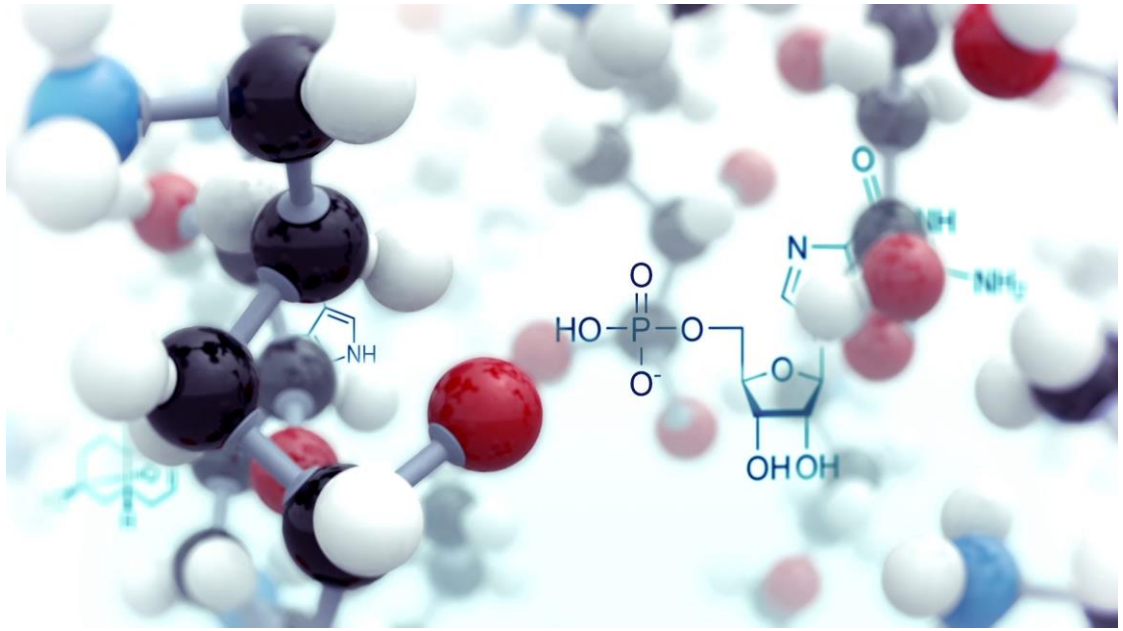
OREGON HEALTH & SCIENCE UNIVERSITY

BME Coding Camp

Become a Researcher, Data Scientist, Coder and Programmer with OHSU Biomedical Engineering



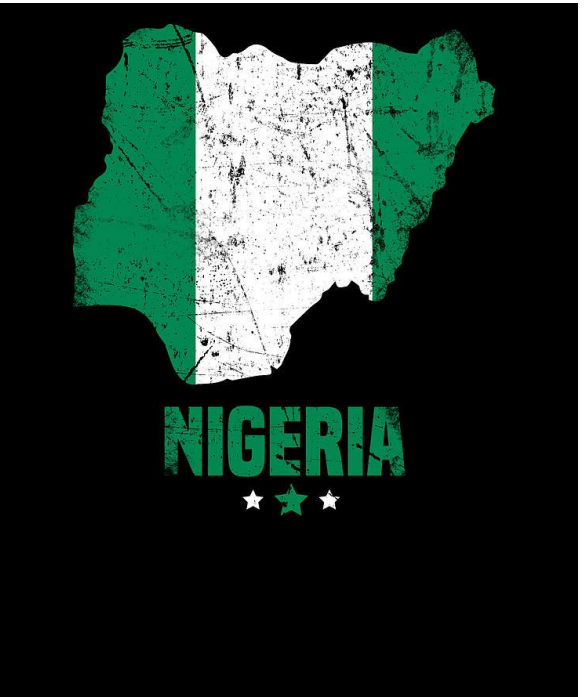
Ogechukwu Ezenwa

ABOUT ME

- Lived in Nigeria for 18years
- Graduated from high school in 2017
- Took a gap year to prepare for college
- Applied to schools in the US

