



## **Stakeholder Panel on Strategic Food Analytical Methods**

**Expert Review Panels for**

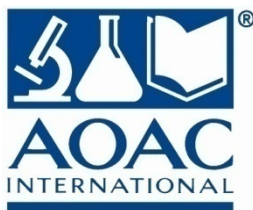
**-SPSFAM Ethanol in Kombucha Methods-**

**EXPERT REVIEW PANEL CANDIDATES FOR  
OFFICIAL METHODS BOARD APPROVAL**

Expected to Convene: September 18, 2016

**SHERATON DALLAS HOTEL**

Dallas, Texas, USA



## Expert Review Panel for SPSFAM Food Allergens

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**AOAC INTERNATIONAL: Expert Review Panel for SPSFAM Kombucha:**

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**APPLICABLE SMPR(s):**

- AOAC SMPR 2016.001, *Standard Method Performance Requirements (SMPRs®) for Determination of Ethanol in Kombucha*

**LIST OF METHODS SUBMITTED IN RESPONSE TO CALL FOR METHOS:**

- **KOM-01: Ethanol in Kombucha**
  - Author(s): Blake Ebersole
  - Submitted by: Blake Ebersole, NaturPro Scientific
- **KOM-02: Fluorescent Detection of Ethanol in Kombucha via Alcohol Dehydrogenase**
  - Author(s): Michael Valley, Jolanta Vidugiriene, James Cali
  - Submitted by: Michael Valley
- **KOM-03: Ethanol Analysis in Kombucha Drinks**
  - Author(s): Samuel J. LaBonia
  - Submitted by: Samuel J. LaBonia
- **KOM-04: Determination of ethanol in Kombucha by Gas Chromatography-Flame Ionization Detector: Intra-Laboratory Validation**
  - Author(s): Xin Du and Yonglin Ren
  - Submitted by: Xin Du
- **KOM-05: Determination of Alcohol Content in Kombucha Tea by Headspace Solid Phase Microextraction and Gas Chromatography-Mass Spectrometry**
  - Author(s): Katherine K. Stenerson
  - Submitted by: Katherine Stenerson, Millipore Sigma

**LIST OF ALL APPLICANTS**

|                | Name                            | Affiliation  | Country           |
|----------------|---------------------------------|--|-------------------|
| 1.             | Alahmad, Shoeb                  | Damascus University                                      | Syria             |
| <del>2.</del>  | <del>Beshore, Timothy</del>     | <del>Chemours</del>                                      | <del>USA</del>    |
| 3.             | Bhandari, Sneha                 | Mérieux NutriScience                                     | USA               |
| <del>4.</del>  | <del>Borsos-Baião, Denise</del> | <del>Centro Universitario FEI</del>                      | <del>Brazil</del> |
| 5.             | Crum, Hannah                    | Kombucha Brewers International                           | USA               |
| 6.             | Ebersole, Blake*                | NaturPro Scientific LLC                                  | USA               |
| 7.             | Jayabalan, Rasu                 | National Institute of Technology Rourkela                | India             |
| 8.             | Joseph, George                  | AsureQuality   | New Zealand       |
| 9.             | Mirzoian, Armen                 | TTB  | USA               |
| <del>10.</del> | <del>Paucar Oré, Fiorela</del>  | <del>Complementos y Suplementos Orgánicos del Perú</del> | <del>Peru</del>   |
| 11.            | Stenerson, Katherine*           | Millipore Sigma  | USA               |
| 12.            | Stryffeler, Rachel              | The Coca-Cola Company                                    | USA               |
| <del>13.</del> | <del>Tuzimski, Tomasz</del>     | <del>Medical University in Lublin</del>                  | <del>Poland</del> |
| 14.            | Valley, Michael*                | Promega  | USA               |

*\*Method author of methods submitted in response to issued Call for Methods*

*Names with strikethrough lines were reviewed by CSO and OMB. Due to insufficient evidence of expertise, these names are removed from the final recommendation for the expert review panel.*

**Qualification of Expert Reviewers:**

To qualify as an Expert Reviewer, the candidate must meet one of the following requirements:

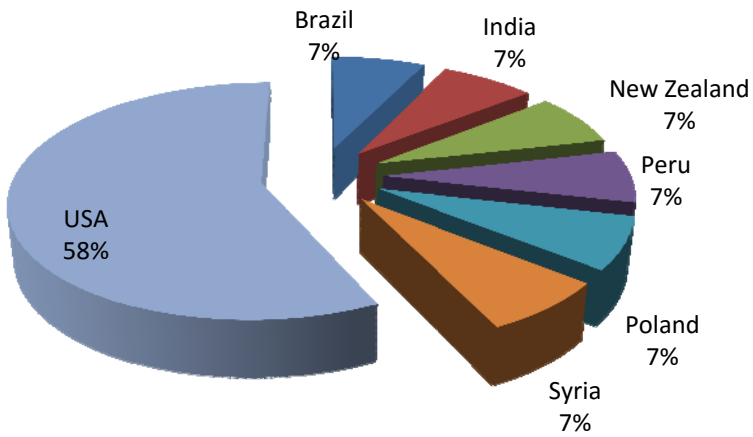
- Demonstrated knowledge in the appropriate scientific disciplines.
- Demonstrated knowledge regarding data relevant to adequate method performance.
- Demonstrated knowledge of practical application of analytical methods to bona fide diagnostic requirements.

These qualifications must be clearly described in a CV submitted to the CSO and kept on file at AOAC headquarters.

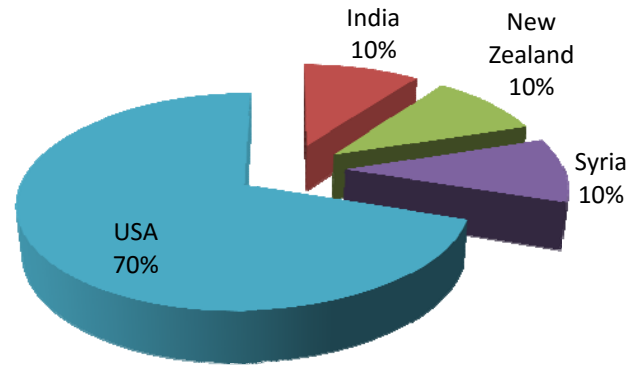
**RECOMMENDED CANDIDATES FOR THE ERP**

|     | Name                     | Affiliation                               | Country     |
|-----|--------------------------|---|-------------|
| 15. | Alahmad, Shoeb           | Damascus University                       | Syria       |
| 16. | Bhandari, Sneha (Chair)  | Mérieux NutriScience                      | USA         |
| 17. | Crum, Hannah (nonvoting) | Kombucha Brewers International            | USA         |
| 18. | Ebersole, Blake*         | NaturPro Scientific LLC                   | USA         |
| 19. | Jayabalan, Rasu          | National Institute of Technology Rourkela | India       |
| 20. | Joseph, George           | AsureQuality                              | New Zealand |
| 21. | Mirzoian, Armen          | TTB                                       | USA         |
| 22. | Stenerson, Katherine*    | Millipore Sigma                           | USA         |
| 23. | Stryffeler, Rachel       | The Coca-Cola Company                     | USA         |
| 24. | Valley, Michael*         | Promega                                   | USA         |

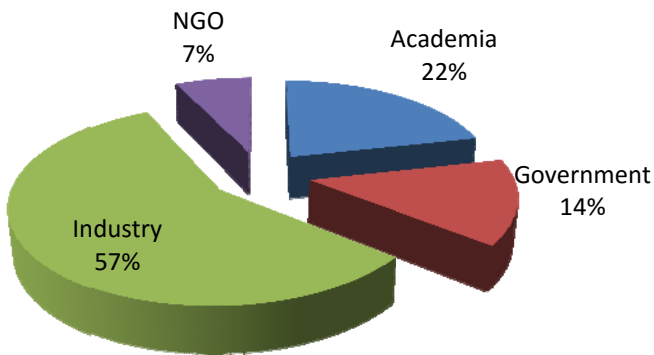
Applicants by Region



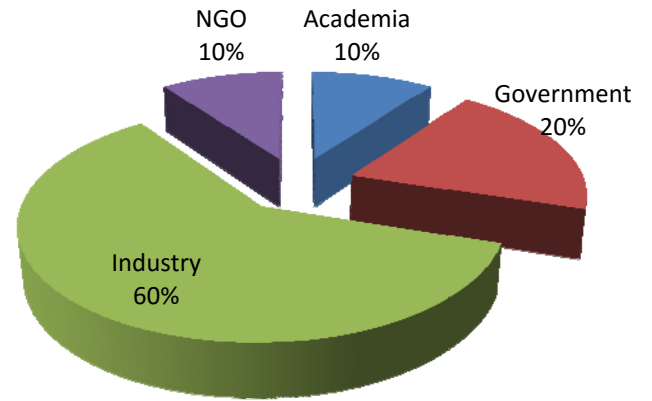
Recommended Panelists by Region



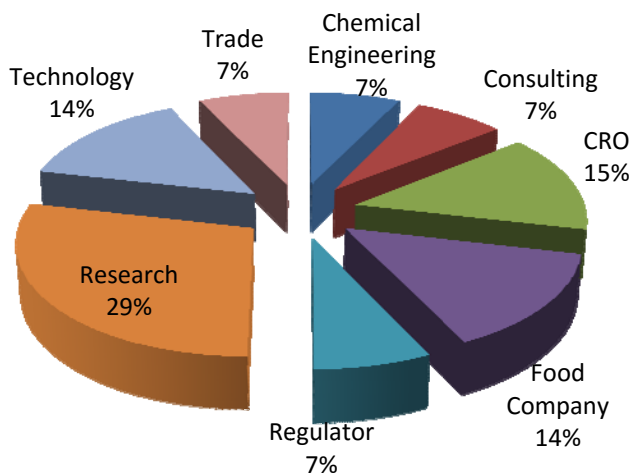
Applicants by Broad Perspectives



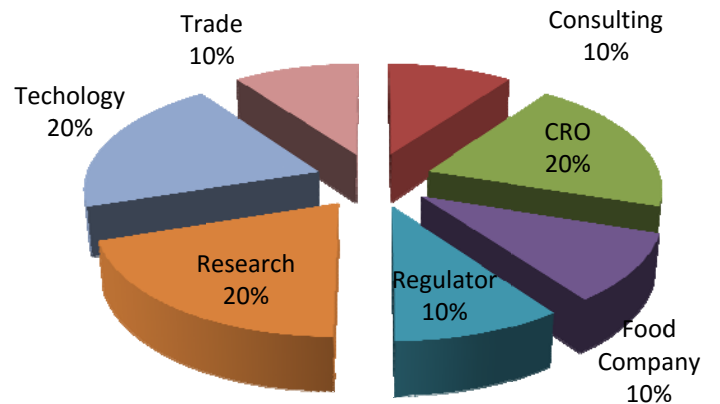
Recommended Panelists by Broad Perspectives



Candidates by Specific Perspectives



Recommended Panelists by Specific Perspectives



**AOAC SPSFAM Kombucha ERP: Recommended Panelists' Statements of Expertise**

|    | <u>CANDIDATE NAME</u>                                 | <u>AFFILIATION</u>             | <u>STATEMENT OF EXPERTISE</u>  | <u>PDF PAGE NO.</u> | <u>CSO RECOMMENDATION</u>          |
|----|---|--------------------------------|--|---------------------|------------------------------------|
| 1. | Alahmad, Shoeb  | Damascus University            | I have taught "Drugs control and instrumental analysis" in Damascus and Albaath and Kalamon universities.  | 8                   | Recommended                        |
| 2. | Bhandari, Sneh<br>(Nominated during<br>8/11 OMB call) | Mérieux NutriSciences          | Expertise and to serve as chair of the panel corroborated by OMB members on 8/11/2016.   | 10                  | Recommended                        |
| 3. | Crum, Hannah  | Kombucha Brewers International | As president and co-founder of Kombucha Brewers International, the non-profit trade association for the Kombucha industry, Hannah Crum is a longtime educator and Kombucha advocate. Taking KBI's mission to promote and protect the Kombucha industry worldwide to heart, she has been a featured speaker at conferences, festivals and on television as the leading expert in Kombucha. She started her Kombucha journey over a decade ago and was inspired to teach others how easy and safe it is to brew Kombucha at home which she has been doing since 2004 via the popular educational site, KombuchaKamp.com. The most visited website in the world for Kombucha information, recipes and advice co-authored with her partner, KBI co-founder and Chairman of the Board, Alex LaGory. Together, they have directly mentored and consulted Kombucha brewers from start-up to scale-ups since 2007 and have published the authoritative tome, The Big Book of Kombucha (Storey Publishing, Mar 2016). | 14                  | Recommended as a non-voting member |
| 4. | Ebersole, Blake                                       | NaturPro Scientific, LLC       | Blake Ebersole, B.S. Forensic Chemistry, M.B.A, has worked in production and quality control of botanical and nutritional products for more than a decade. As quality director, Blake developed quality management systems (QMS) based on food safety, ISO 9000 and GMP standards, meeting requirements of Fortune 500 food, supplement and pharmaceutical clients. As director of R&D, Blake directed clinical, preclinical, analytical method validations and toxicology research, and has been author/advisor on more than 70 published studies. Recently, Blake has established a number of quality compliance initiatives such as ID Verified™, and co-founded IDDI, an independent standards setting organization for dietary ingredient quality. Currently, Blake is working to implement industry-wide quality systems that harmonize risk management, Good Agricultural Practices, and Good Manufacturing Practices.  | 15                  | Recommended                        |
| 5. | Jayabalan, Rasu                                       | National Institute Of          | I am working in the field of Kombucha since 2007 with respect to its   | 24                  | Recommended                        |

08/23/2016

|     |   |   |  |           |             |
|-----|---|---|--|-----------|-------------|
|     |   | <b>Technology Rourkela (India)</b>          | phenolic contents, hepatoprotective property, anti cancer property, preservation study, etc. Many of my papers are published in peer-reviewed reputed journals and are mentioned in the CV enclosed here. Recently, a review on Kombucha, and two reference series, one in Elsevier and other one in springer were published regarding Kombucha.   |           |             |
| 6.  | <b>Joseph, George</b><br><b>(Recommended by OMB members)</b>            | <b>AsureQuality (New Zealand)</b>           | Expertise corroborated by OMB members on 8/11/2016.  | <b>36</b> | Recommended |
| 7.  | <b>Mirzoian, Armen</b>  | <b>US Treasury – Tax &amp; Trade Bureau</b> | I have more than 12 years of experience in the areas of alcoholic beverage analysis and authentication for labeling and tax classification compliance purposes. I developed and validated numerous beverage alcohol analysis methods using various analytical instrumentation and techniques. I'm a chapter editor for the AOAC Official Methods of Analysis (OMA) Chapter 28 (Wine).  | <b>39</b> | Recommended |
| 8.  | <b>Stenerson, Katherine</b><br><br><b>(responded to targeted email)</b> | <b>MilliporeSigma</b>                       | I have experience in analysis of various volatile organic compounds by headspace from water and other sample matrices. I have used headspace solid phase microextraction (SPME) and purge and trap for this type of testing. With regards to analysis of alcohols, I have used both direct injection GC analysis and headspace SPME. For GC analysis, I have experience with quantitative methodologies related to environmental testing (alcohols, glycols, VOCs), and have developed several SPME-based methodologies for volatile organics from various food-based products. The later includes methods for methanol in biodiesel, residual solvents in herbal extracts, ethanol in Kombucha tea, terpenes in cannabis, and trichloroanisole and halophenols in wine. | <b>41</b> | Recommended |
| 9.  | <b>Stryffler, Rachel</b>  | <b>The Coca-Cola Company</b>                | I have worked on developing and optimizing a method for the quantitation of alcohol in kombucha by GC-MS. During this process I have learned about the kombucha production process and the challenges of testing for ethanol in this beverage matrix. Together with my strong background in analytical chemistry, I believe that I am qualified to evaluate analytical methods for the determination of ethanol in kombucha.   | <b>43</b> | Recommended |
| 10. | <b>Valley, Michael</b>  | <b>Promega</b>                              | After getting a BA in chemistry, I studied enzymology in both my graduate school and postdoctoral years. Upon joining Promega, I applied my enzymology skills to developing a variety of luminescent assays. Some of these assays were designed to detect changes in enzyme activity, but most have been designed to use enzymes to detect various analytes with high levels of specificity and sensitivity.   | <b>46</b> | Recommended |

08/23/2016

Name : Shoeb Alahmad

Email : [ph.shoebalahmad@hotmail.com](mailto:ph.shoebalahmad@hotmail.com)

Mobile : 002-01021174458



### Academic Information

Academic Qualification : Master Degree.  
Major : Pharmaceutical science.  
Specialization : Drugs control.  
University : Damascus university.  
Country : Syrian Arab Republic.  
Graduation Year : 2014

### Teaching Subjects

Drugs control.  
Pharmaceutical Chemistry.  
Biopharmacy.  
Drug synthesis.  
I have taught these subjects in Damascus and Albaath universities.

