3/28/54

p 184

518t750-1 (Look up origins) Nature of segregant.

Seg.	/HFT-1	/HFT-4	Locus
1	o	+	1⁻
2	o	+	"
3	o	+	"
4	o	+	"
5	o	+	"
6	o	+	"
7	o	+	"
8	o	+	"
9	o	+	"
10	o	+	"
11	o	+	"
12	o	+	"
13	o	+	"
14	o	+	"

all λ^R

what happened to 4⁻?

lysate made of these to see if HFT-Hfr λ has any additional properties

2341 transductions (for TCN) using his culture which was found $\underline{\underline{tp}}^S$)

269-1

7. K12 lambda
1. no add = 4
2. 0.1 K12 (5/30?) = 32×58 = 116 = 1856
174
1856

Use in crosses of added segment as a test of elim. and passage of segment in 5th crosses.

2345 (above) 1. 902 lambda - (no date HFT Hfr)

7. no add 2
2. 0.1 902λ 42

Not done beyond [illegible]

4/7/54

In Relation to 518t750-1 Above. Transduction of 811 with HFT 1⁻ 2346 Examination of stability - Is the $\frac{1^- \; 4^-}{1^+ \; 1^-}$ combination +? Does 1⁻ and 4⁻ segregate from such a complex? Are one observed (+) in 4⁻, 1⁻ transductions (+) after elim. of a (-) allele?

269-3

1. 8 papillae examined 6/8 stable.

	/HFT 1⁻	/HFT 4⁻		HFT/1⁻	HFT/4⁻
A 1.	−	+	B 1.	+	−
2.	−	+	2.	+	−
3.	−	+	3.	+	−

3/28/54

Examination of HFT stocks.

1. Previously noted (in last week) that cultures of N16 (= 2342) and NA-4 (= 2346) were segregating NFT lines (spot plate test) (irrad. on plate possible. (hopeful added to indicator, plate irradiated). In each case of 10 colonies 8 were HFT - From Each a NFT and HFT selected and placed on slants and stored in refrigerator to lessen segregation. A portion of each plated on Bgal and reversion examined - (See pg 267)

2. 241-14 (a gal_2 - HFT) tested against 1210, 750 - 10 colonies

	Colonies
against 750	⊕ ○ ⊕ ○ ⊕ / ⊖ ⊕ ⊕ ⊕ ⊕ = 8/10 HFT. Stocks made of an HFT, NFT
against 1210	○ ○ ○ ○ ○ / ○ ○ ○ ○ ○

3. 241-19 (a gal_2 - HFT) as 2 above

against 750	○ ⊕ ⊕ ○ ○ / ⊕ ○ ⊕ ○ ⊕
against 1210	○ ○ ○ ○ ○ / ○ ○ ○ ○ ○

Examination of NFT, HFT stocks above - also 2342, 2346 - See page 267 also

Culture	No Reversion	Stability	Transduction assay of 1+ HFT	1- HFT	2 HFT	4- HFT	Kilde
241-14 HFT	19 (Smaw)	12/12 +"	(+)	+	0	(+)	2-
" NFT	12	12/12 stable	+	+	0	+	2-
241-19 HFT	12	12/12 +"	(+)	+	0	(+)	2-
NFT	0	—	+	0	0	+	1-2-
2342 HFT	62	12/12 +"					
2342 NFT	(0)	—	+	0	0	+	1-2-
2346 HFT	5	4/5 +"					
2346 NFT	8	8/8 stable	+	0	+	+	1-

4/5/54

Examination of HFT lysates:

1. 750tKR-2 - Assay on different indicators - 0.1 ml of overnight unaerated cult. used.

dil	0.1 ml No pap.	Assay cult	dil	0.1 ml No pap.	Assay Cult.	dil.	0.1 ml No pap	Assay cult
no	0	750	no	0	2433 (1-2-)	—	3	1210
10^2	+++	"	10^2	++	"	10^2	+	"
10^4	365	"	10^4	214	"	10^4	23	"
10^6	12	"	10^6	4		10^6	1	"
Titer	1.2×10^8		4×10^7 2.1			2×10^6		

2. 750t902-2 4/8/54 (Lysate that worked)
Titered on U2 (sp. λ's) $10^7 = 717 = 7.2 \times 10^9$ - Lysate tested stuck. p267

Constitution presumed $\frac{1^- \; 2^+}{2^- \; 1^+}$

Assay	1- 750	2- 1210	1-2- 2433
no dil	0	3	0
0.1 ml of dil 10^2	+++	1/8 = 200 = 1600	183
" 10^4	++	13	1
" 10^6	12	?	0
titer	1.2×10^8	1.0×10^6	1.83×10^5

suggests

4/10/54

U2 - spont. λ_p^s? from 2175t811 → (-) seq λ_p^s gal$_4$ - Only useful marker for elim. possibility of contaminant is prototrophy. This culture grows on EMS gal. Presumably this is a valid recurrence of λ_p^s - No other gal$_4$ - λ_p^s prototrophs about at time of isolation.

4/5/54

In search of triplet (→) 1⁻ 2⁻ 4⁻

1. W2350 ~~transduced~~ exposed to HFT 1⁻ (2346) - Segregants examined

seg #.	HFT 1	HFT 2	HFT 4
1	+	0	+
2	+	0	+
3	0	+	+(weak)
4	0	+	+ (weak)
5	+	0	+
6	+	0	+
7	+	0	+
8	+	0	+
9	+	0	+
10	+	0	+

8 2⁻
2 1⁻

In these cases a few small papillae noted similar to the rx of 2350 against HFT 2⁻ Significance?

2⁻ +
1+ X − −
4− +

2. 778 = W2433 gal₁⁻ gal₂⁻ ~~transduced~~ exposed to HFT 4⁻ (2478-1) - Segregants exam.

	1	0	0	+
	2	0	0	+
→	3	0	0	+
	4	0	0	+
	5	0	0	+
	6	0	0	+
	7	0	0	+
	8	0	0	+
	9	0	0	+
	10	0	0	+

maximum papillae on these - even on control spots. →

272-2

all 1⁻2⁻

2⁻ +
1⁻ +
4+ −

4/7/54 - and several days earlier

Recovery of Lp_2^s from Lp_2^R culture

W902 -

1. transduced c̄ 2346 AFT 1⁻ λ - Reaction suggest fairly large fraction of Lp_2^s present.
2. Streched and B gal - seg +ᵃ observed -
3. just few seg and (c.b.) all gal_1^-
4. One tested for nutrition - D(0) no growth
   " + TL growth 2 days
   + LB no growth
   + TB_1 no growth
   + TLB_1 growth 24 hrs.

   } nutrition ok. make stock — tested on B Mal (mal +)

5. Examination of more segregants

W2584

W945

1. transduced c̄ 2346 AFT 1⁻ λ - React. also suggest fairly large no. Lp_2^s present.
2. stroked B gal - +ᵃ observed.
3. 6 seg tested /2346 λ, /2342 λ - all gal_2^-
4. Examination of the culture for sugar reactions.

   Mal + Xyl - Mtl -

   3 additional colonies also found Mal +

W2580

4/9/54 In search of phage mutants.

Platings on Endo - all platings gave no plaques.
With the following cultures.

1485, 518, 2281

Assays on NSA (pours)

	$/10^7$ dil	$/10^8$ dil
2281 =	274	10
1485	237	10
518	281	6

4/10/54

Repeated at lower dilution

	10^3	10^5
Spont. Lp^s → U2		
518	0	0

4/14/54

Is the complex $\frac{1^+ 4^+}{1^- 4^+}$ phen. (+)? All (+)" appear to be secondary - segregate only one (-)

SIF t 2746 λ - Single exposure to "flange - unaerated fish, near sat. pen. cell.