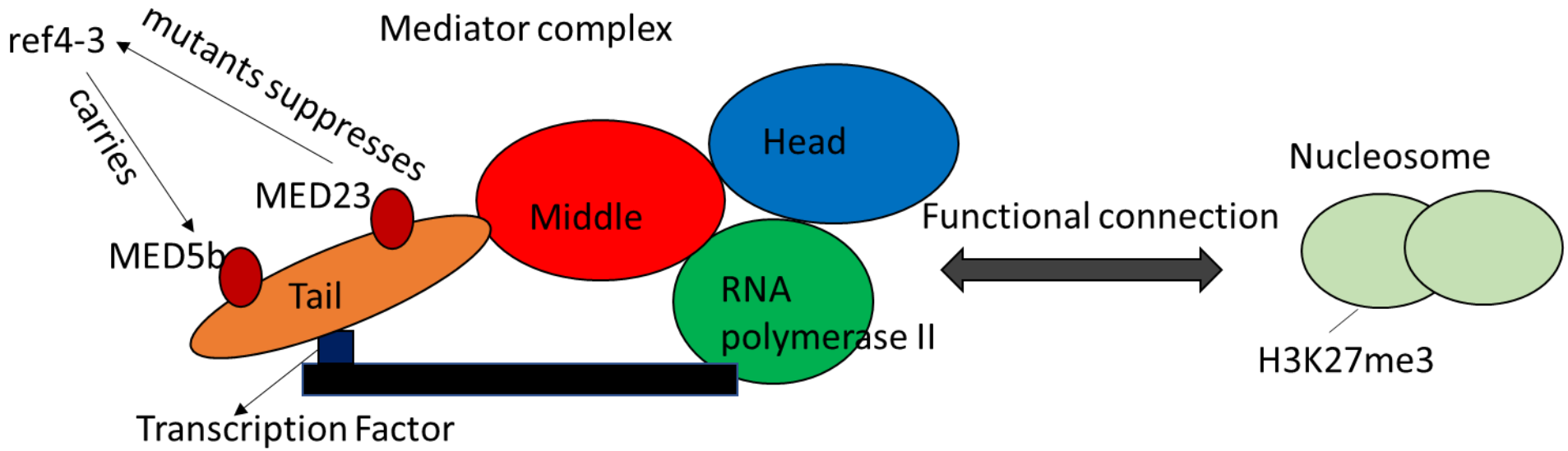
- Worked in a plant science research lab (2020 -2022)
- Fulfilled all college/departmental requirements
- **Finally graduated in 2022!!!!**

- Choose Purdue due to family, my high school friend, and affordability
- Moved to the United States in 2018
- Majored Biochemistry



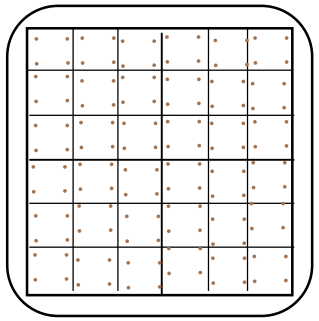
PLANT SCIENCE RESEARCH

EXAMINING THE CONNECTION BETWEEN MEDIATOR COMPLEX AND H3K27ME3



WHAT DID I DO IN MY RESEARCH?

Plating of Seeds



7 - 10 days old seedlings

- Extract DNA from plants
- Purify DNA
- Verify genotype of the plants though PCR
- Run a gel electrophoresis to visualize segments of DNA

