The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Radioactive Sources: Applications and Alternative Technologies

Virtual Meeting

PUBLIC AGENDA

January 28, 2021 Eastern Time (ET)

Connection Information
Link: https://nas-sec.webex.com/nas-sec/j.php?MTID=mce831b6c0a75f47ae9422da5f3aef8fc
Meeting ID: 199 913 5593
Password: sdGHUthB633 (73448842 from phones and video systems)
Telephone: +1-415-527-5035 or +1-929-251-9612
Access code: 199 913 5593

1:00 pm – 1:05 pm	**Open PUBLIC SESSION** Tom Kroc, Committee Chair
1:05 pm – 1:25 pm	**1. Sterile Insect Techniques: Use of Radioactive Sources and Alternative Technologies** Rui Cardoso Pereira, International Atomic Energy Agency
1:25 pm – 1:40 pm	**Q+A and Discussion**
1:40 pm – 2:00 pm	**2. Food Irradiation and Safety Treatments in the United States** Lane Highbarger, Office of Food Additive Safety and Center for Food Safety and Applied Nutrition, Food and Drug Administration
2:00 pm – 2:15 pm	**Q+A and Discussion**
2:15 pm – 2:35 pm	**3. Cs-137 use in Metrology and Calibration at NIST** Ronaldo Minniti, National Institute of Standards and Technology
2:35 pm – 2:50 pm	**Q+A and Discussion**
2:50 pm – 3:10 pm	**4. The Role of Cs-137 in International Ionizing Radiation Metrology** Malcolm McEwen, National Research Council of Canada
3:10 pm – 3:25 pm	**Q+A and Discussion**
3:25 pm – 3:30 pm	**General Discussion** **Adjourn Meeting**

READING MATERIAL

1.
IAEA, 2020. Nuclear Applications for Insect Pest Control, World-Wide Directory of SIT Facilities (DIR-SIT). Available at https://nucleus.iaea.org/sites/naipc/dirsit/SitePages/World-Wide%20Directory%20of%20SIT%20Facilities%20(DIR-SIT).aspx. Accessed on January 19, 2021.

IAEA, 2020. Nuclear Applications for Insect Pest Control, International Database on Insect Disinfestation and Sterilization (IDIDAS). Available at https://nucleus.iaea.org/sites/naipc/ididas/SitePages/International%20Database%20on%20Insect%20Disinfestation%20and%20Sterilization%20(IDIDAS).aspx. Accessed on January 19, 2021.

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Parker et al., 2020. Dose mapping by scanning Gafchromic film to measure the absorbed dose of insects during their sterilization; Food and Agriculture Organization of the United Nations/International Atomic Energy Agency; 17 pp. Available at http://www-naweb.iaea.org/nafa/ipc/public/Dose-Mapping-Gafchromic-2020-11-02.pdf. Accessed on January 19, 2021.

Mehta, 2017. Technical Specification for an X-Ray System for the Irradiation of Insects for the Sterile Insect Technique and Other Related Technologies. Food and Agriculture Organization of the United Nations/International Atomic Energy Agency. 11 pp. Available at http://www-naweb.iaea.org/nafa/ipc/public/X-Ray-system-sit.pdf. Accessed on January 19, 2021.

Mastrangeko et al., A New Generation of X Ray Irradiators for Insect Sterilization; Journal of Economic Entomology; Volume 103, Number 1; 2010; 85-94. Accessed on January 19, 2021.

2.
FSIS, 2001, Labeling and Consumer Protection. Irradiation Q's and A's. https://www.fsis.usda.gov/OPPDE/larc/Policies/IrradiationQA.htm Accessed on January 25, 2021.

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Hobson, 2010, Health Blog Q&A: What to Do About E. Coli. The Wall Street Journal. https://www.wsj.com/articles/BL-HEB-33698 Accessed on January 25, 2021.

Bruhn, 2017, Food Irradiation. UC Davis Center for Consumer Research. Available at https://ccr.ucdavis.edu/food-irradiation. Accessed on January 25, 2021.

Webb and Penner, 2000. Food Irradiation. Kansas State University. Available at https://www.ksre.k-state.edu/historicpublications/pubs/mf2426.pdf. Accessed on January 25, 2021.

Food Irradiation Processing Alliance, 2006. Food Irradiation Questions and Answers. Available at http://www.foodirradiation.org/PDF/FIPA%20QandA.pdf. Accessed on January 25, 2021.

FDA, 2018. Food Irradiation: What You Need to Know. Available at https://www.fda.gov/food/buy-store-serve-safe-food/food-irradiation-what-you-need-know. Accessed on January 25, 2021.

FSIS, 2016. Irradiation and Food Safety Answers to Frequently Asked Questions. Available at https://www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/production-and-inspection/irradiation-and-food-safety/irradiation-food-safety-faq. Accessed on January 25, 2021.

FoodIrradiation.org provides educators, the public, the irradiation industry and others with accurate information related to the irradiation of food. (http://foodirradiation.org/) Accessed on January 25, 2021.

