

Admissions Questions - Please consider your answers to all three Admissions Questions carefully. You are given limited space for answers. They should be to the point, thoughtful, and grammatically correct. There is not one right answer to these questions; our intent is for you to reflect on what your unique and genuine answer is. The reviewers of your application will not be "looking for" something specific other than to better understand why you want to study Biology. Biology Academic Services Staff will not be available to assist you with writing and reviewing your short answers. Having completed an introductory sequence of Biology to be eligible to apply to one of our major options you should at this point be able to articulate your answers to these questions in the space given.

### **Molecular, Cellular, and Developmental Biology**

The *Molecular, Cellular, and Developmental Biology* option is for students seeking undergraduate training in the molecular, genetic, and cellular basis of life. These topics will assist students in understanding the complex biological processes that underlie cellular function, disease processes and embryonic development.

**Genetics** is the study of heredity.<sup>1</sup>

**Genomics** is defined as the study of genes and their functions, and related techniques. <sup>1,2</sup>

The main difference between **genomics and genetics** is that **genetics** scrutinizes the functioning **and** composition of the single gene where as **genomics** addresses all genes **and** their interrelationships in order to identify their combined influence on the growth **and** development of the organism.

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**For the Biology Major Option you chose above, what most interests you about studying these aspects of Biology? (limit 200 words)**

My favorite aspect of Molecular, Cellular, and Developmental (MCD) Biology is how it delves into the genetic basis of life. Our genetics not only holds all the information our cells have to carry out our biological functions, but also the potential to innovate. Understanding how our cells replicate DNA and regulate genes unlocks a whole realm of potential treatments and targeted therapies. Unraveling genetics is the key to transforming with genomics.

Studying genomics combines my interests in genetics, immunology, and computer science in the form of immunotherapies. While there are many different types of immunotherapy applications in cancer research, I have a specific interest in oncolytic viral therapy where genetically modified viruses target cancer cells. This is a large improvement from chemotherapy which tends to significantly damage healthy cells. When patients are diagnosed with something as exhausting as cancer, the treatment should work to target the specific problem rather than accepting damaged healthy cells as a necessary casualty. Manipulating genetics opens doors to personalized medical treatments focused on curing the disease while preserving the welfare of patients.

I am tremendously excited to dive deeper into the study of genomics and be able to contribute to the future of targeted immunotherapies. (200 currently)

**What have been your most significant learning experiences in college so far? This can be inside or outside your classroom experience. (limit 200 words)**

I have been taught repeatedly that without effective communication, research conducted has little value. It has been my ongoing objective to ensure my ideas are reaching my audience commendably.

Last summer, I participated in the Summer Undergraduate Research Program and received formal scientific research training; this involved writing research abstracts, creating a research poster, and presenting at a symposium. With these skills added to my repertoire, I was ready to build upon this foundation with a biological application.

I am currently part of an MCD biology research lab. My personal project studies the effects of somatosensory neurons on epidermal cells in zebrafish through RNAseq analysis. My lab places a strong emphasis on honing research skills often overlooked in undergraduate education. We regularly practice incorporating presentation and communication of results with our studies. My research project involves aligning RNA data collected from epidermal cells to a reference genome, generating expression levels of genes, and computing analysis of differential gene expression across experimental conditions with bioinformatic software.

Working individually exercises my critical thinking skills and collaborating with colleagues provides fruitful and inspiring conversations. These experiences have significantly contributed to my endeavor to understand unique topics and methods and communicating the results. (199 currently)

**How would you like to use your Biology education once you earn your degree?  
(limit 200 words)**

I would like to pursue a Ph.D. in Immunology with a focus on targeted immunotherapies. Similar to oncolytic viral therapies I mentioned earlier, immunotherapy has a strong application in allergies in the form of subcutaneous immunotherapy. I feel a personal connection to this subject because I am affected by a myriad of food and environmental allergies and I am aware that there is a remarkable amount of information left to uncover about the causes of allergies and how our immune systems act in response.

How does a child's environment influence allergy development? Why can allergies seemingly appear or disappear over the course of a person's lifetime? These are just two of the questions that I want to answer. An example of a dream project I would love to work on is finding a similar treatment to subcutaneous immunotherapy for food allergies, as allergy shots are currently only recommended to treat seasonal, indoor, and insect sting allergies.

In order to achieve this dream, I need a strong foundation in biological education. I believe the Department of Biology at the University of Washington can provide me with a rigorous undergraduate career that will inspire me to exceed my own expectations.  
(199 currently)