Newly lysogenic phage: 826
776-370; 373

March 12, 1951.

(A) (B)

776-370 and -373 were found to be lysogenic for W518. Also for W811.
Pick plaques on W518 to produce a W518 [776].
Although supplied as separate cultures from NIH.L. 370 and 373 may well be identical.
They were the sole SR in their groups and resemble each other culturally.

None of 8 W518 recovered each from plaques from A and B.
Inoculate A + B together with W518 for preliminary growth of the phages.

a) High titer stock obtained on W518. W518 survivors were
λ^{370} S 18/20. 2 R.
None lysogenic.

Attempt to induce or modify lysogenicity re λ^{370}.

b) Inoculate suspensions + λ^{370} stocks into Penassay.

1	W1248	pR	λ^-	
2	1027	S	−	
3	1177	R	+	ca 100 none lysogenic against W1177
4	677	S!	+	
5	660	S	+	
6	58-161			} 40 each tested
7	W518 + λ + λ^{370}		+ λ^{370}	none lysogenic against W1177

anti - K12 lactase.

	A	B	C
Antigen .5 ml	1:10	1:20	1:40

Antiserum .5 ml undil. (serum 117).

Incubate at 37°. Then refrigerate

sediment the precipitate.

a). supernatants: Dilute A 1:4 B 1:2 C ~~[illegible]~~ no dil.

Take .1 ml samples to 5 ml H_2O, 1 ml npg M/200 in M/20 buffer
Inc 37° 10 mins. Add M/1 Na_2CO_3.

npg: A > B > C.

b) Wash ppts twice. Resuspend in 1 ml saline. Assay .1 ml samples as above, 20 mins. Add Na_2CO_3.

npg A > B > C. ca 1/5 as active as supernatants

A .5 ml antigen + .5 ml antiserum. to 1 ml volume
B .05 "
C .005 "

D E F (A' B' C') with .5 ml NaCl rather than serum

G H I = 3x washed ppts. of ABC.

~~For control of ppt. washing, also add antigen to boiled serum ppt~~

Assay .5 ml samples, equivalent to 1:100 dilution (C).
Di

A	.008	227
B	.020	620 sic!
C	.128	142
D	.00[illegible]	|
E	.004	|
F	.0[illegible]	0
G	.0[illegible]	|
H	[illegible]	|
I	.018	

Protective effect of serum???

Assay antigen!

(over)

827:) Assay antigen:
dilute 1:100. 1:1 with saline, then as

in previous assays.
ca 500.

824 - 3
H281

828

3/19/57 H289 is Mtl v Xyl v Lac + Mal −, + v?

Incr D(Mal) 10 ml with mixed growth from original EMS Mtl streaking, incubate in air 24h. Plate out at 10^{-7} on EMS Mal, EMB Mal, Mtl.

EMB Mtl plating shows 90% Mtl v. On EMB Mal, no clear Mal v colonies are seen, but very numerous mottled Mal+, which might be Mal +/- ... v.

↳ Ca 30: all Mal ++ 20 all ++ Mostly Mtl v.

This "culture" is probably a duplex pair Mal +, − resp. Check Mal- for hemizygosity.

