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### Reflective Essay

Multiple sclerosis (MS) is the most prevalent chronic inflammatory disease of the central nervous system (CNS), affecting over 400,000 in the United States. It is punctuated by fully or partially reversible episodes of neurologic disability, usually lasting days or weeks. Typical syndromes at presentation include visual loss, limb weakness, double vision, or impaired muscle coordination. After typically 10 to 20 years, a progressive clinical course develops in many patients eventually leading to impaired mobility and cognition. More than a dozen disease-modifying medications are available to reduce the frequency of transient episodes of neurologic disability and limit the accumulation of focal white-matter lesions on magnetic resonance imaging (MRI).

Due to my interest in the pathogenesis and pathophysiology of the disease, I started working on a clinical research project at University of Maryland School of Medicine focusing on the association of meningeal inflammation and cortical lesions (CLs) in MS cases. Post-contrast FLAIR MRI has emerged as a potential biomarker of meningeal inflammation in MS. Autopsy studies suggest a link between CLs and meningeal inflammation. In this study, we determined the relationship between meningeal inflammation and cortical demyelination in MS using leptomeningeal enhancement (LME) and CLs as imaging biomarkers on 7-Tesla (7T) MRI. The results of this study do not strongly support a relationship between LME and CLs; perhaps except for hippocampal lesions. The correlations between cortical gray matter volume and LME support a link between widespread, non-lesional cortical atrophy and meningeal inflammation.

This relationship may be decoupled later in the disease course – hence the lack of this finding when including those with progressive MS phenotypes.

Throughout this research project, I used the University of Maryland Library's databases to access various journals to perform literature review. Additionally, I used the citation tool to create AMA citations for the manuscript. For data analysis, I used the University of Maryland Library's statistical consulting services to perform appropriate tests using the SPSS software. Statistical consulting can be expensive, and I am very appreciative of the free access to statistical consulting at University of Maryland. Consulting with a statistician also guided me on how to create appropriate figures and tables. After drafting the manuscript, I made appointments with Dr. Linda Macri at the Graduate Writing Center at McKeldin library to go over the writing component of the paper. Her feedback and recommendations helped me to improve the paper in terms of cohesiveness, organization, diction, etc. My English professor, Nicole A. Cuffy, guided me and other students on how to utilize the University of Maryland library resources. We learned to search for the appropriate databases and cite in various formats (AMA, APA, MLA, etc.). I began to find peer-reviewed articles utilizing the UMD library homepage and the many databases to which we have access. I also took advantage of several books which pertained to the topic. Many of the books could be found in McKeldin library while some were conveniently available as e-books. Because I wanted to gain a full understanding of the research that was relevant, I utilized almost any sources which I deemed to be legitimate, making that determination on the basis of whether it was peer-reviewed, had been previously replicated and had been cited by other articles. I used older articles in order to gain an understanding of the constructs and newer findings to help formulate and support my hypotheses and reasoning. In addition, throughout my experience, I realized that a large part of the research process requires that

one be able to accurately and efficiently utilize the multiple resources that have been put at our disposal.

I see myself as a future public health physician focusing on the prevention of disease within communities, assessing public health problems, and conducting research related to those problems to implement programs that will promote health. My passion lies in creating health equity within communities by developing prevention programs, increasing disease awareness through educational programs, and conducting research.

This research experience made me not only to learn about the many aspects of scientific research but also helped me refine my approach to conducting medical research. For one, I learned that staying organized is extremely important given the vast amount of information that one must analyze. For a research project, one must come up with a clear outline of their project, develop a thesis, collect resources, and write persuasively. Research can be exhaustive, and one must be willing to improve their work and be open to constructive criticism. It took me six drafts to complete this assignment and I used the UMD Graduate Writing Center and Statistical Consulting services to receive feedback on my work. Additionally, my professor provided feedback on the organization and cohesiveness of this assignment which improved my writing skills. The skills that I have learned throughout this process can be applied for future assignments in my career as I plan to develop my own research studies. I believe that every undergraduate must learn about the research process to improve their writing skills and develop research analytical skills.