### Books & Published Researches



- **Validated HS-GC-FID Method for Determination of Residual Ethanol in Solid Dosage Form**  
Shoeb Alahmad, Mhd. Amer Almardini, Mahzia yahia , RJPT , Volume 07, Issue 02, February 2014; 184 – 187.

- **Validation of the HS-GC-FID Method for the Determination of Residual Ethanol in Tablets**  
Shoeb Alahmad, Mhd. Amer Almardini, Int. J. Pharm. Sci. Rev. Res., 23(1), Nov – Dec 2013; 102 – 140.

- تطوير طريقة ذات مصدوقية لتعيين الإيتانول في الأشكال الصيدلانية الصلبة بواسطة الكروماتوغرافيا الغازية مع استخدام الحيز الفوقي ومكشاف تأيين اللهب.  
شعيب الأحمد، محمد عامر مارديني. الجمعية العلمية لكليات الصيدلة في الوطن العربي.

## Languages

Arabic, English .

## Sneh Bhandari

### Current Position

Chemistry Research & Development Director,  
Silliker Laboratories, 3600 Eagle Nest Drive, Crete, IL 60417.

### Experience

Since May, 1997                      Silliker Laboratories                      Crete, IL

#### Chemistry Research Director

- Direct & Manage the chemistry research and serves as a resource to the Silliker clients to resolve their analytical issues.
- Working with corporate to plan budget, growth and development of the department.
- Write proposals to justify research studies. Create research reports to summarize the findings and discuss those in relation to the objective and existing knowledge.
- Design research studies, experiments and protocols. Work with in guidelines of ISO 17025.
- Work with National & International Agencies to lead efforts in improving method of food, dietary supplement analysis
- Fellow of AOAC. Expert review panel and strategic committee member for AOAC SPIFAN program.
- Chair AOCS Analytical Division.
- Member Chromatography Division, AOCS
- Help clients about regulatory guide lines (FDA, USDA) including nutritional labeling.
- Wrote a chapter on food hazards resulting from environmental, industrial and agricultural contaminants.
- Made various presentations at professional and scientific meetings including AOAC, IFT, AOCS etc.
- Managed special projects like stability testing, method validation including studies to fill in the gaps cited in FDA form 483 and other audits.
- Helped clients to study oil authenticity and also oil adulteration.
- Served on various AOAC Expert Review Panels and Stakeholder Panels.
- AOAC Technical Committee member for Additives (2004-2007).
- Was involved in EPR for vitamin E analysis in dietary supplements (AOAC task force; FDA/NIH ).
- Develop and write SOPs, Policies and the method protocols to be used in routine functions of the lab.
- Validated HPLC/GC methods to analyze various nutritionally important food analytes, i.e., tocopherols, tocotrienols, vit K, nutraceuticals, capsaicin, cholesterol & phytosterols. sugars, sugar alcohols etc.

1995–1997                      Silliker Laboratories                      Chicago Heights, IL

#### Research Manager

- Managed Research Department.
- Developed and validated various new HPLC methods for analysis including B-lactam antibiotics in milk, vitamin K analysis using post-column, derivatization, iodine by by ion-chromatography with PAD, amino acids analysis, hydroxy-citric acid, benzocaine, resorcinol, carotenoids, ginginoides, aspartamae and its degradatory products.
- Participated in AOAC collaborative study on ethoxyquin.

1990–1995                      Silliker Laboratories                      Chicago Heights, IL

#### Method Development Specialist

- Managed and supervised instrumental and vitamin dept.

- Developed/validated various new HPLC methods for vitamins, preservatives, organic acids etc.
- Participated in AOAC collaborative study on vitamin D analysis by HPLC.

1987–1990 Dept of Food Science & HN, Gainesville, FL

#### **Postdoctoral Research Associate**

- Studied metabolism and bioavailability of folate vitamers in humans using stable isotopes analyzed using mass-spec.
  - Synthesized various stable isotopes of folates and purified using HPLC & characterized by photo diode array.
  - Studied Polyglutamyl conjugase from human intestinal brush border vesicles and from porcine pancreatic juice using a HPLC assay.
  - Devised various methods of folate extraction from biological tissues assessed using HPLC methods.
- 1986–1987 Dept of Pharmacology, LSUMC, Shreveport, LA

#### **Postdoctoral Research Fellow**

- Studied mechanism of folate transport in rat kidney. Characterized folate receptor in renal brush border vesicles.
- Studied effect of ethanol on folate metabolism and bioavailability of folate vitamers in rat using radioactive isotopes.

1976–1986 Biochemistry Dept., MS University, Baroda, India

#### **Reader and Lecturer**

- Taught Biochemistry, Human Physiology and Clinical Chemistry, Human Nutrition and Food Chemistry to post-graduate students.
- Studied effects of nutritional factors on intestinal enzymes and lipids.

1982–1983 Dept. of Pediatrics, AHSC, Tucson, AZ

#### **UNESCO Postdoctoral Research Fellow**

- In vitro studies on sugar transport using everted gut sac technique and its correlation with activities of digestive enzymes.
- Studies on thyroid hormone receptors in isolated intestinal epithelial crypt and villi cells.

1977–1980 Biochemistry Dept., MS University, Baroda, India

#### **Principal Investigator**

- Studies on intestinal phosphoinositide metabolism.

1972–1976 Biochemistry Dept., MS University, Baroda, India

#### **Research Fellow**

- Studies on intestinal enzymes and biochemistry in relation to nutrition.

1972–1972 Biochemistry Dept., MS University, Baroda, India

#### **Research Fellow**

Studies on soybean hemagglutinins and trypsin inhibitors and effect of food processing on the same.

#### **Education**

1972–1977 Biochemistry Dept., MS University, Baroda, India

## 3

- Ph.D. in Nutritional Biochemistry

1970–1972 Biochemistry Dept., MS University, Baroda, India

- M.S. in Biochemistry. Specialization: Human Nutrition.

1967–1970 Jodhpur University, India

- Bachelor of Science.

Major subjects: Chemistry, Botany, Zoology and Physics.

**C.N.S.**

1994 Certification Board for Nutr. Sp., American College of Nutrition

- Certified Nutrition Specialist (C.N.S.)

**Honors**

◆ Chair AOCS Analytical Division, 2012

◆ Vice Chair AOCS Analytical Division, 2012

◆ Fellow of AOAC International, 2011

◆ Member of the AOAC Official Methods Board since 2010

◆ AOAC Additives Technical Committee Member

◆ Involved in AOCS in Chromatography Technical Committee (member fatty acid analysis group)

◆ AOAC Horwitz Advisor

◆ AOAC/FDA/NIH Expert Review Panel member – Coenzyme Q (2005)

◆ Serving as a Single Lab Validation Expert for Vitamin E Analysis in Dietary Supplements for AOAC/FDA/NIH Task force.

◆ Sweetener Technical Committee member ISBT.

◆ Past - AOAC Associate Referee for Vitamin E .

◆ Listed in Strathmore's Who's Who Directory (1995-96).

◆ UNESCO Postdoctoral Fellowship (1982).

**AOAC****Collaborative Studies Participated**

◆ Vitamin D in infant formula by a HPLC method AOAC 995.05 (1995).

◆ Ehoxyquin in feeds by a HPLC method (996.13).

◆ Participated in USDA led folate analysis in foods using triple enzyme method.

**Theses**

◆ Ph.D. Nutritional Studies on rat intestinal Phytase

◆ M.Sc. Effects of diet on Cholesterol Metabolism.

**4**

**Publication**

◆ Original Research Papers Published : 20

◆ Book Chapter : 1 (In: Handbook of Food Safety, 2003, Wiley)

◆ Presentations at Scientific meetings : 60

# Hannah Crum

CELL: 424-245-5867  
E-MAIL: info@kombuchabrewers.org

## Work Experience

I've been speaking, educating and presenting on Kombucha at health and business conferences for the last 5 years. Over the last decade, I've literally read every piece of literature on the subject available and I've visited more Kombucha breweries and tasted more Kombucha than anyone else in the industry or the world.

March 2016

### Co-Author, **The Big Book of Kombucha (Storey Publishing)**

- Co-wrote book with partner Alex LaGory
- Compiled and read numerous studies on Kombucha from around the world for research appendix

February 2016

### Presenter, **AOAC Pacific Southwest Meeting**

- Presented information on Kombucha to the AOAC PACSW meeting including the AOAC process

9/15-present

### Co-Chair, **AOAC Working Group for Kombucha**

- Lead meetings with AOAC team members and other scientists to establish the testing method requirements for the SMPR
- Presented at the 2015 Annual Meeting & the 2016 Mid-Year Meeting on Kombucha

10/13-present

### President – **Kombucha Brewers International - Los Angeles, CA**

- Co-Founded organization in 2014 to support the commercial Kombucha industry
  - o Started w/40 member companies
  - o Have grown to over 130 companies around the world
  - o Mission: Promote & protect commercial Kombucha around the world through education, advocacy and marketing
- KombuchaKon co-founder – annual conference for the commercial Kombucha industry
- Currently serving as Executive Director and maintain all daily operations for the association including communications, lobbying, strategizing and implementation of all programs and projects of the organization

6/10-present

### Founder & Principal – **KombuchaKamp.com – Los Angeles, CA**

- Co-founded KombuchaKamp.com to disseminate quality information and education about how to safely brew Kombucha at home
- Robust blog with loads of informational posts on WordPress platform including educational & how to videos for brewing Kombucha
- Co-wrote 130 page ebook as support manual and resource for brewing Kombucha
- Building a database of Kombucha research papers to launch as a public portal this year (nearly 200 papers already gathered)
- “Bacteria Farmer” – co-created ideal techniques for cultivating robust Kombucha SCOBYs as we also sell quality cultures for consumers and at wholesale to commercial Kombucha breweries
- “Master Brewer” – worked at several different locations in Los Angeles as the onsite Master Brewer; also offer consultation services to start-ups & those scaling up their operations

11/04 - present

### Educator – **Kombucha Kamp – Los Angeles, CA**

- I founded the Kombucha Kamp Workshop as an educational seminar in my home
- The workshop inspired me to start KombuchaKamp.com to reach a broader audience
- Created videos and other educational materials & presentations about Kombucha that have been distributed through YouTube, EHow and other internet sites

*References, samples of completed work and additional experience available upon request.*

## Education

University of Illinois, Urbana- Champaign – Double Degree: BA in Mandarin Chinese Language & Literature, BA in Spanish Language & Literature

**08/23/2016** Received Fellowship to study at ICLP in Taiwan (98-99); Golden Key National Honor Society, Sigma Delta Pi (Spanish honor society)

## Blake Ebersole

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CV



Humans have used natural products to support health for thousands of years. Today, a new wave in natural products is here which presents an enormous opportunity to improve people's lives.

On this foundation, my life's goal is to apply the highest level of scientific rigor, transparency and care to fulfill the true potential of natural products.

To this aim, I have committed to a life of learning and expertise in research, development, manufacturing, regulation, quality assurance and marketing of natural products.

### Professional Experience:

#### Quality Management:

- Developed internal Quality Management System (QMS) from scratch based on ISO 9000 and GMP (CFR 111/110) standards meeting requirements of F50 food, supplement and pharmaceutical customers.
- Led certification of agricultural and manufacturing operations in India for GMP (21 CFR 111), USDA Organic, Non-GMO Project, Good Agricultural Practices, Fairtrade and Amway Nutricert programs, coordinating farm and manufacturer levels
- Coordinated single laboratory validation of analytical methods for marker compounds in pomegranate, basil and kombucha
- Coordinated industry effort in support of Procter and Gamble initiative to validate analytical method for inorganic bromides, producing data that led effort to revise USP <561> limits
- Reduced internal rate of nonconformances by 240% and improved quality KPI by 600% year-over-year.
- Led development, optimization and validation of dozens of natural product analytical methods in adherence to USP, ICH, GLP and other compendia guidelines.
- Managed and mentored skilled and unskilled staff in the art and science of quality assurance and quality control

#### R&D and Product Development:

- Directed a \$10+ million research program and served as coauthor/advisor on 100+ scientific studies spanning a number of disciplines including clinical, preclinical, chemical and toxicology
- Served as inventor and/or executor on 10+ patents covering products having \$100+ million in sales
- Led manufacturing scale-up from concept to commercial (metric tons) for dozens of natural products
- Led product development on world-renowned, patented solid-lipid particle formulation (Longvida® Optimized Curcumin).
- Scientific liaison and research collaborator with numerous physicians and Ph.D.'s across various disciplines
- Founded *Verdemedica*, the first research journal dedicated to botanical product science and quality control practices.

#### Legal and Regulatory Affairs:

- Corporate legal counsel liaison and lead expert on FDA DSHEA dietary supplement regulations including GMP, product safety, product labeling and claims substantiation
- Liaison for FDA, regulatory and patent attorneys; Led intellectual property (patent and trademark) research, submission and licensing on 3+ patents, 10+ patent applications, 20+ trademarks and copyrights
- Led and coordinated regulatory document submissions, including IND, NDI, GRAS and product registrations to US FDA, EU (EFSA), Australia TGA, Health Canada, KFSA, Japan FOSHU

## Blake Ebersole

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CV

- Generated, reviewed and negotiated legal agreements such as confidentiality, research, supply, quality, licensing and MOU

### Technical Sales and Marketing:

- Lead technical contact for press, scientist, physician, B2B and consumer communications; authored or contributed to 60+ trade press articles
- Performed marketing analysis using Porter's Five Forces, SWOT, market trends and consumer behavior to determine, develop and communicate desired characteristics for dozens of health products
- Lead brand management for 15+ proprietary branded products sold as ingredients and consumer products
- Presented value-added proprietary products to Fortune 500 and global customers, resulting in millions in sales
- Generated marketing content for external and internal stakeholders, including sales sheets, website content, sales presentations, training sessions, webinars, press releases, and technical dossiers
- Lead marketing and sales strategy and manage projects for B2C start-ups; generate successful online content for B2C

### Leadership

- Planned and implemented numerous corporate-level strategic and tactical plans, processes and policies which improved performance in research, quality, supply chain, sales/marketing, finance and legal departments
- Managed projects and budgets for research, marketing, legal and quality departments
- Department supervisor with 5+ direct reports, experienced in HR practices and requirements
- Led training sessions for corporate, sales/marketing and quality departments
- Serve as principal liaison to trade associations and standards-setting agencies such as USP, AHPA and others
- Computer-savvy (PC, Mac, MS Office/Excel, Adobe, CRM, ERP)

### Diplomas:

|      |   |   |
|------|---|---|
| 2010 | Masters, Business Administration              | <b>Butler University</b><br>Indianapolis, IN, USA       |
| 2000 | Bachelor of Science, Forensic Chemistry (ACS) | <b>West Chester University</b><br>West Chester, PA, USA |

