My undergraduate experience has pushed me in every way, in terms of knowledge, independence, leadership, empathy, and confidence. I am leaving college more socially aware, less apologetic, bolder, and more risk-tolerant than I was on day one. This learning has occurred in my courses, in the lab, overseas, and in the everyday places in between. Each experience over the past four years has shaped my current perspective by making me go outside of my comfort zone, and this reading list represents the cumulative impact of all of these influences. While these texts encompass a wide range of subjects, each one represents a facet of a deepened sense of awareness that I aim to carry with me going forward in my future career and life.

One of these texts is Ten Books on Architecture by Vitruvius. As a first-year student in biochemistry, I was not expecting to connect so strongly to a text about architecture, but I was unexpectedly drawn to this text in HON 112 for its discussion of liberal education. I love how Vitruvius shows that every field is deeply interconnected, despite seeming disparate. Studying music, chemistry, geometry, or any other discipline can make one a better architect—or a better research scientist, in my case. Vitruvius discusses the value of each of these disciplines to an architect’s training. For example, Vitruvius writes, “The architect should also have a knowledge of the study of medicine on account of the questions of climates, air, the healthiness and unhealthiness of the sites, and the use of different waters. For without these considerations, the healthiness of a dwelling cannot be assured.” (Pollio 2008). In nature, there is no distinction between these areas of study, but our human nature causes us to try to compartmentalize them and focus solely on one area.

Keeping this text in mind throughout college, I have made an effort to open my mind to learning in various areas outside of my comfort zone. The process of my thesis research has integrated lessons from not only various natural sciences but also humanities and even music
because these studies have helped me develop skills of leadership, teamwork, critical thinking and questioning, and communication. I have received the type of liberal education Vitruvius discusses through my experience in the Honors College by delving into history, literature, art, and culture and through studying abroad in Ireland by taking courses in Irish language and history and ancient Celtic history. Going forward as a scientist, it is paramount not only that I have knowledge and skills in my area but also that I am an effective communicator and can empathize with people, especially as I hope to mentor students in the future. I hope to continue this integrated learning throughout my career and life in general. (Pollio 2008).

This integrated learning was the foundation for my experience in my HON 150 phage genomics course, which brings me to my next text: the HON 150 Aseptic Technique Exercise Protocol. This was the first scientific protocol I performed in college, which taught me the important lesson of accepting and embracing mistakes. In my HON 150 learning journal at the end of my first week, I wrote that I did not expect my most significant learning experience of my first week of college to be dropping a purple cap—but it was. While performing the aseptic technique protocol, I dropped the cap of a conical tube onto the benchtop, contaminating it, and my first-day-of-college self instantly felt like I was already falling short on even the simplest technique. This seemingly trivial mistake represents a major lesson I was in the process of learning; as Dr. Molloy told me, I needed to get comfortable with being uncomfortable. Mistakes are not only inevitable; they are the fuel for growth. I understood this conceptually at the time, but I was still struggling to actively live it. At the beginning of college, I was a perfectionist and was afraid of messing up. Now, I am still very careful about aseptic technique in the lab every day and about any other decision I make, but I try to not let the fear of failure hold me back. I still have a way to go, but I am confident that my next endeavor pursuing a PhD will
exponentially increase my comfort with being uncomfortable and making mistakes. (Poxleitner 2018).

Being comfortable with the uncomfortable pertains not only to making mistakes but also to accepting one’s humility amidst a universe of unanswered questions. *Seven Brief Lessons on Physics* by Carlo Rovelli captures this feeling and details the simultaneous awe and frustration that I feel in studying science. For example, Rovelli writes, “Here, on the edge of what we know, in contact with the ocean of the unknown, shines the mystery and beauty of the world. And it’s breathtaking.” (Rovelli 2016). Although physics is not my primary area of study, I relate to what Rovelli describes. Science is thrilling, and Rovelli articulates this feeling so beautifully. The more I learn in science (or any area), the more I appreciate how little I actually know. With each new piece of knowledge, countless more new questions arise. This is a theme I have noticed in my undergraduate studies since taking HON 150 freshman year. Rovelli makes the case for finding comfort in this inherently unsettling reality because then it becomes truly mesmerizing and mind-blowing. New knowledge can only occur at the interface of the known and the unknown. I feel like less of an expert in biochemistry now than I expected to feel when graduating, but I am incredibly grateful to be leaving with many questions. If there is one thing that college has taught me, it’s to keep asking questions. (Rovelli 2016).

