Thesis Portfolio

Design of an Amgen Trastuzumab Manufacturing Facility to Continuously Produce Kanjinti, a HER2+ Breast Cancer Treatment Biosimilar

(Technical Report)

Roots of Biologics Accessibility Issues Due to Pricing as Seen Through Traditional Biologics and COVID-19

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The technical topic encompasses the design of a manufacturing facility for Kanjinti. Kanjinti is a biosimilar to Herceptin which are both trastuzumab, a specific monoclonal antibody (mAb) used to treat various types of cancers. The STS prospectus will explore the accessibility issues of biologics, which include mAbs, through the lens of traditional biologics such as Kanjinti and newer COVID-19 biologics. The production plant will continuously produce Kanjinti using single use perfusion bioreactors which allow for a lower cost of production, thereby lowering the cost to patients. This connects to the STS prospectus on biologics accessibility issues due to the high costs of mAbs and pricing being the main factor of accessibility. The societal dimensions of the accessibility issues include the moral dilemma of pharmaceutical companies putting profit first, who can afford to take these therapeutics, and how inequities arise in various stages of the biologics' lifecycle. To study this, the origins of biologics' high cost will be analyzed and then compared to the current development of coronavirus biologics. Due to the global problems caused by the pandemic, the government has gone away from the norm to increase accessibility to coronavirus vaccines. Therefore, politics play a major role in the current pandemic biologics as well as with traditional biologics. The various drivers of biologics cost, the structures in place that allow for accessibility issues to develop, and the underlying ethics are explored to reveal the causes and potential methods to remedy the accessibility issues.