(A)

	Treat	SIF cell dil	No. (-) partially lysed	No (+)	No. pure (-)	Total
1.	broth	10^6	0	0	67	67
2.	2346 λ HFT 1⁻	"	9	2 (papillate)	41	52

(B) Examine (-) on treated plate to see what they are segregating

1. Single (-) appearing colony (up to 2 days - then giving a papillating appearance thus ⊛, and turning darker in the following days.
2. Streaked out and giving
   a. (+) some of which appear to be segregating (-)
   b. (-) non papillating (?)
   c. parental type (-) which papillate
3. 10 (-) colonies picked and streaked against HFT 1⁻ + HFT 4⁻

#	HFT 1⁻	4⁻	Lp Rx	Comment	Allele	
1.	+	0	s		4⁻	
2.	+	0	s		4⁻	
3.	mixed (+) and (-)		R? —	Lp is segregating also	— (?)	Only segregants are 4⁻ Lp^s
4.	+	0	s		4⁻	
5.	mixed (+) and (-)		R(?) —		— (?)	
6.	"	" "	R(?)		—	
7.	"		R(?)		—	
8.	0	+ ?	sens R?	Rc ✓	—	Is Lp^R preventing segregation of 1⁻?
9.	intermed (+) turning dark after 3 days				—	
10.	"	"	R?		—	

parental
parentheses
parentheses
parental
parental
parental
parental

4/28/54

902 Mal- → Mal+ = $\lambda p_2^R \rightarrow \lambda p_2^S$?

10 well isolated colonies (+) on Mal, tested and found λp_2^R
checked on Mal for reversion exam. (1 / streak) and on gal
coated with HFT 1-
1. Exam papillae on gal for instability indicating λp_2^S + transduction
2. Exam dead + for λp_2 reaction

① Original Colony

	No. reversions B mal	λp_2 Reaction of Mal+	No. pap. B gal + HFT1	Stability of Gal papes. (6 picked)	Mal + λp_2 single colony characteristics	unstable papes (control the blue)	Transd. of Segregant from exp. HFT	Transd. of Segregant from HFT
1	+	λp_2^S	31	3/6 stbl	mal-	λp_2^R	0	0
2	0	—	16	4/6 stbl	"	"	0	0
3	+	λp_2^S	18	0/6 stbl	"	"	0	0
4	+ (+) internal	faint reaction	12	5/6 stbl	"	"	0	0
5	+	λp_2^S	14	2/6 stbl	"	"	0	0
6	0	—	10	3/6 stbl	"	"	0	0
7	+ (+) internal	faint reaction	16	3/6 stbl	"	"	0	0
8	+	λp_2^S	26	1/6 stbl	"	"	0	0
9	+	λp_2^S	12	1/6 stbl	"	"	0	0
10	+	λp_2^S	21	4/6 stbl.	"	"	0	0
		6 λp_2^S					All non transducible	
		2 internal scan.						

Σ. mal+ reversions are λp_2^S or intermediate sensitive

Selection here may not be for the occurrence of λp_2^S under conditions of extreme purity of all population but may be for host range mutants in the HFT phage population.

② Lysate made of #1 (unstable and seg(-))

	O.D. mu/	results
1.	750	solid smear
2.	578	" "
3.		

5/6/54 W2331 mal- tested for transd. with N16 5/9/54 λ (HFT
not found transd.

5/4/54

J.L. Single cell expt.

1. 2342 (1/9/54) + 518 cells

2.4×10⁹

0.5 ml + 0.5 ml → Adsorption 10 min. 37C → Centrifuge 10 min. → Resuspd. 0.5 ml Pen. → Total Cells No. (+)

213 185 / 2 199 = 2.0×10⁸ 16 (18)

dil 10², 10⁴, 10⁶ 425 / 16 = 3.8% (+)

dil fct = 10⁶

2. Control

0.5 ml Pen + 0.5 ml ml → → → → 401 451 / 2 = 4.25×10⁸ 0

24 hour count

JL reports no transd present in his sample of cells studied c̄ the microtransp.

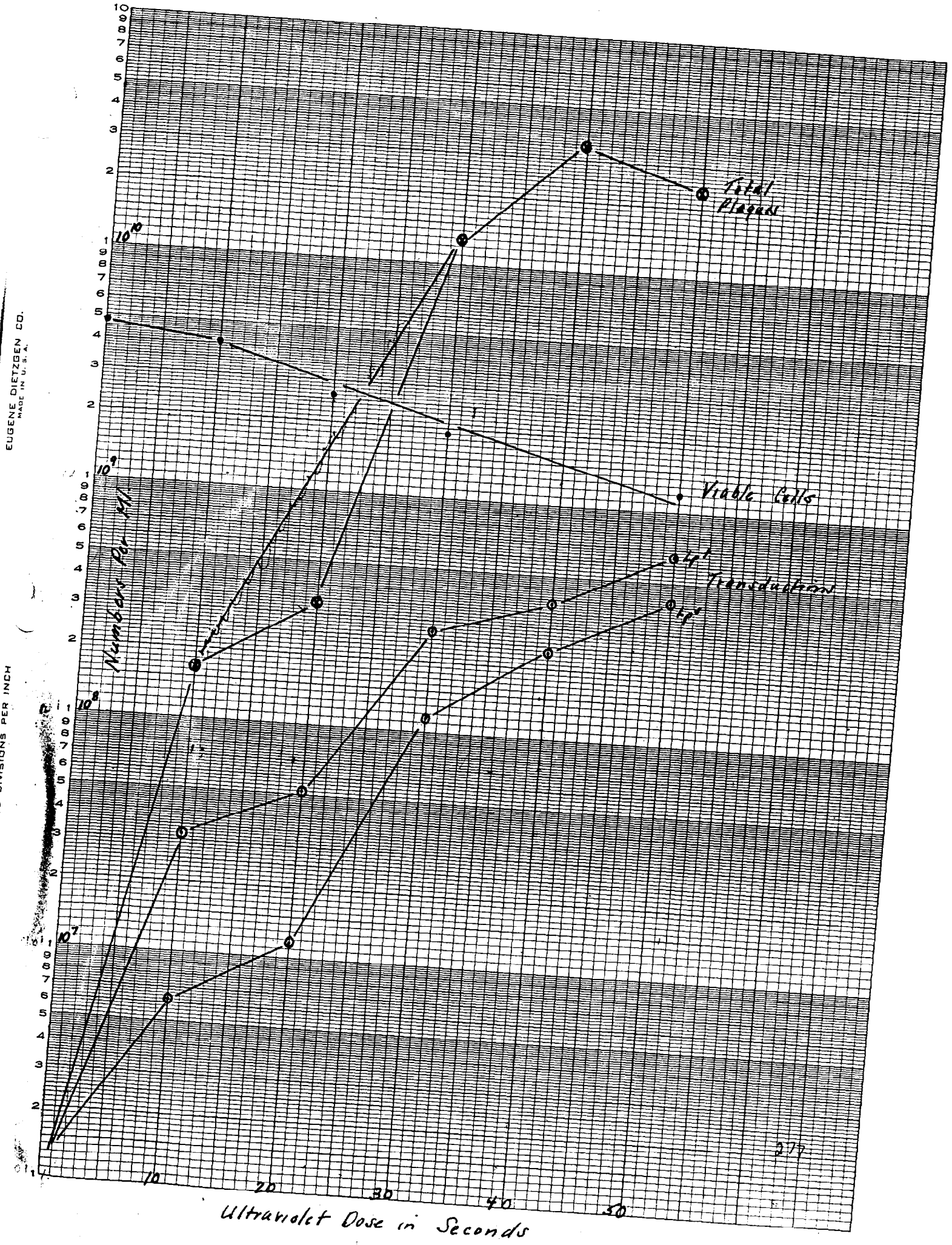
5/6/54

This day 2252x — Hfr gal₄⁻ (24 hrs. of 1/9/54) entered in stock book as W2487 presumably made and tested c. Mar. 24, 1954 — Culture to TCN at this time also.

5/6/54 For the purpose of studying the transmission of the piece in crosses. As sugg. by JL. Transf. 2252 (= Hfr gal + lp's) to ++ / −+ and then cross to ++ / −+ ⊗ +− / 1/9/54

1. 2252 treated Hfr gal₄⁻ (~16) colonies examined for "phage contam" appearance — some found streaked out.

