Down the hall I heard the beeping of linear accelerators as physicians ablated tumors using high-energy photons with pinpoint precision. I witnessed the power of physics in medicine as cancer patients, just finishing their first treatment, exited rooms remarking on the painlessness of the procedure. I could not help but smile knowing that physics had given them an option they could be optimistic about.

I interned at MD Anderson Cancer Center in medical physics because I was seeking to bridge a gap between my two passions-- physics and impacting everyday human lives. During my study of physics, I fervently learned about the phenomena of the universe, from the motion of protons in an electric field, to the quantum dynamics of its spin, and eventually leading to the principles of the MRI. My journey in physics even brought me to the Large Hadron Collider, the particle accelerator used to discover the Higgs boson, where I helped design the online monitoring system used during collisions. While in-depth experiences in physics have shown me its power, I was curious to explore its integration with healthcare and see its impact on the lives of those who are ill. Throughout my medical physics internship, I observed radiation treatment procedures alongside the medical physicists, and the miraculous potential of physics combined with modern medicine. However, during most of the treatment, the patient was isolated in the radiation room restricting all interactions to the several minutes spent prepping the patient for treatment. I discovered strong desires to interact with the patients and play a long-term role in their therapy, from consultation to post-treatment follow-up. This led to my shadowing experience with Dr. Steven Lin, MD, Ph.D., a radiation oncologist. While I had many great experiences with Dr. Lin, I will never forget the miraculous recovery of a patient he treated that highlighted the power of medicine.

Dr. Lin enlarged the patient's 18-month-old FDG scan on the screen. Over a dozen FDG avid lesions peppered the mediastinum, indicating aggressively metastasized lung cancer. My heart sank as I wondered how long ago the patient had passed away-- but before I could ask, Dr. Lin stood up and said, "Let's go check on him." The patient and his family were waiting to review the follow-up scan; they greeted us with visibly tense smiles and nervous handshakes. Dr. Lin's jovial personality began to ease them and melt the tension in their bodies. Then, he pulled up an FDG scan with today's date, and we all let out a sigh-- theirs in relief, mine in awe. Every lesion was gone. Their eyes glistened with tears as they thanked Dr. Lin for returning a sense of normalcy to their lives. Afterwards, he explained to me that the results were due to a new trial protocol in which immunotherapy is administered with concurrent radiation therapy. In curiosity, I asked him for literature on this combined treatment method. As I read the papers, I was impressed by the potential of this synergistic use of radiation therapy in medicine-- it had saved the patient from certain death.

I continued to shadow Dr. Lin and observed his impeccable bedside manners. One of his patients was particularly irate; with fists clenched, he threatened to change hospitals due to numerous miscommunications with staff about his treatment schedule. Dr. Lin acknowledged the patient's frustration, compassionately explaining why he could provide the best treatment for him. Within ten minutes, the patient thanked Dr. Lin for convincing him to stay. I was astonished by his ability to console patients; he made tears disappear and frustrations fizzle. Listening to patients talk about their struggles with cancer-- and witnessing their triumphs over them-- moved me. I want to be the one to fight alongside them and convince them that everything will be fine. I want to impact the lives of patients by giving them assurance and the ability to fight illness in their greatest time of need.

As a physician, I also want to do more than heal sick patients. With my research experience and background in physics and math, I wish to expand the methods of cancer treatment, for instance: despite its efficacy, radiation therapy has its limitations. High radiation doses to critical structures such as the spine or heart restrict its usage, leading to cases in which cancer recurrence near these structures cannot be treated. By improving imaging for earlier cancer detection or discovering safer methods to fight cancer, I can impact more than just the patients that I would personally care for in my lifetime. I cannot save everyone, but at least I can give all of them a fighting chance.