I have learned that being a critical thinker and asking questions is crucial not only in scientific endeavors but in any aspect of life, including being an informed citizen. When I entered college, I did not consider myself a very political person; I preferred to keep my opinions to myself. However, I have grown to realize that being not only critical but also vocal about pressing issues is crucial because that is the only way change is made. Politics influences every aspect of life, from my career field in biomedical science to aspects of life as fundamental as our
basic rights. This is abundantly clear in *The Coming Plague* by Laurie Garrett, which discusses the emergence of infectious diseases in recent history and the challenge of preparing for a new emergence. In this text, Garrett shows how science can be manipulated by politics. Reading this in 2020 was especially timely, as I have witnessed how politics has usurped nearly every aspect of the COVID-19 pandemic and how unprepared our world was for it. This text reflects much of the scientific learning that has occurred during my undergraduate experience while relating the topics to the broader context; Garrett describes infectious diseases in the context of issues including racism, gender inequality, homophobia, poverty, xenophobia, and more. Just as Vitruvius describes that subject areas are connected, these societal issues are also deeply connected to each other and to our governments. Going forward in my scientific career, I want to keep in mind how my research has a ripple effect that manifests differently in each of these areas. (Garrett 2020).

Specifically, I want to keep in mind how my research could variably impact different demographics. In particular, I think of its effects on women as brought up by the text *Ask Me About My Uterus* by Abby Norman. Norman graduated from my high school a few years before I did and has long been a role model for me. In addition to its content, this text is significant to me because it illustrates someone like me using her voice to raise awareness about an issue, which I strive to do. In this text, Norman describes her experience with endometriosis and how multiple physicians did not take her pain seriously and routinely dismissed it. Norman had to scour the medical literature to learn about her symptoms and keep advocating for herself, and it likely saved her life. It was unsettling to realize that Norman’s situation is far from unique, and many of us could easily end up in Norman’s position. When I was seriously considering becoming a physician during the beginning part of my undergraduate career, I appreciated this text for its
ability to shed light on how as a physician, I will need to consider issues such as gender bias.

Although I have decided to pursue a more research-oriented career, I take this lesson with me to research because, although less obvious, my research will have ripple effects and could possibly affect patient care in some way. More directly, my actions every day impact those around me, in a professional setting and otherwise. I want to make sure that I am aware of potential biases so I can address them appropriately. When working in the lab with cells and proteins, it can be easy to lose sight of the big picture, but I am committed to keeping my ultimate focus on the human impact. (Norman 2019).

While I hope to keep in mind issues such as gender bias going forward in my career, I also want to be aware of how these issues influence my own life. While reading *Of Woman Born* by Adrienne Rich, my ideas about gender in the context of motherhood expanded significantly, and this text made me consider female identity and motherhood in a way I had never considered. Like Norman’s experience with the healthcare system, Rich describes that even childbirth is a process that does not always cater to a woman’s needs. I would argue that this also extends to pregnant people who do not identify as women, but for the purpose of this text, I will focus on the experience of women. I had not previously thought about motherhood as an institution in the way Rich presents it, but it is clear now that this is the case. For example, the societal expectations of mothers are a significant contributor to the pay gap between men and women. Mothers are often expected to take responsibility for a larger portion of childcare and homemaking duties than fathers, which in turn can limit them in their careers. This doesn’t make sense; shouldn’t there be equal expectations for parents? One of my most significant concerns going forward is balancing my career and my home life because it is very important to me to have a family while also having a meaningful career. Rich showed that motherhood can
completely define a woman’s identity and make her want to break away from that label, such as how Rich used poetry as escapism. Mothers, and women in general, often face issues such as this every day. Reflecting on this text feels particularly timely as we have just inaugurated our first female Vice President, celebrated the life of Justice Ruth Bader Ginsberg, and commemorated the 100th anniversary of the 19th Amendment, all of which represent the continuing progress toward gender equity in our society. The significance of a particular societal role can extend to any label; for example, being a scientist is often consuming and can define a person’s life. Subscribing to multiple of these all-consuming labels at once is a complex balance. (Rich 1997).

