Szilard

1951

Febr. — June

Mar 1/57

Phagostat

If all bacteria lyse in the growth tube. —

D. unit vol

p phage density in the tube

n bact.

L latent period

s is adsorption probability in unit time

$$p = \frac{w_1 n P}{w_2 + s n w_1 L} = \frac{nP}{\frac{w_2}{w_1} + s n L}$$

for finite τ_2

$$w_1 n e^{-\frac{L}{\tau_2}} P = w_2 p + s p n w_1 \frac{\tau_2 L}{\tau_2 + L}$$

$$p = \frac{w_1 n P e^{-\frac{L}{\tau_2}}}{w_2 + s n w_1 \frac{\tau_2 L}{\tau_2 + L}}$$

$$p = \frac{n P e^{-\frac{L}{\tau_2}}}{\frac{w_2}{w_1} + s n \frac{\tau_2 L}{\tau_2 + L}}$$

$$\frac{p^* \; L}{3\,10^{-11}\; 10^4\; 10^3} = 3 \times 10^{-4} \times P$$

$$\frac{3}{100}$$

Gounda

$$p^* = p\, 10^{-7} \frac{t}{L}$$

$$p = \frac{nP}{\frac{w_2}{w_1} + s n L}$$

$$n^* = \left(\frac{n^*}{n}\right) n$$

$$p^*_{max} = \frac{\left(\frac{n^*}{n}\right) n P}{\frac{w_2}{w_1}}$$

$$p^* = \frac{n P\, t/L\, 10^{-7}}{\frac{w_2}{w_1} + s n L}$$

we want large value for $\frac{p^*}{p^*_{max}} = \frac{10^{-7} \frac{w_2}{w_1} t/L}{\frac{n^*}{n}\left(\frac{w_2}{w_1} + s n L\right)}$

H

$$p = \frac{n e^{-\frac{L V_2}{W_2}} P}{\frac{W_2}{W_1} + \sum n \frac{V_2 L}{V_2 + L W_2}}$$

~~assuming all bacteria infected in a time << τ_2~~

Multiplicity of infection

$$M = n p L$$

$_{II}S''$ in percent absorbed on $5\ 10^7$/cc particles in broth at 37°

	$_{II}S''$
T_2, T_4, T_6	20
T_5	1
T_1, T_3, T_7	10

$$S = {}_{II}S'' \frac{1}{100} \frac{1}{60} \frac{1}{5\ 10^7}$$

for T_3 $S = \frac{10}{3\ 10^{11}} = 3.3\ 10^{-11}$

~~$3.3\ 10^{-11}$~~

~~$10^9 \times 3.3\ 10^{-11}\ 10^{...}$ $M = 33$~~ ~~$1000\ 3.3\ 10^{-11}\ 2.5\ 10^{8}$~~ ~~$10^9 = 2.5\ 10^{...}$~~

10 10 10

Phaging by ~~[illegible]~~

T3h of B/347 in the

phosphate. —

Probability for 1 B/347 to

be phaged for cm³. $P_h = 1/cc$

[around ~~[illegible]~~ no types of B/347]

$n = 1000/cc$

Δ 1000 ~~[illegible]~~ 4000

$3\,10^{-11}$ $4\,10^{8}$

10^{-4} per hour

$t = 10^5$ sec

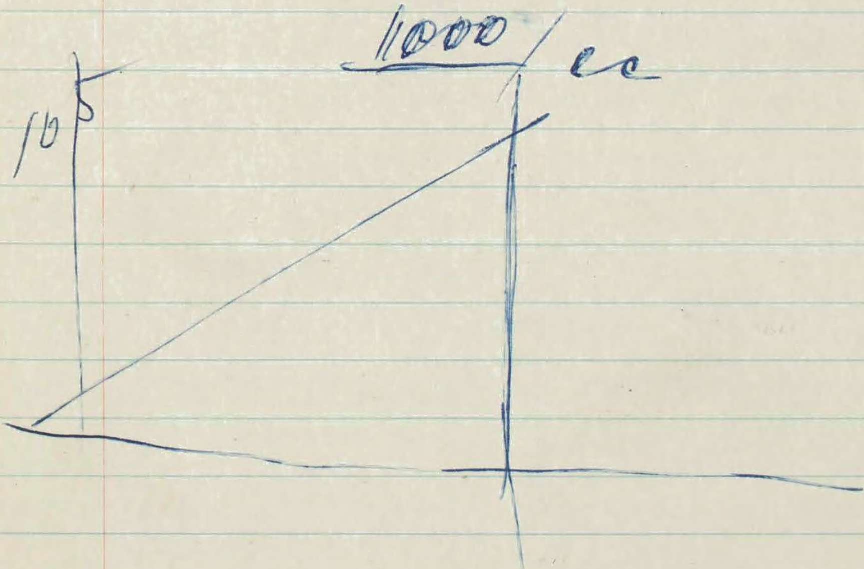
H

$$\frac{p^*}{p^*_{max}} = \frac{10^{-7}\; 2\; 10^5/1000}{\left(\frac{n^*}{n}\right)\left(2 + 3\,10^{-11} \times 10^{+8}\, 1000\right.}$$

$\left(\frac{n^*}{n}\right) = 10^{-5}$

$n = 10^8/cc$

$$\frac{p^*}{p^*_{max}} = \frac{2\; 10^{-5}}{10^{-5}\left(\quad\right)}$$



Accumulation of
B/347 in stationary state;

$$\left[B/_{347}\right] = \frac{W_1}{W_1+W_2}\,\frac{1}{70_{min}-\tau_2}\,n$$

$$\frac{1}{[B_{347}]}\,\frac{d[B_{347}]}{dt} = \frac{W_1 n}{[B_{347}]\,V_2} - \frac{1}{\tau_2} + \alpha_0$$

$$\frac{1}{\alpha_0} = 70\,\text{min}$$

H

$$p w_2 + \frac{p s n w_1 L}{V_2} = w_1 n P$$

$$p w_2 + p s \frac{n w_1 L}{V_2}$$

$$p + p s n \frac{w_1}{w_2} \frac{L}{V_2} = \frac{w_1}{w_2} n P$$

$$p = \frac{w_1/w_2 \, n P}{1 + \frac{w_1}{w_2} s n \frac{L}{V_2}}$$

$$p = \frac{n P}{\frac{w_2}{w_1} + \frac{s n L}{V_2}}$$

sec^{-1}

$$\frac{\Delta n}{\Delta} = \frac{\text{number}/\text{sec}}{\text{number}/\text{cc}} = \quad s = \frac{cc}{sec}$$

Sz Carol

1957

Febr – Trub