

**2017 IFT-EFFoST International Nonthermal Processing Workshop, May 24-25  
Chicago Marriott Southwest at Burr Ridge, IL, USA**

**Theme: Applications and Commercialization of Nonthermal Food Processing Technologies**

Wednesday, May 24, 2017 (Workshop – Day 1)	
<b>7:15 – 8:15 AM</b>	Registration
<b>8:15 – 8:30 AM</b>	<b>Welcome Address</b> <b>Robert Brackett, Ph.D.</b> , Professor, IIT Vice President and IFSH Director, IIT IFSH, USA
<b>Workshop Session 1</b> <b>Keynote Addresses: Latest Developments and Needs for Nonthermal Processing Technologies</b>	
Session Chairs: <b>Jason Wan, Ph.D.</b> , <b>Glenn Black, Ph.D.</b>	
<b>8:30 – 9:00 AM</b>	Keynote Presentation 1.1: <b>Regulatory Perspective</b> <b>Mickey Parish, Ph.D.</b> , Senior Science Advisor, FDA CFSAN, USA
<b>9:00 – 9:30 AM</b>	Keynote Presentation 1.2: <b>Industry Perspective</b> <b>Marcia Walker, Ph.D.</b> , Director of Food Innovation, 915 Labs, USA
<b>9:30 – 10:00 AM</b>	<b>Coffee Break/Poster Viewing/Vendor Interactions</b>
<b>Workshop Session 2</b> <b>Food Safety Application of Nonthermal Processing Technologies</b>	
Session Chair: <b>Mickey Parish, Ph.D.</b>	
<b>10:00 – 10:20 AM</b>	Keynote Presentation 2 Latest Development and Challenges in Microbial Inactivation Using Nonthermal Processing Technologies <b>Jason Wan, Ph.D.</b> , Professor, Associate Director, IIT IFSH, USA
<b>10:20 – 10:40 AM</b>	Invited Presentation Engineering Advances in Combined Nonthermal and Thermal Technologies for Inactivation of Foodborne Pathogens <b>Bala Balasubramaniam, Ph.D.</b> , Professor, The Ohio State University, USA
<b>10:40 – 11:10 AM</b>	Invited Presentation Recent Advancements in Membrane Processing Technologies <b>Carmen Moraru, Ph.D.</b> , Associate Professor, Cornell University, USA
<b>11:10 – 11:20 AM</b>	Invited Presentation Recent Advancements in Light-based Technologies <b>Kathiravan Krishnamurthy, Ph.D.</b> , Assistant Professor, IIT IFSH, USA

<b>11:20 – 11:40 AM</b>	Invited Presentation Extending Shelf-Life of Milk by Nonthermal Methods: Bactofugation and Microfiltration <b>Berlan JeanPierre</b> , Market Area Leader, Tetra Pak Inc., Canada
<b>11:40 – 12:00 PM</b>	Invited Presentation Safer Fresh Produce: Meeting the Challenge with Ozone Application <b>Ahmed Yousef, Ph.D.</b> , Professor, The Ohio State University, USA
<b>12:00 – 1:00 PM</b>	<b>Lunch/Poster Viewing/Vendor Interactions</b>
<b>Workshop Session 3</b> <b>Nonthermal Technologies for Texture, Extraction and Functionality Applications</b>  Session Chairs: <b>Christopher Doona, Ph.D., Alvin Lee, Ph.D.</b>	
<b>1:00 – 1:30 PM</b>	Keynote Presentation 3 Enhancing Functionality of Plant-based Products through Nonthermal Technologies <b>Olga Martin-Belloso, Ph.D.</b> , Professor, Universidad de Lleida, Spain
<b>1:30 – 1:50 PM</b>	Invited Presentation Tomato Juice Processing using Thermal, PEF and HPP Technologies <b>Kemal Aganovic, Ph.D.</b> , Group Leader - Alternative Technologies, German Institute of Food Technologies (DIL e.V.), Germany
<b>1:50 – 2:10 PM</b>	Invited Presentation High Intensity Ultrasound as an Abiotic Elicitor - Effects on Functionality of Fresh Produce <b>Hao Feng, Ph.D.</b> , Professor, University of Illinois – Urbana-Champaign, USA
<b>2:10 – 2:30 PM</b>	Invited Presentation Pulsed Electric Field Processing of Fruits and Vegetables <b>Michael A. Kempkes</b> , Vice President of Marketing, Diversified Technologies, Inc., USA
<b>2:30 – 2:45 PM</b>	Presentation Forward Osmosis as a Nonthermal Method for the Concentration of High Quality Liquid Foods and Juices <b>Carmen Moraru, Ph.D.</b> , Associate Professor, Cornell University, USA <i>Other co-authors:</i> Olga I. Padilla-Zakour; Marcela Patino; Kyle T. Kriner - Cornell University, Ithaca, USA; Fabrice Gascons Viladomat; Alizé Leblanc - Ederna SAS, France
<b>2:45 – 3:00 PM</b>	Presentation Understanding the Effect of Ionic Strength on the Pressure Denaturation of Myofibrillar Proteins

