RUTGERS HEALTH
Center for Biomedical Informatics and Health Artificial Intelligence
Institute for Health, Health Care Policy and Aging Research

The Rutgers Health
Center for Biomedical Informatics & Health Artificial Intelligence (BMIHAI)
presents

Rutgers Health Roadmap Initiative

2026 Request for Applications

Summer Bootcamps in Biomedical Data Science and Health AI

Funding Opportunity Purpose:

The Summer Bootcamp program is designed to augment Biomedical Data Science and Health AI training for Rutgers Health Postdoctoral trainees and Graduate Students and introduce them to the value of using AI in Healthcare and Biomedical applications. We are offering two Bootcamps summer 2026: (1) **Bootcamp I** "Hands-on AI-assisted Scoping Review" June 1-5 (virtual)
(2) **Bootcamp II** "Machine Learning for RNA-seq" June 15-19 (in person)

Release Date: March 31, 2026

Information Webinar – April 10 from 4:00 PM – 5:00 PM. Register here: https://rutgers.zoom.us/meeting/register/bEBaD04BQaC1y7ccZxZmsQ (hosted by Antonina Mitrofanova, Evan Johnson, Dmitry Scherbakov)

Application Deadline: April 17, 2026 (Space is limited. Apply early)

Student Acceptance Notification: May 1, 2026

Acceptance of participation and final registration: May 15, 2026

Bootcamp Days: June 1-5 (**Bootcamp I**) and June 15-19 (**Bootcamp II**), 2026

Location: June 1-5: virtual;
June 15-19: Daniel L. Kessler Building, 675 Hoes Lane West, Piscataway, NJ – West Lecture Hall.

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I. Overview of the Program

The Rutgers Health (RH) Center for Biomedical Informatics & Health Artificial Intelligence (BMIHAI)https://ifh.rutgers.edu/center-for-biomedical-informatics-and-health-artificial-intelligence/ is established to serve as the catalyst for a transformative effort that establishes Rutgers as a national and international leader in computational medicine and health AI. The overarching goal of this initiative is to bring together substantial existing, but currently siloed, strengths in the broad area of biomedical informatics, including bioinformatics, clinical informatics, clinical research informatics, public health informatics, translational bioinformatics, etc., and substantially expand them, especially in the area of health AI, making them collectively much more than the sum of their parts.

The Summer Bootcamp program in Data Science and Health AI is one of the many Rutgers Health Roadmap Initiatives and is designed to augment Biomedical Data Science and Health AI training for Rutgers Health Postdoctoral trainees, Medical Students and Graduate Students and introduce them to the value of using AI in Healthcare and Biomedical applications. We are offering two Bootcamps summer 2026: (1) Bootcamp I "Hands-on AI-assisted Scoping Review" June 1-5 (virtual); and .(2) Bootcamp II "Machine Learning for RNA-seq" June 15-19 (in person) Bootcamp I is a one-week virtual program that will cover the full workflow of conducting a quick but comprehensive scoping review, from refining a research question to drafting a manuscript. Bootcamp II is a one-week in-person program that will cover machine learning for RNA-seq: from bioinformatics to predictive models. Up to 15 participants will be selected from the pool of applicants to participate in Bootcamp I, and up to 35 participants will be selected to participate in Bootcamp II.

II. Requirements for 2026 RFA

- ## Information Webinar
  - An information webinar will be hosted to explain program requirements and topics covered. The information webinar will be held on April 10th from 4:00 PM – 5:00 PM. Register here: https://rutgers.zoom.us/meeting/register/bEBaD04BQaC1y7ccZxZmsQ (hosted by Antonina Mitrofanova, Evan Johnson, Dmitry Scherbakov)

- ## Instructors
  - **Bootcamp I:** Dmitry Scherbakov (Senior Data Scientist, Medical University of South Carolina)
  - **Bootcamp II:** Evan Johnson (Director of the Institute for Data Science and Professor, NJMS, Associate Director BMIHAI)

