The Miracle Pill, III

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Diabetes is a prevalent, dangerous, and sometimes even fatal, disease that causes multiple afflictions, including increased hunger, thirst, unexplained weight loss, and fatigue. Diabetics currently require insulin injections, which they must take 2-3 times a day, to maintain their blood glucose. However, these repeated injections cause adverse side effects, such as muscular dystrophy, and tissue degradation. The aim of the experiment was to create an oral alternative to insulin, that withstands the varying pH conditions and enzymes of the gastro-intestinal tract (GIT) and effectively delivers insulin to the bloodstream, by combining a strategically engineered enteric coating, and using micro-encapsulated insulin, and testing it in an in-vitro environment that simulated the GIT. The pill included a shellac, gelatin, microcrystalline cellulose, and liposomal glutathione coating while the microcapsules were made by a self-assembling micro encapsulation technique that involved the ionic cross linking of chitosan and insulin. After testing in an in-vitro environment that mirrored the variety of enzymes and pH found in the GIT, the results proved that the pill was successful in withstanding the dynamic acidity and enzymes of the stomach and duodenum for a duration of 3 hours and the microcapsules withstood acidic and basic conditions for 2 hours. The results from this experiment could be used to engineer an oral alternative to injected insulin that would improve the lives of diabetics worldwide. The concept of this pill can also be expanded upon to treat multiple other diseases, and revolutionize the medical field.

Awards Won:

Samvid Education Foundation: Agni Third Award