### Positions held:

|              |   |
|--------------|---|
| 2015-present | <b>Co-Founder</b> , Identification of Dietary Ingredients (IDDI), USA   |
| 2015-present | <b>President</b> , NaturPro Scientific LLC, Indianapolis, IN, USA   |
| 2014-2015    | <b>NIH/NCCAM Grant Advisor</b> , "Botanicals and Drug Interactions", University of Rhode Island   |
| 2013         | <b>International Association for Dental Research (IADR) Grant Co-investigator</b> : "Topical curcumin administration to gingival tissue as potential treatment for periodontal disease", Stony Brook University |
| 2012-2013    | <b>Founder and Editor</b> , <i>Verdemedica: Journal of Botanical Product Science and Quality</i>  |
| 2012-2015    | <b>NIH Grant Advisor</b> , "Efficacy of <i>Withania somnifera</i> Compounds on Breast Cancer", Emory University   |
| 2012-2014    | <b>Consultant</b> , AquaNourish/HE Group, Cincinnati/Detroit, USA   |
| 2010-2012    | <b>Technical and Consumer Marketing Advisor</b> , Phytosensia, Indianapolis, USA  |
| 2009-2010    | <b>Business and Intellectual Property Consultant</b> , ArmorTech/Ultra Armoring, Brooklyn, NY.  |
| 2006-2015    | <b>Technical Director</b> , Verdure Sciences, Noblesville, IN, USA  |
| 2005-2006    | <b>Marketing Coordinator</b> , Geni Herbs, Noblesville, IN, USA   |
| 2002-2005    | <b>Principal</b> , RainbowLight.net, Etters, PA, USA  |
| 2001-2002    | <b>Chemistry Teacher</b> , Honolulu School District, Honolulu, HI, USA  |
| 2000         | <b>Analytical Chemist</b> , Pennsylvania Equine Toxicology and Research   |



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Laboratory, West Chester, PA, USA

### Training, Projects, Honors:

- **Nutrition Business Journal**, *Supply Chain Transparency Award* for PLT360, 2016 (Client contracted)
- **American Society of Quality**, *Certified Quality Auditor Coursework*, 2016
- **NutraIngredients**, *University Research of the Year Award* for “Effect of curcumin on cognitive function and mood in healthy older humans” published in *Journal of Psychopharmacology*, 2015
- **Single Laboratory Validation of Analytical Methods for Botanicals**, Analytical Labs/Blaze Sciences
- **Development of Scientific Animation Business Model**, Purdue Research Park, Butler University, 2010
- **Adhering to Good Manufacturing Practices**, American Herbal Products Association, 2010
- **Gateway Competition Prize**, Butler University, 2008
- **Dietary Supplement Health Claim Substantiation under DSHEA**, American Herbal Products Association, 2006
- **Chemistry Seminar**, West Chester University, 2000: *Pharmacology and binding of ligands at the serotonin receptor*
- **Honors Merit Scholarship**, West Chester University, 1996-1997

### Professional Organizations and Contributions:

- **American Herbal Products Association**, Associate Member and Committee Member: Labs, Methods and Standards Committee
- **American Botanical Council**, Member
- **American Botanical Council/American Herbal Pharmacopoeia/National Center for Natural Products Research**, Peer reviewer, Lab Guidance on Black Cohosh, Skullcap and Pomegranate
- **AOAC International**, Member, Participant on Kombucha Ethanol SMPR Working Group, 2015-2016
- **State of Colorado Marijuana Enforcement Division**, Pesticides Testing Working Group, 2016
- **Institute of Food Technologists**, Member
- **Journal of Medicinal Food**, Peer-reviewer
- **American Chemical Society**, Member (Agricultural and Food Chemistry Division)
- **U.S. Pharmacopoeia (USP)**, Monograph development liaison, past
- **NIH**, Research liaison
- **USDA**, Research liaison, past
- **National Center for Natural Products Research (NCNPR), University of Mississippi**, Research liaison, past

### Scientific Publications (Author/Advisor):

1. Single laboratory validation of a GC-FID method for ethanol in kombucha, Eckert M, Schmidt R, **Ebersole B**. 2016 Journal of AOAC, Submitted
2. Curcumin supplementation improves vascular endothelial function in middle-aged and older adults. Santos-Parker JR, Strahler TR, Bassett CJ, Chonchol MB, Seals DR. *The Gerontologist* (2015) 55 (Suppl 2): 195. doi: 10.1093/geront/gnv554.01
3. Lymphatic transport and human pharmacokinetics of a solid-lipid curcumin particle product. Eidenberger T, **Ebersole B**. Manuscript.
4. Reduced inflammatory and muscle damage biomarkers following oral supplementation with bioavailable curcumin. McFarlin B et al. *BBA Clinical*, 2016 (5)72-78. doi:10.1016/j.bbacli.2016.02.003

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5. Thymoquinone, a bioactive component of *Nigella sativa*, normalizes insulin secretion from pancreatic  $\beta$ -cells under glucose overload via regulation of malonyl-CoA. Gray JP, Zayasbazan Burgos D, Yuan T, Seeram N, Rebar R, Follmer R, Heart EA. *Am J Physiol Endocrinol Metab*. 2016 Jan 19 doi: 10.1152/ajpendo.00250.2015.
6. Curcumin ameliorates neuroinflammation, tau hyperphosphorylation, amyloid accumulation and memory deficits in p25 transgenic mice. Sundaram JR, Poore CP, Sulaimi NH, Pareek T, Pant HC, **Ebersole B**, Frautschy SA, Low CM Kesavapany S. *Current Alzheimer's Research*, Submitted.
7. A pilot comparison of phospholipidated lutein to conventional lutein for effects on plasma lutein concentrations in adult people. DiSilvestro RA et al. *Nutrition Journal* 2015 14:104
8. Curcumin and yoga therapy for those at risk for Alzheimer's disease. Frautschy SA et al. In progress, available from: <https://clinicaltrials.gov/ct2/show/NCT01811381>
9. Thiol dependent NF- $\kappa$ B suppression and inhibition of T-cell mediated adaptive immune responses by a naturally occurring steroidal lactone Withaferin A. Gambhir L, et al. *Toxicology and Applied Pharmacology*, Online Sept 25, 2015
10. Clinical development of curcumin in neurodegenerative disease. Hu S et al. *Expert Review of Neurotherapeutics* 2015 15(6) 629-637.
11. The effect of pomegranate fruit extract on testosterone-induced BPH in rats. Ammar A et al. *The Prostate* 2015 75(7):679-692
12. Simultaneous estimation of stigmasterol and withaferin A in total herbal formulation using validated HPTLC method. Mistry et al. *Journal of Applied Pharmaceutical Science* 2015. 5(8): 159-166
13. Evaluation of bioactivity of pomegranate fruit extract against *Alicyclobacillus acidoterrestris* DSM 3922 vegetative cells and spores in apple juice. Molva C and Baysal A, *LWT – Food Science and Technology* 2015 62(2):989-995
14. Efficacy of curcumin in the treatment for oral submucous fibrosis - A randomized clinical trial. Hazarey VK et al. *Journal of Oral and Maxillofacial Pathology*. 2015 DOI: 10.4103/0973-029X.164524
15. Herbosomes enhance the in vivo antioxidant activity and bioavailability of punicalagins from standardized pomegranate extract. Vora A et al. *Journal of Functional Foods* 2015 12:540-548
16. Investigation of the effects of solid lipid curcumin on cognition and mood in a healthy older population. Cox KH, Pipingas A, Scholey AB. *Journal of Psychopharmacology*. 2014 Oct 2 pii:0269881114552744
17. Rapid and sensitive method for determination of withaferin-A in human plasma by HPLC. Patial P and Gota V. *Bioanalysis*, 2014\_doi:10.4155/bio.10.207
18. Assessment of potency of PC-complexed *Ocimum sanctum* methanol extract in embryonated eggs against Influenza virus (H1N1). Priyanka et al. *Pharmacognosy Magazine*. 2014 Jan-Feb; 10(Suppl 1): S86–S91
19. Anti-inflammatory effects of novel standardized solid lipid curcumin formulations. Nahar PP, Slit AL, Seeram NP. *Journal of Medicinal Food*. 2014 DOI:10.1089/jmf.2014.0053
20. Pomegranate phenolics inhibit formation of advanced glycation endproducts by scavenging reactive carbonyl species. Liu W1, Ma H, Frost L, Yuan T, Dain JA, Seeram NP. *Food and Function*. 2014 Oct 22;5(11):2996-3004.
21. Indazole-Type Alkaloids from *Nigella sativa* Seeds Exhibit Antihyperglycemic Effects via AMPK Activation in Vitro. Yuan T, Nahar P, Sharma M, Liu K, Slitt A, Aisa HA, Seeram NP. *Journal of Natural Products*. 2014 Oct 24;77(10):2316-20.
22. Skullcap (*Scutellaria baicalensis*) Laboratory Guidance. ABC-AHP-NCNPR Botanical Adulterants Program. Peer reviewer. Manuscript in publication, 2014.
23. Pomegranate Extract Modulates Processing of Amyloid- $\beta$  Precursor Protein in an Aged Alzheimer's Disease Animal Model. Ahmed AA, Subaiea MG, Eid A, Li L, Seeram PN1, Zawia HN. *Current Alzheimer's Research*. 2014 Oct 1.
24. Retinal amyloid fluorescence imaging predicts cerebral amyloid burden and Alzheimer's disease. Frost S, Kanagasingam Y, Macaulay L, Koronyo-Hamaoui M, Koronyo Y, Biggs D, Verdooner S, Black KL, et al. *Alzheimer's and Dementia* 2014; 10(4) S234-235
25. Pomegranate extracts impact the androgen biosynthesis pathways in prostate cancer models in vitro and in vivo . Ming DS, Pham S, Deb S, Chin MY, Kharmate G, Adomat H, Beheshti EH, Locke J, Guns ET. *Journal of Steroid Biochemistry and Molecular Biology*. 2014 Sep;143:19-28.
26. Bitter melon extract attenuating hepatic steatosis may be mediated by FGF21 and AMPK/Sirt1 signaling in mice. Yu Y, Zhang XH, **Ebersole B**, Ribnicky D, Wang ZQ. *Scientific Reports (Nature)*. 2013 Nov 5;3:3142. doi: 10.1038/srep03142.

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27. Inhibitory effect of a standardized pomegranate fruit extract on Wnt signalling in 1, 2-dimethylhydrazine induced rat colon carcinogenesis. Sadik NA, Shaker OG. *Digestive Diseases and Sciences*. 2013 Sep;58(9):2507-17.
28. Curcumin suppresses soluble tau dimers and corrects molecular chaperone, synaptic, and behavioral deficits in aged human tau transgenic mice. Ma QL, Zuo X, Yang F, Ubada OJ, et al. *Journal of Biological Chemistry*. 2013 Feb 8;288(6):4056-65.
29. Optimization of an analytical method for the determination of punicalagins in pomegranate extracts by HPLC. Brown PN, **Ebersole B**, Seeram NP 2013. Manuscript.
30. Effects of *Withania somnifera* in patients of schizophrenia: A randomized, double blind, placebo controlled pilot trial study. Agnihotri AP, Sontakke SD, Thawani VR, Saoji A, and Goswami VS. *Indian Journal of Pharmacology*. 2013 Jul-Aug; 45(4): 417–418.
31. *Withania somnifera* root extract inhibits mammary cancer metastasis and epithelial to mesenchymal transition. Yang Z1, Garcia A, Xu S, Powell DR, Vertino PM, Singh S, Marcus AI. *PLoS One*. 2013 Sep 12;8(9) doi: 10.1371/journal.pone.0075069
32. New phenolics from the flowers of *Punica granatum* and their in vitro  $\alpha$ -glucosidase inhibitory activities. Yuan T, Wan C, Ma H, Seeram NP. *Planta Medica*. 2013 Nov;79(17):1674-9.
33. Optimization and validation of ursolic acid by HPLC in *Ocimum sanctum*. Shah J, Patel S, **Ebersole B**, Hingorani L. *Planta Medica* 2012 DOI: 10.1055/s-0032-1321177
34. Acute human pharmacokinetics of a lipid-dissolved turmeric extract, Shah J, Patel S, **Ebersole B**, Hingorani L. *Planta Medica* 2012 DOI: 10.1055/s-0032-1320664
35. Sustained cognitive effects and safety of HPLC-standardized *Bacopa monnieri* extract: A randomized, placebo controlled clinical trial. Hingorani L, Patel S, **Ebersole B**. *Planta Medica* 2012; DOI: 10.1055/s-0032-1320681
36.  $\alpha$ -Glucosidase Inhibitory Hydrolyzable Tannins from *Eugenia jambolana* Seeds. Omar R, Li L, Yuan T and Seeram NP. *Journal of Natural Products*, 2012, 75 (8), pp 1505–1509.
37. Lack of efficacy of curcumin on neurodegeneration in the mouse model of Niemann–Pick C1. Borbon IA et al. *Pharmacology Biochemistry and Behavior* 2012 101(1):125-131
38. Safety assessment of a solid lipid curcumin particle preparation (LONGVIDA®): acute and subchronic toxicity studies. Dadhaniya P, Patel C, Muchhara V, Bhadja N, Mathuria N, Vachhani K, Soni MG. *Food and Chemical Toxicology*. 2011 Aug;49(8):1834-42.
39. Safety and pharmacokinetics of a solid lipid curcumin particle formulation (LONGVIDA®) in osteosarcoma patients and healthy volunteers. Gota VS, Maru GB, Soni TG, Gandhi TR, Kochar N, Agarwal MG. *Journal of Agricultural and Food Chemistry*. 2010 Feb 24;58(4):2095-9
40. Effects of fruit ellagitannin extracts, ellagic acid, and their colonic metabolite, urolithin A, on Wnt signaling. Sharma M, Li L, Cerver J, Killian C, Kooroor A, Seeram NP. *Journal of Agricultural and Food Chemistry*. 2010 Apr 14;58(7):3965-9
41. *Eugenia jambolana* Lam. berry extract inhibits growth and induces apoptosis of human breast cancer but not non-tumorigenic breast cells. Li L, Adams LS, Chen S, Killian C, Ahmed A, Seeram NP. *Journal of Agricultural and Food Chemistry*. 2009 Feb 11;57(3):826-31
42. Pomegranate extract mouth rinsing effects on saliva measures relevant to gingivitis risk. DiSilvestro RA, DiSilvestro DJ, DiSilvestro DJ. *Phytotherapy Research*. 2009 Aug;23(8):1123-7
43. Protective effects of standardized pomegranate (*Punica granatum* L.) polyphenolic extract in ultraviolet-irradiated human skin fibroblasts. Pacheco-Palencia LA, Noratto G, Hingorani L, Talcott ST, Mertens-Talcott SU. *Journal of Agricultural and Food Chemistry*. 2008 Sep 24;56(18):8434-41.
44. Safety assessment of pomegranate fruit extract: acute and subchronic toxicity studies. Patel C, Dadhaniya P, Hingorani L, Soni MG. *Food and Chemical Toxicology*. 2008 Aug;46(8):2728-35.
45. Curcumin structure-function, bioavailability, and efficacy in models of neuroinflammation and Alzheimer's disease. Begum A et al. *Journal of Pharmacology and Experimental Therapeutics*. 2008 Jul;326(1):196-208.
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47. Absorption, metabolism, and antioxidant effects of pomegranate (*Punica granatum* L.) polyphenols after ingestion of a standardized extract in healthy human volunteers. Mertens-Talcott SU, Jilma-Stohlawetz P, Rios J, Hingorani L, Derendorf H. *Journal of Agricultural and Food Chemistry*. 2006 Nov 15;54(23):8956-61

## Blake Ebersole

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### Inventorship, Licensing and Execution of Patent Applications:

