Rabbit

hot. of plate 20%

If that serum part,

antitoxin is 6%

any % in of plate

$= 10^{-4}$ Antitoxin in that of plate.

$60 \times 6 = 500\ 10^{-6}$ gm/cc $= 5\ 10^{-4}$ gm

Antitoxin

or $\frac{10^{-2}}{5\ 10^{-4}} = 20$

$\frac{\text{Total } \cancel{\text{cc}}}{1 \text{ antitoxin}} = 20$

3 kg Rabbit

$\frac{300 \text{ gm serum}}{5\ 10^{-4}\ 300}$

$1\ 5\ 10^{-2}$

$\frac{1}{10}$ gm

$\frac{1}{100}$ gm | Dry weight

10 days

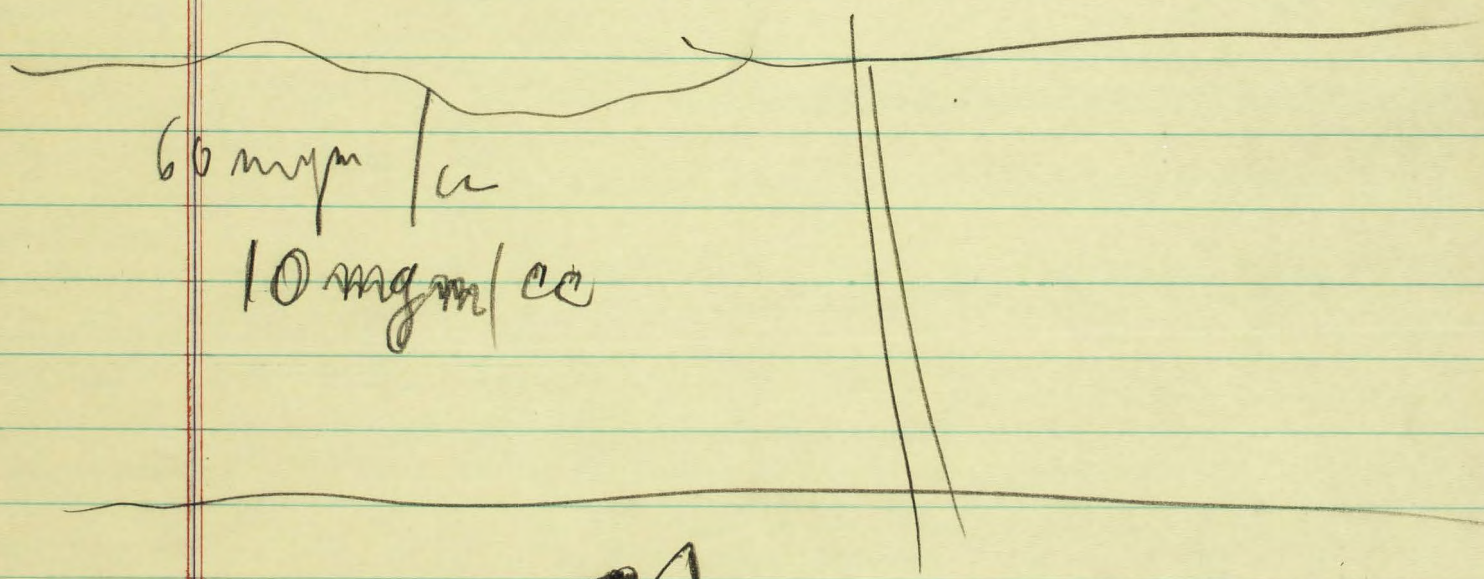
Ant of Globulin 1/0

(2)

Primary response $\frac{1}{3}$ %

To get precipitate $\frac{1}{300}$ %

$\frac{1}{3} 10^{-5} 10^{-2} = \frac{1}{3} 10^{-7}$ molar



3×10^{-5} gm 3 10^{-6} gm Antibody in 1cc

10^{-1} gm = 10^{-3} molar = $3\ 10^{-7}$ molar gives visible precipitate

Immune Horse

Antibody 4 to 5 mgm/cc

(2)

Escher 463

Yaparck 4-6262 ext. 747

Proceedings of Nat.
Acad. of Sciences
Att. Mrs Josephine Williams
N. Ac. of Sc
2101 Constitution Ave
Wash 25 D.C.

