

**CHRISTOPHER J. DOONA, Ph.D.**

**CURRICULUM VITAE**

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## I. Professional Summary and Education

MIT - Institute for Soldier Nanotechnologies, Cambridge MA.  
US Army - Natick Soldier RD&E Center.  
University of Massachusetts – Lowell (HEROES).  
Middlebury College  
Natick Chapter of Sigma Xi - President (2008-09, 2015-17).

Ph.D. Physical Chemistry, Brandeis University, Waltham, MA, 1991  
A.B. (*cum laude*) Biology-Chemistry, Ripon College, Ripon, WI, 1986

Army Acquisition Corps Member (Level III Certified for SPRDE and STM).  
Certified Food Scientist, IFT - The International Food Science Certificate Commission, 2013.  
Rutgers University/IFT - International HACCP Alliance Certification, 2012.  
IFT Professional Training Short Course - Water Activity, 2005.  
Human Genetics, University of Massachusetts Medical School, 1995-1996.  
Human Resources Management, Auburn University MBA Program, 1992-1993.

## II. Professional Experience

**2016-pres.** Massachusetts Institute of Technology – Institute for Soldier Nanotechnologies, Research Associate, Cambridge, MA.

**2009-pres.** Senior Research Chemist, US Army Natick Soldier RD&E Center, Natick, MA.  
**Warfighter Directorate:** Materials Science, Food Science and Technology, Chemical-Biological Decontamination, Base Camps, Future Soldier 20xx – Physical Sciences Advisor.

**1998-2009** Senior Research Chemist, US Army Natick Soldier RD&E Center, Natick, MA.  
**Combat Feeding & Engineering Directorate:** Team Leader, Cell Leader, and researcher for Senior Scientist Research Team, Combat Feeding Innovative Science Team, Advanced Processing & Packaging Team, Food Safety & Defense Team investigating independently and collaboratively various aspects of Food Science & Technology relating to whey dairy protein hydrogels, thermal processing, non-thermal processing technologies, food stabilization and storage, chemical heating, mathematical modeling, water dynamics in foods.

- 1996-1998** Visiting Professor, Middlebury College, Department of Chemistry and Biochemistry, Middlebury, VT 05753.  
Lectured 11 courses, including labs (General, Organic, Physical, Environmental, Analytical & Instrumental, Inorganic, Senior Theses Seminars); Mentored Student Research (Analyzing Mercury in Lake Champlain sediments); Chaired Visiting Scholar Seminar Series.
- 1995-1996** Postdoctoral Researcher, US Army Natick Soldier RD&E Center, Natick, MA.  
Sustainability Directorate: Office of Senior Scientist Dr. Irwin A. Taub.
- 1993-1995** National Science Foundation Postdoctoral Fellow, Auburn University – Department of Chemistry, Auburn, AL.
- 1991-1993** National Science Foundation Visiting Scientist (Principal Investigator, Research at Foreign Centers of Excellence), Die Institut für Physikalische Chemie der Universität-Würzburg, Germany.
- 1989-1991** Graduate Student Researcher, Budapest, Hungary (Eötvös Loránd University, (co-sponsored National Science Foundation-Hungarian Academy of Sciences).
- 1998-1999** Physics (lecture and laboratory), Walnut Hill High School, Natick, MA.  
**1994-1995** General Chemistry (lecture & lab), Southern Community College, Valley, AL.  
**1993-1995** Tutor (Chemistry & Biology), Auburn University Athletics Program.  
**1992-1993** Human Biology, University of Maryland – European Programs for the Military, Giebelstadt, Germany.

### III. References (additional references available upon request)

- i) Prof. Peter Setlow  
Board of Trustees Distinguished Professor  
University of Connecticut Health Center  
[setlow@uchc.edu](mailto:setlow@uchc.edu)  
860-679-2607
- ii) Prof. Kenneth Kustin  
Professor of Chemistry, Emeritus  
Brandeis University  
[kkustin123@att.net](mailto:kkustin123@att.net)  
858-450-2979
- iii) Dr. Phil Gibson  
US Army-Natick Soldier RDEC (ret.)  
[phillipwgibson@comcast.net](mailto:phillipwgibson@comcast.net)  
508-429-3094
- iv) Dr. Brendan Neimira  
USDA-ARS-ERRC  
[brendan.niemira@ars.usda.gov](mailto:brendan.niemira@ars.usda.gov)  
215-233-6583

v) Dr. Alexander Malkin  
Lawrence Livermore National Laboratory  
[malkin1@llnl.gov](mailto:malkin1@llnl.gov)  
925-423-7817

#### **IV. Honors, Awards, and Grants**

- 1. 2017 Institute of Food Technologists – Industrial Scientist Achievement Award.**
- 2. 2015 Institute of Food Technologists – Outstanding Volunteer for the Nonthermal Processing Division, for outstanding contributions to the Division and to the field of Nonthermal processing.**
- 3. 2015 NSRDEC Outstanding Technology Transfer Award 2015 – for research & development work leading to the commercialization of a novel decontamination technology used by international public health organizations (NIH, MSF, WHO) and the US government to fight the outbreak of Ebola at the epicenter in West Africa.”**
- 4. 2015 Warfighter Directorate Tier I Outstanding Technology Transfer Award.**
- 5. Institute of Food Technologists Nonthermal Processing Division Outstanding Service Award 2013.** The Institute of Food Technologists Nonthermal Processing Division Outstanding Service Award honors an individual for a history of exemplified service to the field of Nonthermal Processing.
- 6. The International Food Science Certificate Commission–Certified Food Scientist** for competence, proficiency, professional experience, education, and ethics (inaugural class of 2013).
- 7. Thomson Reuters Top 100 Global Innovators for 2012.** Featured Natick inventor for first time any government agency has ever made this list (see "NSRDEC patents help Army into 'Top 100 Global Innovators,'" available at: [http://www.army.mil/article/99816/NSRDEC\\_patents\\_help\\_Army\\_into\\_\\_Top\\_100\\_Global\\_Innovators\\_/](http://www.army.mil/article/99816/NSRDEC_patents_help_Army_into__Top_100_Global_Innovators_/)).
- 8. Institute of Food Technologists 2011, Chair of the Nonthermal Processing Division.** Elected by peers in the field, and through dynamic, innovative leadership in expanding and intensifying participation in the Executive Committee; increasing opportunities of Students and young women in Science; establishing four (4) new, active Sub-committees (Industry Sponsorship, Publications, International Workshops, and Long-range Planning) and defining their goals, appointing Chairs, and determining member composition; organizing and actively leading ten (10) monthly ExCom and Sub-Committee conference calls; volunteering to judge Graduate Student Poster Competition; organizing, leading, and moderating the first-ever Nonthermal Processing Division-Food Engineering Division Joint Social Networking Event

featuring Evan Turek/Kraft Scholarship, Food Safety Magazine Achievement Award, 2 Distinguished Lecturers, and Divisions Awards presentations.

**9. 2010 Federal Laboratory Consortium Award for Excellence in Technology Transfer – "D-FENS": Disinfectant-sprayer for Foods and ENvironmentally-friendly Sanitation.**

**10. 2009 Department of the Army Research and Development Achievement Award for Technical Excellence – "D-FENS": Disinfectant-sprayer for Foods and ENvironmentally-friendly Sanitation.**

**11. 2009 DoD TechMatch Hot Technologies Contest. "D-FENS": Disinfectant-sprayer for Foods and ENvironmentally-friendly Sanitation (Nominated).**

**12. 2007 Federal Laboratory Consortium Award for Excellence in Technology Transfer – Portable Chemical Sterilizer: Electricity-free Microbial Decontamination Using Green Chemistry.**

**13–15. Who's Who in America 2007-present. Who's Who in the World 2010. Who's Who in Science and Engineering 2011.** Invited biography selected for publication since the 63<sup>rd</sup> edition of Marquis' Who's Who in America. Marquis Who's Who recognizes high-profile individuals whose noteworthy achievements influence the people of today and are sources worthy of interest in the permanent record. Marquis Who's Who in America is the nation's preeminent record of leadership, providing a powerful online database featuring over 1.4 million leaders and achievers from around the world.

**16. 2007 Department of the Army Research and Development Achievement Award for Technical Excellence – Controlling Water Dynamics for Enhanced Physicochemical Stability and Microbiological Safety of Novel Ration Foods and Food Processes.**

**17. 2007 NSRDEC Most Significant Research Achievement, Small Research and Development Laboratory of the Year Award – Dynamic Water Relationships in Foods.**

**18. 2007 Service to America Medal – Portable Chemical Sterilizer (Nominated).**

**19. 2006 Army's Greatest Invention Award – Portable Chemical Sterilizer (Nominated).**

**20. 2006 NSRDEC Most Significant Development Achievement for the Small Research and Development Laboratory of the Year Award, – Portable Chemical Sterilizer.**

**21. 2006 Department of the Army Research and Development Achievement Award for Technical Excellence – Next Generation Food Safety Models to Predict the Inactivation of *Listeria monocytogenes* Showing Tri-phasic Kinetics.**

**22. 2005 Department of the Army Research and Development Achievement Award for Technical Excellence – Portable Chemical Sterilizer for Microbial Decontamination of Surgical Instruments in Far-Forward Areas Using "Green" Chemistry.**

**23. 2005 Award for Significant New Ideas.**

**24. 2005 CFD On-the-Spot Award.**

**25. 2004 Department of the Army Research and Development Achievement Award for Technical Excellence – *Application of the Quasi-chemical Model for Predicting the Safety of Foods Using High Pressure Processing.***

**26. 1997 New England Consortium for Undergraduate Education Grant**, awarded to purchase microwave digestion system for analyzing environmental samples (sediments, plants).

**27. 1996-1998 (3×) Middlebury College Undergraduate Research Awards**, research awards to mentor undergraduate students in the investigation of the occurrence of toxic metals in the environment, particularly the presence of mercury using a cold vapor analyzer.

**28. 1991 National Science Foundation-International Programs: Foreign Research Center of Excellence Visiting Scientist Award (Principal Investigator of competitive research grant #INT-91004593).** Dr. Doona proposed to investigate the use of Coherent Anti-Stokes Raman Spectroscopy (CARS) of the luminol chemical oscillator with Professor Friedemann Schneider at the Universität-Würzburg, Institute for Physical Chemistry, Germany.

**29. 1989-1991 (2×) Visiting Chemistry Researcher Awards**, twice selected to participate in a research grant co-sponsored by the National Science Foundation, Brandeis University and the Institute of Inorganic and Analytical Chemistry, Eötvös L. University in Budapest, Hungary.

**30. 1986 Ripon College Achievement Award in Art History.**

**31. 1984-1986 Beta Beta Beta Biology Honors Society, Ripon College, WI.**

**32. 1985-1986 Eka Francien Chemistry Honors Society, Ripon College, WI.**

## V. Memberships in Professional Societies

1. Sigma Xi – Natick Chapter,  
President in 2016-17, 2015-16, and 2007-2008, Treasurer, Member-at-Large.  
In 2008, won Natick’s first-ever Chapter of Excellence Certificate from Sigma Xi National Committee for expanding and intensifying Chapter activities in accordance with national goals of increasing membership, enhancing Outreach activities, and hosting national speakers, such as Sigma Xi Award Winner Professor Judith Herzfeld of Brandeis University, Harry Lawless of Cornell University, Sigma Xi Distinguished Lecturer Dan Sandweiss of University of Maine, Professor Tom Pochapsky of Brandeis University, and Dr. Mary Mandels of NSRDEC (*Emeritus*).  
Attended 2010 Annual Meeting in Raleigh, NC. Gave poster presentation; judged student poster competition; participated in Delegates Meeting as voting member. Invited Delegate to attend for 2016 Annual Meeting.
  