Like Rich wanted to break away from societal expectations, so did Glennon Doyle as illustrated in her book Untamed. Doyle describes many of the expectations and pressures she has felt and her journey to release herself from them. Doyle describes seeing a cheetah in a cage at the zoo and imagining that the cheetah must wish she could run free, and this story serves as a metaphor for Doyle’s own discontent and feeling of being caged. On the issue of gender roles, she writes, “Human qualities are not gendered. What is gendered is permission to express certain traits. Why? Why would our culture prescribe such strict gender roles? And why would it be so important for our culture to label all tenderness and mercy as feminine? Because disallowing the expression of these qualities is the way the status quo keeps its power.” (Doyle 2020). Although Doyle is discussing the expectations for boys, I related to this sentiment personally. Like Doyle, I have often found myself attempting to adhere to the expectations of me set forth by society and by others in my life. I grew up believing I needed to be tender and gentle as Doyle describes because that’s what I believed girls were. Practicing Taekwondo for several years starting in fourth grade challenged this for me because I slowly began seeing myself as strong, loud, and fierce like my unapologetically powerful female instructor, who remains one of my greatest role
models to this day. I didn’t realize it at the time, but I saw the Taekwondo floor as the place where I did not need permission to be any and all of these things. Taekwondo truly became a way of life for me, and I carried every lesson out of that small martial arts studio. Gradually, I started to see myself possessing these so-called masculine traits in my everyday life, but I was resistant to it because it felt out of place, unlike it did on the Taekwondo floor. Looking back, Taekwondo was where I began learning to be “untamed,” and paradoxically, the small physical space of the Taekwondo floor was where I was uncaged. As Doyle describes, this self-uncaging is important because that is how we challenge the status quo. While Taekwondo jump-started this process for me, it is ever-ongoing, and I have a long way to go. (Doyle 2020).

Part of letting go of society’s expectations, like Doyle says, is to trust one’s instincts. She writes, “I have learned that if I want to rise, I have to sink first. I have to search for and depend upon the voice of inner wisdom instead of voices of outer approval.” (Doyle 2020). Throughout college, I have gradually been working toward putting my own needs first and listening ultimately to my “voice of inner wisdom.” One instance when this was particularly significant was after I had been accepted to the Tufts University School of Medicine Early Assurance Program as a sophomore. After highly focused hard work leading up to and during my application process, I was incredibly excited and honored to have been selected, but I wanted to think very carefully through this major career decision of whether or not to accept the offer. As I was making my decision, I asked several people for advice and was met with a variety of responses, including some encouraging me to take this incredible opportunity. I knew some people would not understand that I was even considering other options—understandably, given our society’s expectations about success. As Doyle describes the importance of looking inward as opposed to outward for acceptance or permission, I learned to look inward when making this
weighty decision. After significant reflection, I decided to pursue a research career. Even with expert advice from people I highly trust and respect, I realized that no one could do this reflection or make this decision for me except myself. My decisions or my process of making them may not make sense to others, and like Doyle depicts, that is okay.

At the same time, I recognize that I am incredibly privileged to have been in the position of contemplating a medical school acceptance in the first place. In addition to the theme of expectations, Doyle also explores the theme of privilege, writing, “Privilege is being born on third base. Ignorant privilege is thinking you’re there because you hit a triple. Malicious privilege is complaining that those starving outside the ballpark aren’t waiting patiently enough.” (Doyle 2020). Growing up, I don’t think I even realized I was on third base, let alone acknowledged how I got there. Many of these texts have helped me get a better sense of that.

