

Keenan Graham

<http://keenangraham.github.io>

49 Broad Street
Asheville, NC 28801
(828) 280-5083
keenangraham@gmail.com

EXPERIENCE

Department of Microbiology and Parasitology, Genova Diagnostics — *Laboratory Director: James Kelton, Ph.D.*

2015 - PRESENT

- Write, revise, and execute custom automation scripts to extract data from the laboratory information system for use in research projects and laboratory monitoring including:
 - All parasitology results from 2014 and 2015 (over 120,000 samples) and patient demographics (age, gender, location)
 - All negative parasitology results since 2001
 - All *Clostridium difficile* results since 2010
- Clean, transform, calculate summary statistics, and **perform complex analysis on data with Python** and Jupyter notebook.
- Create publication-quality visualizations and reports to share with supervisors and display in the laboratory.
- Implement classical statistical hypothesis tests and Bayesian analysis to answer epidemiological questions.
- Liaise with IT Department to create custom SQL queries of the backend database in order to monitor the daily input and output of the laboratory.
- **Build daily parasitology monitoring tools** and interactive, web-ready visualizations in D3.js, JavaScript, HTML, and CSS.

2013 - PRESENT

- Examine via light microscopy trichrome-stained slides and iodine-stained concentrated wet mount preparations in order to **identify intestinal protozoa and parasitic helminths/ova in patient samples submitted for clinical diagnostics**.
- Complete >20 hours of continuing education per year and participate quarterly in College of American Pathologists proficiency testing and in-house quality assurance.
- Cross-train in bacteriology methods of sterile plating, Vitek 2 identification and antibiotic sensitivity assays, and MALDI-TOF mass spectrometry.
- Have resulted more than 20,000 patient samples.

Department of Clinical Genetics, Fullerton Genetics Center, Mission Hospital — *Laboratory Director: Jack Tarleton, Ph.D., FACMG*

2013 (Volunteer Project)

- Identify novel mutations in the *CLCN1* gene leading to myotonia congenita.
- Converse regularly with the laboratory director on general topics of clinical genetics and NGS technology and specific topics of project-related data and goals.

TECHNICAL SKILLS

Data analysis in Python and JavaScript

Custom dashboards and reports with D3.js, HTML, CSS (Twitter's Bootstrap), Jupyter Notebooks, and Markdown

Database creation and **querying in SQL** (Oracle, PostgreSQL, SQLite) and NoSQL (MongoDB)

Web applications with Django, Angular2/TypeScript, jQuery

Software version control with Git and GitHub

LABORATORY SKILLS

Diagnostic parasitology and microscopy

Bacterial culture and antibiotic sensitivity assays

MALDI-TOF mass spectrometry

Analytical biochemistry

Gel electrophoresis

Western blot

Affinity chromatography

PCR and DNA sequencing

Plasmid transformation

- Correct inconsistencies between lookup table of point mutations and raw DNA exon sequences of the gene.

Department of Epidemiology, UNC Chapel Hill Gillings School of Global Public Health — *Principal Investigator: Carla Cerami Hand, M.D./Ph.D.*

2010 - 2011

- Determine parasitemia in blood samples infected with the malaria parasite *Plasmodium falciparum*.
- Isolate the non-erythropoietic, tissue-protective erythropoietin heteroreceptor.
- Collaborate and attend laboratory meetings with practicing research scientists, Ph.D. candidates, and laboratory technicians.
- **Senior research thesis based on experiments performed in this laboratory.**

EDUCATION

University of North Carolina at Chapel Hill, Chapel Hill, NC — *Bachelor of Science in Biology*

2011

Coursework in the Biology of Blood Diseases, Molecular Biology, Genetics, Organic Chemistry, Biochemistry, Modern Physics, Ordinary Differential Equations, Linear Algebra, Advanced Mathematical Methods.

CURRENT PROJECT

The Epidemiology of Intestinal Parasites — *The Prevalence of Protozoal Infection in 120,000+ Clinical Fecal Samples, United States, United Kingdom, Northern Europe, Canada, Australia.*

Genova Diagnostics, Asheville, NC, 2014- 2015.

More at <http://keenangraham.github.io>

INTERESTS

Biostatistics and epidemiology

Hierarchical **Bayesian analysis** and statistical modelling

Interactive data visualization and custom tools

Machine learning (predictions based on features of data)

Clinical research and neglected tropical diseases

COUNTRIES VISITED SINCE 2015

Singapore, China (Hong Kong), Japan, France, Seychelles, Madagascar, Iceland, Germany, United Kingdom