2. Institute of Food Technologists (*Professional Member* since 2001)
  - A. Leadership Activities
    - Annual Meeting Scientific Planning and Advisory Committee (AMSPAP), 2014-2016.
    - Hot Topics Committee, Chair in 2015-16.
    - Executive Committee for IFT Press Advisory Group (formerly Book Communications Committee) since 2007 - present. Review all book concepts annually, and about 5–10 full proposals annually to select books for series.
    - Certified Food Scientist award from IFT’s International Food Science Certificate Commission for competence, proficiency, professional experience, education, and ethics. Part of the historic inaugural class to be honored and recognized at the 2013 IFT Annual Meeting.
    - Executive Committee of Food Packaging Division (elected Chair for 2016-17).
    - Executive Committee of the IFT Nonthermal Processing Division (NPD) since 2006, including elected Member-at-Large, Secretary, and Chair-elect. Served as Chair in 2011-12 and is currently Past-chair. Also served as co-Chair of Technical Program Committee that coordinated review, evaluation, and selection of abstracts for NPD support at IFT Annual Meeting; co-Chair of Graduate Student Poster Competition recruited judges, reviewed and scored abstracts, and participated as on-site Judge of Finalists and at Award Ceremony for top 3 winners; Chair of Long-Range Planning Committee; co-Chair of Industry & Financial Planning Committee that coordinated with fundraisers to develop a Social Networking Event at IFT Annual Meeting that recognized Evan Turek Scholarship winners, Division Distinguished Lecturers, and Food Safety Magazine Award winners; co-Chair of Workshop Planning Committee that developed guidebook for International Workshop applications and determined venues for future international Workshops (Florianopolis, Brazil; 2014 Athens, Greece; 2015 Columbus, Ohio).
    - Co-Director of Nonthermal Processing Short Course at IFT16. Presentation was highest rated among all presenters.

- Developed, Organized and Moderated 2 Symposia at IFT16.
- Co-Director of three (4) IFT Short Courses in HACCP Certification Training and Advances in the Commercialization of Nonthermal Processing that attracted widespread attendance from an international audience.
- Invited member of Executive/Organizing and Scientific Committees for IFT-NPD International Workshops (2010 Montreal, Canada; 2011 Osnabrück, Germany; 2012 Melbourne, Australia; 2013 Florianopolis, Brazil; 2014 Athens, Greece; 2015 Columbus, Ohio; 2016 Beijing, China - postponed) to direct Technical Programming, evaluate submitted abstracts, and judge student poster competitions. Presenter at International Workshops in 2004 (IFSH near Chicago, IL; 2005 at USDA in Wyndmoor, PA; and 2008 in Portland, OR).
- Executive Committee for IFT Food Safety & Defense Subpanel for past 3 years determining areas of interest for Annual Meeting programming, reviewing and scoring submitted abstracts, and selecting Annual Meeting Symposia in discussion with other Subpanel members.
- In March, 2012, invited participation in IFT Face-to-face Workshop in Chicago to meet, discuss with, and get important feedback from leading scientists and experts who have had a demonstrated impact on the performance of the organization to shape changes in IFT structure.
- In Sep, 2012, participated in IFT survey to determine gaps in Food Science and Technology Research in need of support by scientific funding agencies.
- In 2011, invited by IFT to participate on committee for creating and determining appropriate criteria for Division Volunteer and Service Awards.
- In March, 2011, invited participation in IFT Leadership Workshop: Destination Member Value as leadership training to recognized future leaders of IFT.
- In Aug, 2010 invited participation by IFT to participate on committee to develop online educational programs.
- Selected NPD representative at the 2008 IFT Strategic Leadership Forum from March 27-29, 2008 in Chicago, IL. This Forum is dynamic event that invests educational programming that develops leadership skills in emerging leaders for the future of IFT.

#### B. Scholarly Activities

- *Invited Editor of 2<sup>nd</sup> edition of High Pressure Processing of Foods.* CJ Doona, K Kathiravan, FE Feeherry, Eds. IFT Press/Wiley-Blackwell Publishing. Features updates in bacterial spores and mathematical modeling (expected 2014).
- Invited lead Editor of *Case Studies in Novel Food Processing Technologies: Innovations in processing, packaging, and predictive modeling* (Woodhead Publishers, 2010) communicates the significant potential of commercializing novel food processing technologies to improve product quality, product safety, and process efficiency by providing insightful, first-hand experiences of pioneering experts involved with novel processing technologies, such as condensed carbon dioxide, cool plasma, infrared heating, ultrasonics, ozone, or with antimicrobials or oxygen depleting packaging, or with innovations in retorting, microwaving, and predictive modeling. An advanced text for helping



moving great research findings out of the laboratory and into the commercial marketplace.

- Invited co-Editor of the book *Microbial Safety of Fresh Produce* (IFT Press/Blackwell Publishing, 2009). *Microbial Safety of Fresh Produce* was edited by Xuetong Fan and Brendan Niemira (USDA), Christopher J. Doona and Florence E. Feeherry (US Army–NSRDEC), and Robert Gravani (Cornell University) covers all aspects of produce safety by featuring authors at the forefront of the produce industry and academic and government research discussing the latest pro-active strategies and technologies available to improve the safety of fresh produce. *Microbial Safety of Fresh Produce* discusses pathogen ecology, agro-management, pre-harvest strategies such as Good Agricultural Practices, the adverse economic impacts of high-profile outbreaks associated with fresh produce, fast and reliable techniques for detecting pathogens on or internalized in produce, risk analysis of irrigation waters and supply lines, and innovative technological applications as post-harvest interventions such as irradiation, biological controls, and chemical sanitizers. *Microbial Safety of Fresh Produce* features a chapter showcasing the Army's basic research expertise and ingenuity involving adapting novel chlorine dioxide technologies for disinfecting microorganisms for applications in pathogen and bacterial spore inactivation for treating fresh produce, and co-authored by Christopher J Doona, Florence E. Feeherry, and renowned bacterial spore expert Prof. Peter Setlow. *IFT Press* books serve as essential text books for academic programs and as leading edge handbooks for industrial application and reference.
- Invited originator and lead Editor of the book *High Pressure Processing of Foods* (IFT Press/Blackwell Publishing, 2007). *High Pressure Processing of Foods* (Editors Christopher J. Doona and Florence E. Feeherry) is the landmark resource on which all subsequent nonthermal processing books are based. With its focus on the mechanisms and predictive modeling of bacterial spore inactivation by high pressure, *High Pressure Processing of Foods* interweaves contributions from an array of leading international experts relating leading scientific advancements involving the use of molecular biology techniques to explore the biochemical mechanisms of spore germination and inactivation by HPP; investigations of the inactivation of different spore species as functions of processing parameters such as pressure, temperature, time, food matrix, and the presence of anti-microbials; mathematical models predicting spore inactivation kinetics; and an assessment of improvements to food quality through the use of HPP. *IFT Press* books serve as essential text books for academic programs and as leading edge handbooks for industrial application and reference. *High Pressure Processing of Foods* contains 3 invited chapters (Chapters 1, 6, and 10) that showcase the complementary talents of basic research scientists in NSRDECs ILIR program. Featured authors included Margaret Patterson, Christopher J Doona, Peter Setlow, Murad Al-Holy and Barbara Rasco, Chris Michiels, Michael Gänzle, Roman Buckow, Florence Feeherry, Edward Ross, Maria Corradini, Micha Peleg, Ahmed Yousef, Stanley Brul, Ming Lau, Evan Turek, Alan Wright, Armand Cardello, Rick Bell, and Edmund Ting.

- Invited to Originate, Organize, and Moderate 16 cutting-edge, hot-topic Symposia, Technical Sessions, or Expert Panels at IFT Annual Meetings since 2003 with the sponsorship of several Division and Subpanels.
  - Reviewer of IFT's flagship publication *Journal of Food Science*.
3. American Chemical Society. (Member since 1988)
- Invited presentation at NESACS January, 2015 meeting on Army Chemistry in the Fight Against Ebola.
  - Executive Committee for the Theodore William Richards Award for Excellence in Secondary School Education, Northeast Section of the American Chemical Society (NESACS). This committee seeks nominations from local area high school teachers; evaluates the candidates based on their contributions to chemistry and high school chemistry students in the classroom, in the lab, and outside of school; then selects a candidate and presents them with an award at the annual NESACS education dinner in May.
  - Co-Chairman of the NESACS Public Relations Committee. This committee seeks to promote chemistry, chemists, and NESACS by composing stories, and then disseminating these write-ups in local media outlets such as town newspapers and in ACS publications.
  - Invited presentation for the NESACS Young Chemist's Committee in Newton, MA (February, 2003). Presented a talk entitled "Combat Rations Research" to discuss the rewards of food science research with prospective graduate students and post-doctoral researchers.
  - Peer-reviewed publications in major ACS journals (*Journal of Agriculture and Food Chemistry*, *Inorganic Chemistry*, *Journal of Physical Chemistry*, *Journal of Chemical Education* - pending)
  - Poster presentations at ACS National and Regional Meetings.
4. Food Safety Summit (Professional Member since 2010)
- Co-Director and Lecturer for Risk-based Preventative Controls and HACCP Certification Training 3-day Short Course, April, 2014, Baltimore, MD.
  - Co-Director and Lecturer for Risk-based Preventative Controls and HACCP Certification Training 3-day Short Course, April, 2013, Baltimore, MD.
  - Co-Director and Lecturer for HACCP Certification Training 3-day Short Course, April, 2012, Washington, DC. Earned HACCP Training Certificate from International HACCP Alliance and Rutgers University.
  - Invited Presentation and Moderator for Half-day Workshop on HACCP Principles, March, 2011, Washington, DC.
5. Member of the International Conference on Predictive Modeling in Foods (ICPMF) Series
- Invited member of the Organizing Committee, the Technical Committee, a Session Moderator, and a Symposium presenter for the 6<sup>th</sup> ICPMF (Washington, DC, Sep. 2009).
  - Invited Symposium presentation for the 5<sup>th</sup> ICPMF (Athens, Greece, 2007) organized by Agricultural University of Athens, National Technical University of Athens, Aristotle University of Thessaloniki with international co-sponsors

Katholieke Universiteit, Leuven (Belgium), Institute of Food Research, Norwich (UK), ADRIA, Quimper (France), University of Tasmania (Australia).

- Invited Symposium presentation for the 4<sup>th</sup> ICPMF (Quimper, France, 2003). Organized by Université de Bretagne Occidentale, Laboratoire Universitaire de Microbiologie Appliquée Quimper, Technopole Quimper Cornouaille, ADRIA, and Katholieke Universiteit Leuven (Department of Chemical Engineering, BioTeC – Bioprocess Technology and Control), and co-sponsored by Conseil Régional de Bretagne, Conseil Général du Finistère, Quimper Communauté, Université de Bretagne Occidentale, and Sigma Plus.

6. Member of Model-It, The International Symposium Series on Applications of Modeling as an Innovative Technology in the Agri-Food Chain.

- Invited Symposium presentation at Model-It 2008, Madrid, Spain. Organized by IMDEA alimentación, TAGRALIA Comunidad de Madrid, Escuela Técnica Superior de Ingenieros Agrónomos, and Universidad Politécnica de Madrid, under the aegis of International Society for Horticultural Science, Sociedad Española de Ciencias Hortícolas, European Society of Agricultural Engineers, Sociedad Española de Agroingeniería, and International Institute of Refrigeration.
- Invited Symposium presentation at Model-It 2005, Leuven, Belgium. Organized as a European Commission COST-924 initiative (Coordination in the field of Scientific and Technical research by Katholieke Universiteit Leuven, Department of Chemical Engineering, BioTeC – Bioprocess Technology and Control) in Belgium and the Wageningen University and Research Center in the Netherlands under the aegis of ISHS (International Society for Horticultural Science), IIR (International Institute of Refrigeration), and FWO Vlaanderen (Research Foundation – Flanders) and sponsored by Fluent, Comsol, and SAS.

7. Member (since 2010) of International Society of Food Engineering, a global society that aims to strengthen communication and networking opportunities in Food Engineering.

8. American Institute of Chemical Engineers (member since 2003).

Invited to contribute as Symposium organizer and moderator at Annual Meetings, made Oral presentations at Annual Meetings, and have peer-reviewed publications in AIChE journal.