79375 KB11
" KB12

Bjorneboe J. Imm., 37: 201, 1939

Total Nitrogen in serum of 11 normal rabbits : 10.3 ± .72 mg/ml (non protein N : 0.23 – 0.34 mg/ml)

In rabbits immunized by repeated injections of pneumococci

total serum N 10.3 – 13.5 mg N/ml

antibody N 0.08 – 2.63 mg N/ml ←

author claims ab protein = production of "extra" protein

salting out procedures

Acta Path. Microb. Scand., 20: 221, 1943

in normal rabbits protein (serum) 4.7 – 6.9 gm %

Globulin 0.9 – 1.6 "

Albumin 3.6 – 5.4 "

in hyperimmunized rabbits (bacterial vaccine) globulin rises to > 7 gm %

Scheiffarth Int Arch. All. & Appl. Imm., 11: 246, 1957

Rabbits given repeated IV injections of horse serum

paper electr.

	Serum protein	Alb	α1	α2	α3	β	γ
Normal	66.8 mg/ml	34.0	1.7	6.3	3.2	7.2	14.4
Immune	75.8 "	36.4	2.4	6.8	3.6	8.3	18.1

SHARP J. Imm., 44: 115, 1942

In normal rabbit serum γ glob 13 – 29 % of total serum protein

free elect

How much ab after single IV injection of foreign protein → rabbit ?

Formalized data by Stevens

Don't know of any quantitative studies on this point.

Quantitative ppt tests are subject to an error of > 1 γ N.

In any case, there would be marked variation between rabbits, depending on (a) antigen, (b) dose, (c) time between injection and bleeding, (d) individual (genetic?) difference between rabbits.

STEVENS, K.M. & BILEY, P.A. Jr. J Imm, 76: 182, 1956

Rabbits given single IV injection of bovine gamma globulin; Ab response in γ ABN/ml serum

AG DOSE: 40mg BGG

Rabbit	7 DAYS	14 DAYS	28 DAYS (21 DAYS)	
1	103	57	41	alum precipitates
2	113	70	36	
3	115	56	21	
4	179	55	47	
5	224	93	–	
6	171	56	47	
7	73	99	39	Soluble
8	41	61	31	
9	34	56	33	
10	97	119	58	
11	28	60	23	
12	21	65	18	

Jeanette Tortucker, Gregory Sis Kind
Mice (isogenic)

BGJ.

30 ug i. perit. 5-6 gm?
paralysed ~~[illegible]~~ at 80 ~~at~~ 120 days

1 mg at birth when challenged at 80 days gives secondary response challenging dose?

Sunday 3 pm
Miss Williams

June 26/60

$$A/K = \alpha$$

$$\frac{A\rho\tau N}{\alpha}$$ (number of enzyme molecules produced per fin. in case of ~~repres~~ ~~fourty~~ ~~strong~~ repression.)

$$\frac{1}{\ }$$

= per time

and if enzyme not formed escapes in ~~molecules~~ ~~to~~ about 1/2 of cases.

$$\boxed{A\rho\tau < 1}$$

$$\boxed{N_0 = \frac{2000}{\tau}}$$

$$\frac{1}{\alpha} > \frac{\text{per time}}{N} \approx \frac{2000\ \text{sec}}{N}$$

What is $\overline{N}$

1000 enzymes = 10^{-13} gm

1 enzyme = 10^{-16} gm

Weight of Molecule

$N = 500$

500 enzymes

$N = 1000$

$\frac{1}{\alpha} = 2\ \text{sec}$

~~Mol~~ $\frac{10^5}{5 \cdot 10^{23}} = 2 \cdot 10^{-19}$

II

Strongly represented

$$\boxed{\frac{A \rho \tau N}{\alpha} = \text{gen time}}$$

$$\boxed{\frac{\text{gen time}}{\tau} = N_0}$$

or

$$\frac{A \rho}{\alpha} \frac{N}{N_0} = 1$$

$$\frac{AK}{\alpha} \frac{\rho}{K} \frac{N}{N_0} = 1 \qquad \boxed{AK = \alpha}$$

$$\boxed{\frac{N_0}{N} = \rho / K}$$

assume τ is exp time determines N_0 [if anyone is limiting factor

Papers have been sent to the following people:-

Dr. M.Messelson.
Dr.G.Klein.
Prof.M.Delbruck.
Prof.L.Pauling.
F.Jacob.
J.Monod.
T.T.Puck.
S.Brenner.
A.Novick.
M.Heidleberger.
H.J.Muller.
Jonas Salk.
F.M.Burnett.
H.S.Anker.
M.S.Fox.
Colin MacLeod.
E.P.Wigner.
E.Lennox.
M.Cohn.
W.Maas.
L.Gorini.
R.B.Livingstone (2nd paper only).
Maaløe. " " " " .
Fazekas.
A.V.Hill.
H.Harris.
M.Werner.
J.H.Humphrey.
A.N.Mitchison.
P.B.Medawar.
J.Watson.
C.Levinthal.

Political papers to:-

H.J.Muller.
Prof.John Benjamin.