SURF Presentation Abstract

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The buildup of lipoproteins in the vasculature puts pressure on the heart and cause heart disease. Cardiovascular disease is the number one cause of death in the United States and approximately 1/2 of American adults suffer from it[1]. Lipoprotein lipase (LPL) is an enzyme that hydrolyzes triglycerides from lipoproteins, which helps prevent the clogging of the capillaries. Currently, the structure of the ~25 nm oligomer of this enzyme has been solved by Dr. Kathryn Gunn but LPL helices in secretory vesicles were found to be roughly ~12 nm, prompting further investigation. Using negative stain microscopy, different solution conditions promoting the enrichment of the 12 nm LPL filaments were applied to carbon grids to determine the most promising condition. This condition was then analyzed further in cryogenic electron microscopy (cryoEM) and processed in order to reconstruct the structure of the helix. Using the model produced by this processing, future pharmaceuticals will be able to better target the mechanisms and pathways of the oligomer in order to better assist in digestion of lipoproteins.

References:

1. American Heart Association News (2019, January 31). Cardiovascular diseases affect nearly half of American adults, statistics show https://www.heart.org/en/news/2019/01/31/cardiovascular-diseases-affect-nearly-half-of-american-adults-statistics-show