2. on second streaking, all + stbl


Total Plaques
Viable Cells
Transduction
Number per ml.
Ultraviolet Dose in Seconds
10
20
30
40
50
10^{10}
10^{9}
10^{8}
10^{7}
EUGENE DIETZGEN CO.
MADE IN U.S.A.
SEMI-LOGARITHMIC
5 CYCLES X 10 DIVISIONS PER INCH

5/26/54

234p. Test in survival to see if inability to get lysates of high titers is caused by application of wrong a.v. dose.

1. Aerated culture - nearly saturated - centrifuged and resusp. in saline

2. Inoc.

			Single plate Cells	N/N₀	Plaque (lower) 1-100 dil	Transd. plate x 10⁸	Δ		Plaque/1-100 dil
0			477	1.0	0	50	0		0
10			417	0.88	103x16 · 1648x10⁵	112	62	1/3 x10x10⁷	~~[illegible]~~
20	0.1 ml added to 10 ml Pen Inactivated	dil 10⁴ add. in NB for cell Assay	263	0.55	c. 2x 10⁷	164	114		
30			194	0.41	1284x10⁵ = 1.3x10⁸	1200	1150		
40			(256) -	—	3456x10⁵x10²	2368	2318		
50			117	0.25	—	4160	4110		

1-100 10^6

Time	Single Cell Present	"Induced" cells	Transd. produced	Plaques produced
0	4.77x10⁹	0		
10	4.17x10⁹	0.6x10⁹	6.2x10⁶	1.65x10⁸
20	2.63x10⁹	2.14x10⁹	1.14x10⁷	c3.3x10⁸
30	1.94x10⁹	2.83x10⁹	1.15x10⁸	1.24x10¹⁰
40	1.59x10⁹	3.18x10⁹	2.32x10⁸	3.46x10¹⁰
50	1.17x10⁹	3.60x10⁹	4.1x10⁸	2.4x10¹⁰

Transd. Assay on 811

no add Ind. Inc			Plaque Transd.	Ratio
10'	16x200x10⁴ =	3.2x10⁷	16.5/3.2	5.2
20'	32x163x10⁴ =	5.2x10⁷	33/5.2	6.4
30'	169x16x10⁵ =	2.7x10⁸	103/2.7	38
40'	379x10⁶ =	3.8x10⁸	340/3.8	90
50'	654x10⁶ =	6.5x10⁸	240/6.5	37.

6/1/54 Transduction of lp_2^R with HFT lysates - An indication of host range change in λ?

1. 1412 (lp_1^s lp_2^R Gal_4^-) to avoid ē 2342 λ
   no add 40
   2342 λ 456

#1, #2 2. 30 papillae picked - after 2 streakings all stable on Gal
#3 3. 24 gal. papillae " - after 4 " 2 unstable - both non-lys on STP, both mal-
#4, #5 4. 24 " " " " 3 streakings 1 " - Mal(-), non lys. on STP
5. 24 " " " " " 2 " - , non lys on STP
also 23 stable gal+, non lys. on STP

6. Examine Mal + Recessive of above and see if segs.

	Mal Recessive	Mal Dominant	lp_2	Gal	Mal Rec	lp_1^R of Mal Rec	lp_1^R Recall Mal Rec.	Gal+ ?
	intermed	+ 1.	R	seg	fuzz	fuzz segs	R non lys	+*
	fuzz +	2. +	R	seg	"	" " "	S non lys	—
	fuzz +	3. +	R	seg	"	" " "	R " "	+
	intermed	4. +	R	?	intermed	intermed segs.	R " "	+*
	fuzz +	5. +	R	?	?	?	?	?

Suggests that transd. accomplished by lp^R from phage

278 - 1 - 2

7. Examine to see if segregation of lp occurring - Tested against λ, STP

Seg.	Tested	STP	λ	STP	λ	STP
1.	S non lys		r	non lys	r	non lys
2.	S "		"	"	r	
3.	S "		"	"	S	"
4.	r "		"	"	S	"
5.	S "		"	"	—	—

Indicate none cultures look for active phage

Streaks made as 278-1, 2, 3, 4

(1) Lysate made #2 gal+* Mal+ lp^R - no plaques found before irradiation
7/7/54 " " #1 pre irrad. streak indicates mixed for gal - lysate showed no evidence of plaques or transd. on STP

10/26/54 - In testing for whether selection for (Mal-lp^R) intermediate allele from adsorbing λ selected by HFT stock above. Stocks found to be revertants of Mal and lp_2^s. Two gal_4^- lp^R seg found from #3 #4, (3rd repurif.) Revertants of both found stable such that it is likely these lp^R are not digenic

8/1 λ for lysbi lambda prep. Labelled 6/1/54

1. Titer - $209 \times 10^8 = 2.1 \times 10^{10}$

STP t 2342 - Attempts to get higher frequency of transduction

		(-)	(+)	total	cell count	
1.0 ml cells add λ	(1) No add -	216	0	216	$\frac{216}{3} \times 10^5 = 7.2 \times 10^6$	
1.0 ml lysate. Inc. 5 min centrifuge decant resusp in 1.0 ml saline	(2) 2342 lysate (65°)	206	10	215	$\frac{215}{3} \times 10^5 = 7.1 \times 10^6$	c. 5% (+)

WS877
2878
2879
2880

6/17/54

279-1 14/2t 2342 plate - the spontaneous (+) - if picked - Revert for Mal and examine by Mal.

See previous data 278

279-2 14/2t 2342 plate - 12 picked from lysate pulsing of plate - to see nature of lp of the stable gal (+) in lysate pulsing of plate.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. DeMalt (of varying degrees of + ness)	1. non lp	R	S	wk	+		R ✓	-				
	2. "	R	S		sg			-				
	3. "	R	S		sg			-				
	4. "	S not confirmed →	S	wk	sg. +	rev	sg. + R	-				
	5. "	S	S	"	+			-				
	6. "	S	S	"	+			-				
	7. "	R	S		sg			-				
	8. "	R	S	wk	+	rev	stbl, + R					
	9. "	S	S		(-)							
	10. "	R not confirmed →	S	wk	+	rev	stabl, S -					
	11. "	S	S		+			-				
	12. "	R	S	wk	+	rev	stabl, R -					
Σ		4 spont + λ^S										
		3 transd. + λ^R										
		4 " +" λ^R										

1, 2, 3 Refer to 278

free Malt restriction

above not confirmed

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Above 1321	nonly	"	"	"	"	"	"	"	"	"	"	"	"	"
λ	sens.	"	"	"	"	"	"	"	"	"	"	"	"	"
Se	sens.	"	"	"	"	"	"	"	"	"	"	"	"	"

Mal + Rev.

Σ 14 spont (+) λ^S

General summary

transd. appear to be gal + λ^R
gal +" λ^R → sg gal - λ^R
gal +" λ^R → sg gal - λ^S

279-3 Stock 2580tK12 F+ X 1321 3 plates

Control plate on 2580tK12 F+ for distribution of (+), (-) gave 109(+) 57(-)

W 2896

279-3 1. Three plates gave "pustrophs" early (1st day) - all (-)
After 2 days - c. 200/plate - 1 apparent (+) tested as (+) on streaking on B gal - Segregate of gal - tested after (2)
6 segregants of this (+) tested against HFT 2⁻, 4⁻ all transduced by 4⁻, ∴ Gal⁻ from 2580tK12 F+

279-4 Stock 2580tK12 F- X 518 3 plates (discarded one, omitted the other because of minimum.)