Another one of these texts is *Becoming* by Michelle Obama. In the book, Obama reflects on how students in her elementary school already experienced inequity in terms of academic advantages. She writes, “Nobody was talking about self-esteem or growth mind-sets. If you’d had a head start at home, you were rewarded for it at school, deemed ‘bright’ or ‘gifted,’ which in turn only compounded your confidence. The advantages aggregated quickly.” (Obama 2019). This is something I have grappled with since being placed in the “Gifted and Talented” program in 6th grade. I reflected on how my mother conducted at-home school with me before I even went to preschool, which certainly gave me an advantage academically; in other words, it provided me with a privilege. The existence of privilege does not negate my hard work or passion, but it demands acknowledgement. Many privileges that I experience include but are not limited to: growing up in a loving household, growing up with financial security, being white, being cis-gender and straight, being physically and mentally healthy, being a born US citizen,
and having connections. Recognizing privileges such as these is not intended to be a source of guilt but rather a deepened awareness of how aspects of society could be more equitable, like Obama discusses. As a young lawyer, Michelle Obama never saw herself entering into the political arena until she met President Obama. She is a great example of the power of getting involved in something unexpected and using one’s voice, even when it is uncomfortable because she used her platform to spread awareness for good causes. As a naturally shy person, I have tried to use my voice throughout college, taking on roles as an ambassador, teaching assistant, and even an election phone banker. Most importantly, though, I try to utilize and build my awareness in the conversations I have every day (Obama 2019).

A significant factor in privilege is race, which is the theme discussed in Obama’s book and deeply explored in Michelle Alexander’s text The New Jim Crow. In this eye-opening read, Alexander describes the system of mass incarceration in the US and how it essentially functions as a racial caste in a colorblind society. Alexander describes the beginning of the war on drugs and its misleading emphasis on law and order, despite the massive prison population of the US representing mostly minor drug offenses. Alexander then discusses in detail how people of color are disproportionately targeted in this war on drugs and how racism exists at all levels of the criminal justice system. My views on the criminal justice system, and policing in particular, have shifted dramatically throughout my life, including as a result of this text. When I was in fourth grade, a gunman entered my school and held the neighboring fifth grade class hostage. When we were released from lockdown, I vividly remember saying to my friend that the police officers who responded that day are my heroes. I had a very positive experience with law enforcement from a young age because they made me feel safe after moments of feeling anything but safe. However, it is clear to me now that not everyone has a positive interaction with law enforcement
like I did. Specifically, large numbers of Black people face police brutality, discrimination, and criminilization. I see very clearly a need for the greater system of law enforcement in our country to change, yet I am still incredibly grateful for the service of the officers who helped keep my school safe. These two complex, opposing viewpoints, simultaneously, are my reality, and I am grateful for texts such as *The New Jim Crow* which expand my mind to accommodate these diverse perspectives. (Alexander 2019).

After I could no longer feel completely safe at school, my family’s small, rural home especially became the place of unquestioned safety for me. In reality, though, the concept of home is much more complex. Growing up in the small town of Stockton Springs, Maine, with fewer than 2,000 residents, I had difficulty appreciating the forces that shaped my identity and the position of my community in a larger, more diverse network. My definition of home was largely confined to this limited scope until college—and it expanded significantly when I studied abroad at University College Cork in Ireland. Just as knowledge occurs at the interface between the known and the unknown, growth occurs at the interface between one’s comfort zone and the uncomfortable, and studying abroad is a great way to get uncomfortable that I would recommend to any student. One of the most significant learning and growth experiences from my time in Ireland was during orientation when the orientation leader said, “Stand up if you are an immigrant.” When few people rose, she said, “You should all stand; you are all immigrants.” Even under the best circumstances, relocating to another country is intimidating—and for many, those circumstances are far from ideal. My experience with the immigration process afforded me increased empathy for anyone who leaves his or her home country, such as my own Irish ancestors and the tens of millions of current US immigrants. This experience made me more cognizant of my position as a global citizen. The resulting global perspective will be important in
research to maintain my focus on the big picture; just as my definition of home is no longer confined to my hometown, my research is not confined to the laboratory. It has a broader, human impact.

