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INVESTIGATING THE POLYMORPHS OF POLYOMAVIRUS PARTICLES

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The structure of the polyomavirus is primarily composed of the capsomere VP1. VP1 forms pentamers with a protruding tail from each monomer; pentamers bind together to form the viral capsid. Interestingly, VP1 pentamers will create polymorphic capsids that vary in shape and size when put in different environmental conditions. The conditions and structure of the pathogenic polyomavirus capsid have been thoroughly studied in previous research, which has revealed that the VP1 tails of adjacent pentamers interact to hold the capsid together. However, nonpathogenic capsid assemblies have received little attention and there is much knowledge to be gleaned from examining them. To do so, we are constructing high-resolution models of multiple VP1 capsids by expressing and purifying VP1, stimulating the formation of the capsids of interest, and then imaging the capsids via cryo-electron microscopy. All the images taken will be composited through software to create accurate and detailed models of the unique capsids. The models that we create will not only give great insight about the capsids of interest, but they will also elucidate interactions between VP1 tails that have never been understood before.