



Laure H. Kairawicz, Ph.D.

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Biochemistry, Analytical Chemistry, and Toxicology

Dr. Kairawicz trained as a research scientist at Wesleyan University in Middletown, Connecticut, where she received her doctoral degree in Chemistry in 2008. Her specialization was in Protein and Nucleic Acid Biochemistry and Biophysics. She also received a Bachelor's of Science degree in Chemistry, *Cum Laude* in 2000. The bulk of her career as a research scientist has been spent in the pharmaceutical and biotechnology industries for over 10 years. Her expertise and skills have been used in the realm of Research & Development (R&D) of pharmaceutical drugs (small molecules), of novel vaccines, and in the process development of a new type of vaccine for Influenza, FluBlok® approved by the FDA in 2013. Moving from Connecticut to the Tampa Bay region in Florida, she continued R&D and cGMP work for the pharmaceutical industry. An extremely motivated self-learner, Dr. Kairawicz has added, over her years of experience in the laboratory, additional disciplines overlapping biochemistry and biophysics: pharmacology, medicinal chemistry, toxicology.

Personal

Place of Birth: near Bordeaux, Southwestern France

Status: Green Card Holder since 1992

Bilingual in French and English, can read & understand German as well as read Spanish

Areas of Expertise

- Alcohol/Drug Interactions or Drug/Drug Interactions Biochemistry and Toxicology
 - Instrumental Analysis with Method Development Experience
 - Detection of Metabolites in Various Matrices
 - Specialty/Work Experience Focus:
 - Prescription Drugs & Vaccine Research and Safety (FDA Compliance)
 - Pharmaceutical Drugs Side Effects, Safety, Injuries
 - Vaccines Side Effects, Safety, Injuries
 - Biologics Products Compliance
 - Genetically Modified Organisms Research and Safety
 - Clinical Trials Data Review
 - CDC Studies Data Review
 - Cosmetics Products Safety
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Training

RTI CENTER FOR FORENSIC SCIENCE EXCELLENCE (Ongoing Education)

2015

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- Expert Witness Training
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- Instrumental Analysis Techniques of Illegal Drugs and their Metabolites in Use in Forensic Laboratories
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- Latest Development in DNA Analyses Techniques (National Institute of Justice)
 - Controlled Substances and Technology (National Institute of Justice)
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Applications of Higher Resolution Mass Spectrometry in Drug Testing (3 parts):

1. Agilent Course: Higher Resolution Mass Spectrometry (HRMS) Using UHPLC/MS in Drug Testing
2. LC/HRMS (Q-Exactive) Confirmation Methods: Applications in Forensic Laboratory
3. Metabolite Identification of Synthetic Cannabinoids with HRMS

Agilent Course: Method Validation for Quantitation and Confirmation of Amphetamines, Phentermine, and Designer Stimulants by LC/MS/MS

Agilent Course: Confirmatory Blood Identification by Mass Spectrometry; Adapting Proteomics to Forensic Biology

Kura Biotec Webinar: Approaches for Optimizing Hydrolysis of Cannabinoids, Cannabidiol (CBD), and Synthetic Cannabinoids

Agilent Course: DART-TOF for Analysis of Bulk Drugs

Gaining Speed with "Fast GC": A Practitioner's Perspective (Helium to Hydrogen Carrier Gas Switch) (GC: Gas Chromatography).

Agilent Course: Introducing a New Controlled Substances Analyzer, Improving Efficiency in the Forensics Laboratory

Qualifications Summary

- Experience in instrumental technologies such as High Performance Liquid Chromatography, Ultra-High Performance Liquid Chromatography, and Fast Performance Liquid Chromatography, Method Development, Method Transfers, Method Validations), Liquid

Chromatography/Mass Spectrometry of protein and small molecules, other spectroscopic techniques such as Circular Dichroism, Infrared, UV-Visible and Fluorescence Spectroscopy.

