

High School and Undergraduate
Internship Application Summer 2021
Biomedical Informatics

This is the first part of the application process for the internship program in biomedical informatics at OHSU.

This is a 10 - 12 week opportunity with projects starting June 2021. Interns will work 20 or 40 hours per week (depending on project) and will be paid \$15.00 per hour.

Once you complete the online application, the next step will be to provide the following documents:

- 1. Transcripts - unofficial transcripts acceptable, email pdf email to ilgan@ohsu.edu**
- 2. One letter of recommendation, emailed to ilgan@ohsu.edu**

* 1. Please enter the following information to start your application

Name:	<input type="text"/>
Address:	<input type="text"/>
City/Town:	<input type="text"/>
State:	<input type="text" value="-- select state --"/>
ZIP:	<input type="text"/>
Country:	<input type="text"/>
Email Address:	<input type="text"/>
Phone Number:	<input type="text"/>

2. Date of Birth (mm/yyyy)

3. Demographic Information (Optional)

What groups does NIH consider to be in need of a special recruitment and retention plan in order to diversify the biomedical, behavioral, clinical, and social sciences workforce?

A. Individuals from racial and ethnic groups that have been shown by the National Science Foundation to be underrepresented in health-related sciences on a national basis (see data at <http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=27> and the report Women, Minorities, and Persons with Disabilities in Science and Engineering, 2007, p. 262). The following racial and ethnic groups have been shown to be underrepresented in biomedical research: American Indians or Alaska Natives, Blacks or African Americans, Hispanics or Latinos, Native Hawaiians or Other Pacific Islanders. In addition, it is recognized that under-representation can vary from setting to setting and individuals from racial or ethnic groups that can be convincingly demonstrated to be underrepresented by the grantee institution should be included in the recruitment and retention plan.

B. Individuals with disabilities, who are defined as those with a physical or mental impairment that substantially limits one or more major life activities.

C. Individuals from disadvantaged backgrounds who are defined as:

1. Individuals who come from a family with an annual income below established low-income thresholds. These thresholds are based on family size, published by the U.S. Bureau of the Census; adjusted annually for changes in the Consumer Price Index; and adjusted by the Secretary for use in all health professions programs. The Secretary periodically publishes these income levels at <http://aspe.hhs.gov/poverty/index.shtml>. For individuals from low-income backgrounds, the institution must be able to demonstrate that such candidates (a) have qualified for Federal disadvantaged assistance; or (b) have received any of the following student loans: Health Professional Student Loans (HPSL), Loans for Disadvantaged Student Program; or (c) have received scholarships from the U.S. Department of Health and Human Services under the Scholarship for Individuals with Exceptional Financial Need.

2. Individuals who come from a social, cultural, or educational environment such as that found in certain rural or inner-city environments that have demonstrably and recently directly inhibited the individual from obtaining the knowledge, skills, and abilities necessary to develop and participate in a research career.

http://grants.nih.gov/training/faq_diversity.htm#867

	Yes	No
Are you an Underrepresented Minority?	<input type="radio"/>	<input type="radio"/>
Are you an Individual with a disability?	<input type="radio"/>	<input type="radio"/>
Are you economically disadvantaged?	<input type="radio"/>	<input type="radio"/>

4. Please describe your race/ethnicity.

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White
- Other (please specify)

* 5. Country of Citizenship

Academic Information

6. Please provide us with the following academic information

School attending	<input type="text"/>
Major	<input type="text"/>
Minor	<input type="text"/>
Dates attended	<input type="text"/>
Current class in school	<input type="text"/>
Completed credit hours	<input type="text"/>
Current cumulative GPA	<input type="text"/>
Anticipated graduation date	<input type="text"/>

7. Please provide information about experience/classes you have had in the following areas

Programming experience	<input type="text"/>
Quantitative or Qualitative experience	<input type="text"/>
Statistical skills	<input type="text"/>

Project Opportunities

* 8. Please rank your top 4 internships. In each question, the faculty lead(s), the description, and the skills required are listed.