824-8
H288

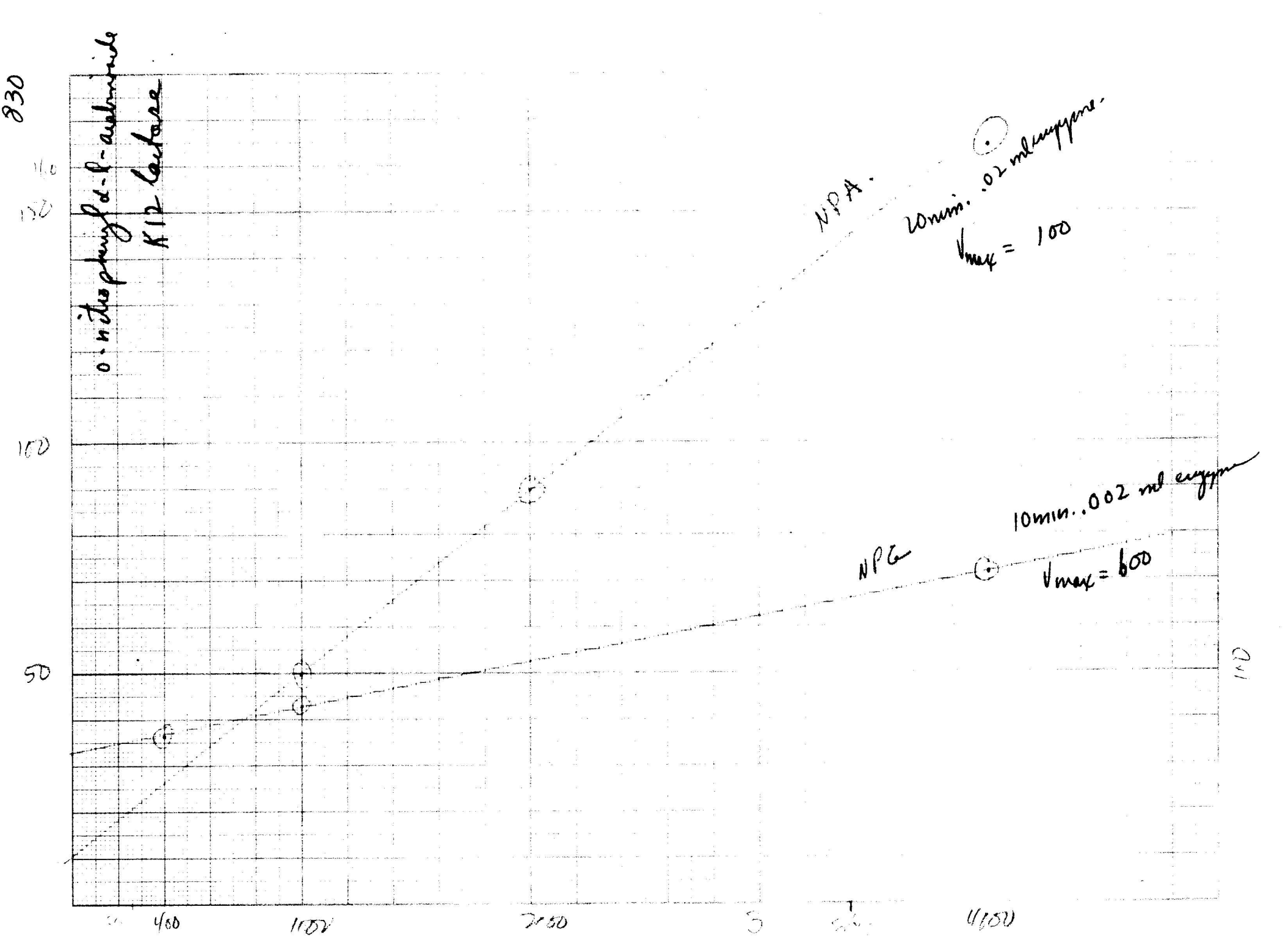
829

3/17/44. /52.

H288 is Lac- MHv Xyl+ Mal- from W466 x W1577
BM Lac- W660 Lac+
T5 S (?) V, R.

Each of 16 Lac+ reversions on EMS Lac was found to be Lac- MHv but the latter character is difficult to score.

∴ Lac- derived from reverse cross is also homozygous.
From this one might argue that the corresponding Lac+ found in the cross W478 x W1490, etc., are also homozygous.
Compare 819 for similar data on Mal.


o-nitrophenyl-β-D-galactopyranoside
K12 Lactase
830
150
100
50
NPA.
20min. .02 ml enzyme.
V_{max} = 100
NPG
10min. .002 ml enzyme
V_{max} = 600
400
1100
2450
4(150)

				1/V	1/S
			Df		
1			098	102	
2			150	67	
3			470		
4			880		
5			128		

		Enz.	Sub	M/200			
20min	1	.02	NPA	.5	061	164	4000
	2	"	"	1	112	89.3	2000
	3	"	"	2	201	49.7	1000
	4	"	"	5			
10min	5	.002	NPG	.5	139	71.9	4000
	6	"	"	2	234	42.7	1000
	7	"	"	5	276	36.2	400

A 259 256

B 279 271 still different

V_{max}^{20min} NPG 606 K_s M/3400 $= 2.9 \times 10^{-4}$

NPA. 1000 K_s M/250 4×10^{-3}

Place new matings

March 22, 1948.

A W1490 × W1511 (w-1 MH) on EMS Lac.

B " × 1578 (w-1 xyl-)

C " × 1519 (")

A 40 Lac "+" picked., streak on EMB Lac. Lac ± : 1-4 1-6 (redacted).

B. 100 Lac "+" (light) picked (Miss Lem) and streaked on EMB Lac. Mostly Lac-!

C. 40 Lac+ picked.

Segregation ratios: B among Lac- 13 + : 78 −
5 + : 15 −
9 Xyl+ : 51 Xyl−

C " " 14 + : 46 −

~~B~~ ..

Lac+ : C : 7+ : 22 − Some correlation with Mal+ recheck.

