

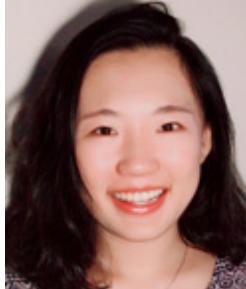
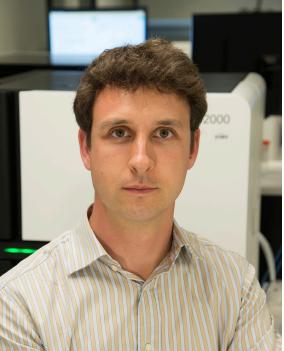


Cold  
Spring  
Harbor  
Laboratory

# Advanced Sequencing Technologies & Bioinformatics Analysis (Virtual)

<http://meetings.cshl.edu/courses.html>

# Introductions to Washington University instructors



**Malachi Griffith**

Assistant Professor of Medicine  
Assistant Professor of Genetics  
Assistant Director, MGI

**Obi Griffith**

Associate Professor of Medicine  
Associate Professor of Genetics  
Assistant Director, MGI

**Felicia Gomez**

Instructor of Medicine

**Huiming Xia**  
PhD candidate

**Kelsy Cotto**  
PhD candidate

**Megan Richters**  
PhD candidate

**Allegra Petti**

Assistant Professor of Medicine



[griffithlab.org](http://griffithlab.org)

[rnabio.org](http://rnabio.org) [genviz.org](http://genviz.org) [pmbio.org](http://pmbio.org)

