

Opportunity Title: FDA Postgraduate Research Engineer Fellowship

Opportunity Reference Code: FDA-CFSAN-2022-20

Organization U.S. Food and Drug Administration (FDA)

Reference Code FDA-CFSAN-2022-20

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A complete application consists of:

- An application
- Transcripts – [Click here for detailed information about acceptable transcripts](#)
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- One educational or professional recommendation

All documents must be in English or include an official English translation.

If you have questions, send an email to ORISE.FDA.CFSAN@orau.org. Please include the reference code for this opportunity in your email.

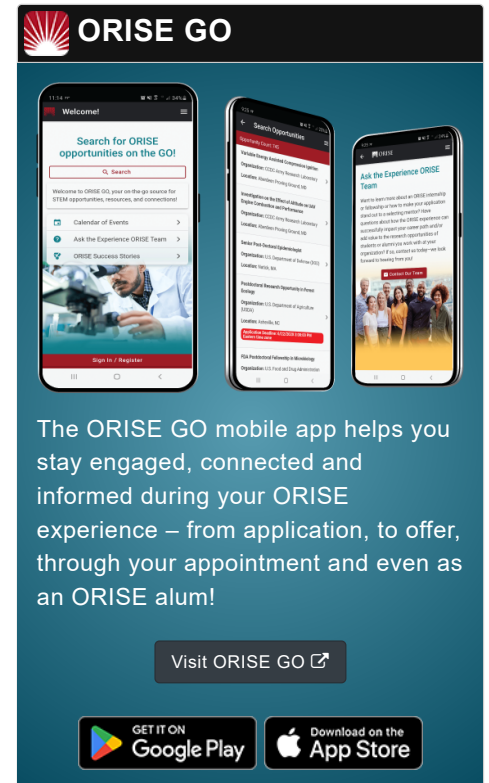
Application Deadline 4/10/2023 3:00:00 PM Eastern Time Zone

Description **Applications will be reviewed on a rolling-basis.*

A research opportunity is currently available at the U.S. Food and Drug Administration (FDA), Center for Food Safety and Applied Nutrition (CFSAN), located in Bedford Park, Illinois.

In 2000, the CDC reported that 18 and 19% of food-borne diseases caused by bacterial pathogens in the years 1993 – 1997 in the U.S. were associated with contaminated equipment and poor hygiene practices, respectively. Although outbreaks can result from extensive growth at abusive storage temperatures, insufficient cooking, etc. there are a significant number that have been associated with bacterial cross-contamination events. Cross-contamination refers to the transfer, direct or indirect, of pathogens from a contaminated product to a non-contaminated product. Bacterial cross-contamination can occur through a variety of routes including air-to-food, surface-to-food, and surface-to-food in liquid transfer. Food allergens and chemical contaminants such as heavy metals are other hazards that may be transferred to food through similar transfer routes. Research is needed to understand and model contaminant transfer events to devise methods for preventing them.

There have been numerous outbreaks associated with low-moisture foods including flour, nuts, nut butters, spices, pet food, cookie dough, and extruded snack foods involving Salmonella and Escherichia coli, which led to over 1,600 cases of foodborne illness and at least nine deaths. Many low-moisture foods, such as flour and peanut butter, are ingredients used in other



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products. If contaminated at any point from harvest through packaging, the final ready-to-eat foods could lead to foodborne illness, especially if processing steps are unable to inactivate food pathogens. While pathogenic microorganisms are unable to grow in these foods, they are able to persist over time. Research is needed to understand the impact of storage conditions and processing methods on survival of pathogens in low moisture foods.

The participant will study, under the supervision of the mentor, 1) bacterial, allergen and chemical contaminant transfer to food through cross contamination/cross-contact and other mechanisms, 2) the development of simple predictive model systems for microbial heat resistance and nonthermal resistance for pathogenic strains of Salmonella and Escherichia coli in low moisture foods, 3) how growth conditions and contamination levels affect survivability of Salmonella in low moisture foods during processing and 4) Salmonella survival during storage and processing. These projects will lead to enhanced understanding of transfer of microbial and chemical hazards to food. In addition, they will result in much needed information on pathogen survival in low moisture foods. The research will also result in the development of preventative controls for pathogens in low-moisture foods.

The participant will be trained in development of mathematical models to trace/model bacterial/allergen/chemical contaminant transfer to food. The participant will be trained in use and analysis of thermal processing and under the supervision of the mentor, participate as a member of a team that will investigate the survival of pathogens such as Salmonella serovars and Shiga toxin-producing E. coli strains during storage and thermal processing of low-moisture foods.

Anticipated Appointment Start Date: July 1, 2022; start date is flexible

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and FDA. **The initial appointment is for three months, but may be renewed upon recommendation of FDA contingent on the availability of funds.** The participant will receive a monthly stipend commensurate with educational level and experience. Proof of health insurance is required for participation in this program. The appointment is full-time at FDA in the Bedford Park, Illinois, area. Participants do not become employees of FDA, DOE or the program administrator, and there are no employment-related benefits.

Completion of a successful background investigation by the Office of Personnel Management is required for an applicant to be on-boarded at FDA. OPM can complete a background investigation only for individuals, including non-US Citizens, who have resided in the US for a total of three of the past five years.

FDA requires ORISE participants to read and sign their FDA Education and Training

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Agreement within 30 days of his/her start date, setting forth the conditions and expectations for his/her educational appointment at the agency. This agreement covers such topics as the following:

- Non-employee nature of the ORISE appointment;
- Prohibition on ORISE Fellows performing inherently governmental functions;
- Obligation of ORISE Fellows to convey all necessary rights to the FDA regarding intellectual property conceived or first reduced to practice during their fellowship;
- The fact that research materials and laboratory notebooks are the property of the FDA;
- ORISE fellow's obligation to protect and not to further disclose or use non-public information.

Qualifications

The qualified candidate should have received a master's or doctoral degree in one of the relevant fields (e.g. Food Sciences, **Agricultural Engineering**, **Chemical Engineering**). Degree must have been received within five years of the appointment start date.

Preferred skills/experience:

- A strong academic record and hands-on expertise in mathematical modeling
- A background in thermal processing
- Ability to contribute research alongside a multidisciplinary team involved in studying bacterial, allergen and chemical contamination cross contamination/cross contact
- Ability to evaluate the efficacy of thermal processing on pathogen survival in a pilot-scale processing facility and determine thermal resistance of pathogens in model systems
- Diverse experience in the areas of basic food microbiology using complex assays such as:
 - Conventional and rapid assays for detection, identification and enumeration of pathogens in food
 - Growth and inactivation kinetics, such as growth rate and D-value determinations
 - Metabolic profiling
- Ability to interpret and evaluate the results of analysis to determine validity and scientific significance
- Ability to write manuscripts with minimal editing which include diagrams, charts, graphs, etc. related to research activities and outcomes
- Excellent verbal and written communication skills

Eligibility Requirements

- **Citizenship:** LPR or U.S. Citizen
- **Degree:** Master's Degree or Doctoral Degree received within the last 60 month(s).
- **Discipline(s):**
 - **Engineering** (27 👁)
 - **Life Health and Medical Sciences** (1 👁)

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Affirmation Have you lived in the United States for at least 36 out of the past 60 months? (36 months do not have to be consecutive.)