

# Biology of Cells Practical 5: Lysosome Activity

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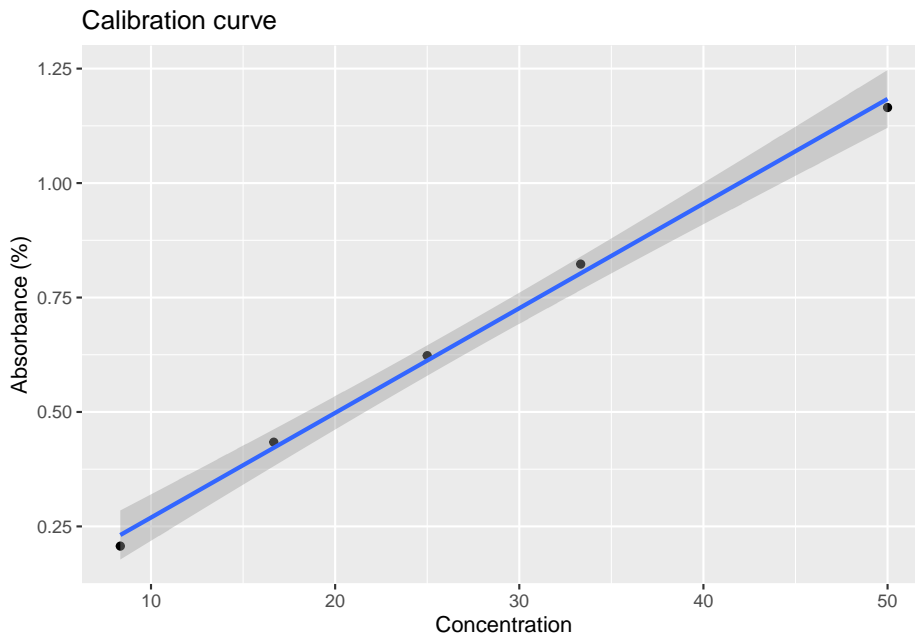
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## (B) Calibration curve

```
## # A tibble: 5 x 3
##   vol  conc  abs
##   <dbl> <dbl> <dbl>
## 1  100 33.3  0.823
## 2  150 50    1.16
## 3   50 16.7  0.434
## 4   75 25    0.623
## 5   25 8.33  0.207
```

## Curve graph



Our compensation model is  $\text{absorption} = 0.041 + 0.023 \times \text{concentration}$ ; with the R-squared value of 0.997.

