

Thesis Project Portfolio

**Allergy Relief at Scale:
Plant Design for Diphenhydramine Hydrochloride**
(Technical Report)

**Patients or Consumers? How Stakeholders Compete to Classify Drugs as OTC or
Prescription in the United States**
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
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In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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This portfolio addresses the question of how medicines reach people safely, affordably, and conveniently. The technical project designs a practical facility capable of producing large amounts of diphenhydramine hydrochloride, a common allergy medicine, without using harmful solvents. By carefully selecting safer chemical steps, the process reduces environmental impact, improves safety for plant workers, and produces medication that meets consumer quality expectations. This ensures that allergy relief can be provided on a scale without sacrificing public safety.

The sociotechnical research paper explores how medicines, once produced, become either prescription or over the counter. Rather than scientific facts alone, this decision involves negotiations among drug companies, physicians, pharmacists, retail stores, insurers, and consumer advocacy groups. The paper investigates how these groups argue about what "safe access" means, influence regulation, and shapes the public's perception, showing that business interests, consumer preferences, and public health priorities all play significant roles.

Together, the two projects highlight the chemical engineer's broader responsibility. Creating a safe and efficient manufacturing process is critical, but equally important is understanding how social institutions affect whether medicines truly benefit people. This combined technical and social perspective helps ensure that medicines are not only effectively made but effectively delivered to those who need them.

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