279-4	Control on (+), (-) in 2580tK12	(+)	(-)	Total	indicates (15 (+), 13 (-)), sg. ct. in apparent
	Plate 1.	300	53	353	30 (+) picked from this cross to find (-) allele - of the 30, 4 were apparently stable (+), of the remaining 26, 25 tested successfully against HFT 2⁻, HFT 4⁻ - all transd. by HFT 4⁻, ∴ Gal⁻ from 2580tK12 F⁻
	2.	241	46	287	
	3.	—	—	—	
		541	99		

W 2897

6/21/54 2342 purified. Of 10 colonies examined 7 were HFT on 84 - new stock prepared

For repeating above transmission experiments

1321 transd. by K12 → 1321 tK12 F⁻

W 2898

Stock - 279-5

6/24/54

280-1 Are the transd. of Lp^+ really of Lp^R/Lp^+ nature? Examine on Lp^+ transd. W 2580 tKC2

① The Gal (-) seq (20)
280-2 ② The Gal +u (20)

— (280-1) the Gal - (In General these were poor tests)
all found to be Lp^+ and λ^R

(280-2) the Gal +u
18 found to be Lp^+ and λ^R - 2 tests were too poor to judge

280-3 Lytic λ - 1485 - 0.5 ml of this lysate into Pen - Sterile after 2 days.

① 1485 grown on NSB overnight - then aerated culture in NSB started until nearly full density - centrifuged, resp'd in 1.0 ml. 811 λ lambda (p2.78) titer = 2.1×10^{10} - Centrifuge resp'd in c.20 ml NSB aerated. After c 4 hours partially cleared. Centrifuged and chlg'd

② Assay.

10^7 = 757 - titer = 7.6×10^9

③ Transduction with.
on D(0): 0.1 ml this lys + 0.1 ml 811 overnight brush cells.
- no colonies after 48 hours - No M duction

④ Gal duction

	Expt/Control	Stability ✓	
1. W 750	2/0		After 2 streakings - 2 non seg stbl (+)
2. W1210	2/1	2 very faint (+)	discarded
3. W 811	10/14	1, a very faint (+)	9 stbl (+) after 2 streakings

Further evidence that lytic λ does not transduce

Cultures 2342 diluted in fresh medium in volume
Incub. cell 0.1 ml + 10 ml

251-1 Production of HFT λ – Assay plate Bl. Lots 518

Time	Cell Assay	Infective Centers *		Trimed. Centers (no. = 49)		Treated 1-100 .48		Treated spec. 25	Plaques 1/100		A x100	N/Inf Centers	HFT/NFT Assay of Colony at Excitation
0	622	3	0	45	0	97	72		6	0	0	0	3/25 = 0.12 (just dose have 26 others)
10	381	193	190	51	2	47	22		11	5	500	2.6	10/25 = 0.4
20	170	372	369	87	38	38	13		[illegible]	41	4100	11	9/25 = 0.36
30	63	519	516	136	87	28	3		68	62	6200	12	9/25 = 0.36
40	20	449	446	128	79	25	0	60	59	53	5300	12	4/20 = 0.20
60	1	259	256	98	49	26	1	32	35	29	2900	11	
70	1	230	227	80	31	16	0	33	24	18	1800	9.	

* Some of these infective centers appear to have papillae in them. There also appears to be papillae cont. infective centers about them.

These values cannot be treated since they represent some growth effect after mechanical lysome

D	Total N/N0	P/N0	T/N0	
0	1.0	—	—	x3.5
10	0.61	0.31	.0032	0.11
20	0.27	0.59	0.061	0.21
30	0.10	0.83	0.14	0.48
40	0.032	0.72	0.13	0.45
60	0.0016	0.41	~~0.066~~ 0.079	0.27
70	—	0.36	0.050	0.17

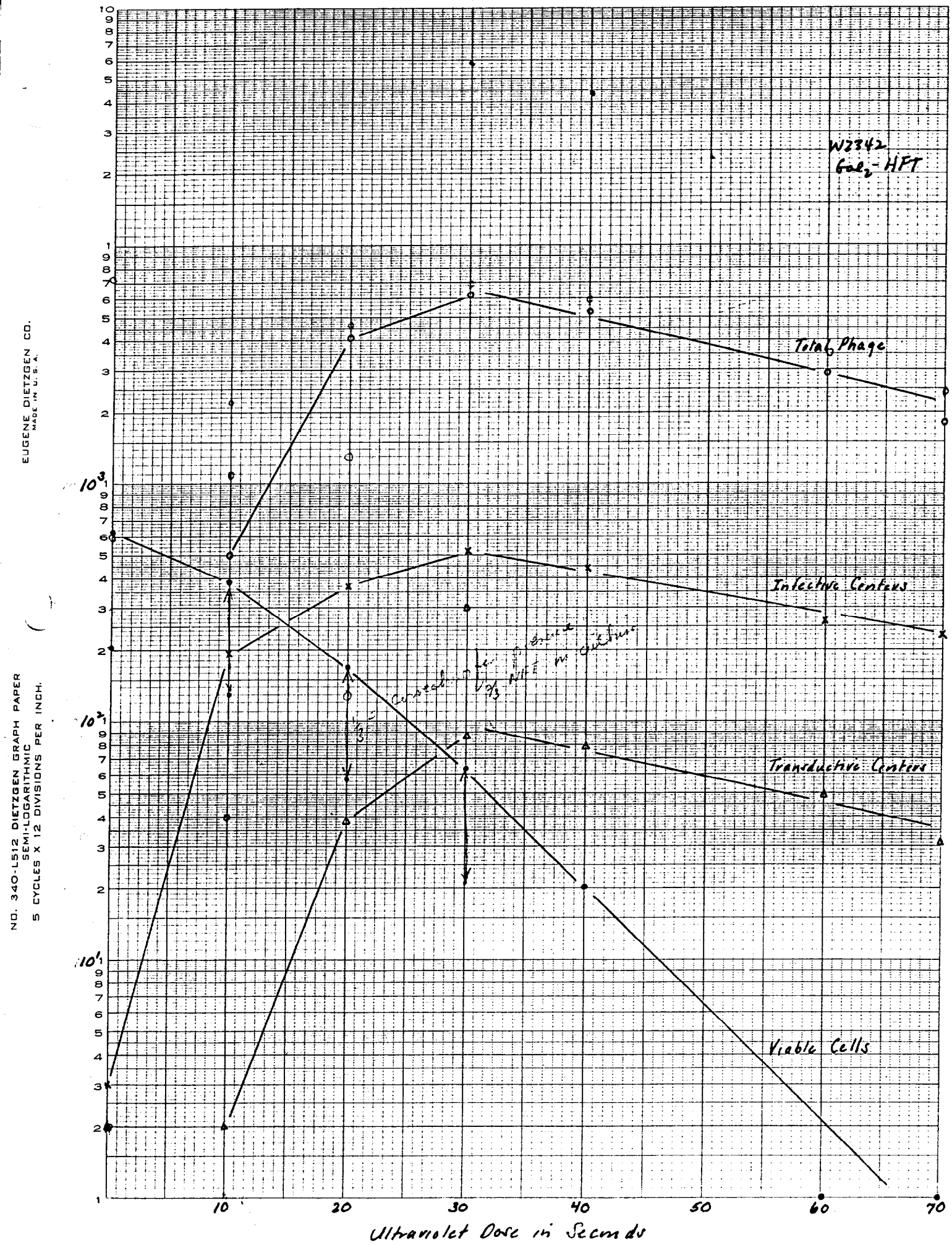
Estimate of fraction HFT

$$\frac{3+10+9+9+5}{25} = \frac{36}{5} = \frac{7.2}{25} = 0.29 \text{ HFT}$$

Corrected for HFT

Inf. $N_0 = 622 \times 0.29 = 180$

D	N/N0	Inf x0.29	P/N0
0	1.0	0	
10	0.61	55	
20	0.27	103	
30	0.10	150	
40	0.032	129	
60	0.0016	74	
70	—	66	


W2342
Gal2-HFT
Total Phage
Infective Centers
Transductive Centers
Viable Cells
Ultraviolet Dose in Seconds
10
20
30
40
50
60
70
10^3
10^2
10^1
EUGENE DIETZGEN CO.
MADE IN U.S.A.
NO. 340-L512 DIETZGEN GRAPH PAPER
SEMI-LOGARITHMIC
5 CYCLES X 12 DIVISIONS PER INCH.

282-1 In the 1^{α} data so far suggests lysates of 1^{α} carry more often than not the (+) of the segment. Really so?

1. 2/15/E750-1 Streaked out and 5 colonies picked - Cultures made and lysates of these prepared.

