Pre-application Webinar

NOSI (NOT-GM-24-006)

Cloud-based Learning Modules

December 18, 2023
2:00 – 3:30 PM

NIH National Institute of General Medical Sciences

Agenda

Welcome Remarks	Krishan Arora, Ph.D., Branch Chief, Networks and Development Programs Branch (NDP) Division for Research Capacity Building (DRCB), NIGMS
Program Description	Lakshmi Kumar Matukumalli, Ph.D., Program Director, NDP, DRCB, NIGMS
Q&A via Chat Window	Moderator: Krishan Arora • Lakshmi Kumar Matukumalli • Alison Gammie, Ph.D., Director, TWD • Nathan Moore, Ph.D., Data Science Strategy Coordinator • Christy Leake, Team Lead, Grants Administration Branch

Application Due Date: February 15, 2024. 5 PM local time.

Disclaimer

The webinar and accompanying slides serve as an overview of the NOSI administrative supplement funding opportunity **NOT-GM-24-006**. They are not meant to be comprehensive in coverage of all required components of an application.

https://grants.nih.gov/grants/guide/notice-files/NOT-GM-24-006.html

Applicants are responsible for following the instructions in the NOSI and any related Notices included in the NOSI

Cloud-Computing Presents Opportunities for Biomedical Researchers

- Biomedical research is becoming increasingly data-driven
  - Need: access to big data and data analytical/storage capabilities
  - Opportunity: broad access to data and data analytical capacity will enable investigators and students with limited research resources to participate in cutting-edge research

- Cloud computing may be the game changer that breaks the insurmountable barrier of operating HPC facilities at every institution

- NIGMS strives to bring Cloud computing to the large number of investigators and students at under-resourced institutions and help unleash their talents

SEPTEMBER 20, 2023

In Other Words: Sandboxes Aren't Just for Kids

BY RACHEL CROWLEY

0 comments

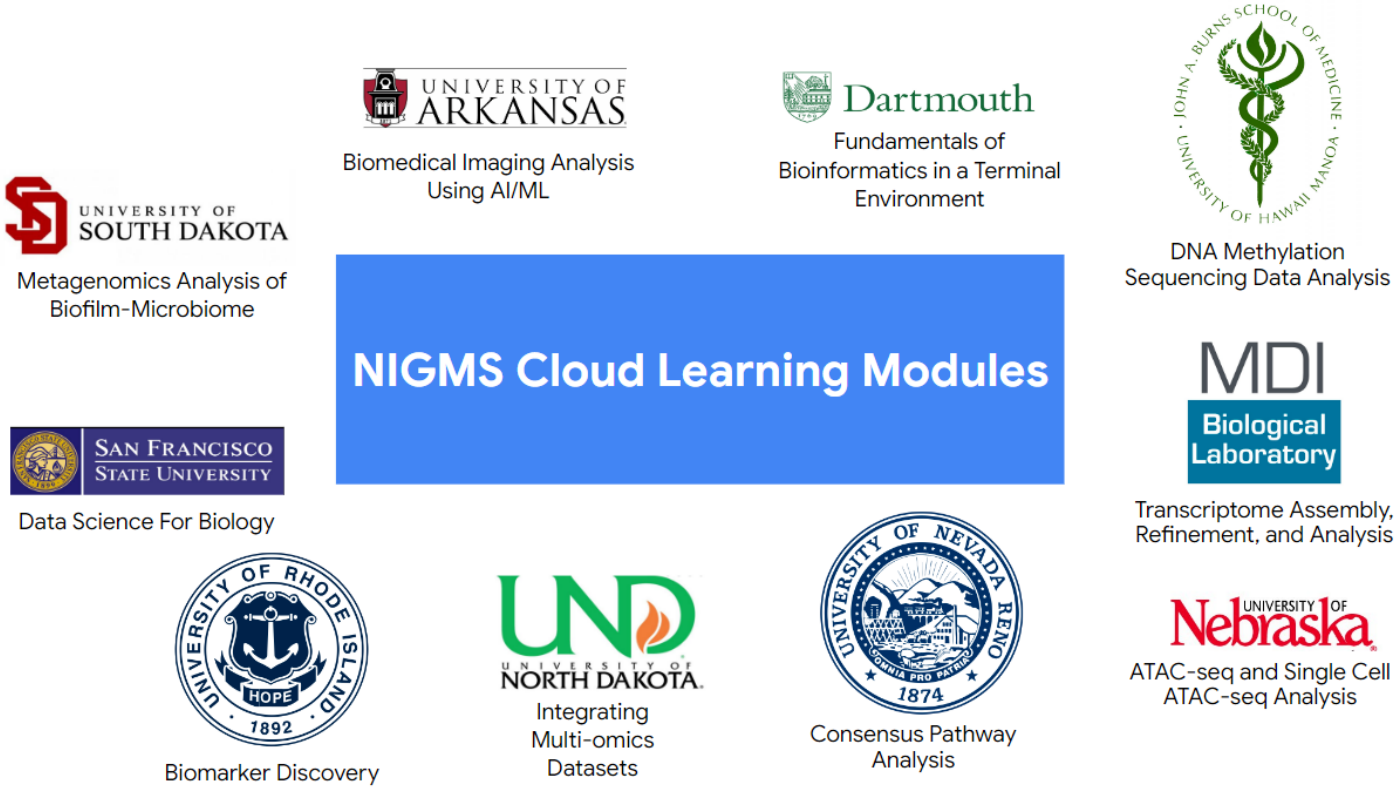
Did you know that kids aren't the only ones playing around in sandboxes? The term *sandbox* may evoke a childhood memory of sensory play, but it's also used to describe a virtual environment where someone can learn from digital products.