1. **Ebersole B**, Hingorani L. Stable solid lipid particle composition for improved bioavailability of lipophilic compounds for age-related diseases. Provisional Patent Application, 2014
2. Frautschy SA, Cole GM. Bioavailable Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. US Patent 9,192,644.
3. Frautschy SA, Cole GM. Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. EU Patent 1993365, registered in Austria, France, Germany, Great Britain, Italy, Poland, Spain and Switzerland
4. Seeram NP, Heber D. Purification of pomegranate ellagitannins and their uses thereof. U.S. Patent 7,919,636
5. Seeram NP, Heber D. Purification of pomegranate ellagitannins and their uses thereof. U.S. Patent 7,897,791
6. Seeram NP, Heber D. Purification of pomegranate ellagitannins and their uses thereof. U.S. Patent 7,638,640
7. Seeram NP, Heber D. Purification of pomegranate ellagitannins and their uses thereof. EU Application 05729156.9
8. Seeram NP, Heber D. Purification of pomegranate ellagitannins and their uses thereof. PCT Application PCT/US2005/009337
9. Frautschy SA. Cole GM. Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. U.S. Application 12/225,005
10. Frautschy SA. Cole GM. Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. EU Application 07752521.0
11. Frautschy SA. Cole GM. Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. PCT Application PCT/US2007/005829
12. Frautschy SA. Cole GM. Curcuminoid Formulations for Treating Alzheimer's Disease and Other Age-related Disorders. India Application

### Scientific Conference Presentations (Author/Advisor):

1. Ethanol analysis of kombucha products with gas chromatography. **Ebersole B**, Institute of Food Technologists Annual Meeting, 2016.
2. Acute human pharmacokinetics of a lipid-dissolved turmeric extract. Shah J, Patel S, **Ebersole B**, Hingorani L. *2012 International Congress on Natural Products Research*, New York, NY. July 31, 2012. *Planta Med* 2012; 78 - PH5 DOI: 10.1055/s-0032-1320664
3. High-throughput screening program for commercial single-herb extracts. Hingorani L, Seeram NP, **Ebersole B**. *2012 International Congress on Natural Products Research*, New York, NY. July 31, 2012. *Planta Med* 2012; 78 - PF85 DOI: 10.1055/s-0032-1320632
4. Optimization and validation of ursolic acid by HPLC in *Ocimum sanctum*. Hingorani L, **Ebersole B**, Patel S. *2012 International Congress on Natural Products Research*, New York, NY. July 31, 2012.
5. Orthogonal validation of analytical and quality systems for botanical products. Hingorani L, Patel S, Darji B, **Ebersole B**. *2012 International Congress on Natural Products Research*, New York, NY. July 31, 2012. *Planta Med* 2012; 78 - PJ156 DOI: 10.1055/s-0032-1321316
6. Sustained cognitive effects and safety of HPLC-standardized *Bacopa monnieri* extract: a randomized, placebo-controlled trial. Hingorani L, Patel S, **Ebersole B**. *2012 International Congress on Natural Products Research*, New York, NY. July 31, 2012.
7. Anti-inflammatory effects of a standardized SLCP preparation (Longvida®) against generic curcumin extract in LPS-stimulated RAW 264.7 macrophages. *244<sup>th</sup> ACS National Meeting and Exposition*, Philadelphia, PA, August 2012
8. Bitter melon extract enhances insulin sensitivity by modulating FGF21 signaling in high-fat diet fed mice. Wang ZQ, Yu Y, Zhang XH, Li H, Qin J, **Ebersole B**, Cefalu WT. *7<sup>th</sup> International Conference for Functional Foods in the Prevention and Management of Metabolic Syndrome*, Southern Methodist University, Dallas, TX, USA, December 3-4, 2010.
9. Optimization of an analytical method for the determination of punicalagins in pomegranate extracts by HPLC. Zhu J, Chan M, Brown PN, Guns ET. *Annual Natural Health Products Research Conference*, Vancouver, Canada, 2009
10. Efficacy of curcumin formulations in relation to systemic availability in the brain and different blood compartments in neuroinflammatory and AD models. Frautschy SA et al, *39th Annual Meeting of the Society of Neuroscience*, Chicago, October 2009.

## Blake Ebersole

CV

11. Can daily pomegranate extract impact the growth of prostate cancer in a cohort of men awaiting radical prostatectomy? A randomized placebo-controlled clinical trial underway. Guns ET, Brown PN, Balneaves L, Van Patten C, Goldenberg L, So A. *Annual Natural Health Products Research Conference*, Vancouver, Canada, 2009
12. Improving bioavailability of curcumin by solid lipid particle for treatment of Alzheimer's (AD). Frautschy, SF. *38th Annual Meeting of the Society of Neuroscience*, Washington DC, November 15, 2008.
13. Evaluation of pomegranate fruit extracts in prostate cancer cell lines and with specific cytochrome P450 enzymes. Brown PN, Guns E, Wood CA, Chan M, Lo A, Garg P, Khelifi D. *Annual Natural Health Products Research Conference*, Saskatoon, Canada, 2007.
14. Pharmacology of *Bacopa monnieri* at 5HT1a receptors, Hall B, Burnett A, Halley C, Christians A, Parker LA, Medora R, and Parker KK. *Annual Meeting of the American Society of Pharmacognosy*, Corvallis, OR, 2005.

### Invited Presentations (Speaker):

1. "Natural Products Research for Neurodegenerative Diseases", NIH/NINDS, Bethesda, MD, March 3, 2015
2. "Optimized Curcumin and the Aging Brain", Amway/Nutriline, October 29, 2014
3. "Curcumin Advancements: The Aging Brain with Longvida® Curcumin", Douglas Labs, April 23, 2014.
4. "Longvida: The Brain Curcumin". *Vitafoods International Conference*, Geneva, Switzerland, May 24, 2012
5. "100% Ingredient Identity". *SupplySide Marketplace Good Manufacturing Practices Workshop*, NY, NY, May 8, 2012
6. "Nutraceuticals: An Overview". Department of Nutrition and Food Science, Texas A&M University, April 6, 2012.
7. "Fortification of Polyphenols into Functional Foods". *Prepared Foods R&D Applications Seminar*, Chicago, IL, USA, August 3, 2011.
8. "Science-based Curcumin", *16<sup>th</sup> International Food Ingredients and Additives (IFIA) Conference*, Tokyo Japan, May 19, 2011
9. "Bioavailability of Botanical Supplements: Challenges and Opportunities". Department of Nutrition and Food Science, Texas A&M University, March 31, 2011.
10. "Foods Designed for Health, Functional Foods, and Nutraceuticals". Department of Nutrition and Food Science, Texas A&M University, March 20, 2008.
11. "Overview of Research-Validated Pomegranate: Focus on Prostate Health". *US Too Prostate Cancer Group Patient Education Symposium*, Chicago, IL, USA, November 2, 2007.
12. "Science-based Nutrition: Finding the Right Pomegranate". *US Too Prostate Cancer Group Regional Meeting*, Chicago, IL, USA, July 24, 2007.

### Published Articles and Quotes in Non-Academic Press:

1. Article, "Probiotic Questions from the Gut," *Natural Products Insider*, May/June 2016
2. Article, "[GNC, FDA Aim Alignment of U.S. with Global Standards](#)", *Natural Products Insider*, March 2016
3. Article, "[Modernization of the Supplement Industry](#)", *Natural Products Insider*, January 2016
4. Article, "[Eight Steps to Developing Research Relationships](#)", *Natural Products Insider*, December 2015
5. Article, "[Supplier Verification Key to New Rules](#)," *Natural Products Insider*, December 2015
6. Article, "[Where the Cannabis Market is Going](#)", *Natural Products Insider*, October 2015
7. Article, "[Dosing and Quality Obstacles to Cannabis Adoption](#)", *Supplement Perspectives*, October 2015
8. Article, "[Welcome to the Gut Jungle](#)", *Natural Products Insider*, August 2015
9. Article, "[How to Design a Clinical Study](#)", *Supplement Perspectives*, June 2015
10. Article, "[Best Way to My Heart? Through the Gut](#)", *Natural Products Insider*, June 2015
11. Article, "[Immunity and Inflammation: Inseparable](#)", *Supplement Perspectives*, June 2015
12. Article, "[Capsaicin and Cannabis: The Hot and Cool of Joint Care](#)", *Supplement Perspectives*, April 2015
13. Article, "[How to Create Natural Product IP](#)", *Supplement Perspectives*, March 19, 2015
14. Article, "[The Athlete's Frenemy: Inflammation](#)", *Supplement Perspectives*, February 2015
15. Article, "[Extracts: More than a Cup of Tea](#)", *Natural Products Insider*, February 2015
16. Article, "[Certifications are Fine, But...](#)", *Natural Products Insider*, January 2015
17. Article, "[Supplement Trends of 2014 and the Future](#)", *Natural Products Insider*, December 2014

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18. Article, "[Traceability: What's the Point?](#)" *Natural Products Insider*, November 2014
19. Article, "[R&D: The Key Disciplines](#)", *Supplement Perspectives*, November 2014
20. Article, "[Dose Delivery: Oil into Water](#)", *Natural Products Insider*, August 2014
21. Article, "[Advances in Brain Health Research](#)", *Natural Products Insider*, July 2014
22. Article, "[Next-Gen Blood Sugar Management](#)", *Natural Products Insider*, June 2014
23. Article, "[Emerging Carotenoid Research](#)", *Natural Products Insider*, April 2014
24. Special Issue, "[Beyond Lutein](#)", *Natural Products Insider*, April 2014
25. Article, "[Sci-Fi, QC and Botanicals](#)", *Natural Products Insider*, March 2014
26. Article, "[Dose Delivery, Old & New](#)", *Natural Products Insider*, March 2014
27. Article, "[Beyond the Test Tube: Superfruit Science](#)", *Natural Products Insider*, Feb 2014
28. Article, "[Joint Health: Alternative Now Mainstream](#)", *Natural Products Insider*, Feb 2014
29. Article, "[Advancement Depends on Going Back to Basics](#)", *Natural Products Insider*, Dec 2013
30. Article, "[Consume Your Political News Frequently--and Calmly](#)", *Natural Products Insider*, November 2013
31. Article, "[The Eyes Are the Window to Our Health](#)", *Natural Products Insider*, October 2013
32. Article, "[Weighting to Lose](#)", *SupplySide Community*, October 2012,
33. Article, "[Eyes Wide Open: Eye Health Supplements](#)", *Natural Products Insider*, August 2013
34. Article, "[The Gut-Brain Axis](#)", *Natural Products Insider*, August 2013
35. Article, "[Five Great Apps for Supplement Science](#)", *Natural Products Insider*, July 2013
36. Article, "[Scientific Validity Keys for Supplement GMPs](#)", *Natural Products Insider*, June 2013
37. Article, "[Ingredient Spotlight: Pomegranate](#)", *Nutritional Outlook*, May 2013
38. Article, "[Sports Supplements: OK for Kids?](#)", *Natural Products Insider*, May 2013
39. Article, "[Your Trade Show Physical and Mental Health Checklist](#)", *Natural Products Insider*, April 2013
40. Article, "[Tips for Hiring the Right Contract Ingredient Manufacturer](#)", *Natural Products Insider*, March 2013
41. Article, "[Politics, Religion and Organic Farming](#)", *Natural Products Insider*, February 2013
42. Article, "[The Eyes Are the Window to.. Our Health](#)", *Natural Products Insider*, January 2013
43. Article, "[Silver Linings in Omega-3 Research](#)", *Natural Products Insider*, December 2012
44. Article, "[Why Antioxidants Are Useful](#)", *Natural Products Insider*, November 2012
45. Article, "[Weighting to Lose](#)", *Natural Products Insider*, October 2012
46. Article, "[The Bugs Are Taking Over](#)", *SupplySide Community*, September 2012,
47. Quoted in "Encouraging Natural Bone Health", *Natural Practitioner*, July/August 2012.
48. Quoted in "Boosting the Brain", *Nutrition Industry Executive*, July/August 2012
49. Article, "[The Research Says It All: Omegas Do a Body Good](#)", *SupplySide Community*, August 2012,
50. Article, "[Ensuring Purity for Prenatal Supplements](#)," *SupplySide Community*, July 2012,
51. Article, "[Are You in the 59 Percent?](#)", *SupplySide Community*, May 2012,
52. Article, "[The Omnivore's Inflammatory Dilemma](#)", *SupplySide Community*, April 2012,
53. Article, "[New Frontiers in Digestive Health](#)", *SupplySide Community*, March 2012,
54. Article, "[Ch-ch changes in Senior Supplements](#)", *SupplySide Community*, February 2012,
55. Quoted in "[Help for Healthy Joints](#)", *Nutrition Industry Executive*, October 2011.
56. Interviewed for three nutrition trade media articles in Tokyo, Japan, May 2011
57. Quoted in "[Superior or Superfluous](#)", *Natural Products Insider Magazine*, March 2011.
58. Quoted in "[Dietary Supplements and Bioavailability: Suppliers Improve Ingredient Bioavailability](#)", *Nutritional Outlook Magazine*, January 27, 2011
59. Quoted in "[The Promise of Pomegranate](#)", *Indianapolis Business Journal*, April 12, 2010
60. Quoted in "[Bioavailability of \*Boswellia serrata\*](#)", *Natural Products Insider*, June 2009
61. Quoted in "[Supplier claims pomegranate functional fortification breakthrough](#)", *Nutraingredients-USA.com*, May 6, 2009.
62. Quoted in "[Verdure Sciences Introduces Pomella® FG for functional foods](#)", *NPI Center*, April 27, 2009.
63. Quoted in "[New findings on bioavailability of 11-keto-B-boswellic acid from \*Boswellia serrata\*](#)," *NPI Center*, March 9, 2009.
64. Quoted in "[Clinical trial shows Pomella® pomegranate extract may benefit oral health](#)", *NPI Center*, February 5, 2009.
65. Quoted in "Striking a balance with immune health ingredients," *Nutrition Industry Executive Magazine*, December 2008.
66. Quoted in "[Verdure launches organic botanical extracts](#)", *Nutraingredients-USA.com*, December 4, 2008.
67. Quoted in "[Verdure Sciences expands sustainability program with certified organic offerings](#)," *NPI Center*, December 2, 2008.
68. Quoted in "[Safety of pomegranate revealed](#)", *NPI Center*, September 17, 2008.
69. Quoted in "[University study finds POMELLA® pomegranate extract may reverse skin aging](#)", *NPI Center*, September 9, 2008

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70. Quoted in "[Verdure Sciences enhances serotonin profile of Bacognize®](#)", *Nutraingredients-USA.com*, October 19, 2007
71. Quoted in "[Clinically researched Bacopa extract redefined; Bacognize®](#) now HPLC-standardized to serotonin-active compounds," *NPI Center*, October 17, 2007.
72. Interviewed for Health Notes Radio Show, "Pomegranate Q+A", British Columbia, Canada, September 24, 2007.
73. Quoted in "[Pomella® extract gains Australian TGA approval](#)," *NPI Center*, August 13, 2007.
74. Quoted in "[Cosmeceuticals: At the Intersection of Nutrition and Beauty](#)", *Inside Cosmeceuticals Magazine*, June 4, 2007.
75. Quoted in "[Pomegranate juice a victim of its own success](#)", *Functional Ingredients Magazine*, May 1, 2007.
76. Quoted in "[Geni shifts strategy with Stauber](#)", *Nutraingredients-USA.com*, September 13, 2006.
77. Quoted in "[The Gold Standard: Superfruits](#)", *Functional Ingredients Magazine*, June 1, 2006.
78. Quoted in "[Geni Herbs takes Pomella into beverages](#)", *Nutraingredients-USA.com*, November 22, 2005.
79. Quoted in "Pomegranate: Red-Hot Fruit", *Natural Products Insider Magazine*, August 2005.
80. Quoted in "Fruits from the Tree of Life", *Prepared Foods Magazine*, August 2005.

