INDIANA GENOMICS RESEARCH TRAINING PROGRAM FOR DATA SCIENTISTS

Students applying to or enrolled in the following master's degree programs at Indiana University may apply to participate in this mentored hands-on training that will prepare them to use powerful computational and statistical methods to decode the functional information hidden in DNA sequences.

- Biostatistics
- Computer Science
- Computational Data Science
- Data Science/Applied Data Science
- Mathematics/Math-Applied Statistics

**INDIANA UNIVERSITY**
SCHOOL OF MEDICINE

WHAT IS GENOMICS DATA SCIENCE?

An interdisciplinary field that merges modern genomics technologies that generate genomic and multi-omics information from living organisms with statistical and computational tools to process, analyze, visualize, store, and interpret these data.

Both disciplines are necessary to acquire and gain insights from vast amounts of genomic data to better understand biological systems.

PROGRAM FEATURES

- **Year-long program**
- **Two program start dates:**
  1st week of January or June
- **Stipend:** $19,200/yr
- **Tuition allowance:** 9 credit hours
- **Research allowance:** $1,000
- **Travel allowance:** $1,000
- **Co-faculty mentors in biological and data science fields**
- **Career development activities**
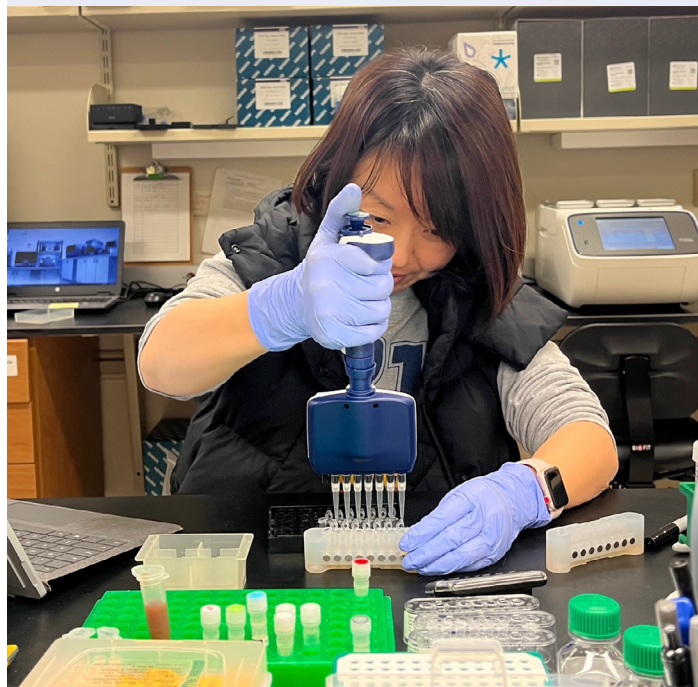
OVERVIEW

The Indiana Genomics Research Training Program for Data Scientists (INGEN4DS) was developed in response to the recent explosion in genomic sequencing data and the need for a well-trained and diverse genomics workforce to mine these data.

The training plan allows qualified candidates enrolled in master's degree programs in data science-related fields to receive practical training and receive hands-on research experience in genomics data analysis. Students may enter the year-long program in either June or January.

INGEN4DS scholars will complete computational genomics coursework as part of their master's program elective course requirements. Each INGEN4DS scholar will be paired with an interdisciplinary co-mentorship team, consisting of one faculty member in the biomedical sciences, who will provide a genomics dataset, and one faculty member in computational biology, who will supervise the bioinformatics analysis. The scholar, under the guidance of the mentors, will develop and execute an appropriate research plan that will have a high likelihood of contributing to a research publication.

In addition, scholars will participate in academic enhancement and professional development activities to better prepare them to enter the genomics workforce or enter a doctoral program with a focus on genomic data science.

COMPETITIVE APPLICATION PROCESS

Up to eight applicants are selected each year through a competitive admissions process that considers prior computational and/or data science-related coursework, previous experience in computational modeling and programming, personal statement, and letters of recommendation. Prior research experience is not required.

HOW TO APPLY

Application deadlines are:
October 31 (January start) and **March 31** (June start). Interested candidates should visit our website at: **medicine.iu.edu/INGEN4DS** or contact us by email: **INGEN4DS@iupui.edu**

ENCOURAGING DIVERSITY

INGEN4DS is committed to ensuring diversity in selecting outstanding scholars to participate in the program. Individuals from diverse backgrounds, including those from groups underrepresented in the biomedical sciences, 1st-generation college students, individuals with disabilities, and those from economically disadvantaged backgrounds are strongly encouraged to apply.

IUPUI and IU-Bloomington have been nationally recognized for their efforts in creating a diverse and inclusive campus environment.

PROGRAM DIRECTORS

Dr. Yunlong Liu, PhD
Professor, Department of Medical and Molecular Genetics

Dr. Kun Huang, PhD, MS
Professor and Chair, Department of Biostatistics & Health Data Science

PROGRAM COORDINATOR

Dr. Jill L Reiter, PhD
Associate Scientist, Department of Medical and Molecular Genetics
Education Coordinator, Center for Computational Biology and Bioinformatics

FACULTY MENTORS

The 40+ training faculty have a broad area of expertise and use genomics data in their research.

Biomedical Science

- Cancer
- Cardiology
- Diabetes
- Immunology
- Musculoskeletal Diseases
- Nephrology
- Neuroscience
- Pharmacogenetics
- Regenerative Medicine

Bioinformatics and Data Science

- Precision Oncology
- Population and Statistical Genetics
- Functional Genomics
- Regulatory Network Analysis
- Multi-omics Data Integration
- Computational Metagenomics
- Imaging Genomics
- Methodology Development for Analysis of Cutting-edge Genomics Technologiess

EMERGING TOPICS IN GENOMICS DATA SCIENCE

- Building tools that identify DNA differences between individuals and link them to medically relevant information, such as an indication for a specific medication among several options.
- Using artificial intelligence systems to interpret genomic data, such as diagnosing diseases at early stages or predicting risk for different diseases using genomic information.
- Cloud computing has become necessary for genomic data storage and analyses. Data scientists are creating tools to make data upload easier and to ensure privacy.

ELIGIBILITY REQUIREMENTS

Eligible applicants for this NIH-funded training program must be U.S. citizens or permanent residents. Candidates must be enrolled and in good standing in an Indiana University master's degree program in statistics, mathematics, computer/data science, or equivalent quantitative or analytical fields, but without an existing genomics component. Individuals currently enrolled in master's degree programs that focus on bioinformatics (or more specifically, genome informatics) are not eligible.

EMPLOYMENT OPPORTUNITIES IN THE GENOMICS DATA SCIENCE WORKFORCE

- Human genomic variation
- Cancer genomics
- Rare genetic diseases
- Genome editing
- Pharmacogenomics
- Noninvasive prenatal genetic testing
- Microbes and microbiomes
- Enhanced DNA-based forensic analyses
- Human origins and ancestry

For more reasons, see
www.genome.gov/dna-day/15-ways