- **Duration and program structure**
  - Two 1-week bootcamps, **June 1-5 and June 15-19, 2026**
  - **Bootcamp I:** Hands-on AI-assisted Scoping Review Practicum (virtual)
  - Short description from the instructor: "This Bootcamp uses several technological components to create a review, including Amazon AWS and Python/R scripts created with generative AI help. The program will go through how to set up these components for each use case. It is desirable that students have installed R or Python on their laptops and know how to run basic commands in these languages. However, since it will be teamwork, they can learn how to run commands from others during group activities. Students are encouraged, but not required, to think about which topic they would like to create a review about. If a topic idea comes up, we encourage students to check online if a similar review was published, and what keywords were used or could be used to look for matching manuscripts."
  - **Bootcamp II:** Machine Learning for RNA-seq: From Bioinformatics to Predictive Models (in person)
  - Morning lectures will focus on the theoretical foundations of state-of-the-art Health-related Data Science, Machine Learning, and AI techniques
  - AM lectures will be open to in-person Bootcamp participants and **to the entire community** via zoom for virtual auditing. For virtual attendance, register here: https://rutgers.zoom.us/meeting/register/SCKbEGu4TA6ptBtBkgteaA
  - PM sessions will focus on hands-on project-oriented training in Health-related Data Science, Machine Learning, and AI (open to registered in-person Bootcamp participants only)
  - Note: The final day, June 19, will be fully remote, due to the holiday

III. Application Process

Eligibility:

Week 1

- Rutgers Health Postdoctoral trainees and Graduate (e.g., PhD, Medical, Dental etc.) students are eligible.
- Students must indicate their current academic status and affiliation on their application.
- Participants must be familiar with basic R/Python commands
- Participants will be trained remotely and will use their own laptop

Week 2

- Rutgers Health Postdoctoral trainees and Graduate (e.g., PhD, Medical, Dental etc.) students are eligible.
- Students must indicate their current academic status and affiliation on their application.
- Participants must be familiar with R and have completed freshman-level statistics
- Participants must bring their own laptop (and charger)
- Rutgers Amarel account will be established for selected participants

Application Submission:

By **April 17, 2026**, interested students must apply here:
https://shprutgers.jotform.com/252814084132855 for Bootcamp I and here:
https://shprutgers.jotform.com/260714172540147 for Bootcamp II.
There is a small fee ($25/week) to secure a spot for each Bootcamp.

Application Requirements:

To be considered complete, a Bootcamp application **must** include the following:

	Page Limits
Summer Bootcamp Application Form	online form
Statement of Interest, including experience with R programming language	up to 150 words
Resume/CV	up to 5 pages
Unofficial transcript (when applicable)	any

Application Review Process:

- Applicants will be screened for eligibility and selected for participation by the Review Committee. Participants for Bootcamp I will be accepted on first-come basis, additional participants will be placed on the waiting list.
- Bootcamp participation will be confirmed by **May 1, 2026**. Acceptance of participation by students and final registration/payment is due **May 15, 2026**.
- If selected as a Bootcamp participant (**by May 1**), the participation fee is $25 each Bootcamp ($50 for both Bootcamps). The registration fee must be paid during final registration (**by May 15**).

IV. Bootcamp Schedule

Bootcamp I

"Hands-on AI-assisted Scoping Review Practicum"

June 1-5 (virtual)

Instructor: *Dmitry Shcherbakov*

Short description from the instructor: "This Bootcamp uses several technological components to create a review, including Amazon AWS and Python/R scripts created with generative AI help. The program will go through how to set up these components for each use case. It is desirable that students have installed R or Python on their laptops and know how to run basic commands in these languages. However, since it will be teamwork, they can learn how to run commands from others during group activities. Students are encouraged, but not required, to think about which topic they would like to create a review about. If a topic idea comes up, we encourage students to check online if a similar review was published, and what keywords were used or could be used to look for matching manuscripts."

Monday

Morning session (Instructor-led)	
9:00 – 10:15	Introduction to Scoping and Systematic Review. How to choose topic for review using PICO Framework
10:15–10:30	Break
10:30–11:15	Breakout rooms: Review Topic Choice
10:30 – 11:15	Discussion of group topics
11:15 – 12:00	Creating Search Strategy with AI Tools
Afternoon session (self-paced)	
1:00 – 4:00	Groups working the search strategy

Tuesday

Morning session (Instructor-led)	
9:00 – 10:15	Groups presenting their search strategy
10:15- 10:30	Break
10:30 – 12:00	Abstract Screening using Large Language Models
Afternoon session (self-paced)	
1:00 – 4:00	Groups working on Abstract Screening