## Questions

1. Yes, it is linear, with a high R-squared value.

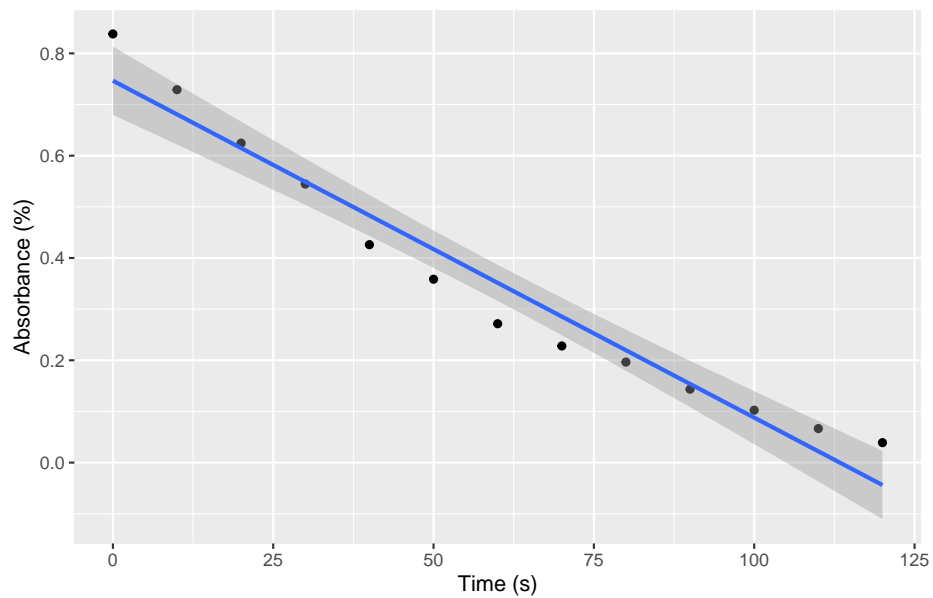
## (C) Lysozyme activity assay

##	time	75	50	30	15
## 1	0	0.8380	0.9740	0.8335	0.7945
## 2	10	0.7290	0.9070	0.7865	0.7435
## 3	20	0.6245	0.8515	0.7505	0.7325
## 4	30	0.5445	0.8190	0.7115	0.7100
## 5	40	0.4260	0.7615	0.6650	0.6685
## 6	50	0.3585	0.6980	0.6170	0.6530
## 7	60	0.2715	0.6440	0.5555	0.6085
## 8	70	0.2280	0.5765	0.5305	0.5875
## 9	80	0.1965	0.5335	0.4845	0.5650
## 10	90	0.1435	0.4910	0.4645	0.5160
## 11	100	0.1025	0.4685	0.3960	0.5090
## 12	110	0.0665	0.4035	0.3965	0.4975
## 13	120	0.0390	0.3840	0.3245	0.4600

## Initial rates of reactions, reaction graphs

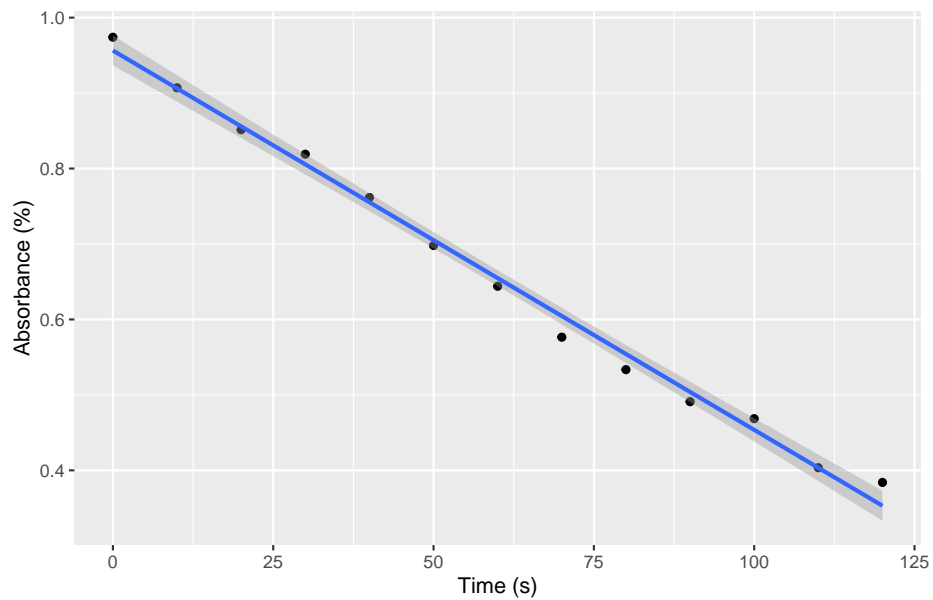
For our reaction graphs, these were meant to have a level of logarithmic decay, however due to the lack of time, we were unable to complete this, and thus have done a linear fit for the initial rate of reaction.