9. International Microwave Power Institute (member since 1996).

10. Reviewer of ARO-sponsored MURI grant titled “Understanding the Skin Microbiome through the Integration of Metagenomics, Bioinformatics, Spatial Ecology and Synthetic Biology” led by researchers at Johns Hopkins University.

11. Reviewer and research collaboration with MURI “Modeling Bacterial Spore Germination.”

- Invited to 2008 kick-off meeting in Key West, FL that convened leading basic researchers in military agencies and academia involved in modeling spore dynamics. The workshop covered overviews of the current state of knowledge of

the two subject areas followed by break-out groups and discussion sessions with the purpose of defining precise courses of action to dissect one of the major remaining "black boxes" of spore germination, to include the establishment of future collaborations. Attendees included, *Military*: K Indest, E Perkins of US Army –ERDC; L Parks, M Strand, B Kokoska, W Buchholz of ARO; CJ Doona of NSRDEC; C Sunday, M Hurley of ARL; N Fisher of AMEDD; M Eby of the Air Force; and *Academia*: P Setlow, A Moir, G Gould, D Popham, P Hanna, Y-Q Li, M Sarker, J Faeder, C Rao, R Srivastava, P Dhurjati, K Radhakrishnan, B Hlavacek, J Edwards, L Hornstra, G Christie, A Halasz. Since 2009, has hosted annual ARO reviews at NSRDEC on progress on this MURI.

- Reviewer and host of MURI review meeting in 2009, 2010, 2011, 2013.
- Invited attendee to MURI retreat meeting at U. Conn. Health Center, Aug, 2012.
- Research collaboration with MURI investigators has led to one co-authored publication, one co-authored manuscript almost ready to submit, and one manuscript in preparation regarding the influence of hydrostatic pressure on spore germination characteristics and behaviors.

## 12. Advisory Board, Editorial Boards, Review Committees

- Editor, Food Engineering Reviews (Springer Publishing).
- Reviewer, National Science Foundation – Board 2020 Vision
- Reviewer, National Science Foundation – Inorganic Chemistry
- Reviewer, USDA – National Research Initiative – Novel processing technologies
- Reviewer, USDA - Cooperative State Research, Education, and Extension Service, Small Business Innovation Research Program.
- Reviewer, US Army Research Office (ARO) – bacterial spores, biofilm formation/inhibition, and health implications of biofilms in drinking water.
- In April 2011, nominated to serve USDA Advisory Board for Univ. Minnesota Proposal on nonthermal pasteurization.
- In Jun, 2010, invited to serve on USDA Research Advisory Board for \$5M Agriculture and Food Research Initiative for Colorado State University.
- In 2005-08, Executive Committee Member (Microbiology Sub-committee) of NSRDEC's Dual Use Science & Technology High Pressure Processing Consortium among government, commercial industry, and academia to promote the mutually beneficial development of high quality, sterilized foods for military rations and the commercial marketplace.
- From 2003-2008, Rutgers University – Center for Advanced Food Technology, Industrial Advisory Board Member. Monitor for the Food Safety cluster and the Flavors and Ingredients cluster. Reviewed CAFT manuscripts prior to submission to peer-reviewed journals. Reviewed research proposals for content and military relevance. Attended semi-annual meetings.
- 1 June 2012 - invitation to join Editorial Board of Journal of Science and Engineering.
- Invited Editorial Board Member, Journal of Food Science and Engineering.
- Invited Editorial Board Member for The Open Food Science Journal by Bentham Science Publishers.

- Tenure Review Committee, Department of Chemistry, Stonehill College, Easton, MA.
- Tenure Review Committee, Department of Chemistry, Portland State University, Portland, OR.

13. Invited expert reviews for premier, refereed research journals

- (IFT) Journal of Food Science
- (ACS) Journal of Physical Chemistry
- (Elsevier) food Microbiology, Journal of Food Engineering, Trends in Foods Science and Technology.
- Lebensmittel-Wissenschaft und Technologie.
- Food Science and Technology.
- Journal of Radiation Chemistry.
- Letters in Applied Microbiology.
- Journal of Applied Microbiology.
- The International Journal of Food Service Technology
- Chemical Research in Toxicology
- Canadian Journal of Chemistry
- Physical Chemistry Chemical Physics
- Journal of Food Protection
- J Food Science and Engineering
- Critical Review in food Science and Nutrition
- Applied and Environ Microbiology.
- Journal of Biomedical Optics.
- Journal of Processing and Preservation.
- Chemical Research in Toxicology

## VI. Patents and Technology Transfer

### A. Patents

1. "CoD: Compartment of Defense" (*disclosure in preparation*).
2. USPTO Patent Application No. 61781313 (allowed August, 2016), CJ Doona and K Kustin. "D-FEND ALL: Disinfectant for ENvironmentally-friendly Decontamination, ALL-purpose"
3. USPTO Patent Application No. 20110054855, CJ Doona, FE Feeherry, K Kustin. "Method for Microbiological Quasi-chemical Kinetics Modeling."
4. USPTO Patent No. 8,366,961, CJ Doona, MA Curtin, IA Taub, and K Kustin. Chemical combination for the generation of disinfectant and heat (3)
5. USPTO Patent No. 8,337,717, CJ Doona, FE Feeherry, K Kustin, MA Curtin. "D-FENS: Disinfectant-sprayer for ENvironmentally-friendly Sanitation."
6. US Patent No. 8,182,715 CJ Doona, MA Curtin, IA Taub, and K Kustin "Chemical Combination for the Generation of Disinfectant and Heat" (2).
7. USPTO Patent No.8,133,450, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (6)
8. USPTO Patent No.8,133,449, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (5)
9. USPTO Patent No.8,133,448, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (4)
10. USPTO Patent No. 7,988,930, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (3)
11. USPTO Patent No.7,976,791, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (2)
12. US Patent No. 7,883,640 CJ Doona, MA Curtin, IA Taub, and K Kustin "Chemical Combination for the Generation of Disinfectant and Heat." (1)
13. USPTO Patent No.7,625,533, CJ Doona, FE Feeherry, DG Baer, MA Curtin, S Kandlikar, K Kustin, IA Taub, AT McManus. "Portable Chemical Sterilizer." (1)
14. USPTO Patent Application 20100001232, CJ Doona, MA Curtin, IA Taub, and K Kustin.
15. USPTO Patent Application 20100196252, CJ Doona, MA Curtin, IA Taub, and K Kustin.

16. US Patent Application 20100193734, CJ Doona, MA Curtin, IA Taub, and K Kustin.

***B. Technology Transfer and Commercialization***

1. (2016) CRADA with Brandeis University (in processing)
2. (2015) CRADA – Applied Mathematics Inc.
3. (2015) Commercial Evaluation License – GoJo Inc.
4. (2014) Commercial Evaluation License – Dow Chemical Co.
5. (2013) Material Transfer Agreement – USDA ARS-ERRC.
6. (2012) Commercial Evaluation License – Biovation, LLC.
7. (2011) Limited Purpose (LP) CRADA – The Ohio State University.
8. (2010) Material Transfer Agreement – USDA ARS-ERRC.
9. (2009) Patent License Agreements (×3) with ClorDiSys Solutions, Inc., Lebanon, NJ (commercial product).
10. (2007-08) Transition from 6.1 Basic Research to 6.2/6.3 Sanitizing Solution Program.
11. (2006) Two Patent License Agreements (×2) – ICA TriNova, LLC.
12. (2006) Two Patent License Agreements (×2) – Primus Sterilizer.

## VII. Publications

### A. Books

1. (Invited book) "Phytochemical and Microbial Quality and Ultrasound and High Pressure Processing." CJ Doona, O Tokusoglu, FE Feeherry (Eds). IFT Press/Wiley-Blackwell (in review).
2. (Invited 2<sup>nd</sup> edition) "Case Studies for Novel Food Processing Technologies." CJ Doona, FE Feeherry, K Kustin (Eds). Elsevier (manuscript anticipated in Winter, 2016).
3. (Invited 2<sup>nd</sup> edition) "High Pressure Processing of Foods." CJ Doona, FE Feeherry, A Yousef (Eds). 2015 IFT Press/Wiley-Blackwell (manuscript in preparation).
4. (Invited book) "Case Studies in Novel Food Processing Technologies." CJ Doona, FE Feeherry, K Kustin (Eds). 2010, Woodhead Publishing Ltd.
5. "Microbial Safety of Fresh Produce: Challenges, Perspectives and Strategies." 2009. X Fan, B Neimira, CJ Doona, FE Feeherry, and R Gravani, Editors. IFT Press/Wiley-Blackwell Publishing.
6. (Invited book) *High Pressure Processing of Foods*, CJ Doona and FE Feeherry (Eds). 2007 IFT Press/Blackwell Publishing.

### B. Book Chapters

1. (Invited book chapter) CJ Doona, FE Feeherry, K Kustin, EW Ross, M Peleg. "The Enhanced Quasi-chemical Kinetics Model and a Unique Probabilistic Model for Microbial Inactivation by High Pressure Processing" In: *High Pressure Processing of Foods - 2nd edition*, CJ Doona, K Kathriavan, FE Feeherry, Eds. 2013 IFT Press/Wiley-Blackwell (*in preparation*).
2. (Invited book chapter) H Daryaei, K Krishnamurthy, SS Sablani, CJ Doona, FE Feeherry, E Ford. "Packaging for Novel Food Preservation Technologies. In: *Introduction to Food Packaging*. Wiley Publishing (*in review*).
3. (Invited book chapter) CJ Doona, K Kustin, FE Feeherry, EW Ross. "Mathematical Models based on Transition State Theory for the Microbial Safety of Foods by High Pressure." In: *High Pressure Processing of Foods – Principles, Technology, and Applications*, GV Barbosa-Cánovas, HLM Lelieveld, VM Balasubramaniam, editor. Springer Publishing (January, 2016).
4. (Invited book chapter) CJ Doona, FE Feeherry, K Kustin, S Grove, K Krishnamurthy, A Lee. "Combining sanitizers and nonthermal processing technologies to improve fresh-cut produce safety." In: *Electron Beam Pasteurization and Complementary Food Processing Technologies*, SD Pillai and S Shayanfar, editors. Woodhead Publishing Ltd., 2015.
5. (Invited book chapter) Ö Tokuşoğlu, CJ Doona. "High Pressure Technology and its Effects on Bioactives in Fruits and Cereals." In: *Fruits and Cereal Bioactives: Sources, Chemistry, and Applications*, 2010. Ö Tokuşoğlu and C Hall III, Eds. CRC Press, Taylor and Francis Group.
6. (Invited Book chapter) CJ Doona, FE Feeherry, EW Ross. "A case study in military ration foods: the Quasi-chemical model and a novel accelerated 3-year challenge test." In: *Case Studies of Novel Food Processing Technologies: Innovations in Processing, Packaging, and Predictive Modeling*. CJ Doona, FE Feeherry, K Kustin, Eds. 2010 Woodhead Publishing Ltd.



