# The Effect of Endocytosis Altering Substances on Vacuole Formation in Tetrahymena

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This project was pursued in order to study how statins and dimethyl sulfoxide (DMSO) affect vacuole formation in Tetrahymena. Both statins, which are drugs which help to lower cholesterol, and DMSO, which is a common component in bladder inflammation medication and topical antibiotics, affect endocytosis, an essential component in the process of vacuole formation. Because statins increase the rate of endocytosis, the rate of vacuole formation in Tetrahymena that have been introduced to a statin solution should increase. Contrastingly, because dimethyl sulfoxide decreases the rate of endocytosis, the rate of vacuole formation in Tetrahymena that have been introduced to a DMSO solution should decrease. In two experiments, Tetrahymena were introduced to either a 1% fluvastatin solution or a 1% Dimethyl Sulfoxide (DMSO) solution. After 10 minutes in the solution, Tetrahymena were placed on a slide with 1% India ink solution and the average number of vacuoles present after 2, 4, 6, 8, and 10 minutes of feeding on the 1% India ink solution were then observed. These results were compared against a control Tetrahymena group, which had been introduced to neither variable substance. The results of the three test groups were statistically significant (all p-values < .001) and showed that compared to the control Tetrahymena, the Tetrahymena introduced to the 1% fluvastatin solution experienced about a 58% faster rate of vacuole formation, while the Tetrahymena introduced to the 1% DMSO solution experienced about a 32% slower rate of vacuole formation. The results support both hypotheses, as the 1% statin solution increased and the 1% DMSO solution decreased the rate of vacuole formation in Tetrahymena.

**Awards Won:**