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Opportunity Title: FDA Research Opportunity- Bacteriophage Therapy as a Preventative of Menstrual Toxic Shock Syndrome (mTSS) Caused by Staphylococcus aureus
Opportunity Reference Code: FDA-NCTR-2026-0007

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

Reference Code FDA-NCTR-2026-0007

How to Apply ***To submit your application, scroll to the bottom of this opportunity and click APPLY.***

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.NCTR@orau.org. Please include the reference code for this opportunity in your email.

Connect with ORISE...on the GO! Download the new ORISE GO mobile app in the Apple App Store or Google Play Store to help you stay engaged, connected, and informed during your ORISE experience and beyond!

Application Deadline 8/28/2026 3:00:00 PM Eastern Time Zone

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

FDA Office and Location: A research opportunity is available immediately with the Food and Drug Administration (FDA), The National Center for Toxicological Research (NCTR) located in Jefferson, Arkansas.

The National Center for Toxicological Research (NCTR), is the only FDA Center located outside the Washington D.C. metropolitan area. The one-million square foot research campus in Jefferson, Arkansas plays an important role in the missions of FDA and the Department of Health and Human Services to promote and protect public health.

Research Project: Menstrual toxic shock syndrome (mTSS), caused by *Staphylococcus aureus*, is a rare but potentially fatal condition affecting menstruating women. Growing antibiotic resistance has renewed interest in bacteriophages (viruses that kill bacteria) and their lytic enzymes (endolysins) as targeted alternatives. In this project, you will combine vaginal microbiome bioinformatics with laboratory validation to evaluate phage- and endolysin-based strategies to reduce *S. aureus* under menstrual and nonmenstrual conditions. You will analyze publicly available vaginal metagenomic datasets to identify microbial community patterns associated with *S. aureus* colonization and to detect phage-derived endolysin genes. Selected bacteriophages and purified endolysins will then be tested in an *in vitro* vaginal model to assess their stability and bacteriolytic activity against mTSS-causing strains of *S. aureus*. Through this, you will help determine whether microbiome-informed phage

approaches could support the prevention of mTSS while preserving beneficial vaginal microbiota. The broad long-term goal of our laboratory is to identify and develop alternatives to antibiotics for preventing diseases caused by *S. aureus*. You will assess both lysogenic and lytic bacteriophages for their ability to lyse approximately 30 clinical mTSS-causing *S. aureus* strains. Phage preparations will be ranked based on the number of susceptible clinical strains and the type of plaque formed.

You will also determine the effectiveness of the most promising bacteriophages in one of four *in vitro* models that mimic the vaginal tract, using a modified genital secretion medium developed in the PI's laboratory. In addition, you will investigate bacteriophage-derived endolysins, which degrade the peptidoglycan cell wall from the "outside in" and therefore represent a potential alternative to whole bacteriophages for treating bacterial infections. As part of a molecular biology component, you will isolate, clone, and express endolysins from the most effective bacteriophages. It is anticipated that incorporating these endolysins into feminine tampons could enhance the overall effectiveness of lysing *S. aureus* and overcome the strain specificity often encountered with whole bacteriophages.

The use of biotherapeutic/probiotic supplements to promote human health is an issue that the FDA faces, the understanding of how a stable vaginal biotherapeutic could be utilized by the FDA as a standard to assess the efficacy of other potential commercially available biotherapeutics/probiotics. Last, this project fits nicely into the general mission of NCTR, which is to "support and anticipate the FDA's current and future regulatory needs." We have identified a problem of interest for the FDA for which such studies should be conducted to address the regulatory gap and provide expert, cutting-edge knowledge in the field.

Learning Objectives: You will gain foundational knowledge in microbiology, with particular emphasis on bacteriology as it relates to the gram-positive bacterium *Staphylococcus aureus* and its specific bacteriophages. You will learn how to isolate, purify, propagate, procure, and characterize *S. aureus* bacteriophages, including both mitomycin-induced lysogenic phages and lytic phages isolated primarily from local environmental sources such as wastewater facilities. You will be involved in all aspects of the project. Depending on your educational background and prior experience, your training will be tailored to ensure you gain the necessary skills to conduct these experiments successfully and to present your findings at national microbiology meetings.

Mentor: The mentor for this opportunity is Mark Hart (mark.hart@fda.hhs.gov). If you have questions about the nature of the research, please contact the mentor.

Anticipated Appointment Start Date: 2026. Start date is flexible and will depend on a variety of factors.

Appointment Length: The appointment will initially be for one year, but may be renewed upon recommendation of FDA and is contingent on the

availability of funds.

Level of Participation: The appointment is full time.

Participant Stipend: The participant will receive a monthly stipend commensurate with educational level and experience.

Citizenship Requirements: This opportunity is available to U.S. citizens, Lawful Permanent Residents (LPR), and foreign nationals. Non-U.S. citizen applicants should refer to the Guidelines for Non-U.S. Citizens Details page of the program website for information about the valid immigration statuses that are acceptable for program participation.

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 participant will receive a monthly stipend commensurate with educational level and experience. Proof of health insurance is required for participation in this program. 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 Ethics Requirements

If an ORISE Fellow, to include their spouse and minor children, reports what is identified as a Significantly Regulated Organization (SRO) or prohibited investment fund financial interest in any amount, or a relationship with an SRO, except for spousal employment with an SRO, and the individual will not voluntarily divest the financial interest or terminate the relationship, then the individual is not placed at FDA. For additional requirements, see FDA Ethics for Nonemployee Scientists.

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

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- ORISE fellow's obligation to protect and not to further disclose or use non-public information.

Qualifications The qualified candidate should be currently pursuing or have received a bachelor's or master's degree in the one of the relevant fields.

Point of Contact Ashley

Eligibility Requirements

- **Degree:** Bachelor's Degree or Master's Degree.
- **Discipline(s):**
  - **Chemistry and Materials Sciences** (12 👁)
  - **Communications and Graphics Design** (2 👁)
  - **Computer, Information, and Data Sciences** (17 👁)
  - **Earth and Geosciences** (21 👁)
  - **Engineering** (29 👁)
  - **Environmental and Marine Sciences** (14 👁)
  - **Life Health and Medical Sciences** (51 👁)
  - **Mathematics and Statistics** (11 👁)
  - **Physics** (16 👁)
  - **Science & Engineering-related** (2 👁)
  - **Social and Behavioral Sciences** (29 👁)

Affirmation I am a U.S. citizen, or I have lived in the United States for at least 36 out of the past 60 months. (36 months do not have to be consecutive.)
AND
I have read the FDA Ethics Requirements.