7. (Invited book chapter) CJ Doona, FE Feeherry, P Setlow, D Sisson, S Chandra S. "Military Applications for the Extended Shelf-life and Safety of Fresh Fruits and Vegetables." In *Microbial Safety of Fresh Produce: Challenges, Perspectives and Strategies*, 2009. X Fan, B Neimira, CJ Doona, FE Feeherry, R Gravani, Eds. IFT Press/Wiley-Blackwell Publishing.
8. (Invited book chapter) CJ Doona, FE Feeherry, EW Ross, M Corradini, M Peleg. "The Quasi-chemical and Weibull Distribution Models of Nonlinear Inactivation Kinetics of *Escherichia coli* ATCC 11229 by High Pressure Processing." In: *High Pressure Processing of Foods*, 2007. CJ Doona and FE Feeherry, Eds. IFT Press/Blackwell Publishing.
9. (Invited book chapter) M Patterson, M Linton, CJ Doona. "Introduction to High Pressure Processing." In: *High Pressure Processing of Foods*, 2007. CJ Doona and FE Feeherry, Eds. IFT Press/Blackwell Publishing.
10. (Invited book chapter) R Ruan, X Ye, P Chen, CJ Doona, TCS Yang. "Developments in Ohmic heating." In: *Improving Thermal Processing*, 2003. Philip Richardson, (Ed. Woodhead Publishing Ltd, Cambridge, England.
11. (Book chapter) R Ruan, X Ye, P Chen, CJ Doona, IA Taub. "Ohmic Heating." In: *The Nutrition Handbook for Food Processors*, 2002. CK Henry and C Chapman, Eds. Woodhead Publishing Limited, Cambridge, England.
12. (Book chapter) R Ruan, X Ye, P Chen, CJ Doona, IA Taub. "Ohmic Heating." In: *Thermal Technologies in Food Processing*, 2001. P Richardson, Ed. 2001 Woodhead Publishing Limited, Cambridge, England.

### C. Peer-reviewed journal publications

1. (Invited) CJ Doona, FE Feeherry, EW Ross, K Kustin, S Marcott, S Liu, X Ye X. 2016 Nonthermal Plasma and the mechanisms of spores of *Bacillus amyloliquefaciens*. *Frontiers in Microbiology – special edition (in preparation)*.
2. P Chatakanonda, CJ Doona, P Chinachoti. 2016. "Effects of High Pressure on Wheat Starch." *Journal of Food Science (in review)*.
3. X Lin, X Ye, P Chen, R Ruan, C Mok, CJ Doona, T Yang. 2016 "NMR relaxometry for measuring the viscosity of yogurt during fermentation." *Food Biophys. (in review)*.
4. Doona CJ, Feeherry FE, D'Angelo PA, Kustin K, Chen H, Huang R, Setlow P. 2016 "Modeling bacterial spore germination." *Food Engineering Reviews (accepted with minor revisions)*.
5. (Featured as AEM spotlight issue) Wang S, Doona CJ, Setlow P, Li Y-q. 2016 Characterization of cold atmospheric plasma inactivation of individual bacterial spores using Raman spectroscopy and phase contrast microscopy. *Applied and Environmental Microbiology (in press – featured in AEM Spotlight issue)*
6. (Featured in AEM Spotlight issue) Doona CJ, Feeherry FE, Setlow B, Wang S, Li W, Nichols F, Talukdar P, Sarker M, Li Y-q, Shen A, Setlow P. 2016. "Effects of high pressure treatment on spores of *Clostridium* species." *Applied and Environmental Microbiology* 82(17), 5287-5297 (featured in AEM spotlight).
7. (Invited review article) Feeherry FE, Kustin K, Doona CJ. 2015 "Chemical Kinetics for the Microbial Safety of Foods Treated with High Pressure Processing or Hurdles." *Food Engineering Reviews* 8(3), 272-291.
8. Doona CJ, Feeherry FE, Kustin K. "Mathematical models for the inactivation of *Escherichia coli*, *Listeria monocytogenes*, and *Bacillus amyloliquefaciens* spores by high pressure processing." *Proceedings of the 2015 International Nonthermal Processing Workshop*, 12-13 November 2015, Athens, Greece.

9. Gulati T, Datta AK, Doona CJ, Ruan RR, Feeherry FE. "Modeling moisture migration in model multi-domain food system: Application to storage of a sandwich system." *Food Research International* 2015, 76, 427-438.
10. Doona CJ, FE Feeherry, K Kustin, GG Olinger P Setlow, AJ Malkin, T Leighton. 2015. "Fighting Ebola with Novel Spore Decontamination Technologies for the Military." *Frontiers in Microbiology* (Research Topic: Microbial decontamination by novel technologies – Analytical approaches and mechanistic insights; A Mathys, K Reineke, H Jaeger, editors) 6 (663), 1-25.
11. (Invited contributing author) Ebola Virus Disease (EVD): Important aspects for the food science and technology community. 2014. *International Union of Food Science and technology (IUFoST) Scientific Information Bulletin*, November, 2014.
12. Luu S, Cruz-Mora J, Setlow B, Feeherry FE, Doona CJ, Setlow P. 2015. The Effects of Heat Activation on *Bacillus* Spore Germination with Nutrients or under High Pressure, with or without Various Germination Proteins. *Applied and Environmental Microbiology* 81(8), 2927-2938.
13. Doona CJ, Ghosh S, Feeherry FF, Ramirez-Peralta A, Huang Y, Chen H, Setlow P. 2014. High pressure germination of *Bacillus subtilis* spores with alterations in levels and types of germination proteins. *Journal of Applied Microbiology* 117(3), 711 - 720.
14. Kong L, Doona CJ, Setlow P, Li Y-q. 2014. Monitoring rates and heterogeneity of high pressure germination of *Bacillus* spores using phase contrast microscopy of individual spores. *Applied and Environmental Microbiology* 80, 345-353.
15. Perez-Valdespino A, Li Y, Setlow B, Ghosh S, Pan D, Korza G, Feeherry FE, Doona CJ, Li Y-q, Hao B, Setlow P. 2014. "Properties and Function of the SpoVAEa and SpoVAF Proteins of *Bacillus subtilis* spores." *Journal of Bacteriology* 196(11), 2077-2088.
16. (Invited video and written article) CJ Doona, FE Feeherry, P Setlow, A Malkin, T Leighton. 2014. "The PCS, D-FENS, and D-FEND ALL: Novel Chlorine Dioxide Decontamination Technologies for the Military." *Journal of Visualized Experiments* 88, e4354 (available at <http://www.jove.com/video/4354/the-portable-chemical-sterilizer-pcs-d-fens-d-fend-all-novel-chlorine>) – accessed 6 July 2015.
17. MA Curtin, S Dwyer, D Bukvic, CJ Doona, K Kustin. 2012. "Kinetics and Mechanism of the Reduction of Sodium Chlorite by Sodium Hydrogen Ascorbate in Aqueous Solution at Near-neutral pH." effector-driven oxidations by chlorite." *International Journal of Chemical Kinetics* 46(6), 216-219.
18. (Invited article) CJ Doona. 2012. "High Pressure Processing for the Inactivation of *Listeria monocytogenes* and Using the Enhanced Quasi-Chemical Kinetics Model. Institute of Food Technologists-Nonthermal Processing Division Newsletter. K Krishnamurthy and VM Balasubramaniam, Eds.
19. XY Butzin, AJ Troiano, WH Coleman, KK Griffiths, CJ Doona, FE Feeherry, G Wang, YQ Li, P Setlow. 2012. Analysis of the effects of a gerP mutation on the germination of spores of *Bacillus subtilis*. *Journal of Bacteriology*, 194(21):5749-58.
20. CJ Doona, FE Feeherry, EW Ross, K Kustin K. 2012. "Inactivation Kinetics of *Listeria monocytogenes* by High-Pressure Processing: Pressure and Temperature Variation." *Journal of Food Science*, 77(8), M458–M465.
21. CJ Doona, EW Ross, FE Feeherry. 2008. "Comparing the Quasi-chemical and Other Models for the High Pressure Processing Inactivation of *Listeria monocytogenes*." *Proceedings of Model-It 2008, the IV International Symposium on Applications of Modeling as an Innovative Technology in the Agri-Food Chain, Madrid, Spain. Acta Horticulturae*, 802, 351-358.

22. FE Feeherry, CJ Doona, EW Ross 2007. "Development of the quasi-chemical model for the inactivation of pathogens and bacterial spores by high pressure and chemical sterilizing agents." Proceedings of the 5<sup>th</sup> International Conference on Predictive Modeling in Foods, Athens, Greece.
23. CJ Doona, M-Y Baik. 2007. "Molecular mobility in model dough systems studied by time-domain nuclear magnetic resonance spectroscopy." *Journal of Cereal Science*. 45(3), 257-262. (Elsevier).
24. FE Feeherry, CJ Doona, EW Ross. 2006 "The Quasi-chemical kinetics model for the inactivation of microbial pathogens using high pressure processing." *Acta Horticulturae* 674, 245-251.
25. CJ Doona, FE Feeherry, M-Y Baik. 2006. "Water Dynamics and Retrogradation of Ultrahigh-Pressurized Wheat Starch." *Journal of Agricultural and Food Chemistry* 54(18), 6719-6724.
26. X Ye, S Wang, R Ruan, J Qi, AR Womac, CJ Doona. 2006. "Water Mobility and Mold Susceptibility of Engineered Wood Products." *Transactions of the American Society of Agricultural and Biological Engineers*, 49(4), 1159-1165.
27. X Lin, R Ruan, P Chen, M Chung, X Ye, T Yang, CJ Doona, T Wagner. 2006. "NMR State Diagram Concept." *Journal of Food Science*. 71(9), R136-R145.
28. CJ Doona, FE Feeherry, K Kustin, MA Curtin, DG Baer. 2006. "Portable Chemical Sterilizer for Microbial Decontamination of Surgical Instruments, Fresh Fruits and Vegetables, and Field Feeding Equipment" (Biomedical Technologies). Proceedings of the 25<sup>th</sup> Army Science, Orlando, FL.
29. CJ Doona, FE Feeherry, EW Ross, L Piscitelle, R DeCoste. 2005. "Quasi-chemical kinetics model and statistical secondary models for the inactivation of *Escherichia coli* ATCC 11229 and *Listeria monocytogenes* OSY - 8578 in surrogate foods by high pressure processing." Proceedings of the American Institute of Chemical Engineers Annual Meeting, Cincinnati, OH.
30. EW Ross, IA Taub, CJ Doona, FE Feeherry, K Kustin K. 2005. "The mathematical properties of the Quasi-chemical model for microorganism growth/death kinetics in foods." *International Journal of Food Microbiology* 99(2), 157-171.
31. CJ Doona, FE Feeherry, EW Ross. 2005. "A Quasi-chemical model for growth and death of microorganisms in foods by non-thermal and high pressure processing." Proceedings of the 4<sup>th</sup> International Conference on Predictive Modeling in Foods, JFM Van Impe, AH Geeraerd, I Legeurinel, P Mafart (Eds), Quimper, France.
32. CJ Doona, FE Feeherry, EW Ross. 2005. "A Quasi-chemical model for growth and death of microorganisms in foods by non-thermal and high pressure processing." *International Journal of Food Microbiology* 100(1), 21-32.
33. (Invited article) FE Feeherry, CJ Doona, EW Ross. 2005. "The Quasi-chemical kinetics model for the inactivation of microbial pathogens using high pressure processing." Proceedings of Model-It 2005, the Third International Symposium on Applications of Modeling as an Innovative Technology in the Agro-Food Chain, MLATM Hertog and BM Nicolai (Eds), Leuven, Belgium.
34. CJ Doona, FE Feeherry, MA Curtin, K Kustin, S Kandlikar, DG Baer. 2004. "Portable Chemical Sterilizer for Surgical Instruments" (Biomedical Technologies)." Proceeding of the 24<sup>th</sup> Army Science Conference, Transformational Science and Technology for the Current and Future Force (Biomedical Technologies section).
35. MA Curtin, IA Taub, K Kustin, N Sao, JR Duvall, KI Davies, CJ Doona, EW Ross. 2004. "Ascorbate induced oxidation of formate by peroxodisulfate: product yields, kinetics and mechanism." *Research on Chemical Intermediates*, 30(6), 647-661.