	Culture	w/o add = 0 Assay/750	w/ add = # found Assay/1210	Plaques/STF	Comment	Ratio P/Fr	Comment 2
lysate contam.	1	1124/448	49 (small)	$.833\times10^{8}$ / 1.2×10^{8} = 2.1×10⁸		2132/497 = 4.3	Higher titer on Gal, than 2 suggest that fragment is 2⁻ or Gal₂⁺
	2	~~[illegible]~~ 460	~~[illegible]~~ 26 (small)	$307\times4\times10^{5}$ / 1.2×10^{8} = 1.2×10⁸	(about 2x as many minute plaques)	1228/488 = 2.5	
	3	336	36 (")	$136\times4\times10^{5}$ / 5.4×10^{8} = 5.4×10⁸	—	544/372 = 1.5	
	4	281	57 (")	$217\times4\times10^{5}$ / 2.7×10^{8} = 2.7×10⁸	—	868/338 = 2.6	
lysate contam.	5	382	34 (")	$191\times4\times10^{5}$ / 7.6×10^{8} = 7.6×10⁸	—	764/416 = 1.8	

due to lower titer, based on 1210? Recovery on W2175

2. Single (-) colony isolated from each and tested for alleles - all were gal₂⁻

also 4 derivatives ~~[illegible]~~

W2851

W2852

Lysate = 282-2

282-2 Transd. of W5117 with HFT 1^{+} 408 (-), 2 (±) Control 440 (-) (B gal) 6, no (+)

(1) W5117 also exposed to HFT 1^{-} λ (NA-4 page 2) plated out. Many partially lysed colonies after 3 days. 6 colonies showing some evidence of (+) product. Of the 6 4 appear to be reversions. Other 2 possible transd., both predominately (+) in streaks, also appear to be segregating. Original colonies were not (+), but pink in color, also of large size as if had selection advantage on Gal.

$\frac{1^{+}4^{-}}{-+} \neq +$

or $\frac{1^{+}4^{+}}{--} = +$, $\frac{1^{+}4^{+}}{--} = +$

(2) Search for $\frac{1^{-}4^{+}}{1^{+}4^{-}}$

(a) 1 discussed below #2 - lysate prepared - Streak of culture before dilution c. 50-50 (+)/(-) started from (-) colony - Assay of lysate (spotted) on STF, 1210, 750 - all HFT reactions

(3) Single (-) pap. colony (the original) → streaked out → single (+) colonies streaked out - 24 in number

(a) 6/24 stable (+)

(b) (-) colonies from remainder tested for allele

Remember these (-) came from pure (+)

	HFT 1^{-}	HFT 4^{-}	λ Reaction	Comment	
1.	+	0	resist.	Gal 4⁻	(4)
2.	not gal (-), but reverting			parental $\frac{1^{+}4^{-}}{1^{-}4^{+}}$	
3.	"	"	"	"	
4.	0	+	resist.	Gal₁⁻	(1)
W2851 5.	+	0	"	Gal 4⁻	(4)
283-1 → 6.	0	0	"	Gal₁⁻ Gal 4⁻	(1)(4)
7.	~~[illegible]~~ +	0	"	Gal₁⁻	(1)
8.	~~[illegible]~~ 0	0	resist	?	?
Discarded 9.	+	0	"	Gal 4⁻	(4)
283-2 → 10.	0	0	resist.	Gal₁⁻ Gal 4⁻	(1)(4)
5/13/55 11.	0	+	"	Gal₁⁻	(1)
12.	+	0	"	Gal 4⁻	(4)
13.	0	+	"	Gal₁⁻ $\frac{1^{+}4^{-}}{1^{-}4^{+}}$	(1)
14.	not gal (-), but reverting			parental	
15.	0	+	resist.	Gal₁⁻	(1)
16.	+	0	"	Gal 4⁻	(4)
17.	+	0	"	Gal 4⁻	(4)
18.	not gal (-) but reverting			parental $\frac{1^{+}4^{-}}{1^{-}4^{+}}$	

Σ. parental	4	all tested against
Gal 4⁻	6	
Gal₁⁻	5	
Gal₁⁻ Gal 4⁻	2	
Questionable	1	
	18	

These are not discovered on original cultures 1210 and found NFT

7/11/54

283

283-1
283-2 } from previous page - are presumably (Gal$_1$ - Gal$_2$ -)

283-1 Transd. c̄ HFT c̄ to get triple (-).
(a) Reaction weak - (+) not strong in cross bound. - suggestion $\frac{1^-4^-2^+}{1^+4^+2^-}$ is not full +?
(b) Streaking out - suggestion that (+) may be of two classes. - one full (+), other intermed.

A 283-1 cross A = ⊗ 2234
B cross B = ⊗ 902 gal$_1$ -

(A) 1st cross not good - heavy 6 kgrd. - no (+) observed (B) 1/8 = 83, = 664 x 10 plates = 6640 (-), no (+) observed.

c 283-1 Further test - transd. 283-1 c̄ HFT gal + λ and obtain (+) - this should then segregate phenotypic (-) which revert rapidly - whose genetic constitution is $\frac{1^+4^-}{1^-4^+}$
(1) transd. c̄ 518+K12 [(#13) p. 267] - dil 10^2 = solid smear, dil 10^4 = c 1000, dil 10^6 = 20 (loop full)
(a) 24 (-) seg streaked out - all appear to be stable (-) - allele = all found 1^-4^-
(b) restreaked 12 (-) seg all stable (-)

283-3 Continuation of 282-1 - #2 lysate. The small plaques? a λ mutant. Attempt to obtain lysogenic culture of - Plaques picked and streaked out, colonies tested

1. 1st 24 colonies found non lys. /518
2. 2nd " " " " " /518

7/16/54

A Repeat examination of +4 after picking single colonies – check on lysates and [illegible]

			Sterility	Assay ob. 0.1 mc 750 c.f. 0		10⁻¹ dil 2175 c.f. 5		811 c.f. 8	
1.	578 E ~~K12~~ 750 -1	6(+) cl.	sterile	14	14	20	15	32	
2.	578 E 902 -1	neg, mostly +	"	0	0	17	13	23	
3.	578 E K12	" "	~~not sterile~~ sterile	—		4	–	~~[illegible]~~	= 1 kg?
4.	750 E 902 -1	" "	sterile	2	2	9	4	26	
5.	750 E K12-2	" "	"	5	5	11	6	26	
6.	811 E 902 -1	" "	"	3	3	11	6	16	
7.	2175 E ~~750~~ -1	" "	"	9	9	15	10	27	
8.	2175 E 811 -1	" "	~~not sterile~~	—					

deletion too general

Repeat assay 10^{-1} dilution (0.1 mc)

1.	578 E 750	5	578 for plaque	148 : 1.5×10⁸	no add 13	not 75	no add : 37 111	74	— active on 1⁻, 2⁻, 4⁻
2.	578 E 902 -1	0		62 : 6.2×10⁷	18	5	45	8	—
3	578 E K12	0		113 : 1.1×10⁸	10	0	39	2	
4	750 E 902 -1	1	~~344 : 3.4×10⁸~~	99 : 9.9×10⁷	~~17~~	0	25	0	
5	750 E K12-2	0 (RD)	~~44 : 4.4×10⁷~~	577 : 5.8×10⁸	32	18	50	13	— active on 2⁻, 4⁻
6	811 E 902 -1	0	~~511 : 5.1×10⁸~~	344 : 3.4×10⁸	10	0	35	0	
7	2175 E 750 -1	24 (?)	~~616 : 6.2×10⁸~~	615 : 6.2×10⁸	160	147	170	133	— active on 1⁻, 2⁻, 4⁻
8	2175 E 811 -1	0	~~146 : 1.1×10⁸~~	116 : 1.1×10⁸	12	0	30	0	

~~Other report~~
~~Chance mutation~~
~~indirect cause~~

Assay 750 (1) 10^{-4} = 501, 5×10⁷
Control = 0
(5) 10^{-4} = 24 . 2.4×10⁶
(7) 10^{-4} = 433 . 4.3×10⁷

Measurement of 750 activity altered such that assay impossible – other experiments show this time suggest this is true also