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E-mail: [jayabalanr@nitrkl.ac.in](mailto:jayabalanr@nitrkl.ac.in), [rasujayabalan@gmail.com](mailto:rasujayabalan@gmail.com)

**Graduation Details**

| Degree                               | Year      | Institution   | Board  | Percentage / CGPA       |
|--------------------------------------|-----------|---|--|-------------------------|
| Ph.D.<br>(Biotechnology)             | 2004-2008 | Department of Biotechnology,<br>Bharathiar University.                      | Bharathiar University,<br>Coimbatore, Tamil Nadu | Thesis Highly commended |
| M.Sc.,<br>(Industrial Biotechnology) | 2001-2003 | Department of Biotechnology,<br>Bharathiar University.                      | Bharathiar University,<br>Coimbatore, Tamil Nadu | 78.38% / 5.72           |
| B.Sc.,<br>(Microbiology)             | 1998-2001 | Sengunthar Arts and Science College,<br>Tiruchengode,<br>Namakkal District. | Periyar University,<br>Salem, Tamil Nadu.        | 82.2%                   |
| Higher Secondary                     | 1996-1998 | Govt. Hr. Sec. School,<br>Komarapalayam,<br>Namakkal District.              | Board of Examinations,<br>Tamil Nadu.            | 89%                     |
| S.S.L.C                              | 1995-1996 | Govt. Hr. Sec. School,<br>Komarapalayam,<br>Namakkal District.              | Board of Examinations,<br>Tamil Nadu.            | 85.8%                   |



|                                      |      |  |   |                       |
|--------------------------------------|------|--|---|-----------------------|
| Typewriting - English - Senior Grade | 1997 |  | Department of Technical Education, Tamil Nadu | Pass with first class |
| Typewriting - Tamil - Senior Grade   | 1999 |  | Department of Technical Education, Tamil Nadu | Pass with first class |

### ***Awards and Honors***

1. Passed in **SET** (STATE ELIGIBILITY TEST) for Lectureship in Tamil Nadu and Pondicherry (March, 2006).
2. University Second Rank – M.Sc. Industrial Biotechnology (2001 – 2003), Bharathiar University, Tamil Nadu, India.
3. University First Rank – B.Sc. Microbiology (1998 – 2001), Periyar University, Salem, Tamil Nadu.
4. Certified E-Waste Management Specialist – Award given by Computer Society of India, Education Directorate, Chennai.
5. Mahatma Gandhi Gold Medal Award (October, 2014) – Award given by Global Economic Progress and Research Association (GEPRA), Tiruvannamalai, Tamil Nadu, India.
6. Gold Medal in Annual Swimming Competition (among teaching and non-teaching staffs) – 100 m breast stroke – NIT Rourkela, September, 2014
7. Official Zumba Instructor – Basics Steps Level I, July, 2015)
8. First place in Annual Swimming competition (among teaching and non-teaching staffs) – 100 m breast stroke – NIT Rourkela, September, 2015
9. Third place in Annual Swimming competition (among teaching and non-teaching staffs) – 100 m free style – NIT Rourkela, September, 2015

### ***Courses / Skills completed***

1. CITI Basic Course for Human Subjects Research, July, 2015.
2. Zumba Basic-1 Instructor Training Course, July, 2015.

### ***Projects Completed***

**Short term Project** : Estimation of Aflatoxins by chromatographic techniques and detection of aflatoxigenic fungi by molecular biological techniques (May-June, 2002, CFTRI, Mysore, Karnataka, India).

**M.Sc. Thesis** : Metabolic activity of Tea fungus (Kombucha) on tea components (December 2002 –April 2003, R & D Centre, Parry Agro Industries Ltd., Valparai, Tamil Nadu, India)

**Ph.D. Thesis** : Effect of kombucha fermentation on biochemical constituents and therapeutic properties of tea (April 2004 – May 2008, Dept. of Biotechnology, Bharathiar University, Coimbatore, Tamil Nadu, India)

**Summary of the work:** Kombucha tea is sugared black tea fermented with tea fungus for about 14 days. Tea fungus is an excellent example for biofilm in which bacteria and yeasts are in symbiotic association. Kombucha tea is claimed to have various beneficial effects on human health but very less scientific evidences are available in the literature. The present study revealed that TF and TR were relatively stable than epicatechin isomers during fermentation. Kombucha tea prepared from green tea, black tea and tea waste material had excellent free radical scavenging activities. Pretreatment with plain black tea and kombucha black tea attenuated aflatoxin B<sub>1</sub> induced hepatic injury. Among the two, kombucha black tea was more effective. Kombucha tea pretreatment can enhance hepatic GSH antioxidant / detoxification system. Ethyl acetate extract of kombucha black tea at 100 µg/mL concentration showed good inhibitory effect on viability of 786-O and U2OS cells. It also reduced the activity of MMP-2 and MMP-9 in 786-O and A549 cells. Heat treatment (60, 65 and 68°C for 1 minute) was found to be efficient in controlling the tea fungal mat formation during storage and heat treated kombucha black tea can be stored for 30 days. Inclusion of dried tea fungal mat in place of ground nut cake in rabbit feed increased the LDL, performance and slaughter characteristics of rabbit.

**Sponsored Research Projects**

| <b>Title of the Project</b>   | <b>Funding Agency (Scheme)</b>  | <b>Amount (Rs.)</b>          | <b>Status of the Project (Registration No.)</b>   | <b>Role</b>             |
|---|---|------------------------------|---|-------------------------|
| Biosynthesis of biologically active and enzymatically resistant Oligosaccharide-Ferulic acid conjugate (a prodrug to target colo-rectal cancer) in microemulsion system | Department of Biotechnology, Ministry of Science and Technology, Government of India (Rapid Grant for Young Investigators 2012)                   | 16,58,000                    | Ongoing   | Principal Investigator  |
| Utilization of mushroom extracts as prebiotic sources to develop synbiotic microcapsules  | Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India (Fast Track Scheme for Young Scientists) | 24,90,000                    | Ongoing (SERC/LS-156/2012)  | Principal Investigator  |
| Development of Capacitive Deionization Technology for Point-of-Use Water Purification   | IC-IMPACTS (India-Canada Centre for Innovative Multidisciplinary Partnerships to Accelerate Community Transformation and Sustainability)          | \$301,000 (Canadian Dollars) | Ongoing ( <a href="http://ic-impacts.com/portfolio-posts/development-of-capacitive-deionization-technology-for-point-of-use-water-purification/">http://ic-impacts.com/portfolio-posts/development-of-capacitive-deionization-technology-for-point-of-use-water-purification/</a> ) | Indian Academic Partner |

**Research Papers Published in International Journals**

1. **R. Jayabalan**, S. Marimuthu and K. Swaminathan. 2007 (May). Changes in content of organic acid and tea polyphenols during Kombucha tea fermentation. *Food Chemistry* 102 (1): 392 – 398 (IF: 3.391 SCI).
2. **R. Jayabalan**, P. Subathradevi, S. Marimuthu, M. Sathishkumar and K. Swaminathan. 2008. Changes in free-radical scavenging ability of kombucha tea during fermentation. *Food Chemistry* 109: 227-234b (IF: 3.391 SCI).
3. **Rasu Jayabalan**, Subbaiya Marimuthu, Periyasamy Thangaraj, Muthuswamy Sathishkumar, Arthurraj Binupriya, Krishnaswami Swaminathan, Sei Eok Yun. 2008. Preservation of Kombucha Tea - Effect of Temperature on Tea Components and Free Radical Scavenging Properties. *Journal of Agricultural and Food Chemistry* 56: 9064-9071 (IF: 2.912 SCI).
4. **R. Jayabalan**, K. Malini, S.E. Yun. 2010. Biochemical characteristics of tea fungus produced during kombucha fermentation. *Journal of Food Science and Biotechnology* 19(3): 201-205 (IF: 0.653 SCI-E).
5. **R. Jayabalan**, S. Baskaran, S. Marimuthu, K. Swaminathan, and S.E. Yun. 2010. Effect of kombucha tea on aflatoxin B<sub>1</sub> induced acute hepatotoxicity in albino rats – prophylactic and curative studies. *Journal of Korean Society of Applied Biological Chemistry* 53(4): 407-416 (IF: 0.690 SCI-E).
6. **R. Jayabalan**, M. Sathishkumar, E.S. Jeong, S.P. Mun, S.E. Yun. 2012. Immobilization of flavin adenine dinucleotide (FAD) onto carbon cloth and its application as working electrode in an electroenzymatic bioreactor. *Bioresource Technology*, 123: 686-689 (IF: 4.494 SCI).
7. **Rasu Jayabalan**, Radomir V. Malbaša, Eva S. Loncar, Jasmina S. Vitas, Muthuswamy Sathishkumar. A Review on Kombucha Tea – Microbiology, Composition, Fermentation, Beneficial Effects, Toxicity and Tea Fungus. *Comprehensive Reviews in Food Science and Food Safety*, 103 (2014) 538-550 (IF: 4.182 SCI).
8. A.R. Binupriya, M. Sathishkumar, D. Kavitha, **R. Jayabalan**, K. Swaminathan and S.E. Yun. 2007. Liquid-phase separation of reactive dye by wood-rotting fungus: A biotechnological approach. *Biotechnology Journal* 2 (8): 1014-1025 (IF: 3.49 SCI-E).
9. N. Chitrapriya, V. Mahalingam, M. Zeller, **R. Jayabalan**, K. Swaminathan and K. Natarajan. 2008. Synthesis, crystal structure and biological activities of dehydroacetic acid complexes of Ru (II) and Ru (III) containing PPh<sub>3</sub>/AsPh<sub>3</sub>. *Polyhedron* 27 (3): 939-946 (IF: 2.011 SCI).
10. M. Sathishkumar, A.R. Binupriya, D. Kavitha, R. Selvakumar, **R. Jayabalan**, J.G. Choi, S.E. Yun. 2009. Adsorption potential of maize cob carbon for 2,4-dichlorophenol removal from aqueous solutions: Equilibrium, kinetics and thermodynamics modeling. *Chemical Engineering Journal* 147: 265–271 (IF: 4.321 SCI).
11. G.S. Murugesan, M. Sathishkumar, **R. Jayabalan**, A.R. Binupriya, K. Swaminathan and S.E. Yun. 2009. Hepatoprotective and curative properties of kombucha tea against carbon tetrachloride induced toxicity – *Journal of Microbiology and Biotechnology* 19(4): 397–402 (IF: 1.525 SCI-E)
12. S. Madhavakrishnan, M. Sathishkumar, A.R. Binupriya, J.G. Choi, **R. Jayabalan**, K. Manickavasagam, S. Pattabi. 2010. *Ricinus communis* pericarp activated carbon as an

- adsorbent for the removal of Pb(II) from aqueous solution and industrial wastewater Environment Protection Engineering 36(1): 83-94 (IF: 0.652 SCI-E).
13. M. Sathishkumar, **R. Jayabalan**, S.P. Mun and S.E. Yun. 2010. Role of bicontinuous microemulsion in the rapid enzymatic hydrolysis of (*R,S*)-Ketoprofen ethyl ester in a micro-reactor. Bioresource Technology 101: 7834-7840 (IF: 4.494 SCI).
  14. Eun-Seon Jeong, Muthuswamy Sathishkumar, **Rasu Jayabalan**, Su-Hyeon Jeong, Song-Yie Park, Sung-Phil Mun, Sei-Eok Yun. 2012. Immobilization of a mediator onto carbon cloth electrode and employment of the modified electrode to an electroenzymatic bioreactor. Journal of Microbiology and Biotechnology, 22(10), 1409-1414. (IF: 1.525 SCI-E).
  15. Debabrat Sabat, Eldin M Johnson, Arra Abhinay, **Rasu Jayabalan**, Monalisa Mishra. 2015. A Protocol to generate germ free *Drosophila* for microbial interaction studies. Advanced Techniques in Biology & Medicine S1: 001. doi: 10.4172/2379-1764.S1-001 (IF: 1.08).

#### Research Papers Published in National Journals

1. P. Ponnuragan, T. Muthumani, **R. Jayabalan** and K. Swaminathan. 2006. A comparative study on kombucha tea and black tea. Journal of Plantation crops 34 (3): 688 – 693.
2. **Jayabalan, R.**, Jeeva, S., Sasikumar, A.P., Inbakandan, D., Swaminathan, K., Yun, S.E. 2010. Extracellular L-Glutaminase production by marine *Brevundimonas diminuta* MTCC 8486. International Journal on Applied Bioengineering, 4(2): 19-24.
3. **Rasu Jayabalan**, Pei-Ni Chen, Yih-Shou Hsieh, Kumaresan Prabhakaran, Pandian Pitchai, Subbaiya Marimuthu, Periyasamy Thangaraj, Krishnaswamy Swaminathan, Sei Eok Yun. 2011. Effect of solvent fractions of Kombucha tea on viability and invasiveness of cancer cells - Characterization of dimethyl 2-(2-hydroxy-2-methoxypropylidene) malonate and vitexin. Indian Journal of Biotechnology 11: 75-82 (IF: 0.386 SCI-E).
4. Allwyn Sundar Raj, R., **Jayabalan, R.**, Rajasekaran, P. 2011. Production of wine from papaya (*Carica papaya*). Advanced Biotech, 11(2): 37-39.
5. **Rasu Jayabalan**, Eun-Seon Jeong, Jin-Ju Song, Sei-Eok Yun. 2012. Changes in concentration of free amino acids in tea during fermentation by tea fungus. Proceedings of International Conference on Traditional Foods 2010 held at Pondicherry University, India. ISBN No. 81-87299-56-8
6. Dash Indira, Barik Jijnasa, Nayak Arati, Sahoo Moumita, Dethose Ajay, Jhonson Eldin, Kumar Sachin, **Jayabalan Rasu**. 2015. Comparative Studies Of Ethanol Production And Cell Viability: Free Cells Versus Immobilized Cells. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(2) March-April: 1708-1714 (IF: 0.35).
7. Sahoo Moumita, Sahoo Banishree , Dash Indira , Dethose Ajay , Jhonson Eldin , Rasu Jayabalan , Thangaraj P , Marimuthu S , Sasikumar AP , Joo-Won Suh , Seung Hwan Yang , and Kamila Goderska. 2015. Changes in Content of Tea Polyphenols in Tea Curd (Functional Food) Developed By Lactic Acid Bacteria

- (LAB) During Refrigerated Storage. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(3): 406-417 (IF: 0.35)
8. M. Sangetha, M. Manoj, **R. Jayabalan**, V. Venkateswarn. 2015. Synthesis of Bis-Dibenzonaphthyridines and Evaluation of their Antibacterial Activity. Oriental Journal of Chemistry. 31(2): 845-855 (IF 0.508).
  9. Moumita Sahoo, Bhaskar Das, Eldin M Johnson, Indira Dash, Sanghamitra Satpathi, Partha Sarathi Satpathi, and R Jayabalan. 2015. In-vitro Cholesterol Reducing Property of Human Gut Bacteria from Rourkela Population, Odisha, India. Research Journal of Pharmaceutical, Biological and Chemical Sciences, 6(6): 765-769 (IF: 0.35)

***Book chapters / Edited Books / Books / Reference series***

1. **Rasu Jayabalan**, Radomir V Malbaša, Muthuswamy Sathishkumar. 2016. Kombucha. Chapter in Reference Module in Food Science, First Edition. Elsevier Ltd., Oxford, UK. <http://dx.doi.org/10.1016/B978-0-08-100596-5.03032-8>.
2. **Rasu Jayabalan**, Radomir V Malbaša, Muthuswamy Sathishkumar. 2016. Kombucha Tea – Metabolites. In: Fungal Metabolites – Part of the series “Reference series in phytochemistry”. Pp 1-14, Springer, Heidelberg, Germany. [http://link.springer.com/referenceworkentry/10.1007%2F978-3-319-19456-1\\_12-1](http://link.springer.com/referenceworkentry/10.1007%2F978-3-319-19456-1_12-1).
3. Jayanta Kumar Patra, Shakti Kanta Rath, **Rasu Jayabalan**. 2016. Natural Products in Foods: Prospects and Applications (Edited book). Studium Press, Houston, USA (Under Publication).
4. Subbiah Jeeva, Eldin M Johnson, Sahoo Moumita, Dash Indira, Bhaskar Das, A.P. Sasikumar, **R. Jayabalan**. 2016. Emerging concepts in biopreservation for food industries. Book chapter in Natural Products in Foods: Prospects and Applications (Edited book). Studium Press, Houston, USA (Under publication).
5. Eldin M. Johnson, Seung Hwan Yang, **Rasu Jayabalan**, Joo Won Suh. 2016. Probiotics, prebiotics and their fermentation products as biotherapeutic agents. In “Prebiotics and Probiotics in Human Nutrition and Health (Edited Book) (ISBN 978-953-51-4715-2), Intech Europe, Croatia.

