Inusah Diallo Final Thesis

A Final Report Submitted to
the

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STS 4600

Socio-technical Synthesis: Novel Treatment for Esophageal Atresia and Ethics of Genetic Engineering

Although on the surface my technical work and STS research problem seem completely unrelated, they do share some similarities. They are tied together in that both focus on ways to provide treatment for people dealing with complex and often destructive medical ailments. Albeit one case was performed much better than the other case. My technical project focused on developing a novel treatment for a birth defect known as esophageal atresia by first developing a computational model of it. My STS research project focused on the case of a disgraced biologist, He Jiankui and how he applied genetic engineering in an unethical fashion.

Esophageal atresia is a birth defect in newborns that results in a discontinuity in the esophagus. This is extremely dangerous to newborns as it can prevent them from feeding. Treatment for discontinuity usually means a surgical procedure in which the esophagus is reconnected. Despite this procedure a complication known as stricture can occur. Stricture is the narrowing of the esophagus that can result in difficulty feeding and drinking for the patient. My team set out to develop better means for treating stricture by first creating a computational model of the what occurs to possibly cause stricture. In order to produce these models, we required Xray images of actual patients. Obtaining the images took considerable time as we had to obtain IRB approval. Despite this hurdle I think it was a very important experience to be able to understand the steps need for ethical use of medical information. I think doing so while also working on my STS research paper further helped to solidify this message. While the STS

project showed what to not do when conducting research involving others our technical project gave us great insight into how to do it properly.

In my STS research project, I examined the case of He Jiankui a biologist who made use of genetic engineering to modify two babies. Despite the possible scientific advancement, I chose to focus on the ethics of He Jiankui's research to determine if he acted ethically. I argued that Jiankui did not act ethically as he had violated all the principle components of care ethics. Through my research it seemed more than likely that the research did not conduct his experiments in order to advance science but simply for personal gain and in doing so acted through unethical means.

I think there was great value in conducting my research for my technical project at the same time with working on my STS research paper. As I mentioned prior the ability to see two very different approaches to research was very eye opening for me. By conducting the technical project and going through the process of gaining IRB approval I learned in detail and firsthand how research should be conducted properly. Writing the STS research paper while not as hands-on as the technical project allowed me to examine a case of severe unethical research. As such conducting both projects at the same time has provided me with many important lessons into how to ethically conduct myself. I hope to further leverage these lessons in the future with my career as an engineer.