Wednesday

Morning session (Instructor-led)	
9:00 – 10:15	Groups Discussion: Abstract Screening process
10:15- 10:30	Break
10:30 – 12:00	Full-text Screening using Large Language Models
Afternoon session (self-paced)	
1:00 – 4:00	Groups working on Full-text Screening

Thursday

Morning session (Instructor-led)	
9:00 – 10:15	Groups Discussion: Full-text Screening process
10:15- 10:30	Break
10:30 – 12:00	Full-text Extraction using Large Language Models
Afternoon session (self-paced)	
1:00 – 4:00	Groups working on Full-text Extraction

Friday

Morning session (Instructor-led)	
9:00 – 10:15	Groups Discussion: Full-text Extraction process
10:15- 10:30	Break
10:30 – 12:00	Manuscript drafting using Large Language Models Choosing publication venue
Afternoon session (self-paces)	
1:00 – 4:00	Groups working on LLM-generated draft

Bootcamp II

"Machine Learning for RNA-seq: From Bioinformatics to Predictive Models"

June 15-19 (in person)

Instructor: *Evan Johnson*

- Morning lectures will focus on the theoretical foundations of state-of-the-art Health-related Data Science, Machine Learning, and AI techniques
- AM lectures will be open to in-person Bootcamp participants and **to the entire community** via zoom for virtual auditing. For virtual attendance, register here: https://rutgers.zoom.us/meeting/register/SCKbEGu4TA6ptBtBkgteaA
- PM sessions will focus on hands-on project-oriented training in Health-related Data Science, Machine Learning, and AI (open to registered in-person Bootcamp participants only)

Monday (in person)

Morning session	
8:00 - 9:45	Introduction to RNA-sequencing: QC, preprocessing, and alignment
9:45 - 10:15	Break
10:15 - 12:00	Dimension reduction methods: PCA, NNMF, and UMAP; Unsupervised machine learning, clustering, and classification
12:00 - 1:00	Lunch (will be provided)
Afternoon session	
1:00 - 2:30	Hands-on experience: From FASTQ to counts
2:30 - 2:45	Break
2:45 - 4:15	Hands-on experience: Exploring relationships in reduced-dimension data; Heatmaps and clustering examples
4:15 - 5:00	Office hours (with RAs)

Tuesday (in person)

Morning session	
8:00 - 9:45	Differential expression analysis
9:45 - 10:15	Break
10:15 - 12:00	Lasso, ridge regression, and Elastic Net; Regularization and variable selection
12:00 - 1:00	Lunch (will be provided)
Afternoon session	
1:00 - 2:30	Hands-on experience: Differential gene expression with DESeq2
2:30 - 2:45	Break
2:45 - 4:15	Hands-on experience
4:15 - 5:00	Office hours (with RAs)

Wednesday (in person)

Morning session	
8:00 - 9:45	Pathway enrichment analysis, gene network analysis
9:45 - 10:15	Break
10:15 - 12:00	Validation and cross-validation in machine learning; Supervised kernel machine learning; Support Vector Machines
12:00 - 1:00	Lunch (will be provided)
Afternoon session	
1:00 - 2:30	Hands-on experience
2:30 - 2:45	Break
2:45 - 4:15	Hands-on experience
4:15 - 5:00	Office hours (with RAs)

Thursday (in person)

Morning session	
8:00 - 9:45	Methods for single cell RNA-seq
9:45 - 10:15	Break
10:15 - 12:00	Decision trees, regression trees, and random forests; XGBoost; Methods for explainable AI (XAI)
12:00 - 1:00	Lunch (will be provided)
Afternoon session	
1:00 - 2:30	Hands-on experience: Supervised machine learning on RNA-seq data
2:30 - 2:45	Break
2:45 - 4:15	Hands-on experience: More supervised machine learning on RNA-seq data
4:15 - 5:00	Office hours (with RAs)

Friday (Holiday: virtual)

Morning session	
9:00 – 10:15	Methods for batch correction and multi-study machine learning
10:15- 10:30	Break
10:30 – 12:00	Introduction to multi-layer feedforward Neural Networks and beyond
12:00 - 1:00	Lunch break
Afternoon session	
1:00 - 2:30	Hands-on experience: Biomarker development in RNA-seq
2:30 - 2:45	Break
2:45 - 4:15	More hands-on experience: Biomarker development in RNA-seq

Questions/Inquiries:

For Inquiries, please email: BMIHAI_bootcamp@ifh.rutgers.edu