

The Structural Study of the $\phi 12$ Virus

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Abstract

The cytovirus $\phi 6-14$ are a very unique group of viruses, they only contain 3 double strands of RNA; furthermore, they all have similar genetic organization and express similar protein. However, the amino acid sequence in the comparable proteins is different among species so they constitute a ready-made mutant library. In this experiment, we studied the recent structural work on one of these viruses, which is $\phi 12$

As we observed this virus underneath the Cryo-EM microscope (a microscope that allows you to view electrons by freezing them and it takes pictures as the console turns) we saw that the virus attaches onto the host cell, which is bacteria, and creates donuts. We found out that if we were to add Butylated Hydroxy Toluene (also known as BHT) to our virus then it removes the spike off the virus, which prevents the virus from attaching onto the host cell.

We decided to conduct an experiment, testing the affect that different concentrations of BHT had our virus. It turns out that high levels of BHT prevented the growth of the $\phi 12$ virus. After finding out this important information, we continued to research the growth of $\phi 12$. So we did a new experiment, but this time we decided to test time. This means that we wanted to see if by adding BHT to our virus and letting it sit out for a given amount of time will it have an effect on how the virus grows once it is placed onto a plate containing the bacteria used as a host cell.

It turns out that time did have an effect on how this virus grew. By leaving $\phi 12$ in a concentration of BHT for 30 minutes before spotting it onto the plate, it whipped out the virus.

Conclusion 1

In this experiment, we concluded that BHT does affect the growth rate of $\phi 12$ I think we finally judged that there is an effect at 1 mM. Also, we noticed that when the BHT concentration was 1mM, the numbers of plaques were pretty much in the middle of compared to the higher and lower concentrations. In lower concentrations of BHT, the virus grew a lot, and in high concentrations the virus didn't grow at all.

After we did this experiment, we asked our selves if we were to put the BHT into the virus and leave it out for 10 minutes, then do the dilution process, will that have any affect on the growth the virus.

Conclusion 2

We concluded that by having the BHT mixed into the virus and left untouched for 30 minutes before doing the dilution, the amount of plaques will drop drastically as opposed to waiting for 10 minutes instead.