1st 2nd 3rd 4th

Comparison of Methods for Information Retrieval (Search) of COVID-19 Scientific Papers

Faculty: Dr. William R. Hersh

Information retrieval (also known as search) systems are used to search for information about many scientific and other topics. One of the challenges of COVID-19 and search is the volume of scientific papers and reports. Recent research in search shows the value of machine learning techniques to improve search systems, but these have not been tested with real searchers. This project will perform experiments to compare different search systems to evaluate how well they perform. Students should have programming experience in Python, Web, and Jupyter notebooks.

Electronic Care Planning for Patients with Multiple Chronic Conditions

Faculty: Dr. David Dorr

Collaborating on plans of care for patients with multiple chronic conditions can be challenging. Aligning patients' values, goals, and preferences with medical evidence and many care teams' input requires substantial work. A new application using Fast Healthcare Interoperable Resources that has both patient- and care team-facing components is being implemented at OHSU, and a student is sought to help design, implement, and evaluate usability and usefulness testing.

High Blood Pressure patient-facing clinical decision support

Faculty: Dr. David Dorr

High blood pressure is one of the most common chronic conditions in adults older than 50, and the most common contributing factor for heart attacks and strokes. Significant evidence exists about both pharmacologic and non-pharmacologic methods to lower blood pressure, but they require substantial shared decision making and patient motivation. The intern will help us with our patient-facing HBP application; depending on their skill set, help programming, testing, or evaluating the tool with patients and care teams.

Evaluation of EHR system implementation and workflow at an academic medical center.

Faculty: Dr. Michelle Hribar

Ongoing projects involve analysis of outcome measures such as speed, efficiency, and documentation quality; as well as optimization of clinical workflow using EHR data and computer simulations. Skills: statistical analysis (e.g. R), computer programming.

Understanding the Role of the Microbiome in Bladder Health

Faculty: Dr. Lisa Karstens

The overall goal of this research is to understand how the microbial communities of the gut, vagina, and bladder contribute to bladder health and overactive bladder symptoms. Intern projects include developing, testing, and improving the pipelines for handling the clinical data associated with these projects (using REDCap), and bioinformatic pipelines for handling 16S rRNA gene sequencing data as well as NMR metabolomics data (primarily in R). The projects will provide experience of analysis and biological interpretation of so-called 'big data' that arises from the rich and complex datasets generated by high throughput techniques used in basic research. Excellent record-keeping skills and self-motivation are essential. Some familiarity with programming and statistical analysis are preferred but not essential.

Data Science and Analytics

Faculty: Dr. Anita Walden

An important aspect of an informaticist is to understand how to work with various types of data especially electronic health record data. The student will participate with members of the N3C Analytics team to perform analytical tasks. They will assist multi-discipline teams (can choose which one) to analyze data to answer clinical research questions; assist with identifying patient cohorts; enable quality control and validation of codelists; and implement analytical workflows.

The student will work closely with members of the Domain Teams and senior Data Scientist who will assign tasks, answer questions, and provide general guidance. Training will be provided through online training modules and open office hours. The student will be required to attend a 30min weekly check-ins with their mentor to address questions, monitor progress and for overall support. Other meetings will be required as needed.

Training Needed and Provided: OMOP Clinical Data Model, Apache Spark, R and GGplot, Javascript (maybe)

Background Information Reading Material: N3C Marker Paper and Cohort Paper

Long COVID

Faculty: Dr. Anita Walden

There are people who are suffering with symptoms after the onset of COVID-19. These individuals are known to have Long COVID, also known as long-haul COVID. There are many questions that need to be answered to help these individuals such as: what types of medications may protect against severe Long COVID symptoms; how do vaccines impact long-term symptoms; do asymptomatic individuals develop Long COVID; is there a resurgence of symptoms in the future; and which symptoms seem to take the longest to resolve. The student will participate with members of the Long COVID Domain Team to answer similar questions. They will assist multi-discipline teams to analyze data; assist with identifying patient cohorts; and perform investigation using the N3C Data Enclave and other publicly available datasets.