	<b>Gina Villamonte</b> <sup>1</sup> ; Laurence Pottier <sup>2</sup> ; Marie de Lamballerie <sup>2</sup> ; Dominique Chevalier-Lucia <sup>3</sup> ; Laetitia Picart-Palmade <sup>3</sup> <sup>1</sup> CELABOR, Belgium; <sup>2</sup> GEPEA, France; <sup>3</sup> UMR IATE, Université de Montpellier, France
<b>3:00 – 3:15 PM</b>	<b>Coffee Break</b>
<b>Workshop Session 4</b> Breakout session I	
<b>3:15 – 4:15 PM</b>	2 Concurrent Breakout Sessions on Key Nonthermal Technologies <ul style="list-style-type: none"> <li>• High pressure processing (Co-chairs: Dr. Bala Balasubramaniam and Dr. Chris Doona)</li> <li>• Other technologies (Chair: Dr. Carmen Moraru)</li> </ul>
<b>4:15 – 4:45 PM</b>	Break – Assemble in front of the hotel by 4:40 PM. Buses will leave hotel by 4:45 PM sharp.
<b>4:45 – 5:45 PM</b>	Bus ride to the dinner venue
<b>5:45 – 6:30 PM</b>	Navy Pier
<b>6:30 – 9:30 PM</b>	Dinner and networking reception on Lake Michigan

Thursday, May 25, 2017 (Workshop – Day 2)

### Workshop Session 5

#### Validation Considerations for Nonthermal Technologies

Session Chairs: **Olga Martin-Belloso, Ph.D., Carmen Moraru, Ph.D.**

<b>8:30 – 8:55 AM</b>	Keynote Presentation 5 Regulatory Considerations for Novel Processing Technologies <b>Glenn Black, Ph.D.</b> , Associate Director for Research, FDA CFSAN Division of Food Processing Science and Technology, USA
<b>8:55 – 9:15 AM</b>	Invited Presentation Global Expansion of High Pressure Processing: Validation, Market Drivers and Challenges <b>Nali Prchal</b> , Senior Food Technologist, JBT-Avure Technologies, USA
<b>9:15 – 9:35 AM</b>	Invited Presentation Quasi-chemical Modeling of Spore Germination by High Pressure Processing <b>Christopher Doona, Ph.D.</b> , Senior Research Chemist, US Army Natick Soldier RD&E Center, USA
<b>9:35 – 9:55 AM</b>	Invited Presentation