3.
BIPM, No Date. The Role and Objectives of the BIPM. Available at https://www.bipm.org/en/about-us/role.html. Accessed on January 25, 2021.

PRESENTER BIOGRAPHIES

Rui Cardoso Pereira is an entomologist since 2007 at the Insect Pest Control Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture in Vienna, Austria and he was appointed Section Head in 2017. He received his B.S in Agronomy and M.S in Integrated Pest Management from Technical University of Lisbon before becoming field operations head and latter program director of Madeira-Med, in Madeira Island, Portugal. After, he received his Ph.D. in Entomology and Nematology at the University of Florida, Gainesville FL, USA. The dissertation "Influence of a juvenile hormone analogue and dietary protein on male Caribbean fruit fly, *Anastrepha suspensa* (Diptera: Tephritidae), sexual behavior" received the "Deparment´s Mulrennan Outstanding Ph. D. Student Award". He is member of the IPPC Technical Panel on Pest Free Areas and Systems Approaches for Fruit Flies (TPFF). Also, since 2014 he was appointed as chair of the International Fruit Fly Steering Committee.

Lane Highbarger received his Ph.D. in biochemistry in 1995 from the University of Maryland where he studied the environment and structure-function of enzyme active sites. He moved on to a post-doctoral fellowship where he studied the complement cascade system and peripheral nerve demyelination in Guillain-Barre syndrome. He then spent three years in patent development in fibre-optics systems. He began working at FDA in 1999 in the Office of Premarket Approval (OPA became the Office of Food Additive Safety (OFAS) in 2002) in the Center for Food Safety and Applied Nutrition where he was involved in reviewing notices for substances that are generally recognized as safe; GRAS. In 2000 he started working on food additive petitions involving the use of ionizing radiation on food, and over time became the offices' subject matter expert in food irradiation. Currently, he acts as team lead for the microbiology review team in OFAS and evaluates the GRAS status of microorganisms used in food, in food ingredient production, and the safe use of microbially produced enzymes used in food. He is also the SME for foods and food ingredients that are exposed to ionizing radiation.

Malcolm McEwen obtained his MSc in Medical Physics from University College London in 1993 and his PhD in Radiation Physics from the University of Surrey in 2002. From 1989 to 2002, he worked at the National Physical Laboratory in the UK, before moving to the National Research Council Canada, where he is Team Leader of the Medical and Industrial Dosimetry group. Dr.

McEwen is responsible for absorbed dose standards and calibration services for users of medical and industrial applications of ionizing radiation. His specific expertise is in the development of water and graphite calorimetric absorbed-dose standards and he is a recognized expert on the performance of such systems as well as the characterization and calibration of secondary dosimeters. He is involved in the development of national and international dosimetry protocols for external beam radiation therapy and brachytherapy and is currently a member of committees of the International Atomic Energy Agency (IAEA), the International Weights and Measures Bureau (BIPM) and the American Association of Physicists in Medicine (AAPM). He is chair of Section I of the BIPM Consultative Committee on Ionizing Radiation, which focusses on dosimetry for x-rays, gamma rays, and charged particles. He has published around 50 papers in peer reviewed journals and in 2015 he was elected a Fellow of both the Canadian Organization of Medical Physicists (COMP) and AAPM for his services to the field.

Ronaldo Minniti graduated in 1997 with a Ph.D. in Physics from the University of Tennessee Knoxville, USA, performing work in the field of atomic collisions at Oak Ridge National Laboratory. Following a National Research Council Postdoctoral Fellow position at the National Institute of Standards and Technology (NIST) in the Atomic Physics Division, he later joined in 2000 the Dosimetry Group of the Radiation Physics Division at NIST. Within the Dosimetry Group, he is the lead scientist for maintaining and disseminating the national standard for air kerma (radiation dose in air) from cesium-137 and cobalt-60 gamma ray beams. He performs high accuracy radiation measurements for calibration facilities and secondary standard laboratories across the country to help ensure that dose measurements made by users are traceable to the national standard to help ensure the safety of patients, radiation workers and the public. These include users in the medical field, radiation protection, homeland security, U.S. Navy, Army and Air force, Department of Energy (DOE) laboratories, instrument manufacturers, industry and academia. He performs proficiency tests (blind tests) and measurements for laboratories that are seeking accreditation through agencies such as the American Association of Physics in Medicine (AAPM), National Voluntary Laboratory Accreditation Program (NVLAP), DOE Laboratory Accreditation Program (DOELAP), and others. At the international level he performs measurement comparisons with National Metrology Institutes (NMIs) around the world to ensure harmonization of international standards. His interests include improving reference dosimetry measurements in gamma-ray beams and kilovoltage and megavoltage x-ray beams; investigation and characterization of new ionization chambers and detectors; design, development and improvement of measurement facilities for radiation measurements in external beams. Dr. Minniti is a member of the AAPM, HPS and the APS.