Section III: Results

Cell Viability

Figure 2 shows the hemocytometer collected data for the endothelial cells across various microplastic treatments and two controls. It is represented as a percentage of total cell death, which was determined by counting the number of dead cells and dividing by the total number of cells found in the hemocytometer. The negative control served as a comparison for no cell disruption and 0.01% Triton served as a comparison for complete cell disruption.

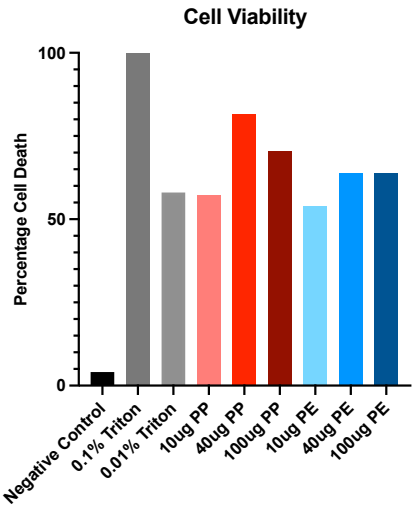

Figure 2- Hemocytometer-determined cell death for controls, polyethylene concentrations, and polypropylene concentrations

Cell Morphology

Four metrics were used to determine changes to cell morphology: Area, Perimeter, Maximum Radius, and Eccentricity.

Endothelial Cell Area

Figure 3 shows the results of the average area of the endothelial cells after treatment with various controls and experimental groups. The results are represented as fold change where they are compared to the negative control. The area was used to show that the various experimental groups affected the coverage of the endothelial cells.

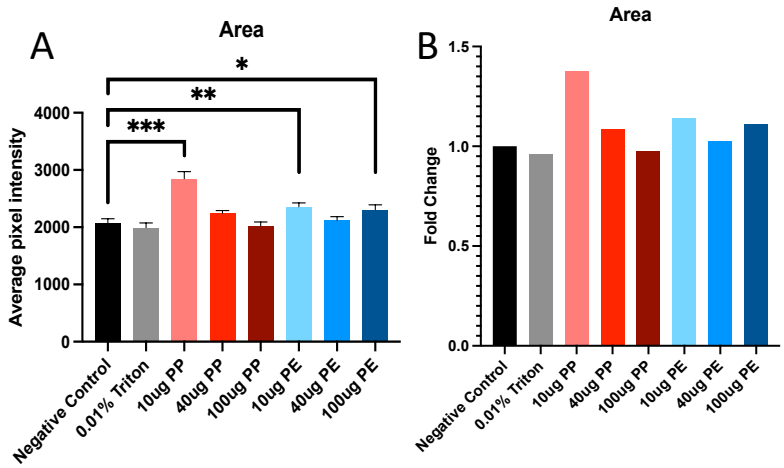

Figure 3- Cell Profiler determined average area of endothelial cells for controls, polyethylene concentrations, and polypropylene concentrations represented as (a) pixel intensity and (b) fold change

This would show that the cytoplasm and cell membrane of the endothelial cells either shrunk or spread out more, depending on how the area changed, showing changes in cell morphology.

Endothelial Cell Perimeter

Figure 4 shows the results of the average perimeter of the endothelial cells after treatment with various controls and experimental groups. The results are represented as fold change, when compared to the negative control. The perimeter was used to show that the various experimental groups affected the coverage of the endothelial cells. This would show that the cell membrane and potentially cytoplasm of the endothelial cells either shrunk or spread out, depending on how perimeter changed, which would show changes in cell morphology.