	<p>Low-Intensity Electric Fields and Their Efficacy in Microbial Inactivation  <b>Sudhir Sastry, Ph.D.</b>, Professor, The Ohio State University, USA</p>
<b>9:55 – 10:15 AM</b>	<p>Invited Presentation  Applications of Food Irradiation Technologies in the Food and Agricultural Industries  <b>Sohini Bhatia</b>, Ph.D. candidate, and Suresh D. Pillai, Ph.D., Professor, Texas A&amp;M University, USA</p>
<b>10:15 – 10:30 AM</b>	<p>Presentation  Evaluation of Strain Variability of <i>Listeria monocytogenes</i> for Designing Safe HPP Meat Products  <b>Diego Wilches-Perez, Ph.D.</b>, Applications and Food Processing Specialist, Hiperbaric, Spain  <i>Other co-authors:</i> Diego Wilches-Perez<sup>1,2</sup> ; Rebeca Ruiz-Diez<sup>1</sup>; Mario Gonzalez<sup>1,2</sup> ; Isabel Jaime<sup>2</sup>; Jordi Rovira<sup>2</sup>; Carole Tonello-Samson<sup>1</sup>  <sup>1</sup> Hiperbaric S.A ., Spain; <sup>2</sup> University of Burgos, Spain</p>
<b>10:30 – 11:00 AM</b>	<b>Coffee Break/Poster Viewing/Vendor Interactions</b>
<b>Workshop Session 6</b> Breakout Session II	
<b>11:00 – 12:00 PM</b>	<p>2 Concurrent Breakout Sessions on Key Nonthermal Technologies</p> <ul style="list-style-type: none"> <li>• High pressure processing (Co-chairs: Dr. Bala Balasubramaniam and Dr. Chris Doona)</li> <li>• Other technologies (Chair: Dr. Carmen Moraru)</li> </ul>
<b>12:00 – 1:00 PM</b>	<b>Lunch/Poster Viewing/Vendor Interactions</b>
<b>Workshop Session 7</b> Commercialization and Industrial Applications	
Session Chairs: <b>Marcia Walker, Ph.D.</b> , <b>Bala Balasubramaniam, Ph.D.</b>	
<b>1:00 – 1:30 PM</b>	<p>Keynote Presentation 7  Experiences in Filing Nonthermal Processes for Regulatory Acceptance and Commercialization  <b>Larry Keener</b>, President, International Product Safety Consultant, USA</p>
<b>1:30 – 1:50 PM</b>	<p>Invited Presentation  Commercialization of High Pressure Processed Juices and Beverages  <b>Carole Tonello, Ph.D.</b>, Applications &amp; Process Development Manager, Hiperbaric, Spain</p>

<b>1:50 – 2:10 PM</b>	Invited Presentation Successes and Lessons Learned in Adoption of Nonthermal Technologies. <b>Patrick Dunne, Ph.D.</b> , Retired, US Army Natick, USA
<b>2:10 – 2:30 PM</b>	Invited Presentation Microbial Removal with Membrane Filtration <b>Joseph Baaklini</b> , Senior Manager, Food & Beverage, Pall Corporation
<b>Workshop Session 8</b> <b>Student Presentations and Judging</b>  Session Chairs: <b>Carole Tonello, Ph.D.</b> , <b>Kathiravan Krishnamurthy, Ph.D.</b>	
<b>2:30 – 2:35 PM</b>	High Pressure Processing for Decontamination of Orange Juice from Natural Flora and <i>Salmonella</i> serovars <b>Abimbola Allison</b> , Graduate student, Tennessee State University, USA
<b>2:35 – 2:40 PM</b>	Photoirradiated Caffeic Acid as an Antimicrobial Treatment for Water and Fresh Produce <b>Andrea Gilbert</b> , Graduate student, University of Maryland, USA
<b>2:40 – 2:45 PM</b>	Application of High Pressure Processing on Fresh and Frozen Strawberries and Blueberries to Inactivate Murine Norovirus and Bacteriophage MS2 <b>Catherine Rolfe</b> , Graduate student, Illinois Institute of Technology, USA
<b>2:45 – 2:50 PM</b>	High Pressure Pasteurization at Controlled Temperature against <i>Salmonella</i> Serovars in Apple Cider <b>Eleonora Troyanovskaya</b> , Graduate student, Tennessee State University, USA
<b>2:50 – 2:55 PM</b>	Effect of Pulsed Electric Field Processing Parameters on Carotenoid Bioaccessibility of Tomato Juice <b>Mariona Vendrell-Pacheco</b> , Graduate student, University of Lleida, Spain
<b>2:55 – 3:00 PM</b>	Inactivation of <i>Salmonella</i> spp. and <i>Enterococcus faecium</i> on Strawberries and Blueberries by High Pressure Processing <b>Zhe Li</b> , Graduate student, Illinois Institute of Technology, USA
<b>3:00 - 3:30 PM</b>	<b>Coffee Break/Poster Viewing/Vendor Interactions</b>
<b>Workshop Session 9</b> <b>Future Prospects of Nonthermal Technologies</b>  Session Chairs: <b>Howard Zhang, Ph.D.</b> , <b>Larry Keener, Ph.D.</b>	
<b>3:30 – 4:00 PM</b>	Keynote Presentation 9 Future Prospects of Nonthermal Technologies