Credit: NIGMS.

https://biobeat.nigms.nih.gov/2023/09/in-other-words-sandboxes-arent-just-for-kids/

NIGMS Sandbox

The NIGMS Sandbox is a collection of 12 biomedical research learning modules, built by NIGMS grantees, that run in the cloud



https://github.com/NIGMS/NIGMS-Sandbox

Sandbox Modules

- **Introduction to Biomedical Data Science and Machine Learning**
  - Introduction to Data Science for Biology - San Francisco State University (B2D)
  - Consensus Pathway Analysis in the Cloud - University of Nevada Reno (INBRE)
  - Analysis of Biomedical Data for Biomarker Discovery - University of Rhode Island (INBRE)
  - Biomedical Imaging Analysis using AI/ML approaches - University of Arkansas (INBRE)
- **Introduction to Bioinformatics and Multi-Omics**
  - Fundamentals of Bioinformatics - Dartmouth College (INBRE)
  - Proteome Quantification - University of Arkansas for Medical Sciences (INBRE)
  - DNA Methylation Sequencing Analysis with WGBS - University of Hawaii at Manoa (INBRE)
  - Integrating Multi-Omics Datasets - University of North Dakota (INBRE)
- **Introduction to Genomic Analysis**
  - ATAC-Seq and Single Cell ATAC-Seq Analysis - University of Nebraska Medical Center (INBRE)
  - Metagenomics Analysis of Biofilm-Microbiome - University of South Dakota (INBRE)
- **Introduction to RNAseq and Transcriptome Assembly**
  - RNAseq Differential Expression Analysis - University of Maine (INBRE)
  - Transcriptome Assembly Refinement and Applications - MDI Biological Laboratory (INBRE)

Sandbox Components

GitHub

- NIGMS Sandbox Repository
- Module code notebooks
- Written instructions
- Links to video tutorials
- Other supporting materials

Google Cloud

- Module data storage and temporary hardware
- Users clone module GitHub repositories and then run the modules in the cloud
- Charge for use of storage, memory, CPUs, and GPUs (most expensive)

- **NIGMS Sandbox Launched – June 23, 2023 (Webinar)**
  - 24 INBREs and 6 TWD awardees invited to submit nominations for 3 Cohorts

	Start Date	End Date	Nominations	Status
COHORT 1	July 3	September 25	203	Completed
COHORT 2	August 26	November 9	247	Completed
COHORT 3	October 10	December 31	184	On-going

- Students clone the modules from GitHub Repository into their cloud workspace and implement them
- Students learn biological concepts, data science, as well as cloud computing basics
- Expression of interest from faculty to gain cloud computing skills and to develop new modules

Notice of Special Interest (NOSI): Availability of Administrative Supplements to NIGMS-Funded Awards for Building Cloud-Based Learning Modules

Notice Number:
NOT-GM-24-006

Key Dates

Release Date:	December 7, 2023
First Available Due Date:	February 15, 2024
Expiration Date:	February 16, 2024

Related Announcements

- **October 9, 2020** - Administrative Supplements to Existing NIH Grants and Cooperative Agreements (Parent Admin Supp Clinical Trial Optional). See NOFO PA-20-272.