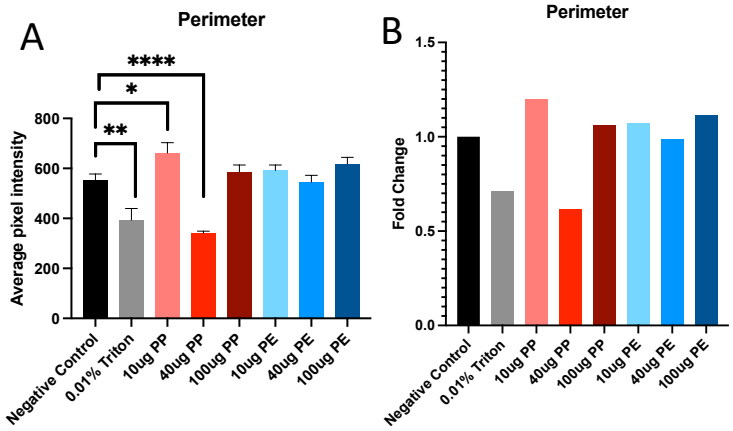

Figure 4 - Cell Profiler determined average perimeter of endothelial cells for controls, polyethylene concentrations, and polypropylene concentrations represented as (a) pixel intensity and (b) fold change

Endothelial Cell Maximum Radius

Figure 5 shows the results of the average maximum endothelial cell radius after treatment with various controls and experimental groups. The results are represented as fold change in comparison to the negative control. The maximum

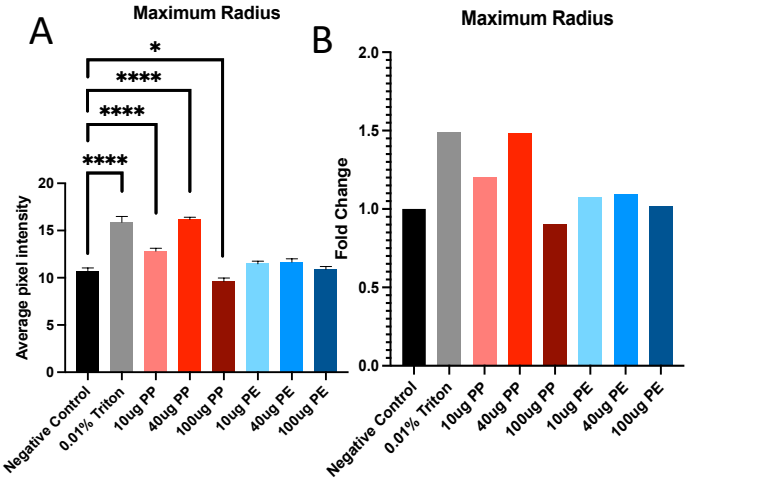

Figure 5- Cell Profiler determined average maximum radius of endothelial cells for controls, polyethylene concentrations, and polypropylene concentrations represented as (a) pixel intensity and (b) fold change

radius was used to show that the various experimental groups affected the overall shape of the endothelial cell. This would show that the shape of the cell was altered due to the exposure to the treatment groups, which would show changes in cell morphology.

Endothelial Cell Eccentricity

Figure 6 shows the results of the average eccentricity of endothelial cells after treatment with various controls and experimental groups. The results are represented as fold change when compared to the negative control. Eccentricity is a measure of how circular an object is, where a circle would yield a value of 0. This was used to show that the various experimental groups affected the overall shape of the endothelial cell, which would show that shape of the cell was altered due to the exposure to the treatment groups, which would show changes in cell morphology.

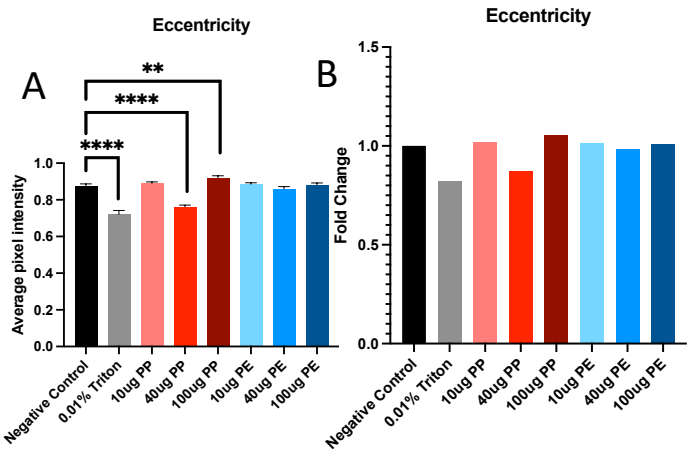

Figure 6- Cell Profiler determined average eccentricity of endothelial cells for controls, polyethylene concentrations, and polypropylene concentrations represented as (a) pixel intensity and (b) fold change