284-B

1. Cross 2487 × 2593 – Gal⁻ 1Hr × Gal, 1Hr – to secure diploid? not plac. (+)?
2. Cultures grown 4 generations c. 3 times, plated out c. 175 bac
   10^{2} dil – c. 10^{3} prototrophs
   10^{4} dil – c. 50 " " "
   10^{6} dil – c. 20-70 " " "
3. Streaking out of 2 groups c. trypsin – slightly positive in appearance, large, 14 in number

1.	(–)	(–)
2.	(–)	no growth
3.	(–) one pos. cl.	no growth
4.	+ also (–)?	+ (free)
5.	+ " "	+ (uniform)
6.	+	+ (uniform)
7.	+	no growth
8.	no growth	" "
9.	+ also (–)	+, also (–)
10.	+ " "	one (–) cl.
11.	(–)	minute cl.
12.	(–)	(–)
13.	(–)	(–)
14.	(–)	(–)

7/18/54

2279 = Gal$_1^-$ tp^s - Repeat of 578t HFT, using Gal$_1^-$ cells instead of Gal$_4^-$

1. Actively growing culture of 2279 in Pen. c. $10^{2.8}$ cells/ml. 0.5 ml cells + 0.5 ml NA-4 prep. 2. Ad. 10', dil 10^2, 10^3, 10^4. Control cells both treated

(a). Control cell. - one of three plates - 155 = $1.55 \times 10^2 \times 10^1 \times 10^1 \times 10^4$ 1.6×10^8 no (+), lysed, or phage exposed colonies observed, nor any weak (+) colonies

(b) expt. cell. - one of three plates = 118
on the three plates { 38 partially lysed colonies observed
2 colonies papillating in appearance, slightly pink observed - similar to appearance of gal$_4^-$ transd. c̄ HFT 1$^-$ = the 2 colonies on streaking out gave many (+), and parental (-), and possibly non-parental (-). Some of the (+) appear to be segregating

285-1
285-2 Stocks

Picking (+) to examine (-) seg.

285-1 (+) colony	stability	seg test 1$^-$	seg test 4$^-$	Allele	285-2 stbl	(-) seg tested 1$^-$ 4$^-$	Notation
1.	s = stbl	—	+	—	u	parental	
2.	u = unstbl	0	+	1$^-$	s	—	
3.	s	—		—	s	—	
4.	u	+	0	4$^-$	u	parental	
5.	u	0	+	1$^-$	u	parental	
6.	u	+	0	4$^-$	u	parental	
7.	u	0	+	1$^-$	u	0 + tp^s	
8.	u	0	+	1$^-$	s	—	
9.	s	—		—	u	parental	
10.	s	—		—	u	"	
11.	u	reverting to + also trans. by 4$^-$?		parental?	u	"	
12.	u	0	+	1$^-$	u	"	
13.	s	—			s	—	
14.	s	—			u	parental	
15.	s	—			s	—	
16.	u	0	+	1$^-$	s	—	
17.	s	—			u	parental	
18.	s	—			u	"	
19.	s	—			s	—	
20.	u	0	+	1$^-$	u	parental	
21.	s	—			u	"	
22.	u	0	+	1$^-$	s	—	
23.	u	0	+	1$^-$	u	parental	
24.	u	0	+	1$^-$	u	"	
	11 stbl			10 1$^-$	8 stbl	1 1$^-$4$^+$?	
	13 unstbl			2 4$^-$	16 unstbl	15 parental	
				1 parental?			

Many of parental's show evidence of lysis - Segregation is that this is an tp^r transduction, segregating (-) seg that are tp^s

2nd batch (-) seg picked from gal$_1^+$ segregation
↓
9 in all

6 were parental
3 were gal$_1^-$ tp^s

As in the case of the 1st of gal$_1^-$ λ — x gal$_4^-$ where the transduction cells also tp^r and segregating tp^s homotypes

no helen type recovered. Crossing over apparently interfered with

From the above information it appears that these (-) seg. are not derived from separate crossover [illegible]

7/22/54

(28R)

Linearity of Gal_L^- & on Gal_1^- and Gal_4^-?

3/17/54 902	a purifie 750		811	
Q	2	Δ	26	Δ
0.025	62	60	357	325
0.05	81	79	415	389
0.075	206	204	725	699
0.100	243	241	1392	1366
0.125	157	155	1734	1708
0.150	130	128	1566	1540

From the above 12 popular picked - to observe if transd. of Lp^+ are by Lp^R particles examine transd. for lysogenicity and also try to confirm the phenomenon of reduced "lysogenicity" ~~with~~ in Gal tarstab. Stanwie say to see if two very are Lp^R or Lp^+. Also lyse one of each to see behavior of + mutts. Make check.

286-1 = 750 & 902 | of the 12 picked - after 2 stk. 11/12 mutts (+)
286-2 = 811 & 902 | " " " " " " 6/12 " (+)

1. In both cases - no clear distinction as regards lysogenicity response between transduction and segregants. No cases of Lp^R segregants observed. On the assumption that Lp^R particles are transducing Lp^+ cells, perhaps the heterotypic segregants showed be Lp^R. However previous evidence indicates that such segregants need not be Lp^R, semi lysates were made of them. see 811 & 902

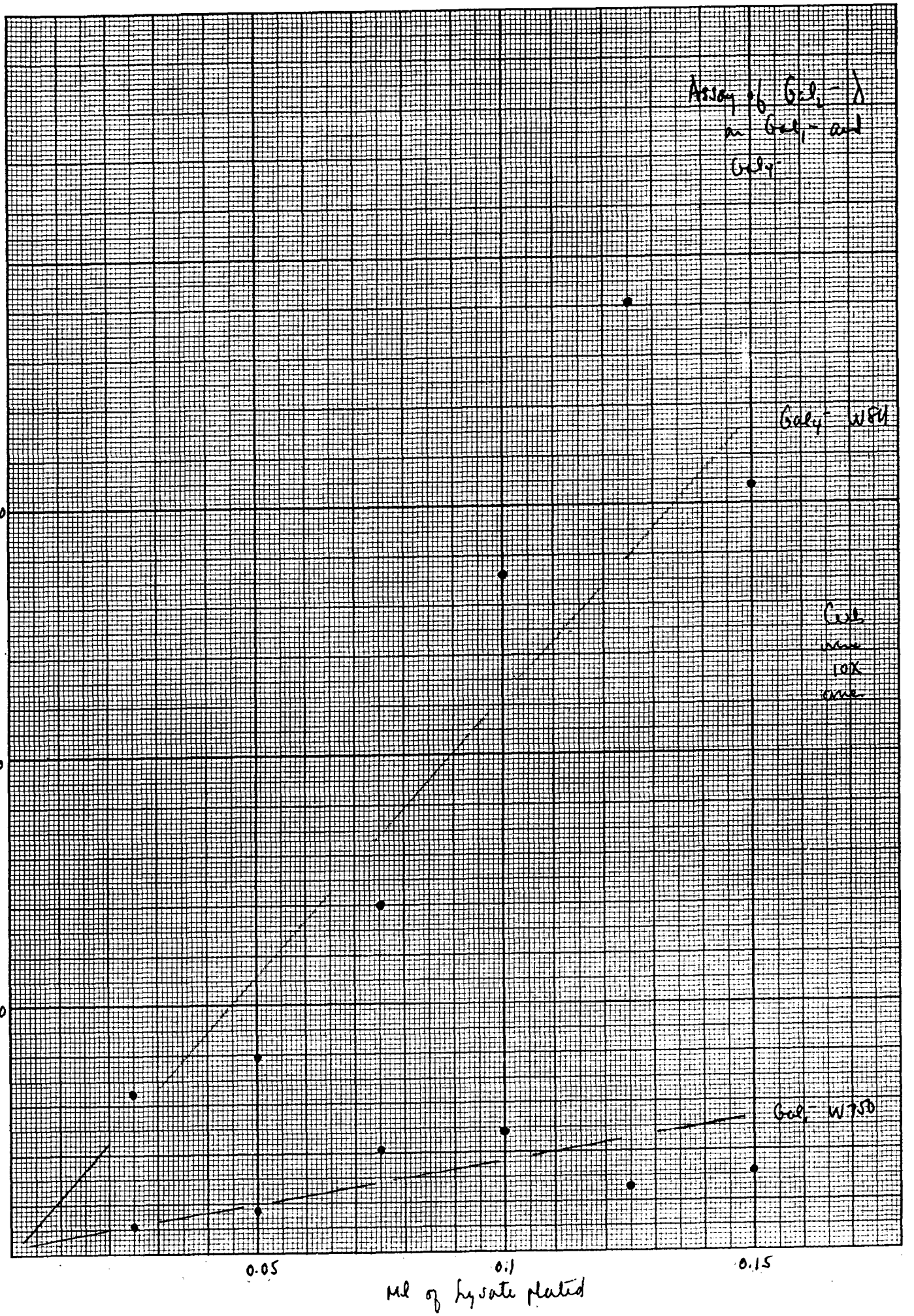
286-1 titer against 518 10^7 PS = 1 plaque = c. 1×10^7