Issued by

National Institute of General Medical Sciences (NIGMS)

Purpose

The National Institute of General Medical Sciences (NIGMS) announces the availability of funds for administrative supplements to NIGMS-funded awardees to build cloud-based learning modules for biomedical research.

Background

Biomedical research is increasingly dependent on access to and analysis of large and complex datasets. Cloud computing enables efficient data analysis and management without investment in on-premises high-performance computing infrastructure and maintenance by individual institutions. To realize the potential of cloud computing in expanding access to cutting-edge data and data analysis capacity, the biomedical research workforce needs effective learning and research tools to obtain hands-on experience with cloud computing. Faculty-built cloud learning modules allow both the trainer (faculty) and the trainees (students and researchers) to become adept at using cloud computing for biomedical research. This “train the trainer” process is efficiently accomplished through the NIGMS Sandbox.

The NIGMS Sandbox is a GitHub repository of NIGMS investigator-built, cloud-based, self-learning modules for diverse biomedical data science topic areas that were developed with prior NIGMS funding (NOT-GM-22-004). These modules have detailed instructions and 508-compliant videos for launching the modules on a cloud platform, conducting data analyses, and drawing inferences to study various biological mechanisms. This NOSI seeks to expand the NIGMS Sandbox repository by developing new modules that can be incorporated into curricula, workshops, and training.

https://grants.nih.gov/grants/guide/notice-files/NOT-GM-24-006.html

Eligibility

- IDeA Networks for Biomedical Research Excellence (INBRE)
- Native American Research Centers for Health (NARCH) awards
- NIGMS Institutional training (T34, T32) awards
- Research Education (R25) award that supports undergraduate, graduate student, or postdoctoral trainees.
- One supplement request per active award

Application Contents

Objective: Convert biomedical research training materials into cloud based *self-learning* modules

Significance: Module topic is unique and non-duplicative (NIGMS Sandbox)

Description: Background, Data processing and analysis steps, software programs, and workflows

Module Development: Describe self-learning module development including, instructional videos, demos, and practicum exercises

Module Dissemination: Plan to include your module and other modules from NIGMS Sandbox into the teaching curriculum

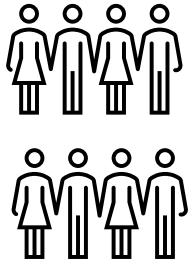
Budget – Administrative Supplement

- The requested length of award may not exceed one year.
- 6 person-months of salary support for the project lead(s).
- 2-person-months of salary support for graduate student(s) for testing the modules
- NIGMS will coordinate with STRIDES / Cloud Service Provider for
  - Project lead cloud training and support (train-the-trainer)
  - Cloud account set up and cloud credits
  - Deployment of the module in the sandbox

Application Due Date: 15 February 2024

Development of New Modules

Applications



Awardee Cohorts

- Protein Structure
- Genetic Variants
- Interactome Mapping
- Phylogeny / Evolution
- Microbiome Virome
- Simulation and Data Analysis
- Host-microbe Interactions
- Complex Biological Systems