My studies in Ireland also gave me a deepened appreciation for the famine, emigration, and political turmoil that my ancestors endured, as well as the ancient roots of Ireland’s rich culture, still tangible as stone structures dotting the emerald countryside like pieces of a time capsule in plain sight. Exploring a place with so much family history made Ireland feel even more like home, as did the incredible friendships I formed. During my time abroad, I would often find myself sitting in a group of five or six friends and realize I was the only one who spoke English as a first language. Despite our different backgrounds, it is clear that there exists far more connection than the “otherness” that is too often perpetuated; genuine human connection transcends language and other artificial barriers. As I gained this more nuanced view of language, my view of home further evolved. About two months into my time in Cork—halfway through my scheduled stay—I returned to Maine on a day’s notice due to the rapidly escalating COVID-19 pandemic. As I said goodbye to my friends and walked the vibrant streets of Cork one final time, I felt like I was leaving home. After over 24 hours in the maelstrom of pandemic-induced travel, however, I felt a relieving sense of being home upon landing in Detroit for my final layover, despite never having been to Michigan. In hindsight, I felt at home in both Cork and Detroit because I was. My sense of home has expanded from my previous small-town view with the realization that as both an individual and a global citizen, home depends on the perspective I choose.

I captured many of my memories from Ireland through various creative outlets. Throughout the rigorous process of learning and questioning in college, it has been crucial for
me to have outlets for self-expression. Rupi Kaur inspired my love for poetry in particular through her collections such as *The Sun and Her Flowers*. Kaur describes many feelings I have experienced in a way that I could not, and each time I reread one of her poems, I see it through the lens of new experiences and new connections. Kaur’s writing shows that poetry can communicate meanings that prose cannot, based on the style and arrangement of the words and punctuation. After reading Kaur’s poetry in high school, I began writing poetry of my own as a creative outlet. In contrast to how Rich used poetry as escapism from motherhood, I have utilized it as a means of being more in touch with my situation. I extended this creative outlet to also include drawing and watercolor painting, inspired in part by Kaur’s own illustrations that accompany her poetry. Reminiscent of the stream-of-consciousness learning journals in HON 150, writing and creating freely has been paramount in helping me process learning experiences such as my time abroad. Echoing the sentiments of Vitruvius, engaging in poetry and art makes me a better scientist because it enables me to connect more deeply with myself and the world around me. While much of my undergraduate learning has occurred through the lens of science, I have grown equally in many other dimensions, and poetry and art can capture these human dimensions in a way that other means of communication cannot. (Kaur 2018).

These past four years have encompassed not only my own academic and personal journey but also a significant challenge for our country. Specifically, I will always remember the sense of reflection and hope I felt when Vice President Kamala Harris delivered her victory speech on November 7th, 2020. Wearing white to represent the women’s suffrage movement, Harris paid tribute to the trailblazers who led to her historic election, beginning with late Congressman John Lewis and poignantly acknowledging that “America’s democracy is not guaranteed” and is instead something we must actively fight for. Harris recognized the American people who
showed up to do just that by organizing, protesting, and voting. This year, the importance of each individual voice and vote was clearer than ever to me, and Harris reaffirmed that urgency. The fragility of our democracy was frighteningly clear before, during, and after the election. I appreciated how Harris beautifully recognized her mother and the countless other women whose sacrifices we must not take for granted:

Women who fought and sacrificed so much for equality, liberty, and justice for all, including the Black women, who are too often overlooked, but so often prove that they are the backbone of our democracy. All the women who worked to secure and protect the right to vote for over a century: 100 years ago with the 19th Amendment, 55 years ago with the Voting Rights Act, and now, in 2020, with a new generation of women in our country who cast their ballots and continued the fight for their fundamental right to vote and be heard. (Harris 2020).

Harris recognizes the weight of the fact that she is the first woman in her elected position but expresses that she will not be the last. In these words, Harris conveys a sense of hope not only to the voters but also the children of the nation, to whom she speaks directly and encourages to “dream with ambition.” Although she was not speaking directly to me in this part, this was the most inspiring moment of her speech to me. As I was watching Harris’ victory speech, I was overwhelmed with hope at the reality that we now, finally, have a woman of color in our nation’s highest office. I can only imagine the pressures and labels that she experiences. Despite the hope and optimism I felt upon Harris’ election, I must not get complacent or take it for granted. Sustained change is going to take time and hard work at every level, and I aim to keep informing
myself and opening my mind with the same passion as when it felt the most urgent because that urgency is not going away. (Harris 2020).

