Statement of Purpose
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My desire to attend graduate school and pursue a career in biological research began in my junior year, after I started taking senior level seminars in Molecular Biology, Cell Biology, and Epigenetics. These courses gave me the chance to learn more about biological research, emerging fields, and various molecular techniques. I also was able to write two grant proposals on various epigenetic regulators, such as chromatin remodeling complexes, which allowed me to dive more into the standing body of literature and contemplate missing information in the field of epigenetics. It was through these projects that I realized my passion for epigenetics and issues facing human health.

As a future graduate student, I'm specifically interested in studying epigenetic mechanisms of gene regulation and the role they play in developmental processes, physiology, and disease. I'm interested in gene regulation because genes and DNA are the fundamental level of biology. I'm fascinated with learning about what happens when gene regulatory processes go wrong. I'm particularly fond of epigenetics because epigenetic modifications are key regulators of gene expression and explain many biological phenomena that cannot be explained by the DNA sequence. In addition, many of today's diseases have a genetic and/or epigenetic component, demonstrating the importance of understanding these aspects of biology. Areas of epigenetics that are intriguing to me include DNA methylation, epigenetic reprogramming, nuclear architecture, and chromosome folding.

Given my interest in epigenetics that developed in my junior year, I knew that I wanted to continue studying this at the graduate level. **To get more experience, I applied for and was awarded an NIH Post Baccalaureate Research Education Program (PREP) Fellowship.** This gave me the opportunity to study and conduct full time research at the University of Pennsylvania, School of Medicine, in the laboratory of Dr. Marisa Bartolomei, which specializes in the study of DNA methylation and genomic imprinting. I have been working on my own project in the lab focused on investigating the epigenetic and multi-generational health effects following prenatal exposure to endocrine disruptors. Endocrine disruptors are chemicals widely used as plasticizers which also have the ability to alter endocrine homeostasis. I have been specifically examining the endocrine disruptor, di (2-ethylhexyl) phthalate (DEHP), which is an antiandrogenic compound. Early life exposure to DEHP is associated with adverse effects on metabolic health in humans and rodents, which is thought to be mediated by epigenetic changes. To explore this, we have used a mouse model with a maternal dietary exposure to DEHP. **I have been responsible for carrying out all of the experimental processes as well as the design, analysis, and dissemination of results.**

Preliminary results from my work suggest that DEHP-exposed male offspring show mild obesogenic effects including elevated body weight, reduced pancreas weight, trends toward glucose intolerance, and trends towards elevated body fat. These results were achieved using glucose tolerance tests and dual energy x-ray absorptiometry (DEXA) scans. These changes are associated with epigenomic changes including reduced global DNA methylation in fetal and adult tissues; a result achieved through a technique known as luminometric methylation assay. These effects are sex specific and do not persist into the F2 generation via maternal transmission. **Our work will be important to the field because we have created a mouse model of exposure that more closely resembles human exposure.** Understanding the effects of prenatal DEHP exposure and the mechanisms through which they work will ultimately improve our knowledge of the risks DEHP poses to human health.

My time in the PREP program has been extremely rewarding. I've been able to complete graduate coursework in Epigenetics, Cell Biology, and Biochemistry, to receive RCR training, and to improve my scientific writing skills through grants, fellowship applications, and abstracts. **I applied for a NIH Diversity Supplement Grant to support my current research of which I was awarded.** I've also written two NSF GRFP fellowships. I've been able to present my work at lab meetings, research in progress talks, interest groups, and conferences**. I presented my research in a podium presentation at the 2016 PREP Research Symposium at the Icahn School of Medicine at Mt. Sinai. I've also presented posters at the 2015 Annual Biomedical Research Conference for Minority Students (ABRCMS) conference in Seattle, Washington, and several other internal meetings.** I will present my research again in a poster at ABRCMS 2016 in Tampa, Florida. I've also had the opportunity to attend my first professional meeting at the NIH, where I was invited to participate in important discussions about groundbreaking research on transgenerational inheritance**. This is where I first learned about the research of Harvard faculty member Dr. Scott Kennedy, whose work inspired me to apply to Harvard**. I've learned how to work with and seek out collaborators to help advance my research. Lastly, I've learned how to cope with adversity and challenges in research. This experience has left me with an unwavering passion for science, a desire to learn more, a desire to conduct more research, and an eagerness to attend graduate school.

I plan to matriculate into a graduate program to pursue a Ph.D. focused in genetics and molecular biology, specifically epigenetics. Upon successfully completing graduate training, **I aim to use my education to secure a faculty position at a research institution,** where I can teach epigenetics and open my own lab to interrogate important epigenetic questions. I also aim to use my faculty position to help the next generation of scientists become passionate about biology and research. I seek graduate programs that will help me achieve this through strong education, training, and professional development.

I strongly feel that becoming a graduate student at Harvard University, in the Biological and Biomedical Sciences (BBS) Ph.D. program, **will undoubtedly give me the best possible understanding and training in molecular biology, genetics, and biomedical research.** This Ph.D. program excites and stands out to me for so many reasons. Firstly, this program has a strong commitment to basic biological research and it applications. As a scientist, I want to answer biological questions that can assist in alleviating issues facing human health. Harvard will help me in achieving this goal specifically with the presence of Harvard Medical School and the biomedically focused research environment. **The interdisciplinary nature of the BBS program also fits someone like me** who has diverse interests and a broad biological background. I also value the research communities in the BBS program because they provide a more focused, intimate, and collaborative graduate education and research environment. BBS also has a great and flexible core curriculum. In regards to training, **there is lot of support both in terms of funding and in professional development for graduate students in the BBS program.** The quality of the research and faculty at Harvard is also very high as many labs publish in high profile journals, receive lots of funding, and make many important scientific discoveries. In addition, the faculty at Harvard is very diverse, particularly in terms of research focus, which allows for exposure to many aspects of biology, the potential for interdisciplinary research, and an enriched graduate experience. **I'm blown away by the amount of faculty studying epigenetics**. As an aspiring epigeneticist, this is the place to be. **I'm particularly fascinated by Dr. Scott Kennedy's research** on small RNAs involved in epigenetic regulation and transgenerational inheritance**, Dr. Eric Greer's research** on chromatin modifications

involved in transgenerational inheritance**, Dr. Bradley Bernstein's research** on chromatin regulation in stem cells and cancer, and **Dr. Alexander Gimelbrant's research** on epigenetic control of allele specific expression. **Harvard's commitments to diversity** is also important given that I am a minority. Seeing that there are organizations such as the WEB DuBois Society, Multicultural Student Alliance, and the Minority Biomedical Scientists of Harvard, give me comfort in knowing that there will be networks of support at Harvard**.** Lastly, the greater Boston and Cambridge area is a scientific, medical, and biotechnological hub which presents many opportunities for collaboration, learning, exposure, and professional development.

I'm convinced that I have adequate knowledge, experience, and preparation to be a successful graduate student at Harvard University, which is evident particularly by my experience in the PREP program. My undergraduate liberal arts education has taught me vital critical thinking skills, how to deal with complexity, diversity, and change, and given me a broad, interdisciplinary understanding of biology, science, and the world. I owe so much to science and biology and I want to see the field continue to grow while I continue to grow with it.