***Research Papers Presented in International Conferences / Symposium***

1. Presented a paper entitled “Hepatoprotective property of kombucha tea against aflatoxin B<sub>1</sub> induced hepatotoxicity in rats” in the International Conference on Ethnopharmacology and Alternative Medicine held at Amala Cancer Research Centre, Thrissur, India.
2. Presented a paper entitled “Effect of temperature on kombucha tea components” in the Biovision 2006, International symposium on Food Engineering for Health care held at Sahrdaya College of Engineering and Technology, Kodakara, Thrissur, India.
3. Presented a paper entitled “Changes in free radical scavenging properties of kombucha tea prepared from black tea and tea waste material” in the International Conference on the Biology of Yeasts and Filamentous Fungi (BYFF 2007) held at National Chemical Laboratory, Pune, India.

4. Presented a paper entitled “Free radical scavenging properties of solvent extracts of kombucha black tea” in Biospectrum 07, an International symposium on Advances in Food biotechnology and Nutrition held at Mar Athanasios College for Advanced Studies, Tiruvalla, Kerala, India.
5. Presented a paper entitled “Effect of kombucha tea on aflatoxin B1 induced hepatotoxicity in albino rats - Prophylactic and curative studies” in International symposium and Annual meeting of the Korean Society for Microbiology and Biotechnology Daejon, Republic of Korea.
6. Presented a paper entitled “Effect of solvent fractions of kombucha tea on viability and invasiveness of cancer cells – Characterization of dimethyl 2-2 hydroxy 2-methoxy propylidene malonate and vitexin” in ICBF 2009, an International Conference on Challenges in Biotechnology and Food Technology held at Annamalai University, Chidambaram, Tamil Nadu, India.
7. Presented a paper entitled “Changes in concentration of free amino acids in tea during fermentation by tea fungus” in the International Conference on Traditional Foods 2010 (ICTF-2010, December 1 - 3) held at Pondicherry University, Puducherry, India.
8. Presented a paper entitled “Screening of biogenic amine production by *Lactobacillus* spp. and development of functional food, tea curd” in the International Conference on Functional Foods-2013 (ICFF-2013) held at Taylor’s University Lake side campus, Selangor, Malaysia during 18 to 20<sup>th</sup> August, 2013.
9. Presented a paper entitled “Evaluation of viability of bacteria using in vitro gastro intestinal model and formulation of functional food with synbiotic microcapsules” in the International Conference on Advances in Food Technology and Health Sciences (ICFTHS-2014) organized by International Institute of Food and Nutritional Sciences, New Delhi, India during 15 to 16<sup>th</sup> October, 2014 (Awarded 1<sup>st</sup> Prize for the presentation).
10. Presented a paper entitled “SCREENING FOR POTENTIAL REGIONAL SPECIFIC PROBIOTIC BIO-THERAPEUTICS FROM HUMAN GUT MICROBIOTA” in International Symposium on Probiotics: From Bench to Community organized by Yakult India Microbiota and Probiotics Science Foundation at The Grand, New Delhi, India during 7-8<sup>th</sup> March, 2015.
11. Presented a paper entitled “Cellulase – a critical enzyme for biofuel industry: A sea water based approach” in 2<sup>nd</sup> International symposium on Recent Trends in Bio-energy Research organized by SSS Nation Institute of Bio-Energy, Kapurthala, Punjab, India during 25-27 Feb, 2016.
12. Presented a paper for Young Investigator Award entitled “Biotherapeutic propensity of the probiotic strains isolated from human gut microbiota against enteric infection by *Salmonella typhimurium* KCTC 2514” in 3<sup>rd</sup> Biennial PAi Conference and International Symposium on Stress, Microbiome, and Probiotics organized by NISER, Bhubaneswar during 11-13 March, 2016.

#### ***Research Papers Presented in National Conferences / Symposium***

1. Presented a paper entitled “Kombucha Tea: A natural way to cure cancer” in the

- “National Conference on Recent Trends in Radiation Biology and Cancer Research” held at Govt. Dungar College, Bikaner, Rajasthan, India.
2. Presented a paper entitled “Kombucha tea – An ancient tribal medicine” in the UGC National seminar on Tribal studies in the Western Ghats” held at Bharathiar University, Coimbatore, India.
  3. Presented a paper entitled “Green synthesis of silver nanoparticles from tea and kombucha tea” in the National Level Seminar “Biogalaxia ‘10” held on 13<sup>th</sup> October, 2010 at Bharathiar University, Coimbatore, India.
  4. Maharasan, K.S., Rajalingam, G.V., Jayabalan, R. “Maximizing contributions from agro-based industry – techno management perspective”. Presented at INDIFED 2011 (Indian Industry: Fostering Economic Development) organized by Annamalai University at Hotel Fortune Park Aruna, Chennai on March 24-25, 2011.

#### ***Training Programme / Short term courses / Workshops Attended***

- Attended Winter Programme on “Data analysis in Social Sciences” conducted by Tata Institute of Social Sciences (TISS), Mumbai, India from November 12 – 24, 2007.
- Participated in a Wipro Mission 10 X workshop and workshop on High Impact Teaching Skills conducted at Karunya University, Coimbatore, Tamil Nadu, India during April 25 – 29, 2011.
- Participated in the workshop on Nanocoatings and Applications – Nanocoat 2011 Organised by Department of Manufacturing Engineering (DoME), CEG Campus, Anna University, Chennai, India on 30<sup>th</sup> May, 2011.
- Participated in “Short term course on Basics of Nutrition and its application in Laboratory Animals” conducted by Central Food Technological Research Institute, Mysore, India during 27.06.2011 – 29.06.2011.
- Participated in Workshop on “Certified E-Waste Management Specialist” conducted by Computer Society of India, Education Directorate, Chennai, India during 17.09.2011 – 18.09.2011.
- Participated in International Workshop on “Thermal Processing” conducted by Dept. of Food Processing and Engineering, School of Food Sciences and Technology, Karunya University, Coimbatore, Tamil Nadu, India on 9.12.2011.
- Participated in Short Term Skill Development Programme on “Cold Chain Management in Food Processing Sector” organized by Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu from 16<sup>th</sup> to 18<sup>th</sup> February, 2012.
- Participated in National Training Programme on “Bioenergy Technology” organized by Sardar Swaran Singh National Institute of Renewable Energy, Kapurthala, Punjab from 16<sup>th</sup> March, 2012 to 17<sup>th</sup> March, 2012.
- Participated in Faculty Training Programme on “Teaching Learning Methodologies” organized by the Teaching Learning Centre, Centre for Continuing Education, IIT Madras from 20<sup>th</sup> August to 22<sup>nd</sup> August, 2012.
- Participated in Short Term training on “Microbial Diversity and Gene Prospecting through Metagenomics” organized by Department of Agricultural Microbiology,



- College of Horticulture, Kerala Agriculture university, Thrissur, Kerala from 16<sup>th</sup> January to 5<sup>th</sup> February, 2013.
- Participated in Workshop on “Sensory Analysis and Consumer Behaviour – Advanced Techniques and Evaluation” organized by Taylor’s School of Biosciences, Taylor’s University, Lakeside Campus, Selangor, Malaysia on 21<sup>st</sup> August, 2013
  - Research training on “Invitro Gastro intestinal model” at Poznan University of Life Sciences, Poland during 9<sup>th</sup> June to 3<sup>rd</sup> July, 2014.
  - Participated in DST sponsored Short term course on “Accountability and Responsiveness in Scientific Organizations” conducted by Academy of Human Excellence at Vadodara, Gujarat, India during 12-16 October 2015.
  - Participated in TEQIP-II sponsored Short term course on “Soil Health and Food Security” conducted by Centre for Rural Development and Technology, Indian Institute of Technology, Delhi, India during 7-11 December 2015.
  - Participated in DST sponsored Brain Storming meeting on “Renewing the tradition of natural product research in India” held during 21-23 Jan 2016 at CSIR-CDRI, Lucknow, India.
  - Participated in The International Workshop on “Applications of Systems and Mathematical Biology in Stress, Microbiome & Probiotics” held during 7-10 March, 2016 at NISER, Bhubaneswar, India.

#### ***Conference / Symposium / Training Programme Organized***

- Organized a one day National Level Conference on “Recent Trends in Process and Product Development of Indigenous Foods (Al Processo’ 11) on 2<sup>nd</sup> March, 2011 at School of Food Sciences and Technology, Karunya University, Coimbatore, Tamil Nadu, India.
- Organized a one day Training Programme on “Preparation of Convenience Foods” on 3<sup>rd</sup> May, 2011 at Food Processing Training Centre, School of Food Sciences and Technology, Karunya University, Coimbatore, Tamil Nadu, India.
- Organized (Joint Convenor) a three days international conference on “Conserving Biodiversity for Sustainable Development (INCCBSD 2013)” during 16 to 18<sup>th</sup> August, 2013 at National Institute of Technology, Rourkela, Odisha, India
- Organized (Convener) a three days conference titled “2<sup>nd</sup> International Conference on Frontiers in Biological Sciences” during 22 to 24<sup>th</sup> January, 2015 at National Institute of Technology, Rourkela, Odisha, India

#### ***Invited Lectures delivered in Conference/Workshop***

- “Prospects of biofuels” in “Odisha Environmental Congress, 2012 - Energy and Environment – Issues, Challenges and Potentials for Odisha and Celebration of International year of sustainable energy for all” held at Bhubaneswar, Odisha, India on 21<sup>st</sup> Dec, 2012 (Jointly organized by Human Development Foundation, Bhubaneswar, Odisha Centre for Environment and Development, Thiruvananthapuram, Kerala and Regional Museum of Natural History, Bhubaneswar, Odisha.

- “Probiotics and Metagenomics” in National Symposium on Recent Advances in Industrial fermentations and Fermented foods held at SRM University, Chennai during September, 26 and 27<sup>th</sup>, 2013.
- “Are Probiotics really helpful? – Insights from Metagenomic studies” in National Seminar on Recent Advances in Food Science and Nutrition, Sambalpur University, Odisha, India during March 22<sup>nd</sup> and 23<sup>rd</sup>, 2014.

#### ***Area of Interests***

- Food Microbiology / Food Technology
- Microbial therapeutic products / Natural products
- Alternate Fuels
- Microemulsion systems
- Co-enzyme regeneration using modified electrodes

#### ***Teaching Experience***

- Worked as a Lecturer in the Dept. of Biotechnology, Sathyabama University, Jeppiaar Nagar, Chennai 600 019, Tamil Nadu, India from July 9<sup>th</sup>, 2007 to April 30<sup>th</sup> 2008.
- Worked as an Assistant Professor (SG) in the Department of Food Processing and Engineering, School of Food Sciences and Technology, Karunya University, Coimbatore, Tamil Nadu, India from 1<sup>st</sup> July, 2010 to 24<sup>th</sup> October, 2011
- Currently working as Assistant Professor in Department of Life Science, National Institute of Technology, Rourkela 769 008, Odisha, India from 1<sup>st</sup> November, 2011.

#### ***Post Doctoral Experience***

Worked as Post Doctoral Researcher at Food Science and Biotechnology Division, Institute of Agriculture Sciences and Technology, Chonbuk National University, Jeonju, South Korea from 19.5.2008 to 30.6.2010.

#### ***Membership in Professional bodies***

- Association of Food Scientists and Technologists (India) – Annual Membership number - 4/R239/10/ZON
- Swedish South Asian Network on Fermented Foods (SASNET – Fermented Foods) – Life Membership No. SASNET-FF/OM/263
- Probiotics Association of India – Life Membership No. 324.
- Association of Microbiologists of India – Life membership No. 885

#### ***Personal Profile***

|                     |   |                              |
|---------------------|---|------------------------------|
| Name                | : | R. Jayabalan                 |
| Father's Name       | : | K. Rasu                      |
| Age & Date of Birth | : | 34 Years; April 10, 1981     |
| Marital Status      | : | Married                      |
| Passport No.        | : | M6796815 (Old No. F6 679862) |

Languages known : English and Tamil (To read, write and speak), Hindi (To read and write)

### References

1. **Prof. Sunil Kr Sarangi**  
Director, National Institute of Technology, Rourkela 769 008, Odisha, India  
Email: [director@nitrkl.ac.in](mailto:director@nitrkl.ac.in)
2. **Dr. K. Swaminathan**  
Professor, Department of Microbial Biotechnology  
School of Biotechnology  
Bharathiar University  
Coimbatore 641 046  
Tamil Nadu, India.  
Email : [kswamibiotech@gmail.com](mailto:kswamibiotech@gmail.com)
3. **Dr. Sei-Eok Yun**, Professor, Department of Food Science and Biotechnology,  
Institute of Agricultural Science and Technology,  
Chonbuk National University, Jeonju 561-756,  
Republic of Korea. Email : [seyun@chonbuk.ac.kr](mailto:seyun@chonbuk.ac.kr)

### Declaration

Hereby I declare that all the details furnished above are true to my knowledge and belief.

**R. JAYABALAN**

## RESUME

### Profile

AsureQuality is a New Zealand government owned enterprise provides world class food safety and biosecurity services to the food and primary production sectors worldwide. As the Chemistry Technical Manager at AsureQuality Auckland laboratory, I am responsible for overall technical matters. The Auckland laboratory is the prime laboratory of AsureQuality and is currently offering wide range of analytical services to its customers including but not limited to vitamin analyses.

### Personal details

Name : George Joseph  
Address (residence) : 37 Claremont Way, Auckland 2016  
Telephone DDI : +64 9 626 8237  
Mobile : +64 21 364412  
Email : george.joseph@asurequality.com

### Career objective

To obtain a challenging management, administrative or technical role as deemed suitable to my skills, experience and background, to help a successful organization to expand further and to help myself grow further professionally.