The January 6, 2021 Capitol insurrection—and its stark contrast to Harris’ historic election—was a powerful reminder of the simultaneous fragility and strength of our democracy that Harris alluded to months earlier. These events reminded me strongly of my trip to Washington, D.C. with the Honors College during my freshman year. This experience was very eye-opening to me because until that point, I felt quite disconnected from our government at the federal level, but entering the Capitol building, Senate buildings, White House, and Library of Congress made this seemingly abstract entity appear more tangible and immediate, and it afforded me the sense that I have a place in this democracy. Thus, when I saw the same Capitol building as the setting for democracy being rocked to its core on January 6th, I was reminded that I stood on those very steps and entered that building less than three years prior and that I have a responsibility to the democracy that it represents. With the equally historic yet contrastingly celebratory events of the Inauguration just a week later, including the stunning poem by National Youth Poet Laureate Amanda Gorman, I again felt the gravity of our democracy, one in which I am proud and grateful to participate.

Finally, Sapiens by Yuval Noah Harari is one of the texts that has shaped my perspective most significantly. In this captivating text, Harari describes human history in a staggeringly humble point of view, illustrating how Homo sapiens emerged as the dominant of the original six human species and has ultimately dominated the rest of the world, too. Harari explains that the defining feature that sets apart Homo sapiens from all other organisms is our ability to form collective fiction. Harari describes that everyday things we take for granted such as money, nation borders, religion, corporations, and job titles are all collective myths; they are not tangible
entities but rather ideas that exist solely in the minds of *Homo sapiens*, which by the millions and billions collectively believe in and live by these myths, thereby giving our species its power. Harari clarifies that labeling something as a myth or fiction does not mean that it is untrue or nonexistent but rather that it is intangible and man-made. Reading this text during the time of quarantine was very fitting because I was concurrently beginning to appreciate the fragility of many of the things we take for granted after evacuating Ireland on a day’s notice, such as our predictable schedules, the economy, and public society. This text, which references history, biology, philosophy, economics, and more, captures the idea of a liberal education that is emphasized in the Honors College and embodies the lesson from *The Ten Books on Architecture*, which I read nearly three years prior. (Harari 2015).

In fact, *Sapiens* showed me that the very subject areas Vitruvius discusses are themselves perfect examples of the myths that define us as a species. Whether between subject areas or populations of people, man-made barriers abound. Yet another collective myth is the scientific method that is the holy grail of my research, in HON 150, and in *Seven Brief Lessons on Physics*; science is only considered credible when executed in the prescribed manner and when many people agree on it. Healthcare policies, governments, and nation borders across which microbes spread as in *The Coming Plague* are also myths. Gender roles such as those discussed in *Ask Me About My Uterus* are entirely fiction, although it is hard to imagine a world without gender. While motherhood itself is very real, the institution of motherhood as described in *Of Woman Born* is a collective myth, as are the expectations discussed in *Untamed* and the politics in *Becoming* and our recent election. The social construct of race and our nation’s criminal justice system as in *The New Jim Crow* are also collective fiction, as is the system of immigration. Art and poetry, such as *The Sun and Her Flowers*, are inherently ambiguous, and it is this very
ambiguity that people agree on and which makes art a valuable collective fiction. While visiting D.C. made our system of government feel more tangible, it is nonetheless a collective myth, and it is clearer than ever that it does not function well when people reject that system.

Although *Homo sapiens* have effectively taken over the world, we are susceptible to microbes we cannot anticipate, laws of physics we may never understand, and myths that control our existence only because they exist nowhere but in our collective minds. These texts, and my undergraduate education as a whole, are a lesson in humility and humanity. The reason they have helped me grow is that they have made me uncomfortable. I have learned that any worthwhile experience involves some discomfort, and I paradoxically have to become comfortable with this. Just as I have over the past four years, I will continue to make mistakes, be nervous to speak up, feel out of place in new cities, have much to learn about many issues, feel overwhelmed by the questions I ask and the questions I cannot yet ask, and define and redefine my own identity. These are uncomfortable experiences for which I will never truly be ready, which means it is time to welcome them with open arms.

**Works Cited**


Harris, K. (2020, November 07). *Vice President Kamala Harris Victory Speech*. Speech, Wilmington, DE.


