Opportunity Title: FDA Postdoctoral Fellowship - Development of Virtual Animal Models to Simulate Animal Study Results Using Artificial Intelligence (AI)
Opportunity Reference Code: FDA-NCTR-2026-0005

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

Reference Code FDA-NCTR-2026-0005

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: You will engage in a multidisciplinary research project to be a part of the development of AnimalGAN, an artificial intelligence (AI)-based virtual animal model that simulates preclinical animal study outcomes. This advances FDA's regulatory science mission by supporting New Approach Methodologies (NAMs) aligned with the 3Rs principles and the FDA Modernization Act 2.0. Through this project, you will:

- Investigate large-scale toxicological datasets (e.g., Open TG-GATEs, DrugMatrix) to curate high-quality animal study data, including clinical pathology, treatment conditions, and molecular descriptors.
- Research generative AI approaches to develop AnimalGAN, modeling relationships between chemical exposure (structure, dose, duration) and multidimensional biological responses.
- Analyze molecular representations (e.g., SMILES, chemical descriptors) to encode chemical information for modeling.

- Contribute to the development of advanced generative models (e.g., conditional GAN, Wasserstein GAN) to improve stability and generalizability for high-dimensional biomedical data.
- Evaluate model performance using rigorous validation strategies, including internal testing, external benchmarking, and scenario-based assessments (e.g., structurally novel compounds, therapeutic class exclusion, temporal validation).
- Investigate quantitative metrics (e.g., RMSE, cosine similarity) to assess agreement between simulated and observed data.
- Collaborate with interdisciplinary teams to define applicability domain and regulatory relevance.
- Participate in application studies, including hepatotoxicity assessment, and explore translational use cases such as prediction of rare adverse events (e.g., idiosyncratic drug-induced liver injury).
- Contribute to peer-reviewed publications and scientific presentations.
- Collaborate with FDA scientists and external partners across toxicology, bioinformatics, and regulatory science.

This project directly supports FDA's mission to protect public health by advancing AnimalGAN, a scalable AI framework for simulating animal study outcomes using existing data. This approach promotes ethical, efficient, and scientifically robust alternatives to animal testing. By integrating AI with toxicological data, the project enhances FDA's ability to evaluate the safety of regulated products, improves reproducibility, and supports evidence-based regulatory decision-making, contributing to modernization of risk assessment.

Learning Objectives: The fellowship will provide you with structured training in AI-enabled regulatory science:

- Generative AI and Deep Learning: Develop and evaluate GAN-based models using Python and high-performance computing.
- Computational Toxicology: Curate, integrate, and analyze large-scale toxicological datasets with emphasis on data quality and visualization.
- Quantitative Modeling and Validation: Apply statistical methods, validation frameworks, and applicability domain assessment to ensure reproducibility.
- Cheminformatics: Generate molecular descriptors and perform chemical similarity analysis.
- Regulatory Science: Gain exposure to FDA frameworks supporting NAMs (e.g., Predictive Toxicology Roadmap, ISTAND).
- Scientific Communication: Contribute to manuscripts, reports, and presentations.
- Gain practical experience in applying AI within regulatory contexts.
- Develop experience in NAMs and AI-driven safety assessment.
- Prepare for careers in government, academia, or industry.

Mentor: The mentor for this opportunity is Weida Tong (weida.tong@fda.hhs.gov). If you have questions about the nature of the research, please contact the mentor.

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Anticipated Appointment Start Date: August/September 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;

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- 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 be currently pursuing or have received a doctoral degree in the one of the relevant fields.

Point of Contact Ashley

Eligibility Requirements

- **Degree:** Doctoral 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.