BIOGRAPHICAL SKETCH

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NAME: Reggiardo, Roman

eRA COMMONS USER NAME (credential, e.g., agency login): RREGGIAR
POSITION TITLE: Trainee

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
UC Santa Cruz	BS	10/2012	6/2017	Biochemistry and Molecular Biology
UC Santa Cruz	PhD	9/2017	In Progress	Bioengineering and Bioinformatics

A. Personal Statement

I am interested in pursuing a career that benefits from my interdisciplinary background and allows me to make meaningful contributions to the advancement of not only scientific discovery but also scientific collaboration and communication. Prior to pursuing bioinformatics, I was an undergraduate student just discovering science at a bench in the lab of Dr. Glenn Millhauser, a celebrated educator and researcher applying biophysical approaches to study the pathogenic activities of the prion protein. My experiences there sparked a strong desire to obtain a PhD, but not in biophysics. Instead, I was fascinated by what we could do with the Mass Spectrometry data that the lab generated. This interest led to my first independent research project and eventually an authorship from related work[1].

Following my interests, I enrolled in the UC Santa Cruz graduate program in Biomolecular Engineering and Bioinformatics where I joined the lab of Dr. Daniel Kim. Dr. Kim's expertise and history of applying cutting edge sequencing approaches to elucidate biological systems driven by RNA has been an excellent complement to my interests in analyzing data sets with biological and clinical significance. I have had the unparalleled experience of working side by side with biologists as we tackle problems by combining our respective expertise into multipronged approaches. Much like the proposal I am submitting for consideration, our current projects rely on our ability to successfully communicate and plan to take advantage of both the wet and dry scientific approaches we have honed and developed during our time here. I look forward to submitting two of these projects in the near future and sharing authorship with two of my colleagues in the lab.

Dr. Kim and I have collaborated extensively on the design and formulation of approaches to liquid biopsy data generation and analysis. We are currently engaged in multiple projects to attempt to expand our understanding of the clinical relevance of cell free RNA using *in vitro* models and clinical blood plasma samples. It is our shared passion to combine our skillsets and generate impactful analysis of liquid biopsy approaches we undertake in the lab to further understand the transcriptional events that occur in the development of lung cancer. We have devoted significant time and effort to characterizing the cell and cell free transcriptomes of model lung epithelial models *in vitro* and are hoping to submit these results for publication imminently.

Outside of the lab, I have made an effort to contribute to multiple outreach programs. I took an officer role in the UCSC Women in Science and Engineering chapter to help plan and execute outreach events for local

middle school students. I also took charge of the social media operation, helping communicate the events and goals of the organization. This past summer, I had the opportunity to be a secondary mentor to two high school student interns in the Kim lab. I helped them design an *R* script to process the qPCR data they were generating in their project. I also taught a week-long course in data visualization using *R* to half of the internship cohort (~60 students). I designed the lesson plan and put together code notebooks for them to follow and complete. As a NHGRI T32 trainee I have endeavored to use the flexibility provided by the fellowship to engage my undergraduate mentees in the science they are exploring. The T32 program has greatly aided in my development of scientific skills, the pursuit of more knowledge in graduate-level classes, and my engagement with my peers and colleagues. I am determined to pursue opportunities that will continue to enhance my experience in graduate school and maintain the rigor and purpose of my training.

B. Positions and Honors

- Modified Supplemental Instruction: Learning Assistant: 1/2017 – 6/2017
- Graduate Student Researcher – Millhauser Lab: Summer 2017
- Teaching Assistant: 1/2018 – 6/2018
- UCSC Women in Science and Engineering Officer: 1/2018 – 12/2018
- Graduate Student Researcher – Kim Lab: Summer 2018
- UCSC Summer Internship Program Secondary Mentor: Summer 2018
- UC Santa Cruz NHGRI T32 Trainee: 9/2018 - Present

C. Contributions to Science

Undergraduate Research:

I was part of two projects during my time in Dr. Millhauser's lab. The first, that would eventually become my undergraduate thesis, was a study of the cleavage events occurring in wild type prion protein (PrP). PrP is known for its role in fatal prion disease where it is observed to aggregate into toxic amyloid structures. I investigated healthy PrP's interaction with a particular protease, ADAM8, known to be present in the same neuronal context as PrP. As a summer graduate student researcher, I worked on the design of a therapeutic construct of the Agouti-Related Peptide (AgRP). AgRP is known to be a potent stimulator of feeding as an inverse agonist to the Melanocortin 4 Receptor. The goal of the design was to create a peptide therapeutic for the treatment of cancer cachexia. My work on the AgRP peptide resulting in an authorship with a collaborator exploring the effects of a related signaling protein, Kir7.1, and its response to exogenous AgRP stimulation in obese mice[1].

1. Anderson, E. J. P. *et al.* Late onset obesity in mice with targeted deletion of potassium inward rectifier Kir7.1 from cells expressing the melanocortin-4 receptor. *J. Neuroendocrinol.* **31**, e12670 (2019).

Graduate Research:

I am working on two collaborative projects which explore the functional roles of RNA in critical biological contexts. KRAS, a potent oncogene, plays an important role in both oncogenesis and differentiation but has an unclear effect on non-coding genes and transposable elements. We have deeply sequenced the polyadenylated RNA of a lung epithelial cell line expressing mutant KRAS and of induced pluripotent stem cells lacking endogenous KRAS. During these projects I have used my computational skill set to complement the wet lab expertise of my colleagues; my efforts to spearhead the data analysis and interpretation have resulted in two co-first authorships on publications that are in submission. We have also endeavored to begin sequencing cell free RNA in both *in vitro* and clinical contexts. Currently, we have sequenced exosomal RNA extracted from the cell media of the previously mentioned lung epithelial line and are currently sequencing plasma from patients with arterial hypertension. I am currently developing analytical approaches to study both contexts and begin modelling the clinical and biological states present in the cells and in patients.

D. Additional Information: Research Support and/or Scholastic Performance

YEAR	COURSE TITLE	GRADE
2013	Gen Chem 1A	C
2013	Gen Chem 1B	A-
2013	Gen Chem 1C	A-
2013	Cell & Molec Bio	A
2013	Development & Phys	B
2014	Calc I	B
2014	Ochem 108A	B-
2015	Ochem 108B	C
2014	Physics I	B-
2015	Physics II	B
2015	Physics III	C
2015	Genetics	B
2015	Org Chem: Apps to Bio	B
2015	Calc II	C+
2015	Biochem I	A
2015	Quantum Mechanics	B
2016	Biochem II	A
2016	Thermodynamics	A
2016	Biochem III	A-
2016	Drug Design/Discovery	A-
2016	Cell Bio	A
2016	Python for Biology	A
2016	Statistical Mechanics	B+
2016	Adv. Biophysical Methods	P
2016	Senior Research	A
2017	Stat. Methods	B
2017	Undergrad Thesis Writing	A
2017	Adv. Macromolecular Structure	P
2017	Euk. Cell Bio	A-
2017	Senior Thesis	A
2018	Adv. Molec Bio	B
2018	Intro Comp. Genomics	B
2018	Adv. Comp Genomics	A-
2018	Bioethics	A