36. FE Feeherry, CJ Doona, IA Taub. 2003. "Effect of Water Activity on the Growth Kinetics of *Staphylococcus aureus* in Ground Bread Crumb." *Journal of Food Science*, 68 (3), 982-987.
37. (Invited article) FE Feeherry, EW Ross, CJ Doona. 2003. "A quasi-chemical model for the growth and death of microorganisms in foods by non-thermal and high pressure processing." Proceedings of the 4<sup>th</sup> International Conference on Predictive Modeling in Foods, JFM Van Impe, AH Geeraerd, I Leguérinel, P Mafart (Eds), 40-42, Katholieke Universiteit Leuven/BioTeC, Belgium, 347 pp., Quimper, France.
38. IA Taub, FE Feeherry, EW Ross, K Kustin, CJ Doona. 2003. "A Quasi-Chemical Kinetics Model for the Growth and Death of *Staphylococcus aureus* in Intermediate Moisture Bread." *Journal of Food Science*, 68(8), 2530-2537.
39. X Ye, R Ruan, P Chen, CJ Doona. 2003. "Simulation and verification of Ohmic heating in a static heater using MRI temperature mapping." *Lebensmittel-Wissenschaft und Technologie*, 37(1), 49-58.
40. X Ye, R Ruan, P Chen, CJ Doona, IA Taub. 2003. "MRI Temperature Mapping and Determination of the Liquid-Particulate Heat Transfer Coefficient in an Ohmically-Heated Food System." *Journal of Food Science*, 68(4).
41. X Ye, R Ruan, P Chen, K Chang, K Ning, IA Taub, CJ Doona. 2002. "Accurate and fast temperature mapping during ohmic heating using proton resonance frequency shift MRI thermometry." *Journal of Food Engineering*, 59(2-3), 143-150.
42. H Zhang, AK Datta, IA, CJ Doona. 2001. "Electromagnetics, Heat Transfer, and Thermokinetics in Microwave Sterilization." *American Institute of Chemical Engineers Journal*, 47, 1957-1968.
43. IA Taub, K Kustin, CJ Doona, MA Curtin. 1997. "Modeling Oxidation-Reduction Reactions in Chemical Heaters for Rations." Proceedings of the 20<sup>th</sup> Army Science Conference, Vol I, 77.
44. CJ Doona, DM Stanbury. 1996. "Equilibrium and redox kinetics of copper(II)-thiourea complexes." *Inorganic Chemistry*, 35(11), 3210.
45. CJ Doona. 1995. "Influences of catalytic metal ions on oligo-oscillations in the chlorite-thiocyanate reaction." *Journal of Physical Chemistry*, 99, 17059.
46. CJ Doona, DM Stanbury. 1994. "Adventitious catalysis in oscillatory reductions by thiourea." *Journal of Physical Chemistry*, 98, 12630.
47. CJ Doona, SI Doumbouya. 1994. "Chaos in the chlorite-thiocyanate oscillator." *Journal of Physical Chemistry*, 98, 513.
48. CJ Doona, K Kustin. 1993. "Oxygen electrode dynamic response calibration." *International Journal of Chemical Kinetics*, 25(4), 239.
49. CJ Doona, R Blittersdorf, FW Schneider. 1993. "Deterministic chaos arising from homoclinicity in the chlorite-thiorurea oscillator." *Journal of Physical Chemistry*, 97, 7258.
50. CJ Doona, FW Schneider. 1993. "Identification of colloidal Mn(IV) in permanganate oscillating reactions." *Journal of the American Chemical Society*, 115, 9683.
51. SI Doumbouya, AF Münster, CJ Doona, FW Schneider. 1993. "Deterministic chaos in serially coupled chemical oscillators." *Journal of Physical Chemistry*, 97, 1025.
52. CJ Doona, K Kustin, M Orbán, IR Epstein. 1991. "Newly designed permanganate-reductant chemical oscillators." *Journal of the American Chemical Society*, 113, 7484.
53. WE Robinson, H Michibata, K Kustin, CJ Doona. 1991. "Glutathione effects *Ciona intestinalis* larval tunic morphogenesis." *Journal of Experimental Zoology*, 27(1), 58.

## VIII. Major Conference and Professional Presentations

1. (Invited Lecturer and Short Course co-Director) Integrating Risk-based Preventative Controls into your HACCP Program and HACCP Certification Training Short Course. Institute of Food Technologists, Chicago, IL.
2. “Enhanced Quasi-chemical Kinetics Model” CJ Doona. Massachusetts Technology Transfer Center, UMass-Boston. 2016. Presentation to license patent to potential investors.
3. (Invited Symposium presentation – Session Chair) CJ Doona. “Mathematical models based on Transition-state theory for the inactivation of pathogens and bacterial spores by high pressure processing.” 2015 International Nonthermal Workshop, Athens, Greece.
4. (Invited Symposium presentation) CJ Doona. “D-FEND ALL – a novel ClO<sub>2</sub> decontamination technology for the military. Institute for Food Technologists Annual Meeting 2014, Chicago, IL.
5. (Invited presentation) CJ Doona. “Fighting Ebola with Army Decontamination Technologies” University Massachusetts-Amherst, September, 2015.
6. (Invited presentation) CJ Doona. “Fighting Ebola with Army Decontamination Technologies” Brandeis University, July, 2015.
7. (Poster presentation) CJ Doona. Self-decontaminating textiles for inactivating aerosolized spores of *Bacillus anthracis* Sterne. C-B Defense Conference (DTRA), St Louis, June 2015.
8. (Invited Lecturer and Short Course co-Director) Integrating Risk-based Preventative Controls into your HACCP Program and HACCP Certification Training Short Course. Food Safety Summit, Baltimore, 10-13 April, 2014.
9. (Invited Symposium presentation – Session Chair – Organizer) Doona CJ. “High Pressure Processing: Case studies in applications and commercialization: The Enhanced Quasi-chemical Kinetics Model for the inactivation of *Listeria monocytogenes* and bacterial spores by high pressure processing High Pressure Processing. Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
10. (Invited Symposium presentation – Session Chair – Organizer) Doona CJ. “. Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
11. (Invited Symposium presentation – Session Chair – Organizer) Doona CJ. “Packaging Systems for Advanced Food Preservation Technologies: Novel packaging for innovative chlorine dioxide technologies for fresh produce safety and shelf-life extension.” Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
12. (Invited Symposium presentation – Session Chair – Organizer – Hop Topic) Doona CJ. “Innovative Multi-hurdle Technology Concepts to Control Bacterial Spores: Biophysical mechanisms of bacterial spore inactivation by high pressure, cool plasma, and chlorine dioxide.” Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
13. (Invited Symposium presentation) Doona CJ. “Chemical kinetics for modeling the inactivation kinetics of *Listeria monocytogenes* by High-pressure Processing: Pressure and Temperature Dependence.” American Chemical Society National Meeting, San Francisco. 4-5 August, 2014.

14. (Invited International Symposium presentation) Doona CJ. "Inactivation Mechanisms of *Bacillus amyloliquefaciens* Spores by Nonthermal Atmospheric Pressure Plasma." INNOVA 2013, Sixth International Symposium on Food Innovation and Development: Paradigms in Food Science and Technology - a future vision for Emerging Technologies, Sustainability, and Health and Wellness. Montevideo, Uruguay. Organized/sponsored by Laboratorio Tecnológico del Uruguay, October, 2013.
15. (Invited International Keynote presentation – Session Chair – Break-out session Chair). Doona CJ. "Effects of nonthermal processes on microorganisms." 2013 International Nonthermal Processing Workshop – "Research and Innovation toward Competitiveness" – Florianópolis, Brazil (Session 1: Nonthermal technologies: food safety and legislation, Chairs: Rosires Deliza, Embrapa, and Sergio Vaudagna, INTI). Organized/sponsored by EMBRAPA, SENAI Santa Catarina, Nonthermal Processing Division of the Institute of Food Technologists (IFT), and the European Federation of Food Science and Technology (EFFoST). 2013- Brazil NPD (Invited Keynote. Also on Executive Committee and on Scientific Committee).
16. (Invited Lecturer) Integrating Risk-based Preventative Controls into your HACCP Program and HACCP Certification Training Short Course. Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
17. (Invited Lecturer – Course Director) Advances in the Commercialization of Nonthermal Technologies Short Course. Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
18. (Invited Symposium presentation – Session Chair - Organizer) CJ Doona. "Bacterial Spore Inactivation by Chlorine Dioxide," at the Symposium titled "Case Studies in Novel Processing Technologies." Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
19. (Invited Symposium presentation – Session Chair - Organizer) CJ Doona. "Case Studies in nonthermal technologies for spore decontamination, bio-films, and preventative controls for food safety. Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
20. (Invited Symposium presentation – Session Chair - Organizer) CJ Doona. "Novel chlorine dioxide technologies for the military for fresh produce safety, decontamination, and surface sanitation." Institute for Food Technologists Annual Meeting 2013, Chicago, IL.
21. (Invited Lecturer and Organizer) Hazard Analysis and Modeling Programs – HACCP Certification Training Short Course, 2013 Food Safety Summit, Baltimore, April, 2013.
22. (Invited Lecture) Doona CJ. "Temperature-accelerated 3-year Microbiological Challenge Test for Enrobed Sandwiches." Doona CJ, Feeherry FE, Ross EW. Australian Institute for Food Science and Technology, at University of Hobart, Launceston, Tasmania, Australia. Oct, 2012.
23. (Invited Presentation) Doona CJ. "Novel Chlorine Dioxide Technologies and Food Safety Applications for the Military." Organized/sponsored by Defence Science and Technology Organisation (DSTO), Scottsdale, Tasmania, Australia. Oct, 2012.

24. (Invited Symposium presentation) Doona CJ. "Biophysical Mechanism of Bacterial Spore Inactivation by Nonthermal Plasma and High Pressure Processing." IFT NPD International Workshop FIESTA 2012. Melbourne, Australia. Oct, 2012.
25. (Poster presentation) High pressure processing and pulsed electric field strategies on shelf-life quality and bioactives in fruit juices and functional soft drinks. O Tokusoglu, CJ Doona. Institute of Food Technologists Annual Meeting, Las Vegas, NV, June, 2012.
26. (Invited Lecturer and Organizer) Integrating Risk-based Preventative Controls into your HACCP Program and HACCP Certification Training Short Course. Institute of Food Technologists Annual Meeting, Las Vegas, NV, June, 2012.
27. (Invited Symposium presentation and Session Chair) CJ Doona and V Gunn (Biovation). Case studies in Packaging for Novel Processing Technologies: high pressure, microwaves, and fresh produce. Institute of Food Technologists Annual Meeting, Las Vegas, NV, June, 2012.
28. (Invited Symposium presentation) CJ Doona and J Swinkels (Applied Oxidation). Case Studies in Fresh Produce Safety: Fast Food, Food Processing, and Food Service. Institute of Food Technologists Annual Meeting, Las Vegas, NV, June, 2012.
29. (Invited Lecturer and Organizer) HACCP Certification Training Short Course, 2012 Food Safety Summit and Food Expo, Washington DC. April, 2012.
30. (Invited oral presentation). Doona CJ, Kustin K, Feeherry FE. "PCS, D-FENS, D-FEND ALL: Novel Chlorine Dioxide Technologies for Food Safety." *Advanced Non-thermal Processing in Food Technology (ANPFT) : Effects on Quality and Shelf Life of Food and Beverages'*. Organized/sponsored by Celal Bayar University at Pine Bay Holiday Resort, Kusadasi, Turkey. May, 2012.
31. (Invited oral presentation). Feeherry FE, Doona CJ, Ross EW. "Temperature-accelerated 3-year Microbiological Challenge Test for Enrobed Sandwiches." *Advanced Non-thermal Processing in Food Technology (ANPFT) : Effects on Quality and Shelf Life of Food and Beverages'*. Organized/sponsored by Celal Bayar University at Pine Bay Holiday Resort, Kusadasi, Turkey. May, 2012.
32. (Invited Keynote presentation). Doona CJ, Feeherry FE, Kustin K, Ross EW. "The Enhanced Quasi-chemical Kinetics Model for Food Safety." *Advanced Non-thermal Processing in Food Technology (ANPFT) : Effects on Quality and Shelf Life of Food and Beverages'*. Organized/sponsored by Celal Bayar University at Pine Bay Holiday Resort, Kusadasi, Turkey. May, 2012.
33. (Poster presentation) CJ Doona, FE Feeherry, K Kustin. "Environmentally-friendly ('green') technologies for bacterial spore inactivation. The ESTCP -SERDP Partners in Environmental Technology Technical Symposium and Workshop, Washington DC, Dec., 2011.
34. (Poster presentation). Doona CJ, Marcott SA, Feeherry FE, Ross EW, Kustin K, Huang Y, Ye P, Radosevich M, Coleman WH, Troiano AJ, Setlow P. "Cool plasma inactivation mechanism of bacterial spores surrogates of *Bacillus anthracis*." CB Defense Conference, Washington DC. Nov, 2011.
35. (Oral presentation) Doona CJ. Novel chlorine dioxide technologies for fresh Produce Safety." Site visit by Biovation LLC, US Army Natick Soldier RD&E Center. Nov, 2011.