B : 3+ : 30 −

	Mal+ MH+	Mal+ MH−	Mal− MH−	Mal− MH+
A. Lac+	40	1	0	13	1
Lac−		3	0	18	0

very close linkage of MH to Mal. Also seen in heterozygote behavior.

March 26, 1951.

1, 2, 3 : Mtl − Mal − Lac v. Growing poorly on EMS Lac.

There heterozygotes give almost a − reaction on EMS Lac, requiring 48 hours to give a full + reaction. (Modifier or pleiotropic effect?)

Each gave a Mtl + Lac v recession with stronger lac + reaction.
∴ Mtl − is hemizygous.

	lac	mal	xyl	Isolated EMS lac +	
1	V	−	V	V	xyl V
2	V	−	V	V	
3	V	−	−	V	
4	V	+	−	V	
5	V	−	−	V	?
6	V	−	V	+	xyl +

In B, C 1 EMS lac+ colony was picked as purified haploid stock.

3, 4, 5 each gave xyl V reversions after storage on EMS xyl

∴ xyl − here is xyl =

	Lac	Mal	Xyl	Isolated EMS + Lac
1	?	—	— .	v? ← mottled but not lac v. Maybe lac+/lac+
2	?	—	— .	+ xyl-
3	v	—	v	v
4	v	—	v	+ xyl v
5	v	—	v	v
6	v	—	v	v
7	v	—	v	v
8	v	—	v	v
9	v	—	v	v
10	v	—	— v . .	v ← —
11	v	+	+ v	v
12	v	—	v	v
13	v	—	v	v
14	v	—	— . .	[redacted] v+v
15	v	+	+	v
16	v	—	v	v
17	v	+	+ (v?)	v
18	v	+	+	v
19	v ?	—	v	v+ (?)
20	v	+	+ (v?)	v

Note correlation here also between xyl+ and Mal+. Would it be possible to arrange to have xyl+ markers screened to verify the homozygosity of xyl "+" in this case?

March 30 ff 1951

A. Lac− Mal−

(~~58−161~~ 478 × W660) × W1394 (Y10 S^R)

	Lac+ *	Lac− *	% [PR] ~~BM~~	
A 1	78	18	19	96
2	82	17	18	99
3	98	30	23	128
4	130	23	28	153
5	151	46	23	197
6	127	30	19	157
7	96	25	21	121
8	120	47	28	167
9	123	38	24	161
10	159	25	(13)	184
11	106	45	(30)	151
12	59	22	27	81
13	125	43	22	168
14	139	44	24	183
15	143	45	24	188
16	122	32	21	154
	~~1958~~	~~530~~	21 %	2488

97 : 23
83 : 17   17

A. Lac+ Mal−

× 1585

B 1	10 *	41	(20)	51
2	69	113	(38)	182
3	30	105	22	135
4	29	112	21	141
5	56	101	36	157
6	31	68	32	99
7	80	134	37	214

25 : 95
32 : 64

A C

2 L−	88 *	31 *	24	129
4 L+	36 *	77	31	113
5 L−	103	21 *	(17)	124
~~6 L+)~~	~~3~~	~~16~~		19
7	27	54		

.... 18 : 78   1394
82 : 14   1177
1394

r, 3 were sterile

March 26 fil. 1951

A. 			W478 x W660
B " " "	58-161 x "
C		" x 1022	ca 5% la, Mal -

Cross x W-1177 with SRP selection (plating onto streptomycin EMS to select S^R prototrophs)

D		478 x 1022.

Isolate various prototrophs for crosses.	ca 5% Lac + Mal -

3/29/51.		K x 1590	Lac + 8	22

	Lac	SRP
K12 x W1177	9+	/41 -
"777+" 1 x "	8+	/45 -
777+ 2 "	1+	/10 -

K-12 x W1589 (= BM Lac - Mal - S^R). All of 41 Mal+. (conflict with S-Mal linkage? streaks out on EMB Mal! W1589 is Mal+. not proper)

lac: 0+ 37-
4+ 28-.

A)
A	Lac -		x 1394
B	Lac +	7) 1100	x 1585
C	Mal +	lac - 1394
	lac + 1177

1,2,3,5 Lac -	1,6,7
4,6,7 Lac +	not prot.

B) do. Mostly Mal -.

C)+D. Mostly Lac + Mal+. Lac - not correlated with Mal -

April 21, 1951.

Lac+ Mal+ from B, C, D × W1177 . EMS lac, Mal—

B (++) 4 plates 1 Lac

C (++) 3 plates 1 Lac -

D ++ 4 plates 0.

Nearly sterile!

