Scientific Repertoire

The goal of this document is to transparently showcase my skills in *science communication*, *research methodologies*, and *field work*. I will also elaborate on *future learning goals*. It is not a CV or resume. Contains a colorized proficiency rating system and links to the indicated item.

*Underlined words are links to referred section or website/software.

Proficiency Rating System

◎ Knows about it. Used/done once or twice.

◎ Amateur: Used/done a few times. Confident but needs more work.

◎ Proficient: Easily done with minimum error. There is always more to learn.

Statement of Interests

My interests are rooted in the evolutionary history of life. To satisfy these increasingly diverse interests, I take an interdisciplinary approach to understanding life's history. In a world where we can instantly connect with each other, no scientific approach should be off limits. There is an increasing need for field biology. Specifically, for the discovery and development of new early branched eukaryotic model organisms (protists).[1] Finding and characterizing new protist species is insightful for biology yet it is often ignored. More so, establishing model organisms is fundamental to biological research. More research information can be found on my **[Website]**.

Co-interests: Science communication and teaching. Organismal photography and microscopy. Husbandry. Field research and specimen hunting.

Biological subdisciplines: Comparative biology. Eukaryotic microbiology. Field protistology. Molecular biology and biochemistry. Paleontology. Biogeography. Biophysics (mainly of light and fundamental particles).

General interdisciplinary study: Physics of matter. Electricity and magnetism. Microscopy and optics. Biochemistry. Photography and videography. Model organism biology.

Science Communication

◎ Teaching: Two years of tutoring biology, chemistry, and physics classes. I use tutoring opportunities to practice new ways of teaching complex scientific ideas. In addition, I've been a teaching assistant for two years. Mentored students in science, research methods, and graduate school.

◎ Presentation: In both poster and oral formats. Aversion to jargon and strong emphasis on background and significance. Expressing results in a transparent way, highlighting both positive and negative parts. Led many journal clubs talking about exciting research from many fields within Biology.

◎ Life Photography/videography: Seeing life in action proves fruitful in education. Item exhibition photography. Various forms of photomicrography. Video editing in Davinci Resolve Studio.

◎ Writing/Literature: *I could greatly improve my scientific writing*. I have yet to write a scientific paper. I have written several abstracts/proposals/research descriptions.

Research Methods and Techniques

Research via Computer

◎ Probing the frontiers of science and literature. Finding relevant information to the project.

◎ Referencing software: Mendeley, Zotero, Papers App.

◎ Protocol finding and development.

⌘ Biotechnology
- ◎ NCBI resources: BLAST, GenBank, Conserved Domain Search.
- ◎ NEB cloning tools
- ◎ UCSC Genome Browser and VirtualBox
- ◎ Benchling, SnapGene
- ◎ I-TASSER

⌘ Comparative Biology and Databases
- ◎ GBIF, ITIS, EoL, WoRMS, OBIS
- ◎ Lifemap (ncbi version)
- ◎ GPlates, PaleoBioDB

In the lab

⌘ Husbandry and Model Organisms – Keeping life in the lab.
- Invertebrate Animals
  - ◎ Amphioxus/Lancelets: Used them as models of ancient chordates. We did many things with these guys including developments in cloning their natural fluorescent protein(s), exploring their paleobiogeography, breeding, making a disease model for immunology study, and immortalizing their cells in culture.
  - ◎ Flatworms: *Planaria*
  - ◎ Nematodes – wild and lab strains.
  - ◎ *Turbo fluctuosa* (Marine snail)
  - ◎ Antlions
- Vertebrate Animals
  - ◎ Pig models: Some exposure to using pigs in research.
- Protists
  - ◎ Algae: *Nannochloropsis*, *Tetraselmis* (Marine)
  - ◎ *Pyrocystis* (with reversed circadian rhythms)
  - ◎ Ciliates: *Paramecium, Blepharisma, Spirostomum*
- Plants (Currently no lab plants) – Future directions entail a green house.
- Bacteria
  - ◎ *E. coli* – For food and cloning.

⌘ Molecular
- ◎ Cloning and DNA work: PCR, ligation, restriction digests, DNA purification, DNA Precipitation, RNA isolation, cDNA Synthesis, electrophoresis (and making gels), plasmid mini and midi preps, transformation, and bacteria culturing.
- ◎ Tissue culture: (293T, RAW 264), and transfection (mammalian).
- ◎ Protein work: Western blotting; dot blot; ELISA

⌘ Microscopy & Imaging
- ◎ Inverted, light, dissection scopes.
- ◎ Fluorescent Microscopy
- ◎ Confocal Microscopy: Leica SP8 w/LasX.
- ◎ **Software:** AxioVision (for Zeiss cameras). ImageJ. Image Pro. MyoVision. Helicon focus. Photoshop.

⌘ Histology
- ◎ Immunohistochemistry: *In muscle tissue* – Cryosectioning, staining, confocal microscopy.
- ◎ Fungal staining

⌘ Organic Chemistry
- ◎ Chromatography – Paper and column
- ◎ NMR and data interpretation
- ◎ IR Spectroscopy
- ◎ Sublimation of caffeine

Field Research

◎ *Lacking in professional field research experience.*

◎ Identification, collection, husbandry, and visualization of certain organisms [go to: Husbandry].

⌘ Marine environments
- Currenting conducting research in the Gulf of Mexico for the search of peanut worms.
- Licensed in advanced open water diving. Experienced in boating.

Goals for Learning and Future Experience

Writing

⌘ Funding: How to write grants and proposals.
⌘ Publishing: How to write and put together research articles and reviews.

Field research

⌘ Interested in field protistology, little experience.

Instrumentation

⌘ Interference and electron microscopy. (I am a microscope nerd if you can't tell.)
⌘ Mass spectrometry.
⌘ Computed tomography.

Programing

⌘ Interested in learning R and python for data visualization.
⌘ How to process and visualize data.
⌘ I can code HTML. Not an achievement as one can learn it in an hour.