36. (Invited Oral presentation) Doona CJ. Comparison of Nonthermal Plasma and High Pressure Processing Inactivation of Bacterial Spores." 2011 International IFT Nonthermal Processing Division Workshop - Innovation Food Conference 2011 (iFOOD 2011). Organized/sponsored by Deutsches Institut für Lebensmittel, Osnabrück, Germany. Oct, 2011.
37. (Poster presentation). Doona CJ, Kustin k. "The Enhanced Quasi-chemical kinetics model: a chemical kinetics approach for the inactivation of bacterial pathogens by ultra-high pressure. International Conference on Chemical Kinetics. Massachusetts Institute of Technology, Cambridge, MA. July, 2011.
38. (Invited Symposium presentation) CJ Doona and T Mattson (ClorDiSys). Novel nonthermal chlorine dioxide technologies for fresh produce safety. Institute of Food Technologists Annual Meeting, New Orleans, LA June 2011.
39. (Oral presentation) Doona CJ. PCS, D-FENS, D-FEND ALL: Novel chlorine dioxide technologies for military applications in Fresh Produce Safety and Bio-decontamination of textiles." Site visit by Applied Oxidation, US Army Natick Soldier RD&E Center. June, 2011.
40. (Invited presentation) Doona CJ. "Validation of: High pressure pasteurization, Microbial Challenge Testing, and Novel chlorine dioxide technologies." New Jersey Food Processors Association Meeting, Rutgers University Food Innovation Center, Bridgeton, NJ. May, 2011.
41. (Invited Lecture) CJ Doona. "Hazard analysis: Microbial challenge Testing." HACCP Training Half-day Workshop, Food Safety Summit and Expo 2011. Washington DC, 19-20 April 2011.
42. (Invited Chemistry Seminar) Doona CJ. "The science of novel nonthermal technologies with military applications in Decontamination and Food Safety." Portland State University, Department of Chemistry. Portland, OR Jan, 2011.
43. (Poster presentation) Doona CJ, Feeherry FE, Kustin K, Curtin MA. "Novel environmental-friendly chlorine dioxide technologies for fresh produce food safety." Sigma Xi 2010 Annual Meeting & Research Conference, Food Safety and Security Symposium. Raleigh, NC, November, 2010.
44. (Invited oral presentation) CJ Doona. "D-FENS and the Portable Chemical Sterilizer and D-FEND ALL - novel chlorine dioxide technologies for fresh produce safety." 2010 IFT-Nonthermal Processing Division International Workshop *Nonthermal Processing Technologies for Enhancing Food Safety, Quality, and Functionality*. Sponsored by IFT, the European Federation for Food Science and Technology, and Canadian Institute of Food Science and Technology at McGill University, Montreal, Canada, 10-14 October 2010.
45. (Invited Chemistry presentation) CJ Doona. Novel chlorine dioxide technologies for the military. Stonehill College, Department of Chemistry, Aug, 2010.
46. (Poster presentation) Y Huang, S Liu, XP Ye, M Radosevich, CJ Doona, FE Feeherry. "Nonthermal plasma inactivation of bacterial spores." 2010 American Society for Agricultural and Biological Engineers International Conference, Pittsburgh, 20-23 June 2010.
47. (Invited industry presentation) CJ Doona CJ and FE Feeherry. "The Enhanced Quasi-chemical Kinetics Model: Innovation, Cost-savings, and a Case Study." SPSS - an IBM Company. Sears Willy Tower, Chicago, IL. July, 2010.



48. (Invited Oral presentation) O Tokusoglu, FT Bozoglu, CJ Doona. "High pressure processing strategies on phytochemical, bioactive, and anti-oxidant activity in foods." Oral Session *Novel bioactives: Approaches for the search, evaluation and processing for nutraceuticals*. 2010 Institute of Food Technologists Annual Meeting, Chicago, IL, 17-21 July 2010.
49. (Invited Symposium presentation) M Peleg, M Corradini, CJ Doona, FE Feeherry. "A probabilistic model for the inactivation of bacterial cells and spores by thermal and nonthermal preservation processes." Symposium *Novel nonlinear inactivation kinetics models and risk assessment tools for controlling food safety using nonthermal technologies*. 2010 Institute of Food Technologists Annual Meeting, Chicago, IL, 17-21 July 2010.
50. (Invited Chemistry Seminar) K Kustin, CJ Doona, FE Feeherry, EW Ross. "The Quasi-chemical model for microorganism population dynamics." 2010 Portland State University, Department of Chemistry, Portland, OR. 17 April 2010.
51. (Poster presentation) CJ Doona. "D-FENS." 2010 Federal Laboratory Consortium Annual Award Banquet, Albuquerque, NM, Oct, 2009.
52. (Invited Oral presentation) CJ Doona, EW Ross, FE Feeherry, K Kustin, S Liu, XP Ye. "The Enhanced Quasi-chemical Kinetics Model for the Inactivation of Bacterial Spores by High Pressure Processing." The 6<sup>th</sup> International Conference on Predictive Modeling in Foods, Washington DC, 8-12 September, 2009.
53. (Invited Poster presentation) S Liu, XP Ye, CJ Doona, FE Feeherry. "Comparison of the Inactivation Mechanisms of Bacterial Spores by High Pressure, Wet Heat, and Chlorine Dioxide Using Rapid FTIR-ATR Techniques." American Society for Agricultural and Biological Engineering Annual Meeting, Reno NV, June, 2009.
54. (Invited poster presentation) CJ Doona, EW Ross, FE Feeherry, K Kustin, S Liu, X Ye. "Adapting and comparing the Quasi-chemical model for the inactivation of bacterial spores in puréed chicken by high pressure processing." 2009 Institute of Food Technologists Annual Meeting, Anaheim, CA, 6-9 June 2009.
55. (Invited Poster presentation) FE Feeherry, EW Ross, CJ Doona. "Comparison of *Staphylococcus aureus* survival in filled French toast sandwiches at three-years versus an accelerated microbiological challenge test protocol." 2009 Institute of Food Technologists Annual Meeting, Anaheim, CA, 6-9 June 2009.
56. (Invited Chemistry Seminar) CJ Doona, EW Ross, FE Feeherry, K Kustin, S Liu, XP Ye. "Adapting and comparing the Quasi-chemical kinetics model for the inactivation of bacterial spores in puréed chicken by high pressure processing." Department of Chemistry and Biochemistry, University of Massachusetts-Dartmouth, 22 April 2009.
57. (Invited Oral presentation) CJ Doona, EW Ross, FE Feeherry, K Kustin, S Liu, XP Ye. "Adapting and comparing the Quasi-chemical model for the inactivation of *Bacillus amyloliquefaciens* spores in puréed chicken by high pressure processing." 2009 Conference on Food Engineering Annual Meeting, Columbus, OH, 18-21 April 2009.
58. (Invited Oral presentation) FE Feeherry, CJ Doona, EW Ross. "3-year versus accelerated microbiological challenge test for *Staphylococcus aureus* survival in filled French toast." 2009 Conference on Food Engineering Annual Meeting, Columbus, OH, 18-21 April 2009.
59. (Invited Oral presentation) CJ Doona, FE Feeherry, K Kustin, MA Curtin. "D-FENS. Disinfectant-sprayer or Foods and Environmentally-friendly Sanitation: a novel

- chlorine dioxide sanitizing spray technology." 2009 World's Best Technology Showcase, Arlington, TX, 24-25 Mar 2009.
60. (Invited Oral presentation) CJ Doona CJ. "Predicting bacterial spore inactivation by high pressure processing using the Quasi-chemical model." 2008 Research & Development Associates Fall Meeting, Reno NV, 7-9 November 2008.
  61. (Invited poster presentation) CJ Doona, EW Ross, FE Feeherry, L Piscitelle, R DeCoste. "Comparison of the Quasi-chemical and other predictive models and a unique secondary model based on processing times for microbial inactivation kinetics by high pressure." 2008 IFT Annual Meeting, New Orleans, LA, 28 June – 1 July, 2008.
  62. (Invited poster presentation) CJ Doona, FE Feeherry, K Kustin. "D-FENS chlorine dioxide sanitizing sprayer system." 2008 IFT Annual Meeting (Food Microbiology Division), New Orleans, LA, 28 June - 1 July, 2008.
  63. (Invited Symposium presentation) CJ Doona, FE Feeherry, EW Ross. 2008. "Comparing the Quasi-chemical and Other Models for the High Pressure Processing Inactivation of *Listeria monocytogenes*." Model-It 2008, the IV International Symposium on Applications of Modeling as an Innovative Technology in the Agri-Food Chain, June 9-11, 2008, Madrid, Spain.
  64. (Invited industry presentation) CJ Doona, FE Feeherry, EW Ross EW. "Novel hurdles to improve the food safety and quality attributes of ground meat purées." Campbell's Soup Company, Soup Innovation R&D Program, May, 2008.
  65. (Invited Oral presentation) CJ Doona, FE Feeherry, K Kustin, MA Curtin. "Novel chlorine dioxide technology for eliminating pathogens on tomato surfaces." 2008 Institute of Food Technologists - Nonthermal Processing Division International Workshop, Portland, OR, 8-11 January, 2008.
  66. (Invited Poster presentation) CJ Doona, FE Feeherry, K Kustin, MA Curtin. "Novel chlorine dioxide technology for eliminating pathogens on tomato surfaces." 2008 Institute of Food Technologists - Nonthermal Processing Division International Workshop, Portland, OR, 8-11 January, 2008.
  67. (Invited oral presentation) FE Feeherry, CJ Doona, EW Ross. 2007 "Development of the quasi-chemical model for the inactivation of pathogens and bacterial spores by high pressure and chemical sterilizing agents." The 5<sup>th</sup> International Conference on Predictive Modeling in Foods, Athens, Greece.
  68. (Invited Symposium presentation) CJ Doona, MG Corradini, FE Feeherry, EW Ross, M Peleg. "The Quasi-chemical and Weibull Distribution Models of Nonlinear Inactivation Kinetics of *Escherichia coli* ATCC 11229 by High Pressure Processing." 2007 IFT Annual Meeting (Nonthermal Processing Division), Chicago.
  69. (Poster presentation) CJ Doona, FE Feeherry, K Kustin, MA Curtin, J Barcus, L Bonvini. 2007 "Kinetics and mechanism of effector-driven oxyhalogen reactions for the inactivation of foodborne microorganisms by chlorine dioxide." 234<sup>th</sup> American Chemical Society National Meeting (Agricultural and Food Chemistry Division), Boston, MA.
  70. (Poster presentation) L Yun, J Qi, X Lin, P Chen, R Ruan, T Yang, CJ Doona. "Monitoring moisture migration in binary food systems using MRI." 2007 IFT Annual Meeting (Food Engineering Division), Chicago, IL.