Assays	10^2	0.1 ml of 10^4	10^6	titer	
750 (contrl.=0)	11	18	0	1.8×10^6	750 & 902
2175 (cont.=11)	63	11	13	6.3×10^4	

286-2 titer against 518 to 10^7 = 73 = 7.3×10^8

Assays	10^2	0.1 ml of 10^4	10^6		
750 (contrl.=0)	41	251	2	2.5×10^7	811 & 902
811 (contrl.=11)	276	13	14	2.8×10^5	

||| Assay culture



EUGENE DIETZGEN CO.
MADE IN U. S. A.
NO. 341-M DIETZGEN GRAPH PAPER
MILLIMETER

9/9/54

2341 Its constitution: Isolated as ~~[illegible]~~ HFR gal - Lp^R - TCN isolated Lp^S segregant from. Is this an indication of Lp^R/Lp^S?

(1) Streaked out and single col tested.
$9\,Lp^R$
$1\,Lp^S$

(2) One Lp^R and the Lp^S grown up and plated B gal to obtain reversions.

(3) Reversion (obtained from separate colonies)
(a) Lp^R - 8/8 appear to be seg ± on streaking
(b) Lp^S - 6/6 " " stable on streaking

∴ 2341 is $\frac{2^-\,Lp^S}{2^-\,Lp^R}$ coming from one following Rx

$\frac{2^-\,Lp^R}{}$ × $\frac{+\,Lp^S}{}$ → $\frac{+\,S}{-\,R}$ → $\frac{-\,S}{-\,R}$

9/10/54 7 gal + R of 2341 placed in stock
Labelled as 2341R

9/12/54 Lysate of 2341 Lp^R (made as with an Lp^+)
assay against 518
no plaques
no transductions

9/13/54

1924 F+ EKR - Recheck and cross c̄ F+ 1436 to see if fragment is ± R by recovery of $\frac{-\,S}{+\,R}$

8 possible transl. obtained - all non lysogenic 1518
(1) crossed c̄ 1436 - both cultures not aerated. B gal
3 plates -

1/8 of plate = 106(+)/39(-)

The (-) 23 picked, streaked out once and tested (2 may be gal slow) - 21 Lp^S 2 Lp^R

The (+) 24 picked streaked out 2c, (-) seg tested = 24 (3 appear either mixed or reversing) (mixed)
21 even λ^R

stock plate of one
saved for further

9/20/54

2341 - 2344

2344 is a V_1^R derivative of 2341 - Since 2341 is $\frac{2 - Lp^s}{2 - Lp^e}$
what is 2344 with regard to this?

① testing of colonies of 2344 streaked out

17 colonies tested / λ - all Lp^s. Suggestion that only Lp^s seg. of 2341 can be made V_1^R (since according to Lavalli suggestion crossing over between fragment and chromosomal gal. results in deployed for V_1 and Lac?

② Plate 2341 / T1 see if any Lp^R V_1^R exist.

③ 31 V_1^R colonies picked, purified once and tested against λ
10 were mucoid and phage reaction surprint
1 lamdba Sens
20 Lp^R

Better repeat with repeated Gal so as to judge segregation

{ 811 - Maturing HFT by adding fragment?
{ 518 (9/15/54) -
- The run with 518 exposed with HFT 4 - 48 tested found NFT against 2175 -

811 (9/20/54) - 24 colonies tested against 2175 - all NFT
single { 18 " " " " - " NFT
run { 2 " " " " - possibly HFT - no
9/30/54 20 " " " 1210 - all NFT

c.
9/18/54

518

To make HFT stocks of other gal 289-1 ← WR870

289-1 → ① 518 against EMC's 2238 λ - of 20 pop picked (very small pop in exposed portion of plate) (1 found segregating)

10 segregants tested are transduced by HFT 4⁻, must be gal 3⁻ ?

Lysate made - Titered for transd. / 2297, 811

② 2070 λ - no +ᵘ found of 24 tested

	no add	0.1 ml of dil 10^4	10^6	titer
811	25	73	33	4.8×10^6
2297	223	313	251	9.0×10^6

9/23/54
2350 - stock to see contaminated ō reversions

10 colonies tested against 2 and 4 HFT } to make gal 3⁻ HFT by segregation from double duction

① after 36 hours in transduction
② " 72 " transductions by HFT 2⁻ - of 4⁺ reversions?

This behavior is consistent with previous.

9/23/54.

Recheck on possibility that reversion lysates give more stable transductions than wild type as typified by K-12

1. The transductions:

		lysate	Control	0.1 lysate	Stability	
290-2	750	750 g+-1	0	384	21/24	+u
290-1		2175 g+-1	0	80	22/23	+u
290-3	2175	750 g+-1	3	540	21/24	+u
290-4		2175 g+-1	3	93	23/24	+u

(Cape 2

no's out stock out 5/12/55

Stocks 290-1 → 8

1210 - transd. c̄ 2070 λ to obtain $\frac{2^- 6^+}{2^+ 6^-}$ →

		lysate	Cont	0.1 ml	
290-5	1. 1210	2070 λ+	1	17	9/12 +u

Single seg clone picked - lysate prepared

0. 7 seg from seg. transd. tested against HFT 2 - all not transd. F 2-)

1210 t 811 for Cavalli Expt

291-A Control 811h 3 62

saved 5/13/55

[1, 2, 3 cultures made (3/tr 4")] 291A1, 291A2, 291A3 out

1. 291A-1 ① 8 seq tested by uv. irrad. spots on 811 - all NFT
   8 spotted on 8 gal to see if reversions stable ① c. 8 found stable
   ② 12 addit. tested a la HFT - none HFT ② c. 5 reversions found stable
2. 291A-2 ① 10 seq as 291A-1 NFT, spotted for reversions ① c. 8 found stable
   ② 12 additional tested via HFT test - none HFT ② 4 reversions found stable
3. 291A-3 ① 8 seq as 291A-1 NFT, spotted for reversion ① c. 8 found stable
   ② ② 4 reversions found stable

HFT strains 2-
202-16
241-14
241-19
} Lac^R found stable

Effect of λ-2 Resistance on adsorption.

811 vs. 1439

1. Expt. 0.5 ml K12 λ (7/27/54 Page 1) + 0.5 ml 10X conc. cell from non-aerated cult.
2. λ prep titer 1518
   Reassay 10^7 = 113, 66 = 8.9×10^8
   10^7 dil. = 66, 16 = 41×10^7 = 4.1×10^8 (better reassay. plaques/ml
3. Adsorb. cell titers
   811 10^7 dil = 927, 793 = 860×10^7 = 8.6×10^9 cells/ml
   1439 10^7 dil = 961, 967 = 964×10^7 = 9.6×10^9 cells/ml
4. Adsorpt. tubes contains
   811 4.3×10^9 cells + 2.1×10^8 λ
   1439 4.8×10^9 cells + 2.1×10^8 λ
5. Assay after 15 min adsorpt. 37C, 10' centrifugation
   811 10^7 dil = 0, 1 = 0.05×10^8 λ est. $\frac{5}{210}$ λ remain.
   1439 10^7 dil = 85, 56 = 7.0×10^8

W2888 (292.3 reddy?)