75 micro litres

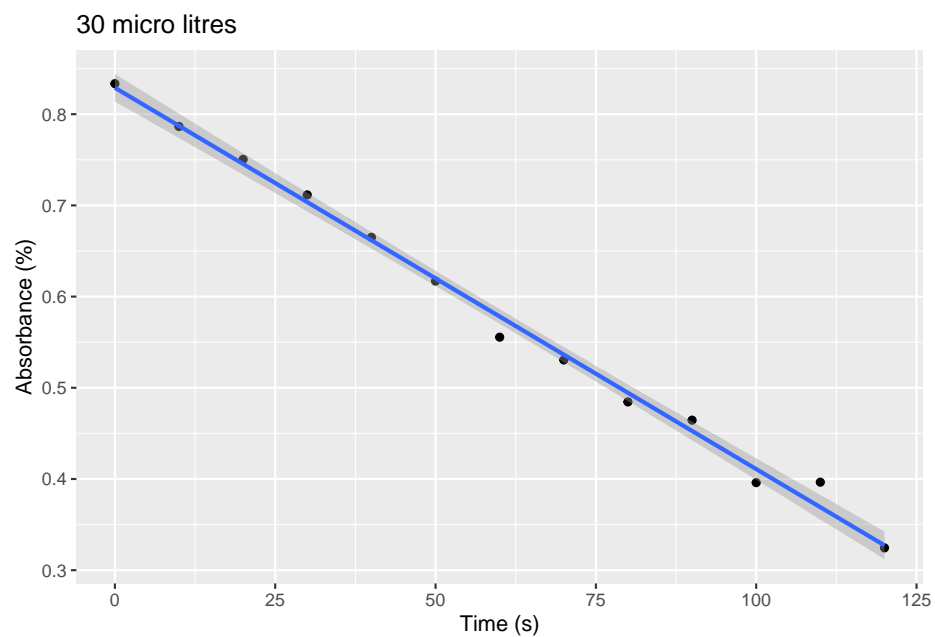


```
## [1] "Initial rate of reaction (first 30 sec): -0.01 micro litres per second"
```

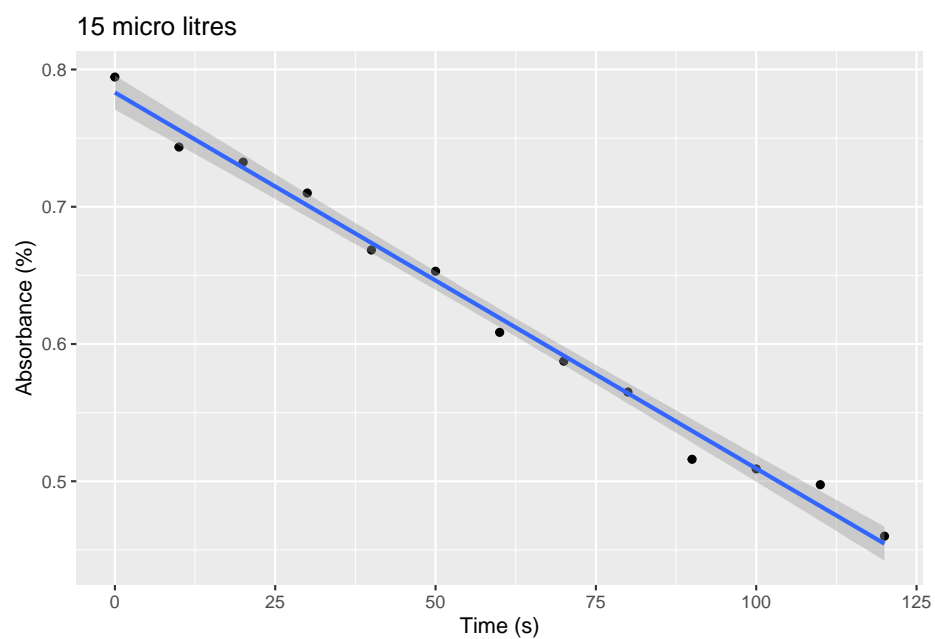
50 micro litres



```
## [1] "Initial rate of reaction (first 30 sec): -0.005 micro litres per second"
```



## [1] "Initial rate of reaction (first 30 sec): -0.004 micro litres per second"



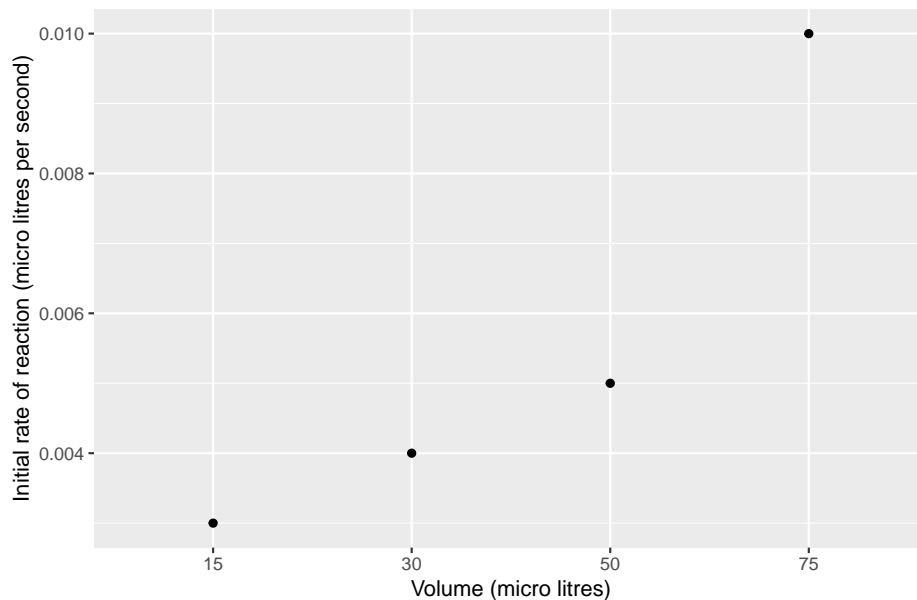
## [1] "Initial rate of reaction (first 30 sec): -0.003 micro litres per second"