### Academic qualifications

- M Sc: Cochin University of Science and Technology, India (1989)
- PhD: Cochin University of Science and Technology, India (1995)

### Personal attributes

- Excellent communication, interpersonal and problem solving skills
- Strong customer focus with orientation capability to convert queries into sales
- Well developed time management skills with the ability to perform multi-tasks
- Flexible, innovative, quick learner and committed to continuous self-improvement

### Awards / Affiliations / Training

- Excellence Award, AsureQuality 2016
- Excellence Award, AsureQuality 2011
- Excellence Award, AsureQuality 2005
- Member AOAC International
- Advisor, Proficiency Testing Australia
- Signatory Chemistry IANZ, LAS, Medsafe, TGA, Instrumentation
- Research Fellow, Department of Atomic Energy, Govt. India, 1989 to 1994
- Training, Solid Phase Extraction (Varian)
- Leadership training by Andre Vaan Heerden (AsureQuality)
- Presentation Skills Training by Kevin Simms (AsureQuality)
- Management Training on People Skills (Grafton Consulting Group, NZ)
- Health and Safety in Employment Training (BWA Group, NZ)
- HPLC Training Course (Waikato Polytechnic, Hamilton)

### **Professional Experience**

- February 2012 to current: Technical Manager, AsureQuality
- June 2009 to February 2012: Scientist / Senior Scientist, AsureQuality
- June 2006 to June 2009: Team Leader, GMP Chemistry, AsureQuality
- November 2005 to June 2006 : Scientific Analyst, Chemistry, AsureQuality
- September 2004 to October 2005: Analyst, Chemistry, AsureQuality
- February 2001 to September 2004: Team Leader, SGS New Zealand Ltd
- September 2000 to February 2001: Analyst, SGS New Zealand Ltd
- October 1994 to June 1999: Lecturer, University of Calicut, Kerala, India
- February 1989 to August 1994: Department of Atomic Energy (DAE) Research Fellow, Cochin University of Science and Technology, Cochin, Kerala, India

### **Analytical Skills and experience**

- Analysis of wide range of raw materials and finished products by Pharmacopoeia Methods
- Developed and validated Folic Acid, Biotin and Vitamin B12 methods by Biacore system for AsureQuality
- Developed and validated methods for many finished products as per various protocols following ICH guidelines.
- Analysis of food samples for nutritional panel information as per NZFSA regulations (Energy, Moisture, Ash, Protein, Fat, Saturated fat, Carbohydrate, Sugar - total, reducing, invert, sucrose and Sodium)
- Free fatty acids, Acid value, Peroxide value, Iodine value, TBA value etc
- Mercury, Calcium, Copper, Iron, Potassium, Magnesium, Manganese, Sodium, Nickel, Lead, Tin, Zinc, Arsenic etc. by AAS
- Acidity, Brix, Salt, Sulphurdioxide, Phosphorus, Water activity, Viscosity, Colour, Turbidity, Conductivity, pH etc.
- Total Dietary fibre, Insoluble dietary fibre, Soluble dietary fibre, Inulin, Resistant Maltodextrins (RMD) etc.
- Benzoic acid, Sorbic acid, Methyl & Propyl paraben, Caffeine, Theophylline, EGCG etc. by HPLC  
Organic acids – Lactic acid, Citric acid, Formic acid, Propionic acid, Malic acid etc. by HPLC
- Wine testing – Alcohol content, Sulphurdioxide, Sugar, Acidity, Heat stability
- Ethanol, Methanol, Propanol, Glycerol, Ethylene glycol, Acetone, Toluene sulphonamides etc. by GC
- Fatty acid profile by GC - Omega 3 (EPA, DHA, ALA) Omega 6, Saturated, Monounsaturated and Polyunsaturated etc.
- Antioxidants – GC
- Vitamins – Vitamin B group, C, A, D, E, K etc by HPLC or GC
- Amino acid separation by ion-exchange chromatography / GC / HPLC

- Protein – separation by electrophoresis, electrofocussing etc
- Enzyme - purification and kinetic studies
- Vanillin assay by GC or HPLC
- Wax esters by GC
- Sugar profile by GC
- Pesticide residue screening of fruits, vegetables, environmental samples and health foods by HPLC and GCMS
- Assay of veterinary preparations for Cypermethrin, Amitraz, Deltamethrin, Permethrin, Diflubenzuron, Ivermectin, Abamectin etc. by HPLC
- Phenols and Acetic Herbicides by GC – ECD
- Volatile organic compounds by Purge & Trap GCMS
- Semi-volatile organic compounds by GCMS
- Organic volatile impurities of pharmaceutical preparations by BP / USP methods by GC / HPLC
- Solid Phase Extraction (SPE), Liquid phase extraction and Gel Permeation Chromatography techniques for the sample preparation in pesticide residue analysis.
- Analysis of wool samples for permethrin and other pesticide residues by HPLC / GC
- HPLC / GC method development, validation and trouble shooting.

### **Instrumentation**

- High Performance Liquid Chromatography (HPLC)
- Liquid Chromatography and Mass Spectrometry (LCMS)
- Gas Chromatography (GC)
- Gas Chromatography Mass Spectrometry (GC-MS)
- Surface Plasmon Resonance, Biosensor systems (Biacore)
- UV-Visible, IR Spectrophotometry

**Armen Mirzoian**

6000 Ammendale Rd  
Beltsville, MD 20705  
Tel: (240) 264-1598  
Email: *armen.mirzoian@ttb.gov*

**WORK EXPERIENCE**

07/2003-current

**Senior Scientist** at US Treasury, Alcohol and Tobacco Tax and Trade Bureau (TTB), Beverage Alcohol Laboratory, 6000 Ammendale Rd, Beltsville, MD 20705

- Mastered the operations of modern analytical instruments for analysis of alcohol beverage products and routinely analyzed alcoholic beverages for determination of label compliance, standards of identity, consumer safety, authenticity and other regulatory compliance purposes
- Developed and validated numerous methods of analysis of small and large molecules in complex mixtures using LC/MS/MS, LC-qToF, GC/MS, and U(H)PLC
- Critically reviewed, analyzed, and reported analytical findings following the guidance of ISO 17025 Quality Control System
- Lead and managed several projects including: Alcohol Beverage Sampling Program (ABSP), Allergen and Gluten labeling compliance, and Alcohol Beverage Authentication
- Performed multi-technique and multi-analyte analysis of various alcoholic beverages and applied multivariate analytical models for classification and authentication purposes

01/1999-07/2003

**Postdoctoral Fellow**, University of Miami, School of Medicine, Department of Molecular and Cellular Pharmacology, Miami, FL 33136

- Incorporation of unnatural amino acid into neuronal acetylcholine nicotinic receptors
- Synthesis and characterization of aminoacylated nucleotides
- Expression and electrophysiological studies of neuronal acetylcholine nicotinic receptors

09/1993-07/1998

**Graduate Research Assistant**, University of Miami, Department of Chemistry, Coral Gables, FL 33146

- Organic synthesis of cyclodextrin based electroactive receptors and ligands
- Electrochemical studies and electrochemically controlled complexation of supramolecular host-guest systems

**EDUCATION**

07/1998

**University of Miami**, Coral Gables, FL, Ph.D. Chemistry. *Dissertation: Solvent Effects and Redox Control on Host-Guest Binding Phenomena*

08/1992

**Moscow State University**, Department of Chemistry and Chemical Technology, Moscow, Russia, BS Chemistry

**SELECTED TRAINING COURSES AND CERTIFICATES**

- Theory, application, and operation of Isotope Ratio Mass Spectrometry
- Concise Course In Brewing Technology, Siebel Institute
- ISO/IEC 17025:1999 Internal Auditor Certificate
- Twelve leadership, communication, and management courses as part of three years Employee Leadership Program (ELP)
- Separate courses in theory, application, and operations of LCMSMS, GC, HPLC, qTOFMS
- Theory and applications of Solid Phase Micro-extraction (SPME)
- The Alcohol School, Montreal

- Introduction to Winemaking, Online Course at UC Davis
- Applications of Chemometrics in Food/Beverage Analysis

## SKILLS

### Chemistry and Instrumentation:

- Mass Spectrometry (LC/MS/MS, qTOF, IRMS); GC/MS; HPLC; NMR; IRMS; FTIR; UV-VIS and fluorescent spectroscopy, electrochemistry
- Patch Clamping, Mass spectrometric protein analysis and sequencing
- Organic synthesis and separation and identification of small molecules

### Computer Skills:

- Classical and multivariate data analysis and statistics software
- Pattern recognition and Chemometrics software
- Microsoft Office

### Language Skills:

- English, Russian, Armenian (Fluent)
- Spanish (Intermediate)
- Japanese (Beginner)

## AFFILIATIONS

AOAC International - Member and Official Methods Chapter Editor (Chapter 28, Wine)

American Chemical Society – Member

## SELECTED SCIENTIFIC PUBLICATIONS AND PRESENTATIONS

**Mirzoian, A.;** Ammann, J.R. Determination of Oxadixyl in Wines by Liquid Chromatography-Tandem Mass Spectrometry: Single-Laboratory and Interlaboratory Validation Study. *Journal of AOAC International*. 2006, 9(4), 1048-1051

McGovern, P. E., Hall, G. R., & **Mirzoian, A.** A biomolecular archaeological approach to 'Nordic grog'. *Danish Journal of Archaeology*, 2013, 1-20

McGrath, S.; Ross, M; **Mirzoian, A**; Callahan, JH Interrogation of Hydrolyzed and Fermented Gluten Proteins by Mass Spectrometry, *Presentation at the Eighth Workshop on Food Allergen Methodologies*, 2013, Vancouver, BC

McGovern, P. E; **Mirzoian, A.;** Hall, G. R. Ancient Egyptian Herbal Wines, *Proceeding of the National Academy of Sciences of the United States of America*, 2009, 106, 7361-7366

**Mirzoian, A.;** Mabud, Md. Comparison of Methods for Extraction of Ethyl Carbamate from Alcoholic Beverages in Gas Chromatography/Mass Spectrometry Analysis. *Journal of AOAC International*. 2006, 89(4), 1048-1051

**Mirzoian, A;** Kinton, V; Ammann, JR Authentication of Vanilla Flavors in Alcoholic Beverages Using SPME GC/MS and Isotope Ratio Mass Spectrometry (IRMS). *Presentation at AOAC 2006 Annual Meeting & Exposition*, Minneapolis, MN

**Mirzoian, A.;** Luetje, C. W. Modulation of Neuronal Nicotinic Acetylcholine Receptors by Mercury. *Journal of Pharmacology and Experimental Therapeutics*. 2002, 302, 560-567

**Mirzoian, A.;** Kaifer, E. A . Electrochemically controlled self-complexation of  $\beta$ -cyclodextrin-viologen conjugates. *Chemical Communications*. 1999, 1603-1604

**Mirzoian, A.;** Kaifer, E. A . Reactive pseudorotaxanes: inclusion complexation of reduced viologens by the hosts  $\beta$ -cyclodextrin and heptakis(2,6-di-o-methyl)- $\beta$ -cyclodextrin. *Chemistry: European Journal*. 1997, 3 (7), 1052-1058



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## Katherine K. Stenerson

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151 Black Bear Lane, State College PA, 16803  
kstenerson@comcast.net

### Professional Profile

I am currently involved in developing sample preparation products and applications relevant to food and environmental testing. My experience includes the following analytical techniques:

- GC
- GC/MS & GC/MS/MS
- HPLC
- LC/MS/MS
- Solid Phase Extraction
- Solid Phase Microextraction
- Thin Layer Chromatography
- Liquid/Liquid Extraction
- Purge and Trap

### Professional Accomplishments

#### Publications

- Application of SPME Using an Overcoated PDMS-DVB Fiber to the Extraction of Pesticides From Spaghetti Sauce: Method Evaluation and Comparison to QuEChERS. *LC/GC North America*, **34** (7), July 2016.
- Sample Cleanup for the Analysis of Pesticide Residues and Polynuclear Aromatic Hydrocarbons in Fatty Food Matrices. *American Laboratory*, **48** (3), April 2016.
- Using Solid Phase Extraction to Analyze Persistent Organic Pollutants in Oily Food Samples. *INFORM*, **26** (8), Sept. 2015
- Analysis of Polynuclear Aromatic Hydrocarbons in Olive Oil After Solid-Phase Extraction Using a Dual-Layer Sorbent Cartridge Followed by High-Performance Liquid Chromatography with Fluorescence Detection. *J. Agric. Food Chem.* **63**, 2015.

#### Professional Affiliations

- American Chemical Society
- ASTM
- AOAC
- Chromatography Forum of Delaware Valley

### Work History

- Principal Scientist (current)    MilliporeSigma, Bellefonte PA    Responsible for developing sample preparation products and applications; and providing publications in the form of posters, presentations, and white paper style articles for company publications. Previous experience included capillary GC product and application development.
- Senior Scientist
- Scientist
- Technical Service Chemist    MilliporeSigma (Supelco)    Assisted customers by providing information with regards to product and method inquiries.

- Organics Supervisor      National Environmental Testing      Pesticide, Herbicide, PCB, SVOC and VOC analysis of soil and water samples.
- GC Group Leader
- GC Analyst
  
- Senior Chemist      Alberto-Culver      Supported R&D staff through non-routine testing and method development using various extraction and analysis techniques.
- Chemist

## Education

Bachelor of Science in Chemistry      University of Illinois

## RACHEL BENNETT STRYFFELER

Atlanta, GA 30332  
rachel.stryffeler@gmail.com

Phone: (330) 990-8122  
www.linkedin.com/in/rachelvbennett

- PhD in Analytical Chemistry developing state-of-the-art techniques for chemical imaging using mass spectrometry (MS).
- Industrial experience in GC-MS and ICP-MS quantitative analysis.
- Strong communication skills demonstrated by numerous scientific publications and presentations. Fluent in Spanish.
- Formal leadership training that was applied to supervising undergraduate students.

### Education

#### **Georgia Institute of Technology, Atlanta, GA**

PhD, Analytical Chemistry May 2015  
Dissertation: New Analytical Approaches for Ambient Mass Spectrometry Imaging  
Advisor: Professor Facundo M. Fernández

#### **College of Wooster, Wooster, OH**

BA, Chemistry May 2010  
Independent Study Thesis Honors  
Study Abroad: Universidad de Córdoba, Córdoba, Spain, Fall 2008

### Work Experience

#### **The Coca-Cola Company, Atlanta, GA**

Scientist IV, Analytical Sciences Group 2015-present

- Performed quantitative metals analysis by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) on beverage, concentrate, and ingredient samples. Used microwave digestion as needed for complex matrices.
- Performed quantitative Gas Chromatography-Mass Spectrometry (GC-MS) of volatiles in beverage, concentrate and ingredient samples. Experienced with direct-injection, headspace, solid phase micro-extraction (SPME), purge and trap methods.
- Developed multiple quantitative ICP-MS and GC-MS analytical methods for trace analyses in complex matrices. Effectively maintained all instrumentation used and successfully performed troubleshooting when problems arose.
- Assisted with the management of group budget and financial tracking.

#### **ABS Materials, Inc., Wooster, OH**

Research Assistant and Technical Translator May-August 2010

- Developed and characterized waveguide interferometry-based gas-phase sensor for TATP
- Translated technical documents, articles and presentation from English to Spanish and Spanish to English

#### **ConocoPhillips, Bartlesville, OK**

Research Consultant May – August 2008, 2009  
Supervisor: Dr. James Howard

- Worked on interdisciplinary team to perform geochemical analysis and modeling of low-salinity water flooding for better understanding the mechanism of improved crude extraction
- Developed sampling protocols for chemical analysis of effluent brine in low-salinity water flooding

## Research Experience

### Georgia Institute of Technology, Atlanta, GA

Graduate Research Assistant

Aug 2010-present

- Designed and implemented differential mobility (DMS) filtering for DESI-MSI resulting in a tenfold signal to noise and twofold contrast enhancement
- Developed novel Robotic Plasma Probe Mass Spectrometry (RoPPI-MS) for the direct sampling and imaging of irregular surfaces in three dimensions
- Utilized desorption electrospray ionization mass spectrometry imaging (DESI-MSI) to the analysis of brain tissues targeting lipids related to traumatic brain injury and medulloblastoma tumors
- Evaluated DESI-MSI and matrix assisted laser desorption ionization (MALDI) methods for imaging of lipid species in biological tissues
- Used high performance liquid chromatography-tandem MS (LC-MS/MS) to confirm identities of key products
- Coupled these atmospheric pressure ionization techniques to a variety of mass spectrometers including Orbitrap, quadrupole-time-of-flight, ion trap instruments (and effectively maintained all)
- Scientific mentoring - 3 undergraduate students and 1 high school student

### College of Wooster, Wooster, OH

Independent Study Research

2009-2010

Research Advisor: Prof. Paul L. Edmiston

- Developed gas-phase sensor for triacetoneperoxide (TATP) using waveguide interferometry with metal-doped organic thin films that were capable of detecting TATP at a concentration of 1 ppmv

## Publications

Robotic Plasma Probe Ambient Ionization Mass Spectrometry Imaging (RoPPI-MS) of Non-Planar Surfaces. E.M. Morzan,\* **R.V. Bennett**,\* F.M. Fernández. *Analyst*, 2014,139 (11).

Contrast-Enhanced Differential Mobility-Desorption Electrospray Ionization-Mass Spectrometry of Biological Tissues. **R.V. Bennett**\*, C.M. Gamage\*, A.S. Galhena, F.M. Fernández. *Analytical Chemistry*, 2014,86 (8).

Imaging of Biological Tissues by Desorption Electrospray Ionization Mass Spectrometry. **R.V. Bennett**, C.M. Gamage, F.M. Fernández. *Journal of Visualized Experiments*, 2013, 77, e50575.

Desorption Electrospray Ionization Imaging Mass Spectrometry as a Tool for Investigating Prebiotic Model Reactions on Mineral Surfaces. **R.V. Bennett**, H.J. Cleaves, J.M. Davis, D.A. Sokolov, T.M. Orlando, J.L. Bada, F.M. Fernández. *Analytical Chemistry*, 2013, 85.

OmniSpect: An Open Matlab-based Tool for Visualization and Analysis of Matrix-Assisted Laser Desorption/Ionization and Desorption Electrospray Ionization Mass Spectrometry Images. R.M. Parry, A.S. Galhena, C.M. Gamage, **R.V. Bennett**, M.D. Wang, F.M. Fernández. *Journal of the American Society for Mass Spectrometry*, 2013, 24.