- Familiar with compliance requirements of cGMP, safety and regulatory environments (FDA).
- Experience in the analytical support of drug development (Research & Development of small molecule drugs & biologics).
- Preparation Liquid Chromatography: purification of proteins as biologics for vaccine process development.
- Organized, take-charge, follow-through abilities and detail orientation; able to plan and oversee projects from concept to successful conclusion; problem solving skills.
- Effective written and verbal communication, public speaking.

- ***Instrumental Technology Related to Chromatography:***

- Waters Corporation HPLC (High Performance Liquid Chromatography) System Alliance and UPLC (Ultra-Performance Liquid Chromatography) System Acquity 1st, 2nd generations, and H-Class
- Mass Spectrometry with Waters Corporation ZQ LC/MS and Quatermass
- Water Corporation Refractive Index, Evaporative Light Scattering (ELSD), PDA (Photo-Diode Array), Dual Wavelength Detectors
- Agilent Technologies HPLC System 1100, 1200, 1260 Series with DAD (Diode Array) Detector and VWD (Variable Wavelength) Detector

- ***Other Spectroscopy and Analytical Technology:***

- Malvern Differential Light-Scattering Spectrometer
- Jasco Circular Dichroism Spectrometer;
- Microcal Isothermal Titration Calorimetry
- Hewlett-Packard (now Agilent) Gas Chromatograph/MS (GC) with ECD (Electron Capture) Detector, FID (Flame Ionization) Detector and Agilent GC Headspace
- Applied Biosystems PCR Cyclers, DNA Sequencers
- Perkin-Elmer Infrared and UV-VIS Spectrometers
- Thermo-Scientific Fluorescence Plate Readers and Fluorimeters
- Varian NMR (Nucleic Magnetic Resonance) 300 MHz, 2-D and 3-D (for Protein Chemistry Applications)

Education

WESLEYAN UNIVERSITY, MIDDLETOWN, CT

June 2008

Ph.D. in Chemistry

Specializations: Biochemistry & Biophysics

- Education Core Advanced Courses: Analytical, Organo-Metallic, Organic, Physical Chemistry, Biochemistry, Biophysics.
- Research Scientist Training: Experiment Design, Execution, Data Analysis and Reporting; Critical Thinking, Problem Solving.
- Thesis: "The Interactions of the RNA Recognition Motif Protein Sex-Lethal with Its Substrate, the Single-Stranded Transformer pre-mRNA".

2006 Peterson Fellowship Award in Biochemistry Excellence

CENTRAL CONNECTICUT STATE UNIVERSITY, NEW BRITAIN, CT

May 2000

B.Sc. Chemistry

Minor: Biology and Biochemistry

2000 Chemistry Department Award for Academic Excellence

1997 Freshman Chemistry Award

Work Experience

Expert Witness Solutions, Hudson, FL

Senior Scientist and Expert Witness Consultant from March 2015 until Present

- 2017 Expert Consulting in the State of California: US Naval Air Force Veteran Suffering from Physical Injuries Caused by Exposure to Toxic Chemicals.
- 2016 Litigation Case in the State of Florida: DUI Arrest of a Suspect Suffering from a Blood Clotting Disorder, Hired by the Defense.

Mentored, Online Education for School Programs

Mentor since January 2017 until Present

- High School Levels General Chemistry, Mathematics, French.

Wyzant Tutoring Private Tutoring, Online and In-Person

Tutor and Mentor from 2012 to 2013 and from January 2016 until Present

- College and High School Levels General Chemistry, Mathematics, French, Biology, General Science.

- College Level Organic Chemistry, Biochemistry, Molecular Genetics, Microbiology, Molecular Biology.
- GED Preparation, All Subjects from the Test.
- Language Exams: TOEL, ESL.
- Graduate Level Course Preparation: Biomedical Science.