Repeat of K-12.

Exp W1367, W1177 as parents.

		(×1367 ×W1177) Lac+	−	W1367
K	1	2	52	
	2	2	26	
A	1	38	150	nuclear pattern
	2	26	246	should be repeated.
B	1	0	3	
	2	[illegible]	[illegible]	
C	1	10	10	
	2	2	27	
D	1	17	89	
	2	20	186	

Repeat A: (extreme ratios)

	L+	L−	% +
A10	97	23	*
A11	83	17	*
B1	25 *	95	
B2	"32" *	"64"	
C4	28 *	78	
C5	82	14	*

of K ×	W1177 Lac+	−	1015	1022
	44	90	+ sterile −	+ sterile !

[Not surprising since 1015 and 1022 are S's!!!]

Auxotroph partial syn. parents. (diploids) 833

[illegible]

				Recover on Lac, via D(Lac) + supp.
1	754A2	M - Lacv Mal -	-, + pap	Lacv or +?
2	754A1	M " "	", "	Recover Lacv
3	754B5	TL - Lacv Mal -	—	
4	H244	M - Lacv Mal -	—	
5	754B6	nogr. TL Lacv Mal -	—	
6	754B11	TLB, Lacv Mal -	ng	
7	754B3	L - Lacv Mal - Xyl -	—	
~~8~~	~~H245~~	~~M - Lac Mal Xyl MtlV~~	~~Lacv~~	TL
9	H244M+	M Lacv MtlV	+ -	
~~10~~	~~H246~~	~~TL Lacv Mal. -~~	Lacv	Prototroph

H245 and 246 reisolated.

Grow in D(Lac) + BM or TLB₁. Cross H245 × W1177

H246 × W1387

Recheck nutrition:

H245 TL
246 prototroph!

833-1 M⁻ Pure Lac+? (some mottling

833-2 M⁻ Lac±

= ~~H~~290

= 754A1

Diploid crosses.

April 4, 1951.

H245 TL- Lac Mal Xyl Mtl v H290 M- Lac v Xyl- Mal-

A. H245 x H290 EMS Lac, Mal

B H245 x W1367

TL	BM	Lac	Mtl	Mal
−	+	+	+	+
−	(−)	− s	−	−
+	−	− m	+	+

C H290 x W1585 (= W1177 Mal+)

+	−	+	−	−
(−)	−	−	−	−
−	+	−	−	+

A. (Lac): Mostly lac+ occasional lac−; wide range of lac+ types. Picks 40: All are lac v except #6, 8, 30, which are lac −. The absence of lac+ is easily understood as the parents are each doubly heterozygous. lac 1-4 +/+

(Mal). Mostly Mal+, as above. Clones, m EMB Mal are difficult to interpret as there may be admixture. They are either Mal v or Mal+ v (except 62 +?, 43 Mal −). = A41-80

Hold, if necessary, for analysis of A. Best test for lac − Mal v.

B As A (Lac)

C Mostly −? →

+	−	v
1	++++	111
	++++ ~~++++~~ (+,−)	
	++++	
	++++ ++++	
	++++ 1	

several +, − streaks noted!

(see over)

833A. Rad status restriction.

4/20/51. Probably +/−

Maybe ++/− ?

April 7, 1951.

Restreak 1-40 on EMB Mal (4/7), EMS Lac (4/8) / EMB Lac 4/7 (Hillsboro) repeated

Lac v except 6, 8, 30. 28 may be +, −

#6, 8, 30 appear Mal v or +v, like others. 28 is Mal +, −

(41-80: 41, 50, 52, 61, 64, 67, 69, 77 are Lac −, others Lac v.)

4/10. Repeat. single EMS Lac + 28 → Lac +, Lac −
6, 8, 30 Lac −

	Lac	Mal	Mtl	
1	v	+v	+v	Definitely → occasional Mal −, Mtl −.
2	v	+v	+v	+v ? ?
3	v	v	+v	
4	v	+v	+v	
5	v	+v	+v	
6	−	+v	+v	Mal v ✓
7	v	+v	+v	Mal v ✓
8	−	+v	+v	Mal v ✓
9	v	+v	+v	Mal v ✓
10	v	+v	+v	Mal v ✓
11	v	+v	+v	
12	v	+v	+v	
13	v	+v	+v	
14	v	v	+v	
15	v	+v	+v	
16	v	+v	+v	
17	v	v	+v	
18	v	+v	+v	
19	v	v? +v	+v	
20	v	+v	+v	
21	v	+v	+v	
22	v	+v	+v	
23	v	+v	+v	
24	v	+v	+v	
25	v	+v	+v	
26	v	v	+v	
27	v	+v	+v	
28	v	v	+v	
29	v	+v	+v	
30	−	+v	−	
31	v	+v	+v	
32	v	+v	+v	

v− compare original and derived.