\*Equally-contributing authors

## Selected Presentations

**R.V. Bennett**, C.D. Kaddi, M.R.L. Paine, M. Banks, A.L. Weber, M.D. Wang, F.M. Fernandez, DetectTLC: A Tool for Turnkey Reaction Mixture Screening on the Basis of Ambient Mass Spectrometric Images. Pittcon Conference and Expo 2015, New Orleans, LA; Poster. March 8-12, 2015.

**R.V. Bennett.** New Analytical Approaches for Mass Spectrometry Imaging. Georgia Tech School of Chemistry and Biochemistry Graduate Research Symposium and Retreat, Helen, GA; Oral. Nov 1-2, 2014.

**R.V. Bennett, C.M. Gamage, F.M. Fernández.** Differential Mobility-Enhanced Ambient Mass Spectrometry Imaging. Poster: 61<sup>st</sup> ASMS Conference on Mass Spectrometry and Allied Topics, Minneapolis, MN; Poster. June 9-13, 2013.

**R.V. Bennett, C.M. Gamage, A.S. Galhena, F.M. Fernández.** Differential Mobility-Enhanced Ambient Mass Spectrometry Imaging. Oral: 25<sup>th</sup> Annual Workshop on Secondary Ion Mass Spectrometry; Oral. May 13-17, 2013.

**R.V. Bennett, D.A. Sokolov, J.M. Davis, T.M. Orlando, H.J. Cleaves, F.M. Fernández.** *Imaging mass spectrometry investigation of formamide reactions on mineral surfaces.* Oral: Astrobiology Conference 2012, Atlanta, GA; Oral. Apr 16-20, 2012.

### Awards

#### **Georgia Institute of Technology**

- Travel Award at School of Chemistry and Biochemistry Graduate Research Symposium 2014  
Awarded for outstanding oral presentation.
- Leadership Fellows Program 2013-2014  
Formal leadership training and served as leadership coach to 6 undergraduate students; prepared and delivered practical coaching training for future coaches
- Travel Award at Georgia Tech Research and Innovation Conference 2013  
Awarded for best poster presentation at institution-wide conference of graduate student research
- Best Poster Award, Gordon Research Conference: Origin of Life 2012  
Awarded to best poster presented at conference
- William H. Emerson Fellowship 2010-2012  
Awarded based on undergraduate academic merit in the form of stipend bonus

### Professional Activities and Leadership Roles

#### **Georgia Institute of Technology**

- Georgia Tech Advisory Board, Graduate Student Representative 2013-2014  
Participated in bi-annual meetings and represented interests of graduate students
- Graduate Education Strategic Plan Committee 2013  
Drafted plans to improve professional career development, evaluation of conflict resolution process to implement policy and training
- Dean of the College of Sciences, Search Committee 2012  
Participated in nomination, airport and on-campus interviews representing graduate students, resulted in hiring of Dean Paul Goldbart
- Women in Chemistry Executive Board 2012-present  
Organized professional development, outreach and networking events.
- American Society for Mass Spectrometry 2010-present

#### **Other**

- Fluent in Spanish

## Michael Patrick Valley

### Home

5463 Shale Road  
Fitchburg, WI 53711  
(608) 332-3397  
valmibeaur@yahoo.com

### Work

2800 Woods Hollow Road  
Madison, WI 53711  
(608) 274-1181 ext 1533  
mike.valley@promega.com

### Current Position

Senior Scientist I in the Assay Design Group of R&D at Promega

### Technical Skills

- Design of various luminescent assays
- Mammalian cell culture, including various 3D cell culture methods
- Site-directed mutagenesis and subcloning of genes for overexpression in *Escherichia coli*
- Protein purification including anion exchange, hydrophobic, affinity, and size exclusion chromatographies
- Kinetics (steady state, stopped-flow, and rapid quench) including anaerobic work, isotope effects, and pH and temperature dependencies
- Enzyme inhibition and substrate rescue studies
- Directed evolution of enzymatic activity including genetic knockouts in *Escherichia coli*
- UV/visible, fluorescence, resonance Raman, 1D NMR, and EPR spectroscopies
- Synthesis and purification of substrates

### Research Experience

- Senior Research Scientist (November 2004 – present)  
Research and Development, Promega, Madison, Wisconsin – *design of luminescent assays to measure enzyme activities, transcriptional reporters, and cellular viability.*
- Postdoctoral Research Associate (June 2001 – October 2004)  
Dr. Paul F. Fitzpatrick, Biochemistry and Biophysics, Texas A&M University, College Station, Texas - *chemical, kinetic, and structural characterization of the flavoenzyme nitroalkane oxidase.*
- Graduate Student (August 1994 – May 2001)  
Dr. John D. Lipscomb, Biochemistry, Molecular Biology and Biophysics, University of Minnesota, Minneapolis, Minnesota - *spectroscopy, mutagenesis and structure-function studies of the metalloenzyme protocatechuate 3,4-dioxygenase.*
- Industrial Internship (August – November 1998)  
Dr. F. Sima Sariaslani, E.I. DuPont Central Research & Development, Wilmington, Delaware - *protein purification and characterization.*

### Education

- University of Minnesota, Minneapolis, Minnesota, Ph.D. in Biochemistry, Molecular Biology and Biophysics, July 2002, GPA 4.0/4.0.
- University of Illinois, Champaign, Illinois, B.S. in Chemistry, May 1994, GPA 5.0/5.0, summa cum laude with highest distinction.
- San Jose State University, San Jose, California, Department of Energy sponsored six week course in Nuclear and Radiochemistry, Summer 1992.

## Publications

- Valley, M.P., Karassina, N., Aoyama, N., Carlson, C., Cali, J.J., and Vidugiriene, J. "A bioluminescent assay for measuring glucose uptake." *Anal.Biochem.* (2016) **505**:43-50.
- Duellman, S.J., Valley, M.P., Kotraiah, V., Vidugiriene, J., Zhou, W., Bernad, L., Osterman, J., Kimball, J.J., Meisenheimer, P., and Cali, J.J. "A bioluminescence assay for aldehyde dehydrogenase activity." *Anal.Biochem.* (2013) **434**:226-32.
- Hall, M.P., Unch, J., Binkowski, B.F., Valley, M.P., Butler, B.L., Wood, M.G., Otto, P., Zimmerman, K., Vidugiris, G., Machleidt, T., Robers, M.B., Benink, H.A., Eggers, C.T., Slater, M.R., Meisenheimer, P.L., Klaubert, D.H., Fan, F., Encell, L.P., and Wood, K.V. "Engineered luciferase reporter from a deep sea shrimp utilizing a novel imidazopyrazinone substrate." *ACS.Chem.Biol.* (2012) **7**:1848-57.
- Valley, M.P., Fenny, N.S., Ali, S.H., and Fitzpatrick, P. F. "Characterization of active site residues of nitroalkane oxidase." *Bioorg.Chem.* (2010) **38**:115-119.
- Major, D.T., Héroux, A., Orville, A.M., Valley, M.P., Fitzpatrick, P.F., and Gao, J. "Differential quantum tunneling contributions in nitroalkane oxidase catalyzed and the uncatalyzed proton transfer reaction." *Proc.Natl.Acad.Sci.U.S.A.* (2009) **106**:20734-9.
- Héroux, A., Bozinovski, D.M., Valley, M.P., Fitzpatrick, P.F., and Orville, A.M. "Crystal structures of intermediates in the nitroalkane oxidase reaction." *Biochemistry* (2009) **48**:3407-16.
- Zhou, W., Andrews, C., Liu, J., Shultz, J.W., Valley, M.P., Cali, J.J., Hawkins, E.M., Klaubert, D.H., Bulleit, R.F., and Wood, K.V. "Self-cleavable bioluminogenic luciferin phosphates as alkaline phosphatase reporters." *Chembiochem.* (2008) **9**:714-8.
- Cali, J.J., Niles, A., Valley, M.P., O'Brien, M.A., Riss, T.L., and Shultz, J. "Bioluminescent assays for ADMET." *Expert.Opin.Drug.Metab.Toxicol.* (2008) **4**:103-20.
- Fitzpatrick, P.F., Bozinovski, D.M., Héroux, A., Shaw, P.G., Valley, M.P., and Orville, A.M. "Mechanistic and structural analyses of the roles of Arg409 and Asp402 in the reaction of the flavoprotein nitroalkane oxidase." *Biochemistry* (2007) **46**:13800-8.
- Valley, M.P., Zhou, W., Hawkins, E.M., Shultz, J., Cali, J.J., Worzella, T., Bernad, L., Good, T., Good, D., Riss, T.L., Klaubert, D.H., and Wood, K.V. "A bioluminescent assay for monoamine oxidase activity." *Anal.Biochem.* (2006) **359**:238-46.
- Zhou, W., Valley, M.P., Shultz, J., Hawkins, E.M., Bernad, L., Good, T., Good, D., Riss, T.L., Klaubert, D.H., and Wood, K.V. "New bioluminogenic substrates for monoamine oxidase assays." *J.Am.Chem.Soc.* (2006) **128**:3122-3.
- Nagpal, A., Valley, M.P., Fitzpatrick, P.F., and Orville, A.M. "Crystal structures of nitroalkane oxidase: insights into the reaction mechanism from a covalent complex of the flavoenzyme trapped during turnover." *Biochemistry* (2006) **45**:1138-50.
- Valley, M.P., Brown, C.K., Burk, D.L., Vetting, M.W., Ohlendorf, D.H., and Lipscomb, J.D. "Roles of the Equatorial Tyrosyl Iron Ligand of Protocatechuate 3,4-Dioxygenase in Catalysis." *Biochemistry* (2005) **44**:11024-39.
- Valley, M.P., Tichy, S.E., and Fitzpatrick, P.F. "Establishing the kinetic competency of the cationic imine intermediate in nitroalkane oxidase." *J.Am.Chem.Soc.* (2005) **127**:2062-6.

- Fitzpatrick, P.F., Orville, A.M., Nagpal, A., and Valley, M.P. “Nitroalkane oxidase, a carbanion-forming flavoprotein homologous to acyl-CoA dehydrogenase.” *Arch.Biochem.Biophys.* (2005) **433**:157-65.
- Nagpal, A., Valley, M.P., Fitzpatrick, P.F., and Orville, A.M. “Crystallization and preliminary analysis of active nitroalkane oxidase in three crystal forms.” *Acta.Crystallogr.D.Biol.Crystallogr.* (2004) **60**:1456-60.
- Valley, M.P. and Fitzpatrick, P.F. “Comparison of Enzymatic and Non-Enzymatic Nitroethane Anion Formation: Thermodynamics and Contribution of Tunneling.” *J.Am.Chem.Soc.* (2004) **126**:6244-6245.
- Valley, M.P. and Fitzpatrick, P.F. “Reductive Half-Reaction of Nitroalkane Oxidase: Effect of Mutation of the Active Site Aspartate to Glutamate.” *Biochemistry* (2003) **42**:5850-5856.
- Valley, M.P. and Fitzpatrick, P.F. “Inactivation of Nitroalkane Oxidase upon Mutation of the Active Site Base and Rescue with a Deprotonated Substrate.” *J.Am.Chem.Soc.* (2003) **125**:8738-8739.
- Daubner, S.C., Gadda, G., Valley, M.P., and Fitzpatrick, P.F. “Cloning of Nitroalkane Oxidase from *Fusarium oxysporum* Identifies a New Member of the Acyl-CoA Dehydrogenase Superfamily.” *Proc.Natl.Acad.Sci.U.S.A.* (2002) **99**:2702-2707.
- Valley, M.P., Burk, D., Frazee, R.W., Yu, H., Dolbeare, K.B., Ohlendorf, D.H., and Lipscomb, J.D. “Differences in Single versus Multiple Turnover of a Mutant Protocatechuate 3,4-Dioxygenase: A Short Circuit in Catalysis.” *In preparation.*
- Vetting, M.W., Valley, M.P., D’Argenio, D., Ornston, L.N., Lipscomb, J.D., and Ohlendorf, D.H. “Biophysical Analysis of R457S and R133H Mutants of Protocatechuate 3,4-Dioxygenase from *Acinetobacter* Strain ADP1.” *In preparation.*

#### Abstracts

- Valley, M.P., Sobol, M., Karassina, N., Duellman, S., Leippe, D., and Vidugiriene, J. “New Bioluminescent Assays Enable Easy Measurement of Glucose-Dependent Metabolic Pathways” Fifth Annual SLAS Conference, San Diego, CA. January 23-27, 2016.
- Valley, M.P., Sobol, M., Karassina, N., Duellman, S., Leippe, D., Aoyoma, N., Hancock, M., Carlson, C., and Vidugiriene, J. “Sensitive and Easy to Use Bioluminescent Assays for Measuring Glucose Dependent Metabolic Pathways” 75<sup>th</sup> Scientific Sessions, Boston, MA. June 5-9, 2015.
- Valley, M.P., Sobol, M., Karassina, N., Duellman, S., Cali, J.J., and Vidugiriene, J. “A Bioluminescent Assay for Measuring Glucose Uptake” AACR Annual Meeting 2015, Philadelphia, PA. April 18-22, 2015.
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- Valley, M.P., Zimprich, C., Cali, J.J., and Lazar, D.F. “A Bioluminescent Cell Viability Assay Optimized for 3D Microtissues” AACR Annual Meeting 2013, Washington D.C. April 6-10, 2013.



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- Valley, M.P., Hawkins, E.M., Scurria, M.A., Unch, J., Good, T., Good, D., Bernad, L., Klaubert, D.H., and Wood, K.V. "5'-Fluoroluciferin is a Novel Luciferin Analog that Improves Luciferase Reagent Technology" Assays and Cellular Targets 2007, San Diego, CA. October 17-19, 2007.
- Valley, M.P., Zhou, W., Hawkins, E.M., Shultz, J., Good, T., Good, D., and Wood, K.V. "MAO-Glo™ Assay: Fast and Easy Luminescent Assay to Measure Monoamine Oxidases" 13<sup>th</sup> North American ISSX Meeting, Maui, HI. October, 23-28, 2005.
- Valley, M.P. and Fitzpatrick, P.F. "The Reductive Half Reaction of Nitroalkane Oxidase: Effect of Mutation of the Active Site Aspartate to Glutamate." 18<sup>th</sup> Enzyme Mechanisms Conference, Galveston Island, TX. January 4-7, 2003.
- Valley, M.P. and Fitzpatrick, P.F. "Asp402 is the Catalytic Base in Nitroalkane Oxidase." 14<sup>th</sup> International Symposium on Flavins and Flavoproteins, Cambridge, England. July 14-18, 2002.
- Valley, M.P., Vetting, M.W., Brown, K., Burk, D., Elango, N., Ohlendorf, D.H., and Lipscomb, J.D. "The Activation of Substrate by Protocatechuate 3,4-Dioxygenase." EUROBIC-5, Toulouse, France. July 17-20, 2000.
- Valley, M.P., Burk, D., Elango, N., Ohlendorf, D.H., and Lipscomb, J.D. "Substrate Activation and the Role of Tyrosine 408 in Protocatechuate 3,4-Dioxygenase." ICBIC-9, Minneapolis, MN. July 11-16, 1999.
- Valley, M.P., Elango, N., Ohlendorf, D.H., and Lipscomb, J.D. "The Trans Effect of Residue 408 in Protocatechuate 3,4-Dioxygenase." National ASBMB Meeting, San Francisco, CA. August 24-29, 1997.

#### Activities and Honors

- Invited speaker at Gustavus Adolphus College, Department of Chemistry, Saint Peter, MN, May 1997.
- University of Minnesota, Biochemistry, Molecular Biology, and Biophysics graduate student body co-President, Minneapolis campus, 1996-1997.
- Member of Alpha Chi Sigma, professional chemistry fraternity, Active 1992-1994, President Fall 1993.
- NIH Biotechnology Training Program, 1996-1999.
- University of Minnesota Graduate School Fellowship, 1994-1997.
- Barry Goldwater Scholarship, 1993-1994.