10/10/54

(1) Reexamination of 257C-6 $\frac{4^- 2^+ s}{+ - R}$, its segregants to study crossing over - 24 colonies picked and streaked out from original streaking of stock. Single (+) seg selected.

	HFT 2	HFT 4	Lp	Genotype	Stbl	2-	4-	Lp	Genotype
292-1 1.	0	+	R	✓ 2- R	16	0	+	R	✓ 2-R
2.	+	0	S	- 4- S	17	0	+	R	✓ 2-R
3.	0	+	S	✓ 2-S	S(4)18	0	+	S	✓ 2-S
4.	0	+	R	✓ 2-R	19	0	+	R	✓ 2-R
292-3 5.	0	+	R	✓ 2-R	20	0	+	R	✓ 2-R
6.	+	0	S	- 4- S	S(1)21	0	+	R	✓ 2-R
7.	0	+	S	✓ 2-S	S(1)22.	0	+	partial S	2-seg Lp? 292-22
8.	0	+	R	✓ 2-R					
9.	0	+	S	✓ 2-S	S(1)				
10.	0	+	R	✓ 2-R					
11.	0	+	R	✓ 2-R					
12.	0	+	R	✓ 2-R					
13.	0	+	R	✓ 2-R					
14.	0	+	R	✓ 2-R					
15.	0	+	R	✓ 2-R					

Idiotype	4- S	= 2	1/1	$+^R$ stbl
Allotype	2- R	= 15	11/12	$+^R$ unstbl
Allotype Lp	2- S	= 4	3/3	$+^R$ stbl
Allotype seg?	2- R/S	= 1 ?	not done.	

(one)

See also 298

CONTINUED 292A

(2) Transduction of Lp^R - 1924 x — gal_2^- → gal_2^- Lp^R. Culture is W1 from Expt W. Do this culture heterogenic ~~in any~~ in ~~gal~~ x Lp? Plated out on B gal and reversions examined. 12 picked.

1. 6 obviously slow (+)
2. 6 pure (+). Of these 1 appears to be seg.

292-3 3. The seg clone of 2 above. 3 cul examined for lambda nature

1. seg +
2. pure +
3. pure (-)

/ 2279 all non lysogenic

Attempt to isolate $\frac{x - Lp^R}{2^- Lp^R}$? and see character of phage

(3) 1503 [illegible]. Insertion of gal 4 - After c. 101 colonies examined from single coling experiment (cells + HFT 4 plated out) - failure to find (-) spotting on B(0) of cells and HFT - After about 30 streakings out. 2 (-) observed and a segregating (+), perhaps $\frac{+}{-}$ 0. Stock of (+) made (see card 20)

~~[illegible]~~ 1

NIG 1/17/53 292-7

transduced by HFT 1, 2, 4 — says (-) is spontaneous gal_x^-

292A

292-1, 22

292-1 - The original spot of this in association with the transd. test was pure (-), no suggestion of papillation, (+)

- on streaking out for colony test to see if lp segregating - streak found mixed (+), (-). Pure (-) colonies tested against λ and 1 (+)

① The (+) - weakly sensitive, (segregating probably lp^R/lp^s

② 1 of 10 (-) colonies sensitive lp^R/lp^s #6 (-), #7 from beginning

③ the above (-) spotted ~~against~~ on Gal to check reversion stable

{6 reversion obtained. 2 obviously unstable others may be. Streaks incubated too long

292-22 - The case obviously segregating lp^R/lp^s

① 10 (-) colonies tested 7 out of 10 lp^s #'s 1, 2, 5, 6, 7, 9, 10 - {Reversion found seg = #8, #3, #4 non-seg = #1, 5, 6, 9, 10 no reversion obtained in others (2, 7)

② the above (-) spotted to check reversion stability.

2734

EML selected a better growing isolate from this and labelled 2734

292A - 1503 → original = W2733

Apparently two cultures of 292A-1503 retained and none of the transd. gal of 292

1503 In search of gal, - Het 1503

From the spotting of HFT 4 on 1503 a (-) obtained not transd. ε

9-30 /54 HFT 1-, 2-, 4- apparently sensitive to λ (less so than usually found)

Cross with 2279 - gal, - lp^s to see 1. non-gal, - 2. diploids obtained

(A.) controls OK on B gal. after 3 days both show occurrence of reversions (papillae)

(B) the cross B gal.

	(+)	(-)
1.	12	111
2.	~~27~~ 6	57
3.	7	81
4.	17	127
5.	4	56
6.	23	160
	69	592

Actual no (+) may be higher since small colonies appear to be intermed in appearance and may be immature (+), counted here as (-).

592) 69.0 = 11.4% (+)
592
880
592
2880

12 (+) examined and found stable for gal

10/17/54

Search for HFT 4 - (after many unsuccessful attempts)

2175 EFU - transd. plate = 40/10 (old lysate)

? 15 segregants tested (transd. saved also to see if only certain transd. fam. give HFT, as distinct from a rare segregational event ~~[illegible]~~ from any transduction - two found to be HFT in 2175 stock mixed and also streak out for purification (results could also be certain ε (+)).

Stocks. 293-11 = transd., 293-11S = HFT 4
293-13 = " , 293-13S = " "

Also found 293-12 - lysates prepared of 12, 13 (poor lysates since cultures were aerated 5-6 hours before induction.)

- unfractionated lysates streaked against 2175 lysate 12 ++ 13 0
811 0 ??

SEE 365

11/5/54 293-1, 2, 3 are transductants from which NFT segs were obtained 9/13/55 RH 28B12

Behavior of transductions in giving HFT or NFT - Separately from deg. (+)

transd. seg. #	293-1 1210	293-1 811	293-2 1210	293-2 811	293-3 1210	293-3 811	293-11 1210	293-11 811	293-12 1210	293-12 811	293-13 1210	293-13 811	1280	811
1.	0	SS	0	0	0	15	0	9	SS	1 A	0	0	0	0
2.	0	c.20	1	6	0	18	0	2	SS	0 B	0	c.18	0	0
3.	2	5	0	9	0	13	0	7	SS	2 G	0	0	0	0
4.	0	18	1	15	0	23	0	3	SS	2 D	0	0	0	0
5.	0	14	0	SS A	0	11	0	3	0	12	0	0	0	0
6.	0	c.04	3	3	0	4	0	3	18	2	0	c.20	+	0
7.	0	12	0	SS B	0	30	0	6	SS	0 E	0	0	0	0
8.	0	~~[illegible]~~	1	12	0	4	0	3	0	6	0	c.20	0	0
9.	0	~~[illegible]~~	1	0	0	2	0	A SS	5	2	0	c.20	0	0
10.	0	10	0	18	0	c.40	0	0	SS	1 F	0	~~[illegible]~~	+	0
11.	0	10	0	7	0	c.30	0	0	1	1		7	0	12/16/54
12.									SS	0 G			0	0
	1 HFT 2		2 HFT 2				1 HFT 2 (poor plate)		7 HFT 4 3? HFT 4				0	293-12A substituted for WD2431 as HFT 4 stock

SS = solid smear

est. genetic no. 0 2 0 3 0 6 0 5 0 3 0 3

293-1 A 293-2 A 293-11 A 293-12 A-G

	1210	B 1210	1210	1210		1210	1210
1.	SS	1	0	0	SS	25	0
2.	2	5	3	1	SS	11	0
3.	0	4	2	2	SS	6	0
4.	0	6	3	2	SS	c.40	0
5.	0	SS	0	1	–	1	1
6.	1	4	1	1	–	0	1
7.	1	SS	0	2	SS	c.30	0
8.	0	4	0	0	–	2	3
9.	2	9	2	SS	–	0	2
10.	0	7	4	0	SS	c.50	0
11.	0	3	1	0	0	1	1
12.					SS	12	
	✓	✓	✓				✓

Request assay

Both picked and streaked out and found HFT on 1210 and wild & lysogenic