

I have often been asked why I am a molecular biology major at a small liberal arts college in a rural Amish town, where one might not expect to find a passionate, hard-working and motivated undergraduate student of science. However, Westminster College is an ideal place for a student with these qualities, as it was recently identified as the #1 college for women in the sciences by Forbes magazine. My coursework and research experience at Westminster, my strong interest in science, my summer internship at the University of Pittsburgh, and my dedication to my work have been valuable assets which have fully prepared me to be a highly qualified graduate school applicant and will help me to obtain a Ph.D. in Cell and Molecular Biology. The Molecular, Cellular, Developmental Biology and Genetics program at the University of Minnesota comes highly recommended by both my professors and peers and will prepare me well for my goals: leading my own research program at an academic institution in order to make significant contributions to the field of cell biology and sharing my knowledge with the next generation of students.

At Westminster College, every science course has a laboratory component, which has provided me not only with the opportunity to collaborate with my peers but also with the advantage of learning a range of molecular biology techniques as an undergraduate, including DNA and RNA isolation, PCR, tissue and bacterial culture, and bioinformatics. Learning these methods piqued my interest and I chose to pursue an independent research project in my sophomore year under the guidance of Dr. Karen Resendes. This work developed into my honors project, entitled Characterization of PCID2 in Human mRNA Export, which involves studying the cellular localization and interaction partners of the human PCID2 protein, a human homologue of a yeast protein known to be involved in mRNA export. Through this project, I expanded my skill set to include gene cloning, immunofluorescence, immunoprecipitation, and immunoblotting. I also learned how to work independently, plan experiments, manage my time effectively, and troubleshoot problems. Furthermore, I gained grant writing skills when I successfully applied for a research grant from Westminster's Drinko Center for Excellence in Teaching and Learning; these funds enabled me to purchase monoclonal antibodies critical to my studies. Performing independent research has taught me to take pride in my work, which was exemplified by my opportunity to present my data at the 2011 National Conference for Undergraduate Research in Ithaca, New York. I aim to present my completed honors research at local and national conferences in the spring of 2012.

In addition to my research experience at Westminster College, I was also accepted to participate in the University of Pittsburgh's Summer Undergraduate Research Program (SURP). I was excited to have the opportunity to work with Dr. Gerard Apodaca, who studies membrane traffic in the epithelial cells of the urinary tract. My project within the Apodaca lab involved examining assembly of asymmetric unit membrane (AUM) particles, which stud the apical surface of the bladder and are thought to contribute to its barrier function. Previous research in non-polarized cells showed that three of the four proteins in the AUM complex require a heterodimerization partner in order to be trafficked to the plasma membrane. I examined the cellular localization of two of these proteins, UP1b and UP3a, in a polarized cell line, a better model for animal epithelia than the non-polarized cell lines used in earlier studies. My results successfully demonstrated the importance of heterodimerization in AUM particle assembly at the plasma membrane of polarized cells. Through this internship experience, I built upon the foundations of laboratory and writing skills I had acquired at Westminster. Upon completion of the program, I felt more confident in my research skills and in my ability to independently plan and design experiments. SURP provided me with a realistic view of full-time work in a

laboratory setting, gave me experience in collaboration with other scientists, helped me solidify my decision to attend graduate school, and has already made me an even more independent and eager researcher as I continue my honors research.

It is my desire to attend graduate school in order to further my knowledge and to explore the unknown areas in the field of molecular biology. I have been instilled with a strong work ethic and always go the extra mile, and I believe these traits will help me succeed at the University of Minnesota. Furthermore, I know how to balance my school and lab work with other responsibilities. I participate in several groups on campus, including leadership roles serving as the Tri Beta biology honors society president, captain of the fall colorguard and indoor winterguard performance groups, and public relations chair of the Alpha Phi Omega service fraternity. I am involved in biology education as an on-call tutor for Westminster's Learning Center, and as an employee of the Science in Motion program, which provides laboratory materials to area high schools and middle schools. I believe the skills I have gained through these activities and my extensive research experience make me an ideal candidate for the University of Minnesota's Molecular, Cellular, Developmental Biology and Genetics program. In addition, my interests in cancer biology, nuclear cell biology, and gene expression correspond with the work of university faculty such as Drs. Vivian Bardwell, G.W. Gant Luxton, and Robert Brambl. Because of my background and interests I have much to contribute to the program, while at the same time I am eager to expand my knowledge and skill set in the field of cell biology. I firmly believe that the Molecular, Cellular, Developmental Biology and Genetics program will successfully prepare me for my future career.