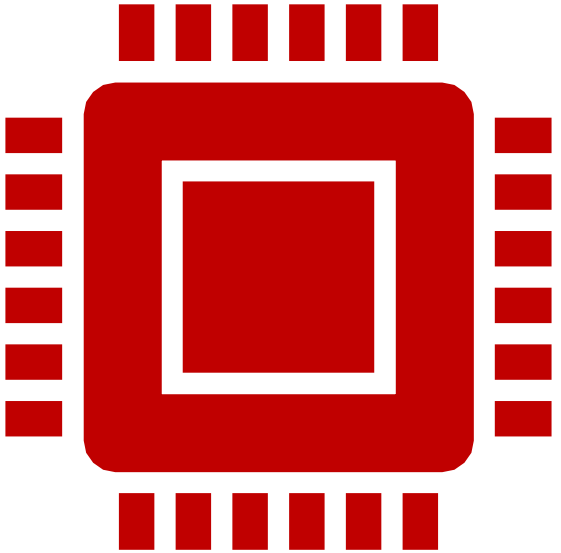
13 – 16 days old seedlings

- Analyze these phenotypes using a microscope
  - Number of leaf hairs
  - Color of plant leaves
  - Germination/Growth rates
- Resistance when using a resistant marker
- Contamination (can highly affect results)

- Collect seeds when completely dry
  - In bulk or individually

TRANSITIONING INTO COMPUTATIONAL BIOLOGY

- Took classes in R programming language that sparked my interest in Bioinformatics/Computational Biology
  - Freshman year: Got introduced to *R programming language* via a Data Mine learning community
  - Sophomore – Junior year: Didn't take any class in programing
  - Senior year: Took a class called *R in Biochemistry*
- Applied to a summer research internship program in OHSU to gain more training
  - Got placed in Dr. Zuckerman's lab and started working with Jeremy
  - Learnt so much as a Research Intern and looking to pursue Computational Biology long-term



COMPUTATIONAL BIOLOGY RESEARCH

Objectives 

Our research goal is

- To develop trained networks of paired single-cell information that can analyze live-cell movies
- To generate images of corresponding Immunofluorescence signals
- To address the molecular mechanisms that drive and determine live-cell behavior and phenotypes

Hypothesis 

We hypothesize that

- Supervised machine learning with training and testing datasets of paired live-cell imaging and immunofluorescence readouts can yield validated predications about specific protein pathway activity over live-cell movies and
- Provide insight into the molecular mechanism that drive and determine live-cell behavior and phenotypes.

WHAT I HAVE DONE TO SET UP MY COMPUTER

1

Learning Python

- Came in without any experience in Python
- Did several tutorials to familiarize myself on how to write python scripts

2

Installing Anaconda and Setting up Environments

- Anaconda is a software for Python and R
- Virtual environment is created manage several packages used in different projects

3

Installing WSL (Windows Subsystem for Linux)

- The python scripts I am running are Linux commands and cannot be ran on Windows operating system

4

Connecting to Supercomputer (Exacloud)

- Exacloud is OSHU's cluster computing environment

Source

ADVICE FROM A RECENT COLLEGE GRADUATE

College is a roller-coaster that comes with a lot of experience

- One step into adulthood
- Embrace those experiences and friends you make along the way

Explore different areas of research interest or industry internships

- You will eventually find your footing

Build connections and try to maintain them

- Networking will take you a long way

Don’t be afraid to ask for help/assistance

- Shoot that email. The least you get is a “no” and that is okay.

It is okay to fail

- Life happens and things don’t go the way you want it
- Reflect but don’t dwell

Learn at least one programming language

ACKNOWLEDGMENTS

Ogas Lab

- Joseph P. Ogas, Ph.D., Professor and Principal Investigator
- Kwok Ki Ho, Ph.D.
- Jiaxin Long, Ph.D. Student
- Emily Therese Johnson, Former Undergraduate Research Assistant
- Jacob Ryan Fawley, Former Undergraduate Research Assistant
- Angela Rose Meyer, Former Undergraduate Research Assistant
- Shelby Lynn Sliger, Undergraduate Research Assistant

Zuckerman Lab

- Daniel M. Zuckerman, Ph.D., Professor and Principal Investigator
- Jeremy Copperman, Ph.D.
- August George, Ph.D. Student
- John Russo, Ph.D. Student
- Shelby Santos, Research Assistant
- Harry Ryu, Ph.D., Postdoctoral Researcher

Cell, Developmental & Cancer Biology Summer Internship

- Ferdinando Pucci, Ph.D., Internship Director
- Amy Moran, Ph.D., Internship Director
- Laura Paquette, Program Coordinator