

Scientific Practise: Bacteriophage Replication

Keelan Krinsky: 1634953

Burst Size of T4 phage in *Escherichia Coli*, as determined by the Ellis and Delbruck one step growth curve.

Aim

The aim of this experiment was to determine the burst size of T4 phage in *Escherichia Coli* . Within this aim the objectives included constructing a sufficiently dilute bacterial and phage solutions

Results

The average number of Plaques relating to each time experimental time interval was calculated and plotted in **Figure:1** below. The full set of results can be seen in **Table:1** of the appendix.

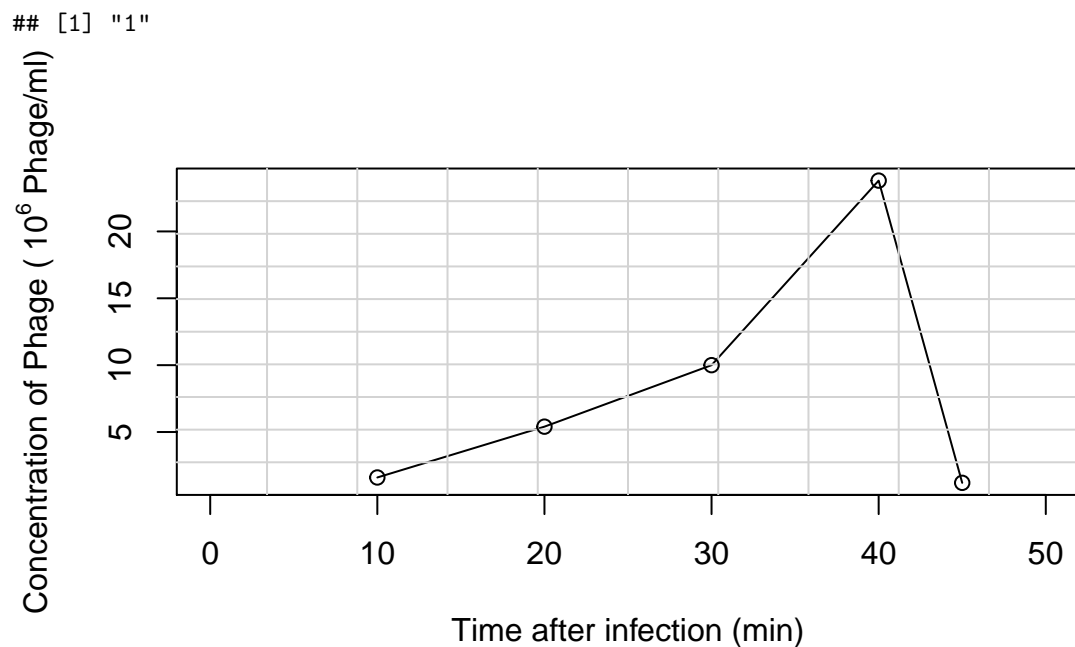


Figure : 1 One Step Growth Curve of bacteriophage T4 in *Eschericia Coli* Bacterial Host

Burst size.

Discussion.

Appendix1: Results

Table 1: Record of Plaques observed after *E.coli* cultivation which, phage solution generated by forced lysis after the given time intervals

Time From start	10 min	20 min	30 min	40 min	45 min
Experiment1	21	67	131	181	10
Experiment2	6	54	92	504	0
Experiment3	11	53	128	182	11
Experiment4	26	40	87	121	0
Experiment5	23	68	93	130	38
Experiment6	25	55	99	304	0
Experiment7	11	34	92	316	26
Experiment8	10	64	93	202	NA
Experiment9	14	51	89	207	NA
Average	16	54	100	238	12

Appendix 2: Calculations

As each plaque forming unit is assumed to be a single phage the number of phage present after dilution can be taken as equal to the number of plaques counted.

The concentration of phage in tube II is therefore equal to $\frac{n}{0.1ml}$, where n is the number of phage counted. Similarly concentration in tube = $\frac{n \times 100}{0.1ml}$, and concentration in ADS tube 2 = $\frac{n \times 100^2}{0.1ml}$ which implies that the number of phage present in the reaction mixture after the given time intervals are as follows.

Table 2: Concentration of phage in original infection solution

Time from infection	10 min	20 min	30 min	40 min	45 min
Average Concentration (Phage/ml)	1600000	5400000	10000000	23800000	1200000

The Initial concentration of phage in the reaction mixture = $\frac{2 \cdot 10^8 \text{ Phage} \cdot \text{ml}^{-1}}{100^2} = 2.0 \cdot 10^4$