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*Using Artificial Cells to Solve Lactose Intolerance: A Theoretical Approach*

This theoretical project describes a process to create artificial cells, in order to solve lactose intolerance, a protein deficiency of the enzyme lactase in the small intestines. The use of artificial cells is better than extensively-studied gene "swapping," which carries a risk of dangerous mutations such as cancer due to faulty delivery. The artificial cell can be formed from E. coli cell parts. To build the cell, a cell membrane will be formed and filled with organelles. It can be stabilized by creating a cytoskeleton inside it, and then it will be injected with DNA. The DNA will include genes to maintain the cell, to replicate the cell, to produce human lactase, and to prevent mutation; however, genes that allow the cell to take advantage of a human compromised immune system would be removed for safety purposes. The artificial cells will be cultured in the laboratory and be delivered to the human intestines orally via pill. Since the artificial cells are alive and self-maintaining, lactase will be constantly produced, therefore solving the problem. In the case of dislodging, the surviving cells can replicate and restore the original population of cells. The main risk of DNA mutation is very low, so it is very safe. The project not only describes a potential way to create artificial cells, but can be extended to any protein deficiency as well by encoding for a different human protein and placing the cells in a different part of the body.