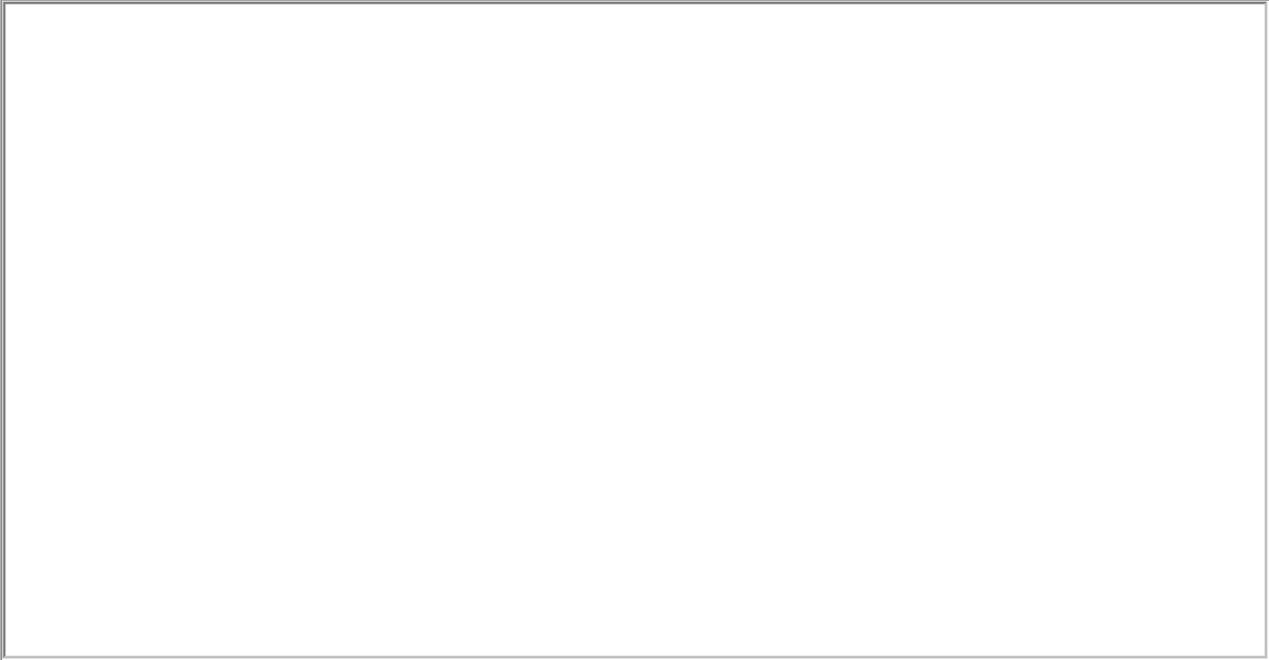
The student will work closely with members of the Domain Teams, senior Data Scientist and other project members who will assign tasks, answer questions, and provide general guidance. Training will be provided through online training modules and open office hours. The student will be required to attend a 30min weekly check-ins with their mentor to address questions, monitor progress and for overall support. Other meetings will be required as needed.

Training Needed and Provided: OMOP Clinical Data Model, Apache Spark, R and GGplot, Javascript (maybe)

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Essay Question

* 9. Essay Question: Please tell us how your education, experience, skills, and interest make you the best candidate for your top (few) choices.

A large, empty rectangular box with a thin black border, intended for the user to write their essay response to the question above.

Finishing up the application process

* 10. How did you hear about this program?

11. Are you planning to pursue graduate education? If so, in what field.

Thank you for applying to the summer undergraduate internship program in biomedical informatics at OHSU.

The application deadline is April 1, 2021 . Candidates will be notified the first of May regarding acceptance into the program.

Please remember to submit the additional documents to complete your application.

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2. One letter of recommendation, emailed to ilgan@ohsu.edu

Specific questions can be directed to Andrea Ilg at ilgan@ohsu.edu