### Rate graph

##	volume	rate
## 1	75	0.010
## 2	50	0.005
## 3	30	0.004

```
## 4      15 0.003
```

Initial rate of reaction vs volume



## Questions

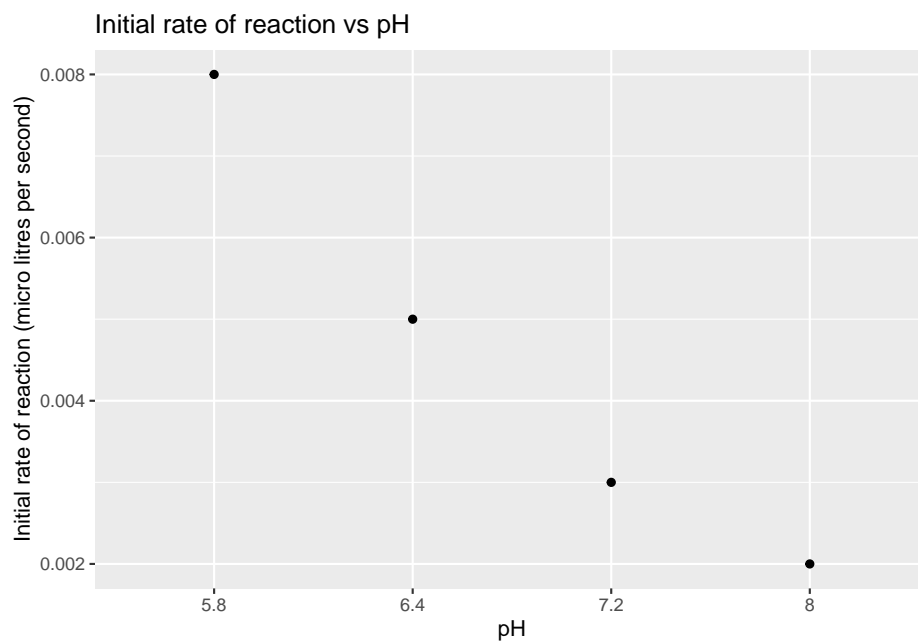
### (D) The effect of pH on activity

```
## time      8  7.2  5.8
## 1    0 0.8030 1.233 0.8735
## 2   10 0.7865 1.198 0.7850
## 3   20 0.7400 1.143 0.7030
## 4   30 0.7400 1.139 0.6295
## 5   40 0.7285 1.091 0.5370
```

### Graph of rate against pH

We also included the 50 micro litre reaction in this graph, as it was the same volume of reactants but a pH of 6.4.

```
## pH rate
## 1  8 0.002
## 2 7.2 0.003
## 3 5.8 0.008
## 4 6.4 0.005
```