Bausch and Lomb-Valeant-Pharmaceuticals, Tampa, FL

Senior Analytical Chemist: from July 2013 to February 2015

- Senior support scientist for the QC chemistry laboratory operations developing/validating analytical methods for contract manufacturing and site projects commitments. I provided supervision, guidance, and directions to the team analysts for the preparation of solutions, standards and samples needed in method development.
- Developed HPLC methods (assays, impurities, and in-process/cleaning) for contract manufacturing clients with products featuring complex chemistries of analytes with formulation matrices.
- Technical leadership to different QC chemistry groups in analytical method development, allowing me to troubleshoot and solve difficult problems in chromatographic separation.
- Weekly project status reports for clients and all test analytical methods, method validation protocols, and validation and method transfer reports. I also presented orally and, when needed with Power Point slides, results to clients.
- Self- continuing education in analytical techniques or strategies in the research and development of chromatographic analytical methods: an example is the simulation of chromatograms using MS Excel and simulation software programs.
- Coordinated method development, method transfers, and validation timelines with manufacturing schedules in order to meet the tight deadlines imposed by contract manufacturing clients.

Protein Sciences Corporation, Meriden, CT

Development Process Scientist: from January 2010 to June 2013

- Purifications of influenza hemagglutinins; mini-scale up to 10 L (H3, H1, H5, B)
- Ion-Exchange, Hydrophobic Interactions Chromatography, Affinity Chromatography using AKTA FPLC (Purifier, Explorer, Avant, Pilot).
- Stability studies focusing on process improvements for manufacturing support.
- Protein extraction yield improvements.
- Depth-Filtration/Tangential Flow Filtration for implementation into process development.
- Chromatography with Fed-Batch, Novel Protein Constructs troubleshooting experience.

- Implemented in-process analytical assays in Downstream Process Development (Size-Exclusion Chromatography, Differential Light-Scattering, and Detergent HPLC Assays) with Waters Alliance HPLC (Empower II).
- Training and Supervision of Research Associates.

Pfizer PGRD, Groton, CT

Senior Analytical Chemist: from July 2009 to December 2009

- Responsible for the rapid purification and quality control of newly synthesized compounds progressing from discovery to sample logistics for biological screening.
- In charge of pre-purification analyses involving method development; in charge of routine purification and QC analyses by HPLC and UPLC (Mass Lynx Waters Software), using Mass Spectrometry-Electrospray Ionization, Evaporative Light Scattering Detection, and UV detection.
- Handling TECAN robotics equipment: serial weighing, dilution/duplication, reformatting of samples for QC analysis.
- Liaison between synthetic chemists and analytical group, troubleshooting pipeline compounds quality of analysis.
- Liquid Chromatography/Mass Spectrometry method transfer between acetonitrile-run and methanol-run systems to achieve best quality of analysis.

VaxInnate, New Haven, CT (R& D Relocated in Cranbury, NJ in January 2009)

Research Scientist Protein Chemistry: from October 2008 to January 2009

- Responsible for the expression and purification of flagellin fusion protein constructs (malaria and HPV) purification, using FPLC instruments (AKTA Explorers), ion -exchange, size-exclusion, and affinity chromatographies.
- Gained experience working with Histidine-Tag constructs, cysteine-tagged protein constructs for bioconjugation.
- Worked with proteins prone to degradation.
- Monitored endotoxin levels with LAL and BCA assays as well as tagging integrity with immunoprecipitation.
- Routinely performed SDS-PAGE gels and Western Blotting for visualizing protein purification results.

Unilever HPC, Trumbull, CT

Research Analytical Chemist: from June 2007 to June 2008

- In charge of HPLC and UPLC method development for the analysis of anti-aging and skin lightening ingredients (fatty acids, UV-protecting small molecules).
- Responsible for stability studies of these molecules in various formulated bases that were personally prepared.
- Carried out research involving lipid active ingredients using synthetic methods, spectroscopy, and chromatography.
- Redesigned existing methods of analysis, specifically involving unstable ingredients such as lycopene, to improve their detection and quantitation.
- Acted as an analytical support scientist for other groups using HPLC, troubleshooting their experiments, and reporting their results with data analysis.