	<b>Howard Zhang, Ph.D.</b> , Center Director, Beltsville Agricultural Research Center, United States Department of Agriculture, USA
<b>4:00 – 4:40 PM</b>	<p><b>Panel Discussion on Future Prospects of Nonthermal Technologies</b></p> <p>Chair: <b>Howard Zhang, Ph.D.</b></p> <p>Invited Panelists:  <b>Mickey Parish, Ph.D.</b> – Regulatory considerations  <b>Carole Tonello, Ph.D.</b> – High pressure equipment  <b>Larry Keener</b> – Process validation and filing  <b>Patrick Dunne, Ph.D.</b> – Federal research programs  <b>Carmen Moraru, Ph.D.</b> – Academic research capabilities  <b>Olga Martin-Belloso, Ph.D.</b> – European perspective</p>
<b>Workshop Session 10</b> Workshop Summary	
<b>4:40 – 4:50 PM</b>	Summary of Workshop Student Presentation Awards
<b>4: 50 – 5:00 PM</b>	Presentation on 2018 Nonthermal Processing Workshop & the Symposium at Cornell University

## List of Poster Presentations

Posters will be displayed on both the days of the workshop and the attendees are encouraged to visit the posters during the break. The presenters are requested to stay close to the posters at the following times as much as possible.

### Wednesday, May 24, 2017

- 9:30 – 10:00 AM
- 12:00 – 1:00 PM
- 3:00 – 3:15 PM

### Thursday, May 25, 2017

- 10:30 – 11:00 AM
- 12:00 – 1:00 PM
- 3:00 - 3:30 PM

High Pressure Processing for Decontamination of Orange Juice from Natural Flora and Salmonella serovars

**Abimbola Allison**; Eleonora Troyanovskaya; Shahid Chowdhury; Aliyar Fouladkhah - Public Health Microbiology, Tennessee State University, Nashville, TN

Photoirradiated Caffeic Acid as an Antimicrobial Treatment for Water and Fresh Produce

**Andrea Gilbert**; Rohan Tikekar Ph.D. - University of Maryland, College Park

Effect of high hydrostatic pressure on *Listeria innocua* inactivation of and carotenoid content in Minas Frescal cheese incorporated with carrot

Fabiola Gouveia<sup>1,2</sup>, Ronoel Godoy<sup>1</sup>, Eduardo Walter<sup>1</sup>, Elisa Ferreira<sup>2</sup>, Julia Tiburski<sup>2</sup>, Regina Nogueira<sup>1</sup>, **Amauri Rosenthal**<sup>1</sup>

<sup>1</sup> Embrapa Food Technology, Rio de Janeiro, Brazil; <sup>2</sup> Federal Rural University of Rio de Janeiro, Brazil

The influence of high hydrostatic pressure in beer wort saccharification

Lígia Santos<sup>1,2,3</sup>, Ronoel Godoy<sup>1</sup>, Carlos Piler<sup>1</sup>, Elisa Ferreira<sup>2</sup>, Fabiano Oliveira<sup>3</sup>, **Amauri Rosenthal**<sup>1</sup>

<sup>1</sup> Embrapa Food Technology, Rio de Janeiro, Brazil, <sup>2</sup> Federal Rural University of Rio de Janeiro, Brazil, <sup>3</sup> CEFET Federal Center of Education, Valença, Brazil

Application of high pressure processing on fresh and frozen strawberries and blueberries to inactivate murine norovirus and bacteriophage MS2

Mu Ye; **Catherine Rolfe**; Yingyi Zhang; Alvin Lee - Institute for Food Safety and Health, Illinois Institute of Technology; Bedford Park, USA

High Pressure Pasteurization at Controlled Temperature against Salmonella Serovars in Apple Cider

**Eleonora Troyanovskaya**; Abimbola Allison; Shahid Chowdhury; Aliyar Fouladkhah - Public Health Microbiology Laboratory, Tennessee State University, Nashville, TN

Engineered Osmosis: New approach for sensitive liquid foods concentration

**Fabrice Gascons Viladomat**; Alizé Leblanc; Thomas Maugin; Glenn Pickett - EDERNA S.A.S., France

Efficacy of Various Pulsed Light Systems for the Inactivation of *Salmonella* Enteritidis PT30 on Almond Kernel Surface