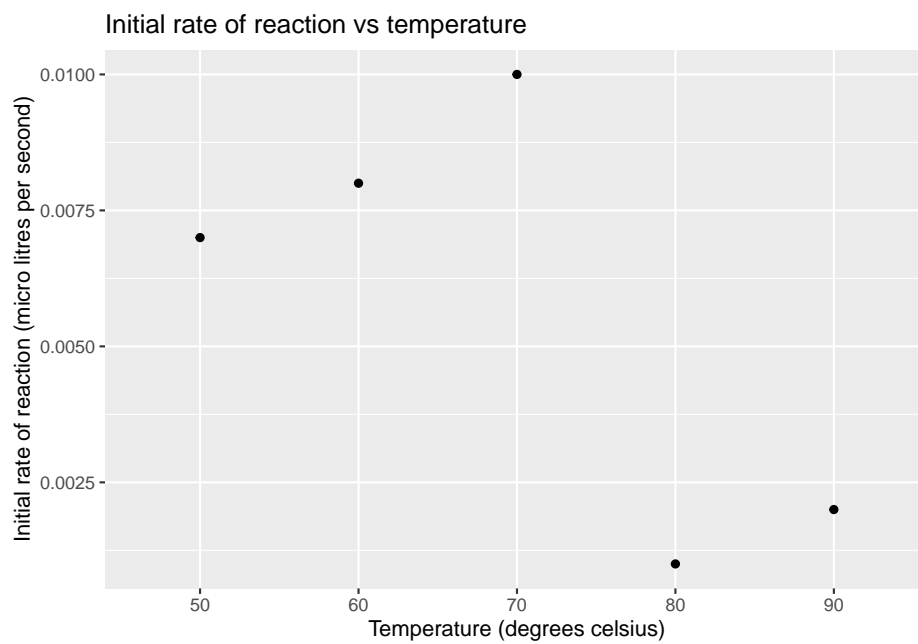
## Questions

### (E) The effect of temperature on activity

##	time	50	60	70	80	90
## 1	0	0.5155	0.5560	0.6810	0.8140	0.7570
## 2	10	0.4265	0.4550	0.5710	0.8865	0.8405
## 3	20	0.3645	0.3770	0.4625	0.8775	0.8145
## 4	30	0.3075	0.3255	0.3935	0.8590	0.8175

### Graph of rate against temperature

##	temperature	rate
## 1	50	0.007
## 2	60	0.008
## 3	70	0.010
## 4	80	0.001
## 5	90	0.002



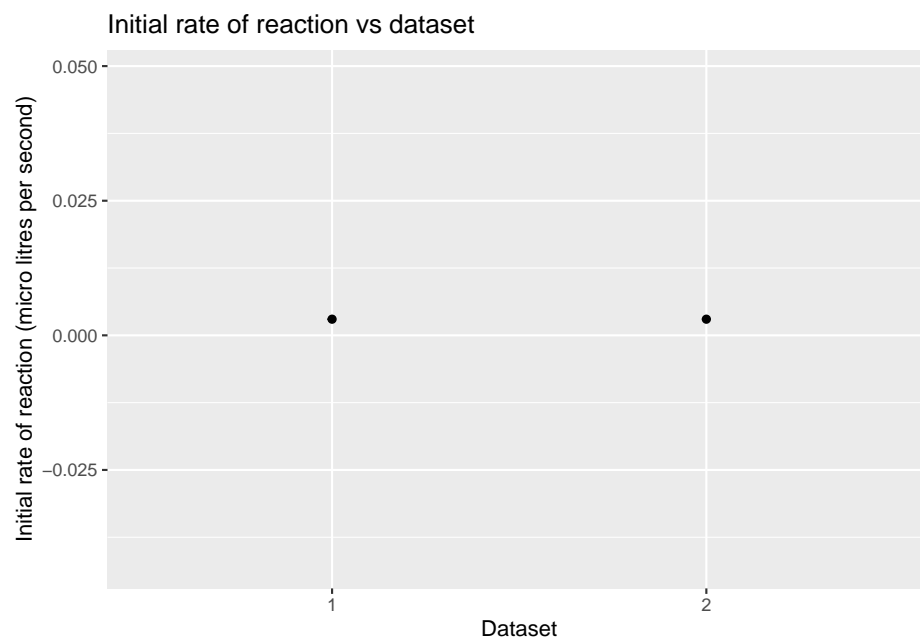
## Questions

### (F) The search for lysozymes

```
##   time      1      2
## 1    0 1.320 1.228
## 2   10 1.260 1.207
## 3   20 1.170 1.216
## 4   30 1.147 1.197
## 5   40 1.145 1.186
```

### Graph of rate against time

```
##   dataset  rate
## 1         1 0.003
## 2         2 0.003
```



## Questions