71. (*Invited poster presentation*) FE Feeherry, CJ Doona, K Kustin, MA Curtin. "Novel chlorine dioxide technology for eliminating pathogens on tomato surfaces." 2007 IFT Annual Meeting (Food Microbiology Division), Chicago, IL.
72. (*Oral presentation*) CJ Doona. "Portable Chemical Sterilizer for surgical instruments." 2007 Site Visit - Army Medical Department Center and School (AMEDD C&S), AMEDD Combat Developer Colonel James Signaico.
73. (*Oral presentation*). FE Feeherry, CJ Doona, M Richardson, J LeBlanc. "Effects of temperature on microbiological challenge tests of enrobed sandwiches undergoing long-term storage." 2006 IFT Annual Meeting (Food Microbiology Division), Orlando, FL.
74. (*Invited poster presentation*) CJ Doona, FE Feeherry, K Kustin, MA Curtin, DG Baer. "Portable Chemical Sterilizer for Microbial Decontamination of Surgical Instruments, Fruits and Vegetables, and Field Feeding Equipment" (Biomedical Technologies). 2006 – 25<sup>th</sup> Army Science Conference, Orlando, FL.
75. (*Invited Poster presentation*) J Qi , R Ruan, P Chen, Yuh Li, Yun Lin, CJ Doona. "Study of Water Diffusion between Bread and Cheese." 2006 ASABE Annual International Meeting, Portland, OR, 9-12 July 2006.
76. (*Invited Poster presentation*) R Fu, J Qi, R Ruan, P Chen, X Lin, XP Ye, CJ Doona, T Yang. "Monitoring Starch Saccharification Using Low-Field NMR." 2005 ASAE Annual International Meeting, Tampa, FL. July 2005. Paper No. 057018.
77. (*Invited Oral presentation*) XP Ye, R Ruan, P Chen, X Lin, CJ Doona, T Yang. "Low field magnetic resonance imaging of low-moisture food systems." Session title: Sensing Technologies in Food Quality and Safety. 2005 ASAE Annual Meeting, Las Vegas, NV.
78. (*Invited Oral presentation*) CJ Doona, FE Feeherry, K Kustin, MA Curtin, DG Baer. "Portable Chemical Sterilizer for surgical instruments." 2005 Army Medical Department Center and School (AMEDD C&S) - Directorate of Combat and Doctrine Development, Combat Casualty Care Integrated Concept Team, Tampa, FL.
79. (*Invited Symposium presentation*) CJ Doona, FE Feeherry, EW Ross. 2005. "The Quasi-chemical kinetics model for the inactivation of microbial pathogens using high pressure processing." Model-It 2005, The 3<sup>rd</sup> International Symposium on Applications of Modeling as an Innovative Technology in the Agri-Food Chain, Leuven, Belgium.
80. (*Invited oral presentation*) CJ Doona, FE Feeherry, EW Ross, R De Coste, L Piscitelle. "The Quasi-Chemical Kinetics Model and Statistical Secondary Models for the Inactivation of *Escherichia coli* ATCC 11229 and *Listeria monocytogenes* OSY - 8578 in Surrogate Foods by High Pressure Processing." 2005 American Institute of Chemical Engineers Annual Meeting, Conference on Food Engineering, High Pressure Processing Session, Cincinnati, OH.
81. (*Invited oral presentation*) FE Feeherry, CJ Doona, EW Ross. "The Quasi-chemical kinetics model for the high pressure inactivation of *Listeria monocytogenes* OSY – 8578 and of *Escherichia coli* ATCC 11229." 2005 IFT Annual Meeting (Food Microbiology Division), New Orleans, LA.
82. (*Invited poster presentation*) CJ Doona, FE Feeherry, K Kustin. 2005. "Controlled chemical generation of chlorine dioxide to eliminate pathogens from fresh fruits and

- vegetables.” 2005 IFT Annual Meeting (Fruits and Vegetables Products Division), New Orleans, LA.
83. (*Poster presentation*) J Qi, R Ruan, P Chen, X Lin, XP Ye, CJ Doona, T Yang. “Monitoring starch saccharification using low-field NMR relaxometry.” 2005 IFT Annual Meeting (Food Engineering Division), New Orleans, LA.
84. (*Poster presentation*) AH Barrett, U Sajjad, M Auerbach, CJ Doona, R Ruan R. “Effect of matrix structure on moisture migration in bilayer systems.” 2005 IFT Annual Meeting (Food Engineering Division), New Orleans, LA.
85. (*Poster presentation*) J Qi, R Ruan, XP Ye, P Chen, X Lin, CJ Doona, T Yang T. “MRI study of low moisture food and biopolymers with short relaxation times.” 2005 IFT Annual Meeting (Food Engineering Division), New Orleans, LA.
86. (*Invited*) CJ Doona, FE Feeherry, EW Ross. “Quasi-chemical kinetics model and statistical secondary models for the inactivation of *Escherichia coli* ATCC 11229 and *Listeria monocytogenes* OSY - 8578 in surrogate foods by high pressure processing.” 2005 IFT – Nonthermal Processing Division Meeting and Workshop, USDA-ARS Eastern Regional Research Center, Wyndmoor, PA.
87. (*Oral presentation*) Ross EW, Doona CJ, Feeherry FE. “Properties of the quasi-chemical mechanistic model for bacterial growth and death by non-thermal technologies.” 2004 IFT Annual Meeting (Non-thermal Processing Division and Food Microbiology Division), Las Vegas, NV.
88. (*Oral presentation*) Feeherry FE, Doona CJ, Ross EW, Sikes A, Magnone J. “Quasi-chemical model of *Staphylococcus aureus* growth-decline kinetics in intermediate moisture meat as functions of humectants, anti-microbials, and acidulants.” 2004 IFT Annual Meeting (Food Microbiology Division), Las Vegas, NV.
89. (*Invited Symposium Presentation*) Doona CJ, Feeherry FE, Ross EW. “Applying the quasi-chemical kinetics model to the high pressure inactivation of *Escherichia coli*.” At the Symposium entitled “Inactivating pathogens, parasites, and viruses using high pressure and other emerging nonthermal technologies” organized and moderated by Doona CJ, Feeherry FE, Dunne CP. 2004 IFT Annual Meeting (Nonthermal Processing Division and Food Microbiology Division), Las Vegas, NV.
90. (*Poster presentation*) Ye X, Ryan RR, Mok CK, Chen L, Yu F, Chen PL, Doona CJ, Yang TCS. 2004. “Monitoring the yogurt fermentation process using Magnetic Resonance Imaging and Relaxometry.” IFT Annual Meeting, Las Vegas, NV.
91. (*Invited Symposium presentation*) Baik MY, Feeherry FE, Doona CJ. 2003. “NMR and DSC analysis of physical changes to model food systems using high pressure processing.” IFT Annual Meeting (Non-thermal Processing Division and Food Microbiology Division), 13–16-July-2003, Chicago, IL.
92. (*Oral presentation*) Baik M-Y, Kou Y, Ross EW, Taub IA, Doona CJ. 2003. “Modeling water mobility distributions in dough, gluten, and starch systems using time-domain NMR spectroscopy.” IFT Annual Meeting (Nonthermal Processing Division), Chicago, IL.

93. (*Oral presentation*) Feeherry FE, Ross EW, Doona CJ. 2003. The inactivation kinetics of foodborne microorganisms in model foods using high pressure. IFT Annual Meeting (Food Microbiology Division), 12–16-July-2003, Chicago, IL.
94. (*Invited oral presentation*) Feeherry FE, Ross EW, Doona CJ. 2003. A quasi-chemical model for the growth and death of microorganisms in foods by non-thermal and high pressure processing. 4<sup>th</sup> International Conference on Predictive Modeling in Foods, Quimper (France).
95. (*Invited oral presentation*) Doona CJ, Dunne CP, Darsch GA. 2003. “The Role of the U.S. Army Ration Program in Implementation of New Food Processing Technologies: Past, Present and Future.” Conference on Food Engineering, AIChE Annual Meeting, San Francisco, CA.
96. (*Oral presentation*) Ye X, Ruan R, Chen P, Doona CJ, Yang TCS 2003. “Modeling and MRI temperature mapping of ohmic heating: effect of the applied voltage.” ASAE Annual Meeting, Las Vegas, NV.
97. (*Poster presentation*) Feeherry FE, Ross EW, Kustin K, Taub IA, Doona CJ. 2002. Predictive modeling of pathogen growth and death in intermediate moisture (IM) rations. 23<sup>rd</sup> Army Science Conference, 8-12–Dec-2002, Orlando, FL.
98. (*Published abstract*) Baik M-Y, Doona CJ, Kou Y, Ross EW, Taub IA. 2002. “Spectroscopic evidence for microstructural domains in food matrices using water mobility distributions.” 23<sup>rd</sup> Army Science Conference, Orlando, FL.
99. (*Oral presentation*) Feeherry FE, Doona CJ, Ross EW, Sikes A, Magnone JP, Yang APP, Taub IA. 2002. Predictive modeling of microbial pathogen growth as a function of water activity in intermediate moisture (IM) turkey meat. IFT Annual Meeting (Food Microbiology Division), 15-19–Jun-2002, Anaheim, CA.
100. (*Oral presentation*) Baik M-Y, Kou Y, Chinachotti P, Taub IA, Ross EW, Doona CJ. 2002. “Probing Water Population Dynamics in Dough with Time-domain NMR,” IFT Annual Meeting, Anaheim, CA.
101. (*Poster presentation*) Feeherry FE, Ross EW, Kustin K, Taub IA, Doona CJ. 2002. “Predictive Modeling of Pathogen Growth and Death in Intermediate Moisture (IM) Rations.” 23<sup>rd</sup> Army Science Conference, Orlando, FL.
102. (*Oral presentation*) Feeherry FE, Doona CJ, Ross EW, Sikes A, Magnone JP, Yang APP, Taub IA. 2002. “Predictive modeling of microbial pathogen growth as a function of water activity in intermediate moisture (IM) turkey meat.” IFT Annual Meeting, Anaheim, CA.
103. (*Oral presentation*) Doona CJ, Taub IA, Ruan R, Ye X, and Kandlikar S. 2002. “Ohmic heating potato and whey protein samples: Intrinsic chemical marker analysis of temperature uniformity and MRI determinations of interface heat transfer coefficients.” IFT Annual Meeting, Anaheim, CA.

104. (*Oral presentation*) Ye X, Ruan R, Chen P, Doona CJ, Taub IA. 2002. "Modeling and verification of 3-dimensional Ohmic Heating in a static system using magnetic resonance imaging," ASAE Annual Meeting in Chicago, IL.
105. (*Oral presentation*) Doona CJ, Ross EW, Taub IA. 2001. "Reaction kinetics and mechanism for the formation of intrinsic chemical markers." IFT Annual Meeting, New Orleans, LA.
106. (*Oral presentation*) Doona CJ, Taub IA, Kandlikar S, Ruan R, Ye X. 2001. "Using chemical markers to map temperature distribution in Ohmically-heated whey gel 'electric' circuits." IFT Annual Meeting, New Orleans, LA.
107. (*Oral presentation*) Ye X, Ruan R, Chen P, Doona CJ, Taub IA. 2001. "Study of heat transfer in ohmically heated food system using fast magnetic resonance imaging." ASAE Annual Meeting. Sacramento, CA.
108. (Invited Symposium presentation) Taub IA, Doona CJ, Ross EW, Prakash A. 2000. "Validation of microwave sterilization based on chemical marker formation." Food Engineering Division and Food Microbiology Division co-sponsored Symposium titled "Microwave Sterilization of Foods," IFT Annual Meeting, Dallas, TX.
109. (*Oral presentation*) Doona CJ, Poulin N, Segars R, Kandlikar S, Ruan R, Ye X, and Taub IA. 2000." Modeling Ohmically-heated whey protein gel circuit analogues." IFT Annual Meeting (Food Chemistry Division), Dallas, TX.
110. (*Oral presentation*) Doona CJ, Taub IA, Segars R. 1999. "Use of whey protein gels to simulate electrical circuits relevant to Ohmic heating." IFT Annual Meeting (Food Engineering Division), Chicago, IL.
- 111-115. Five (5) poster presentations at American Chemical Society Annual Meetings (×2), American Chemical Southeast Regional Meeting in Birmingham, AL 1994, Chemical Chaos Conference in Washington DC 1993, Nonlinear Dynamics and Instabilities in Chemical Systems Gordon Research Conference in Newport RI 1992.