Maite Harguindeguy<sup>1</sup>, **Kathiravan Krishnamurthy**<sup>1</sup>, Nathan Anderson<sup>2</sup>

<sup>1</sup>Institute for Food Safety and Health, Illinois Institute of Technology; <sup>2</sup>Food and Drug Administration, Bedford Park, USA

Efficacy of Three Pulsed Light Systems for Effective In-package Decontamination of *Salmonella* Montevideo on Black Pepper

Xinran Xu<sup>1</sup>, **Kathiravan Krishnamurthy**<sup>1</sup>, Nathan Anderson<sup>2</sup>

<sup>1</sup>Institute for Food Safety and Health, Illinois Institute of Technology; <sup>2</sup>Food and Drug Administration, Bedford Park, USA

More Sustainable Food Design with Insects, Agri-Food Waste Streams and High-Moisture Extrusion

Sergiy Smetana; **Kemal Aganovic**; Volker Heinz; German Institute of Food Technologies (DIL e.V.), Quakenbrueck, Germany

Effect of pulsed electric field processing parameters on carotenoid bioaccessibility of tomato juice

**Mariona Vendrell-Pacheco**; Olga Martín-Belloso; Robert Soliva-Fortuny; Pedro Elez-Martínez - Department of Food Technology, University of Lleida, Spain

Pulsed Light Inactivation of Murine Norovirus, *Escherichia coli*, *Listeria monocytogenes* and *Salmonella* on Strawberries

**Mu Ye**; Dandan Feng; Catherine Rolfe; Alvin Lee - Institute for Food Safety and Health, Illinois Institute of Technology; Bedford Park, USA

Phenolic Compounds Recovery from Alicante Bouschet Grape Pomace by High Hydrostatic Pressure

Aline Teles; William Leal; Amauri Rosenthal; Leda Gottschalk; **Renata Tonon** - Institute of Chemistry, Rio de Janeiro, Brazil, Embrapa Agroindústria de Alimentos, Rio de Janeiro, Brazil

Evaluation of Advance Oxidation System in Controlling Healthcare-Associated Infections on Various Surfaces.

**Rick Falkenberg**, CFS - Scientific Air Solution

Influence of Pulsed Electric Fields (PEF) Pre-treatment on the Drying Process of Onions

Robin Ostermeier; Philip Giersemeh; **Claudia Siemer**; Stefan Toepfl - Elea Vertriebs- und Vermarktungsgesellschaft mbH, Quakenbrueck, Germany

Retention of the Functional Compounds of Mango Puree (*Mangifera indica* L.) by High Hydrostatic Pressure and Moderate Temperature

Mariana Camiro-Cabrera; **Zamantha Escobedo-Avellaneda**; Blanca Salinas-Roca; Olga Martín-Belloso; Jorge Welti-Chanes - Centro de Biotecnología FEMSA, Tecnológico de Monterrey, México

The Effect High Hydrostatic Pressure and Mild Heat Treatments in Orange Peel Dietary Fiber Functionality and Hygroscopic Properties



Viridiana Tejada-Ortigoza; Luis Eduardo Garcia-Amezquita; Sergio O. Serna-Saldívar; **Zamnatha Escobedo-Avellaneda**; Jorge Welti-Chanes, Centro de Biotecnología FEMSA, Tecnológico de Monterrey, México

Inactivation of *Salmonella spp.* and *Enterococcus faecium* on Strawberries and Blueberries by High Pressure Processing

Mu Ye; Catherine Rolfe; **Zhe Li**; Alvin Lee - Institute for Food Safety and Health, Illinois Institute of Technology; Bedford Park, USA

Friday, May 26, 2017 (Optional industry visit)	
<b>7:00 – 8:00 AM</b>	Registration
<b>8:00 – 8:30 AM</b>	Shuttle to the Institute for Food Safety and Health (IFSH)
<b>8:30 - 10:30 AM</b>	Tour of the nonthermal processing facilities at IFSH
<b>10:30 – 11:30 AM</b>	Shuttle to Liberty Cold – high pressure processing toll facility
<b>11:30 – 1:30 PM</b>	Tour of Facility
<b>1:30 – 2:15 PM</b>	Debriefing, Questions & Answers Boxed lunch (potentially be sponsored by the hosting company)
<b>2:15 – 3:00 PM</b>	Shuttle to Marriott, Burr Ridge