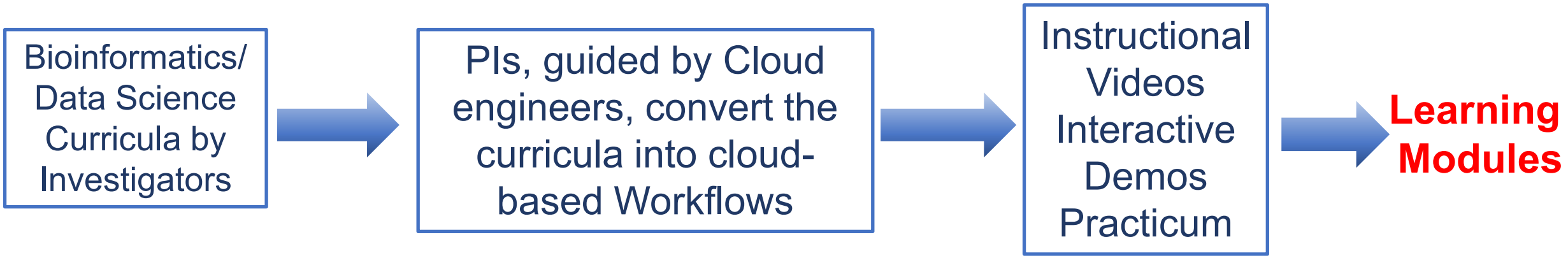
Example Learning Modules

Project leads should have programming experience and subject matter expertise

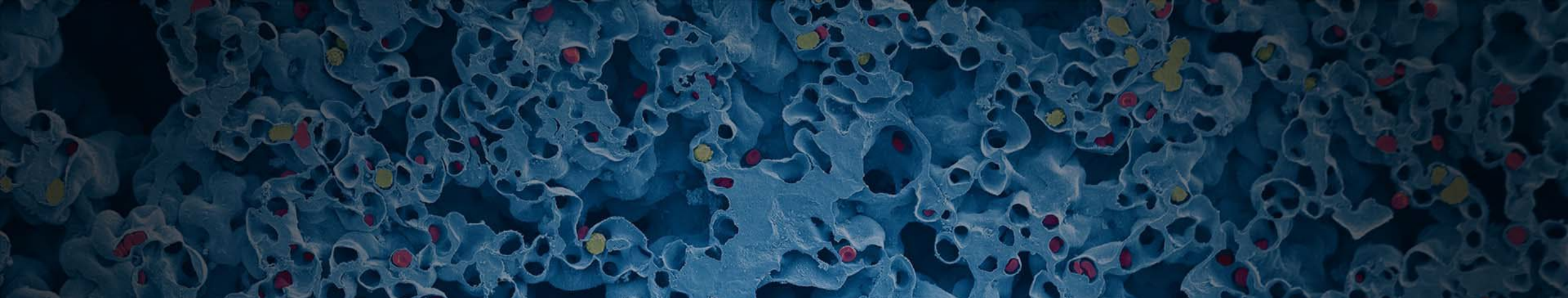
Project leads will work with cloud software engineers arranged by NIGMS to develop learning modules.

The modules should have **minimal overlap** and complement with the existing NIGMS Sandbox modules.

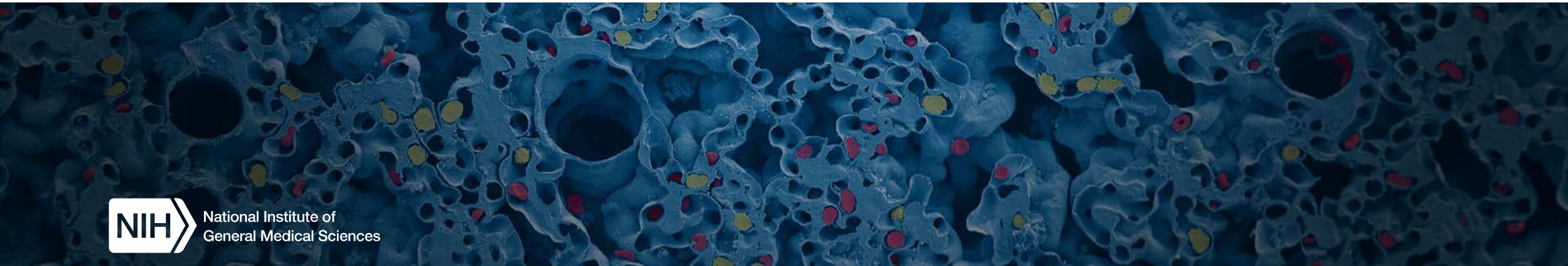
Building Cloud-based Learning Modules



Train-the-Trainer:
GM-supported investigators gain programming skills to develop more cloud-based tools in the future



Questions?



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