## IX. NSRDEC Committees and Activities

### 1. Future Soldier Initiative 20xx.

- Arranged site-visit to MIT's Institute of Soldier Nanotechnology (ISN) for potential partnering with ISN, ICB, etc.
- Attended World Future Society's Annual Conference in Boston, MA.

2. In 2007, invited member NSRDEC Senior Technology Advisory Council as a Subject Matter Expert to provide strategic S&T guidance and support to all levels of scientists at NSRDEC through the review of 6.1 Basic Research proposals, the annual review of projects, by providing leading accomplishments, direction, and written materials for presentation to external review bodies of the NSRDEC 6.1 Basic Research program (e.g., the Army Basic Research review, the Department of the Army 6.1 ILIR Annual Report, etc.), by providing presentation information to attract top-candidate Cadets from West Point to NSRDEC, and to objectively provide career-enhancing guidance and mentorship to younger S&Ts at NSRDEC comprising advocacy and the support in the quest for deeper truth through science.

### 3. Presentations, honors, and awards for the Portable Chemical Sterilizer

- Food Safety Workshop for R&D Associates, 2005
- SOCOM-Biomedical Initiatives Steering Committee
- (Poster) Ballistic Trauma Conference in Pretoria, South Africa
- Site-visit of RDECOM Environmental programs representatives
- Site-visit of Department of Homeland Security/National Protection Center
- Site-visit of AMEDD Center and School – Combat Developer
- Site-visits of Federal Laboratory Consortium to receive Award for Excellence in Technology Transfer
- Site-visit by Army Laboratory Assessment Group (2006) – discussed in Addenda, don't put in Factor IV package

4. Presentation of *Water Dynamics in Foods* for Army Laboratory Assessment Group, 2007.

5. Prepared benefit-to-cost ration analysis of 6.1 research for moisture migration/First Strike Ration for Department of the Army analysis at the request of WarSTAR Director Dr. John Gassner and CFD Director Gerald Darsch (March, 2008). – move to Addendum/program description *Water Dynamics*

6. Lends credibility and professional stature to make career-enhancing opportunities available to junior S&Ts at NSRDEC in terms of co-authored presentations and potential peer-reviewed publications.

- Davies Fellow Ms. Rachele DeCoste – co-authored conference presentations
- Ms. Michelle Richardson – provided information for chapter in *Water Activity in Foods*
- Dr. Ann Barrett – contributed to NMR/MRI studies of moisture migration for conference presentations, recommended Dr. Barrett to reviewer for the Book Communications Committee
- Ms. Vicki Loveridge – guided presentation at R&DA Food Safety Workshop
- CW4 Dr. Greg Burnham – reviewed article published in *Food Quality* magazine
- Ms. Deb Sisson and Mr. Shubham Chandra – co-authored invited book chapter

- Ms. Florence Feeherry – supported Factor IV promotion, nominated to Executive Committee of the IFT Nonthermal Processing Division, and nominated for NSRDEC’s Women’s History Month (scientific accomplishments were displayed in the lobby of NSRDEC’s Main Building) - annual performance review, not Factor IV
7. Mentored young scientists and undergraduate students, including women in science (Ms. Feeherry, Ms. Sisson, Ms. Richardson, Dr. Burnham, Ms. Ingraham, Mr. Ruggiero, Mr. Duvall).
  8. Invited participation in 2007 Small Research and Development Laboratory of the Year presentation - Most Significant Research Technical Achievement, *Water Dynamics in Foods*, Washington, DC.
  9. Invited participant in meeting of ALAG members Dr. Moxley and Dr. Pamulapati with NSRDEC Senior S&Es (2006).
  10. Prepared written and presentation materials for 2006 RD LOY for ALAG visit and for presentation in Washington.
  11. Trained NSRDEC Factor IV panelist (average 1 review per year, since 2006) –add as a committee.
  12. Served on 6.2 Tech Merit and Senior Review Committees (2002-2004).
  13. Patent reviewer for NSRDEC Legal Office (periodically since 2003).
  14. Review BAA, CAPPS, SEED, and CORANET proposals (2-3 per year).
  15. Displayed Portable Chemical Sterilizer for RDECOM, NSRDEC, CFD at 2006 25<sup>th</sup> Army Science Conference and for CFD’s 2006 CFREB annual meeting and review.
  16. Prepared energy bar Information Paper for CFD Director Gerry Darsch
  17. Invited participation in Innosight Innovation seminar to improve the NSRDEC workplace.
  18. Trained Lean Six Sigma Whitebelt.
  19. SensorySpectrum certified for sensory panels.
  20. Invited Chemistry Reviewer, 2007 for The Department of Defense (DoD) Science, Mathematics, and Research for Transformation (SMART) Defense Scholarship for Service Program offers education and rewarding educational scholarships to students who have demonstrated ability and special aptitude for training in Science, Technology, Engineering & Mathematics (STEM) fields and career opportunities to continue their research as civilian employees of a DoD lab in a number of interdisciplinary, military technology areas.
  21. Invited participation 2005-present as Science Judge and as Ambassador for eCYBERMISSION, the virtual science competition on behalf of the United States Army, The Chief of Staff.
  22. St Bernadette's School Science Fair Judge 5-6 grade.
  23. LIFT Program sponsor of Science Teacher Ms. Judy MacDonald from Immaculate Conception School (Marlboro, MA) to integrate professional scientific research with school curricula and promote the development of secondary school curricula and the advancement of women in science.
  24. Worcester Regional High School Science and Engineering Fair - volunteer judge.
  25. Natick High School interview with Biology Honors Students April 09.



## X. Recent Collaborators

- Natalie Pomerantz, Mike Dion – IPFS Fabrics Bio-decontamination manuscript.
- Pearl Yip, Phil Gibson, Ken Carter, Soeun Kim, Sachin Albachare (UMass-Amherst), Francesco Fornasiero (LLNL) – DTRA-funded Second Skin Project.
- Paola D’Angelo – spore decontamination manuscript, hydrogel project.
- Ramaswamy Nagarajan (UMass-Lowell), Nandao Bruno – fluorescent bio-polymers.
- Florence Feeherry (US - Natick contractor)
- Kenneth Kustin (US- Brandeis University)
- Heidi Gibson, John Walker, Derek Ball – DTRA-funded synthetic chemistry, decontamination.
- Ashim Datta (US - Cornell University)
- Paul Lorcheim (US - ClorDiSYS Solutions Inc)
- Alexander Malkin (US - Lawrence Livermore)
- Terry Leighton (US - CHORI)
- Gene Ollinger (US - NIH/NIAID)
- Peter Setlow (US - Uni Connecticut)
- Aimee Shen - Tufts Medical School
- Kathir Krishnamurthy (US - IFSH - IIT)
- Alvin Lee (US IFSH-IIT)
- Hao Feng (US - Uni Illinois)
- Jonathan Huang (US - Uni Delaware)
- Yongqing Li (US - East Carolina)
- Lingbo Kong (US - UC-Davis)
- Mahfuz Sarker \_ Oregon State
- Jim Faeder – Uni Pittsburgh
- Yong-qing Li – east Carolina State Uni
- Kai Reineke – Uni Potsdam
- Robert Sevenich – DIL (Germany)
- Alexander Mathys – DIL
- Dietrich Knorr – Technical University Berlin
- Erika Georget – Buehler (UK)
- Nicolas Meneses – Buehler (Switzerland)
- Dong Peng – DIL
- Carole Tonello – Hiperbaric
- Carmen Moraru – Cornell
- Lee Cadesky – Cornell
- Christina DeWitt – Oregon State
- Austin Lowder – Oregon State
- Micha Peleg – Umass-Amherst
- Donna Schaffner – Rutgers Food Innovation center (Bridgton, NJ)
- Margaret Patterson – Queen’s College (Belfast, Northern Ireland)
- Mark Linton
- Murad Al-Holy – Hashemite Uni (Jordan)
- Chris Michiels – KU Leuven (Belgium)
- Michael Gaenzle – Uni Alberta
- Ahmed Yousef – The Ohio State University

- Bala Balasubramaniam - The Ohio State University
- Stanley Brul – Unilever
- Ming Lau – Kraft
- Armand Cardello – Natick
- Alan Wright – Natick
- Rosires Deliza – EMBRAPA (Brazil)
- Amauri Rosenthal – EMBRAPA (Brazil)
- Gaston Ares – EMBRAPA (Brazil)
- Ed Ting – Pressure Biosciences
- Rukma Reddy – IFSH
- Guy Skinner – IFSH
- Kristin Schill – IFSH
- Petros TaoukisNatioan Technical University of Athens (Greece)
- Eleni Gogou – National technical University Athens (Greece)
- Giovanni Ferrari – University of Salerno (Italy)
- Jorge Saraiva – University of Aveiro (Portugal)
- Hossein Daryaei - IFSH
- Kathir Krishnamurthy – IFSH
- Yoonseok Song
- Roger Ruan – Uni Minnesota
- Paul Chen – Uni Minnesota
- Xindi Zhu – Uni Minnesota
- Peng Peng – Uni Minnesota
- Yanling Cheng – Uni Minnesota
- Yun Li – Uni Minnesota
- Yonhui He – Uni Minnesota
- Xiangzhong Huang – Uni Minnesota
- Oh Chatakanonda – Thailand
- Pavinee Chinchahotti - Thailand
- Oli Schlueter – Potsdam
- Marcus Volkert – Potsdam
- Sandra Olivier – CSIRO (Australia)
- Roman Buckow – CSIRO (Australia)
- Nick Duggan (internal)
- Michelle Fasolino (internal)
- Megan Hoey (internal)
- Rob Stote (internal)
- Weera Kiratitanavit (UML)
- Tushar Gulati (Cornell)
- Bob Connors (WPI)
- Chris Zoto (WPI)
- Dallas Hoover, Haiqing Chen, Ye Mu (Uni Delaware)
- Dr. Jerry Shan - Rutgers Uni
- Timothy Swager - MIT
- Micha Peleg and Mark Normand - UMass-Amherst

## **XI. STEM and Mentoring Activities**

1. Mentoring of younger scientists, particularly to promote education and the advancement of women and minorities in science.
2. Science Fair Judge - eCYBERMISSION (annually since 2004).
3. Science Fair Judge - Worcester Regional S&E Fair (since 2009).
4. Science Fair Judge - St. Bernadette's Catholic School (2014, 2016).
5. Reviewer and On-site Judge for IFT-Nonthermal Processing Division - Graduate Student paper competition (annually since 2009).
6. Reviewer and on-site judge for IFT- Food Packaging Division - Graduate student paper competition (since 2013).
7. Mentoring younger scientists Stephanie Marcott, Ericka Ford, Paola D'Angelo, Chris Zoto, Jonathan Huang, Runze, Huang, Mu Ye, Florence Feeherry.
8. Promote involvement of other scientists in Community, Regional, and National science competitions through Sigma Xi.
9. Stephanie Marcott, Paola D'Angelo - gave guidance on instrumental analysis methods of spores and recognized their contributions in conference presentations - am working on manuscripts for publication of their work and contributions to help advance careers. Most hours spent on preparing presentations and manuscripts, since they had technical expertise.
10. Ericka Ford - gave opportunity to contribute as co-author of chapter on Food Packaging - chapter is currently being reviewed and near completion. Time spent on preparing chapter and reviewing with other authors, since made use of Ericka's existing expertise.
11. Chris Zoto - mentored on kinetics analysis of singlet oxygen production, trapping, and release and analysis of kinetics data while still a student at WPI. Interacted for about 4 hours per week for a few months.
12. Mentored University of Delaware graduate students on bacterial spore inactivation by high pressure and other nonthermal technologies - student have been contributing as a co-author to a published peer-reviewed manuscript and co-author of a book chapter. Ongoing, averages a few days-weeks per year.
13. Florence Feeherry, Carole Tonello, Carmen Moraru - mentored women in science and gave opportunity to serve in leadership positions of IFT Nonthermal Processing Division ExCom and of IFT Food Packaging Division ExCom that were otherwise not available. Timeframe in the estimate of hours per month.