *Society for Neuroscience Abstracts 25(2)* 836.19 (1999).
13. **Kane, M.D.**, Watson, M.D., Campbell G.W., Emmerling, M.W., and Schwarz, R.D. Selective inhibitors of the V-type ATPase, bafilomycin A1 and concanamycin A, protect against  $\beta$ -amyloid-induced cell death in NGF-differentiated PC12 and rat cortical neuron cultures. *Sixth Annual Conference on Alzheimer's disease and Related Disorders*, 1998.
14. Schwarz, R.D., **Kane, M.D.**, Emmerling, M.W., St. Pierre, L., and Watson, M.D. A $\beta$ (1-42) is taken up into NGF-differentiated PC12 cells in a fucoidan-sensitive manner. *Sixth Annual Conference on Alzheimer's disease and Related Disorders* (1998).
15. Davis, J.W., Mills, E.M., **Kane, M.D.**, and Vanden Heuvel, J.P. The use of undifferentiated PC12 cells as a model system to study peroxisome proliferator-activated receptor (PPAR) signaling. *FASEB Abstracts* (1998).

### **Technical and Editorial Publications:**

1. **Kane, M.D.** (Invited) Critical Advancements to Linking Disease Phenotypes with Human Genomic Variations. *Personalized Medicine* 5(5): 428-429, 2008
2. **Kane, M.D.**, Springer, J.A., and Sprague, J.E. Clinical Genotyping: Near-Term Considerations for System-Wide Implementation, Operations, Adoption, and Data Management for Improving Drug Safety. Response to the U.S. Department of Health and Human Services Request for Information (RFI): *Improving Health and Accelerating Personalized Health Care Through Health Information Technology and Genomic Information in Population- and Community-based Health Care Delivery Systems*, 2007.
3. **Kane, M.D.** (invited) Bioinformatics Outstrips Information Technology. Guest Editorial, *Genomics and Proteomics*, 6(2): 2006.
4. **Kane, M.D.** (invited) Interdisciplinary Training in Bioinformatics & Information Technology. Guest Editorial, *Genomics and Proteomics*, 5(4): 10, 2005.
5. Frank, M.B., Cadwell, R.C., **Kane, M.D.**, and Centola, M. Optimizing oligonucleotide microarray printing parameters. *Genomics and Proteomics*, 4(9): 2004.
6. **Kane, M.D.** (invited) Meeting Highlights: 3<sup>rd</sup> International Symposium on Early Toxicity Screening: Early ADME-Tox Screening Approaches. *Expert Opinion on Drug Safety* 2(2): 199-201, 2003.
7. **Kane, M.D.** (invited) Automating Molecular Biology, Guest Editorial, *Genomics and Proteomics* 2: 11, 2002.
8. **Kane, M.D.** and Pisano, M. (invited) Outsourcing Genomic and Proteomic Technology: A Value-Added Solution. *Helix* 2: 14-16, 2001.

### **Invited Presentations:**

1. “Emerging Opportunities in Forensics Technology and Education”, Bowling Green State University seminar series, Bowling Green, Ohio (2014).
2. “Clinical Genotyping and Personalized Medicine”, Purdue President’s Council, Purdue University, West Lafayette, Indiana (2013).
3. “Personalized Innovation”, Speaker at the inaugural Purdue TEDx Conference, Purdue University, West Lafayette, Indiana (2012).
4. “Clinical Genomics and Personalized Medicine”, College of Life Science, Kyung Hee University, Suwon, South Korea (2011).
5. “Translational Research and Commercialization in the Academic Environment”, College of Computing and Information, Kyung Hee University, Suwon, South Korea (2011)
6. “The Future of Personalized Medicine” 3<sup>rd</sup> Annual Medical Informatics Summit, Indianapolis, Indiana (2011).
7. “Introduction to DNA Forensics” Tippecanoe County Public Defender’s Office, Quarterly Continuing Education Forum, Lafayette, Indiana (2010).
8. “Electric Vehicles: Components and Construction” School of Manufacturing and Design Engineering Seminar Series, Dublin Institute of Technology, Dublin, Ireland (2010).
9. “GeneScription: An Information Management System for Enabling Pharmacogenomics and Drug Safety Assurance” 10<sup>th</sup> Annual Microsoft Research Faculty Summit, Redmond, Washington (2009).
10. “Translational Research in Genomics: A Model for Personalized Medicine in Healthcare” presented at (1) University of Ulster at Coleraine, Northern Ireland, and (2) Dublin Institute of Technology, Dublin, Ireland (2008).
11. “Genomics Research in the 21<sup>st</sup> Century” IEEE Purdue Student Chapter Seminar, West Lafayette, Indiana (2007).
12. “The Nuts and Bolts of DNA Microarray Technology” 30<sup>th</sup> Annual Food Science Symposium: *Nutrigenomics – Does Your Diet Fit Your Genes?* West Lafayette, Indiana (2007).
13. [Keynote Speaker] “Genomics in Non-Sequenced Organisms: Integrating Computational and Experimental Methods”, *Proteomics and Genomics for Complex Respiratory Diseases, The Veterinary Comparative Respiratory Society (VCRS) 25th Symposium*, West Lafayette, Indiana (2007).
14. “A DNA Microarray System for Rapid Detection of Foodborne Pathogens”, *Food Safety and Pathogen Detection, 8<sup>th</sup> Annual Agricultural Research Services & United States Department of Agriculture Research Meeting*, Ocean City, New Jersey (2006).



15. "Interdisciplinary Curriculum Development in Bioinformatics" *3<sup>rd</sup> Annual Indiana Bioinformatics Conference*, Indiana University Medical School, Indianapolis, Indiana (2006).
16. "DNA Microarray Technology: A Technical Perspective" Hillsdale College, Hillsdale, Michigan (2006).
17. "A Novel Method for Deriving Non-Redundant cDNA Probes for Microarray Production." *BIOCHIPS 2003*. Boston, Massachusetts (2003).
18. [Keynote Speaker] "Utilizing Microarray Technology and Gene Expression Profiling in Drug Development." *The Drug Delivery Foundation Annual Meeting, Molecular Biopharmaceutics: A New Era in Drug Absorption, Transport and Delivery*. Honolulu, Hawaii (2003).
19. "Screening for Xenobiotic-Mediated P450 Induction in the Rat using a dedicated DNA Microarray System." *3<sup>rd</sup> International Symposium Early Toxicity Screening: Early ADME-Tox Screening Approaches*. Philadelphia, Pennsylvania (2002).
20. [Keynote Speaker] "Implementing Interdependent Discovery Resources in the Post-Genomic Era." *Symposium on Bioinformatics for Drug Discovery*. University of Toledo, Ohio (2001).
21. "The Utility of Genomic Research Tools and Techniques in Discovery Research." *Midwest Clinical Ligand Assay Society, 25<sup>th</sup> Annual Meeting*. Detroit, Michigan (2001).
22. "Screening for Xenobiotic-Mediated P450 Induction Using a Dedicated DNA Microarray Protocol." *Clinical Ligand Assay Society, 27<sup>th</sup> National Meeting*. Detroit, Michigan (2001).
23. "Aligning Experimental Design with Bioinformatics Analysis to the Meet Research Objectives." *Genomics and Proteomics in Cancer, 3<sup>rd</sup> Samuel A. Latt Motown Microarray Meeting*, Detroit, Michigan (2001).
24. "Aligning the Key Variables for Successful DNA Microarray Analysis." *23<sup>rd</sup> Annual Meeting of the Molecular Biology Society of Japan*, Kobe, Japan (2000).