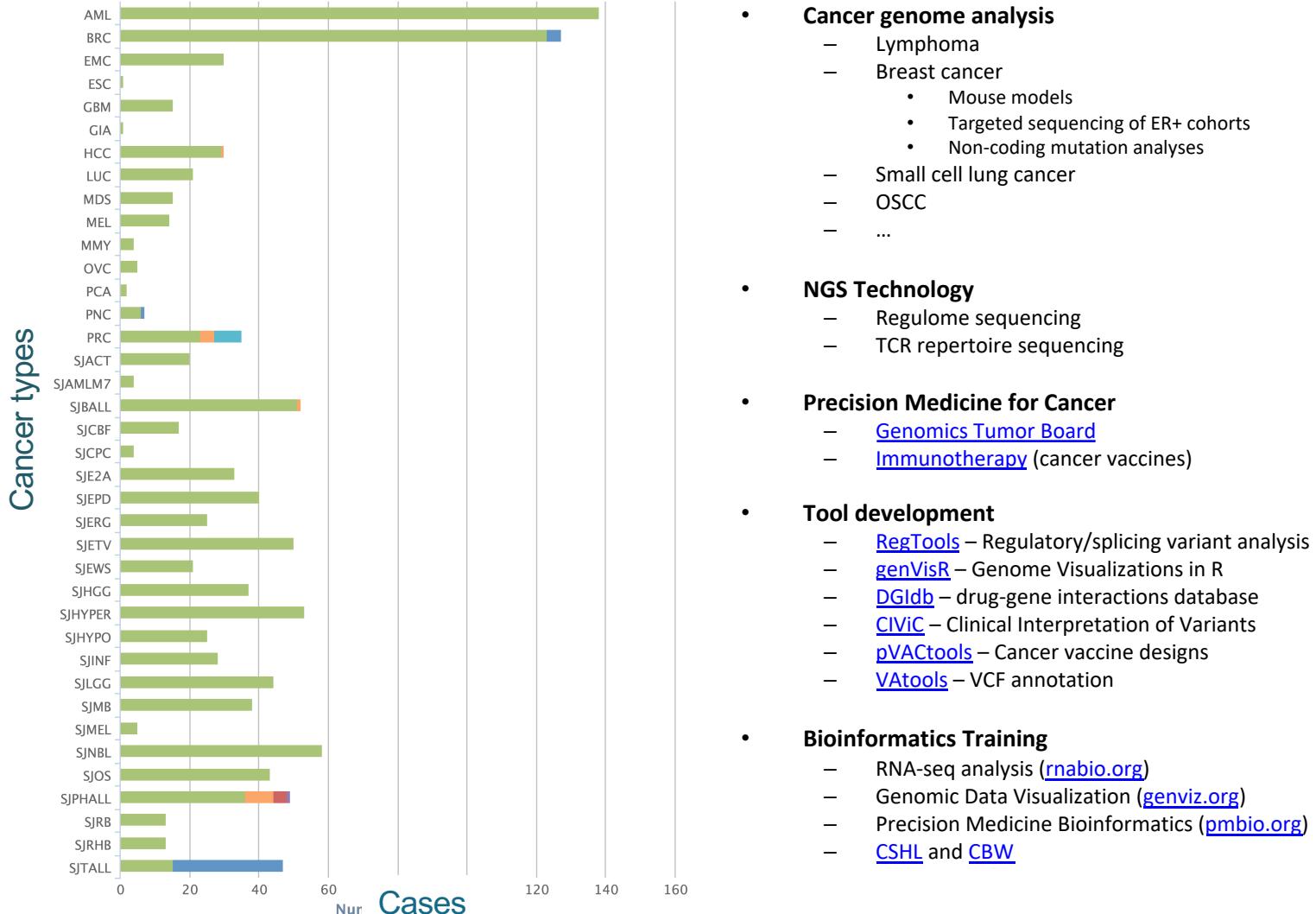


Washington University in St. Louis  
SCHOOL OF MEDICINE

**PETTI LAB**

This will be our first  
virtual workshop!

# Griffith Lab activities are cancer genomics (informatics) focused: new discovery, translation, method development and training



- **Cancer genome analysis**
  - Lymphoma
  - Breast cancer
    - Mouse models
    - Targeted sequencing of ER+ cohorts
    - Non-coding mutation analyses
  - Small cell lung cancer
  - OSCC
  - ...
- **NGS Technology**
  - Regulome sequencing
  - TCR repertoire sequencing
- **Precision Medicine for Cancer**
  - [Genomics Tumor Board](#)
  - [Immunotherapy](#) (cancer vaccines)
- **Tool development**
  - [RegTools](#) – Regulatory/splicing variant analysis
  - [genVisR](#) – Genome Visualizations in R
  - [DGIdb](#) – drug-gene interactions database
  - [CIVIC](#) – Clinical Interpretation of Variants
  - [pVACtools](#) – Cancer vaccine designs
  - [VAtools](#) – VCF annotation
- **Bioinformatics Training**
  - RNA-seq analysis ([rnabio.org](#))
  - Genomic Data Visualization ([genviz.org](#))
  - Precision Medicine Bioinformatics ([pmbio.org](#))
  - [CSHL](#) and [CBW](#)

[www.griffithlab.org](http://www.griffithlab.org)

# Introduction to SEQTEC Informatics – philosophy and goals

*Do “the bioinformatics” for someone, and you help them for a day. Teach someone to do bioinformatics, and you help them for a lifetime.*

*- Ancient Chinese proverb*

- Course goals
  - Learn concepts and develop skills for sequence analysis
  - Build the foundation for tackling your own analysis challenges
  - Learn to think like a bioinformatician
  - Have fun

# **Course outline**

**Monday - Introduction to technologies**

**Tuesday - Bioinformatics basics and NGS data fundamentals**

**Wednesday - RNAseq expression analysis**

**Thursday - RNAseq differential expression analysis**

**Friday - Single cell RNAseq**

# Course format for a typical day

- Lecture
- BREAK
- Lunch
- Practical exercises
- BREAK
- Practical exercises
- Wrap-up and Q&A

# Student poll

Not counting the pre-requisites and materials for this course:

- Do you consider yourself a bioinformatician?
- Are you familiar with linux/command line?
  - Intermediate?
  - Expert?
- Do you sometimes write code?
- Are you familiar with R?
  - Intermediate?
  - Expert?
- Do you use git/github?
- What organism do you work with?
- Are you interested in bulk RNAseq (Yes), scRNAseq (No), or both (hand)?
- Who has a dual monitor setup?

# An overview of bioinformatics

Adam Siepel

Professor, Watson School of Biological Sciences; Chair, Simons Center  
for Quantitative Biology; Cold Spring Harbor Laboratory

Opinion | [Open Access](#) | Published: 29 July 2019

## Challenges in funding and developing genomic software: roots and remedies

[Adam Siepel](#) 

[Genome Biology](#) 20, Article number: 147 (2019) | [Cite this article](#)

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