Wesleyan University, Middletown, CT

Graduate Research Scientist: from September 2001 to June 2008

- Headed project under advisor's supervision on the determination of the factors governing the affinity and specificity of interactions between the protein Sex-Lethal and its RNA substrate Transformer, in terms of hydrogen bonding and stacking interactions.
- Worked out all experimental and peripheral methods from "scratch" by using gel electrophoresis with ³²P labeled RNA, fluorescence spectroscopy, filter binding, protein expression and purification, nucleic acid purification by SDS-PAGE, PCR for site-directed mutagenesis, Circular Dichroism for the study of protein and mutant structures, HPLC-Size-Exclusion Chromatography protein purification.
- Studied the stoichiometry of the Sex-Lethal protein and pre-mRNA Transformer by native gel electrophoresis, fluorescence, Mass-Spectrometry-Electrospray Ionization, and analytical ultracentrifugation.
- Taught for two years introductory chemistry and advanced lab classes for undergraduates.
- Acted as radiation safety officer for five years; organized safety training for new students and regular training for my research group.

Unilever HPC, Clinton, CT

Quality Control Analytical Chemist: from August 2000 to September 2001

- Responsible for the analysis of finished products with FDA-regulated ingredients by HPLC (UV and refractive index detection) in a cGMP-GLP facility.
- Gained manufacturing plant hands-on experience by inspecting and adjusting in-process batches, monitoring additions of in-process FDA-regulated ingredients, collecting microbiological samples of production tanks and other tools for production of batches.
- Supported wet chemical and microbiological testing of raw materials and finished products with colorimetric and Karl Fisher titrations, viscosity, bacterial plating.
- Improved record keeping for the HPLC area, maintained excellent records for FDA review, earning recognition for my efforts to be in the most complete compliance.

COMPUTER SKILLS

Proficient with Chem Draw, ISIS-Draw, Kaleidagraph, WEBLAB Viewer, MOE, Hyper-Chem, Gaussian; Millenium, Empower II and III, HP Chem Station, Mass Lynx, Unicorn; MS Office, Adobe Photoshop, Illustrator, and Premiere. OS: Proficient with Windows, MAC experience.

AMERICAN CHEMICAL SOCIETY MEMBER SINCE 1997

LANGUAGES: Bilingual French/English, reads and understands German and Spanish

LINKED IN Professional Groups Membership:

Analytical Chemistry
Chemistry
R& D Biopharmaceutical, Pharmaceutical, Biotechnology
Florida Life Sciences
Analytical Methods
South Florida Life Sciences
American Chemical Society
Life Science and Technology
Drugs/Toxicology
Chromatography
Preparative Chromatography
Proteomics
Forensic Scientists
Vaccine Professionals

Protein Formulations
LC/MS
International HPLC Users
Nucleosides, Nucleotides, and Nucleic Acids
Bay Area Analytical Chemistry and DMPK Professionals Social Network
Purification
Isothermal Titration
BioFlorida
Biopharmaceutical Analysis

SCIENTIFIC PUBLICATIONS and PRESENTATIONS

Incorvia-Mattina, Mary-Jane; Iannucci-Berger, William; Kairawicz (Dykas), Laure; Pardus, Jennifer.
Impact of Long-Term Weathering, Mobility, and Land Use on Chlordane Residues in Soil
Environmental Science & Technology, *May 10, 1999*

Incorvia-Mattina, Mary-Jane; Iannucci-Berger, William; Kairawicz (Dykas), Laure.
Chlordane Uptake and its Translocation into Food Crops
Journal of Agricultural and Food Chemistry, *April 6, 2000*

Kairawicz (Dykas), Laure
Basis of the Interactions Between the RNA-Binding Protein Sex-Lethal and its Substrate the Transformer Pre-mRNA
Chemical Biology Symposia, Yale University, New Haven, CT, 2004

The Role of Stacking and Hydrogen Bonding Interactions in the Protein-RNA Complex Sex-Lethal/Transformer Pre-mRNA
Chemical Biology Symposia, Yale University, New Haven, CT, 2005

Moussa, Heather; Kairawicz, Laure; Cappucci, Mark; Williamson, Jeffrey; Skultety, Paul.
Comparative Dissolution Study of Pharmaceutical Cocrystals of Active Pharmaceutical Ingredients with Nicotinamide and its Physical Mixture
American Association of Pharmaceutical Scientists National Meeting, 2016