As previously, it is difficult to distinguish Mal and Mtl v from + modified by segregation of other factors. But most or all appear to be Mal + / −

	Lac	Mal	Mtl
33	v	v	+v
34	v	+v	v
35	v	+v	+v
36	v	+v	+v
37	v	+v	+v
38	v	+v	+v
39	v	+v	+v
40	v	+v	+v

Compare B3A (original) and BBB (desired)

April 7, 1951.

M245 x W1367 S^R Mal+ Lac$-^m$ x T-L- Lac1/4 v Malv ....

Restreaks, 24 spots on EMS Lac.

#15 is Mal-, others $+^v$ or v (from spots only).

4/9/51. Repick single EMS Lac colonies and test:

	Lac	Mal	MtL	S	Sm
1	V	V-	V	S	✓
2	V	V	"	S	✓
3	V	$+^v$	"	S	✓
4	V	$+^v$	"	S	✓
5	V	$+^v$ -	"	S	✓
6	V	V	"	S	
7	V	V	"	S	
8	V	V v?	"	S	✓
9	V	V	V	S	✓
10	V	V	V	S	✓
11	V	$+^v$	$+^v$	S	
12	V	$+^v$	$+^v$	S	
13	V	$+^v$	$+^v$	S	
14	V	V	$+^v$	S	
15	V	—	$+^v$	S	-
16	V	V	V	S	-
17	V	V	V	S	
18	V	V	V	S	
19	V	V	V	S	
20	V	V	V	R?	
21	V	V	V	R?	
22	V	V	V	S	
23	V	V	V	S	
24	V	V	V	S	

Mal $+^v$ → Lac$-^s$
Mal V- → Lac$-^m$
Mal V (→ Malv with much higher Mal- component than original)
Mal V ✓ - demarcated

✓

Malv ✓

→ Malv on recession Lac$-^s$
Lac$-^s$

two few initial zygotes for critical determination as $+^{mottled}$ or v on Mal, MtL.

✓1367 S^R ✓.

A number of types are probably represented. Mal- should be specifically tested for hemizygosity. Study for distributions of Lac$-^m$ / Lac$-^s$. Assume Lac4-Lac1+ to be present

Plate out B1, 2, 15, 16 from D(Lac) to EMB Lac, Mal, EMS..

1. Lac v, relatively stable +

   Mal Mottled, no −.

2 Lac v (less stable +). → Lac − m. Mal highly variegated, mostly −. ca. 24 Mal + and Mal − sectors: each Lac / each color by partial segregation in integument.

EMS Mal : Pure +, − about =.

15 Lac v (like 1. Mal: pure − Plate on EMS Mal

16 Lac v (like 1) Mal like 1.

Mal +v are apparently Mal +, with segregating modifiers. These should perhaps be studied as stable tetraploids.

B2 should be studied for interdependence of Mal and Lac segregations.

M290 × W1585⁻ 833C

BM Lac v⁻ TLB, Lac⁻ Mal⁺ S^R D

April 7, 1951.

Recover from EMS Lac. 4 Lac+ or Lac v.

also test 12 other Lac⁻ for $S^{R/S}$ (EMB vs EMS)

(have were S^S on EMS Mal.)

	Lac	Mal	(sm)
1	v	v v	S
2	v	+	R mottled
3	v	v	S
4	+	+	R

This illustrates that Mal is not eliminated in this 2n × 1n cross (unless #2 is hemizygous). It should perhaps be repeated to look for Mal⁻

D: W1490 × M245⁻

BM lac+ $S^R V_6^R$ TL Lac v... V_6^S ?

	Lac	Mal	sm EMS	EMB
1	v	v	S	S
2	v	v	S	S
3	v	v(+)	S	S
4	v	v(+)	S	S
5	v	v+	S	S
6	v	v	S	R
7	v	v	S	S
8	v	v	S	S
9	v	v	S	S
10	v	v	S	S
11	v	v	S	S
12	v	v	S	S
13	v	—	S	S
14	v	v	S, (R)	R
15	+	+	S	S
16	v	?	S	R
17	v	v	S	S
18	v	v	S	S
19	v	?	S	S
20	+	?	S	R

EMB Mal scoring imperfect

S^D/S^s heterozygotes

833E

April 14, 1951.
H245 × W1606

TL LacvMalv BM S^D
Lac+

	Lac		Mal		S EMB
1	v	−	−	-?	S
2	v	+	+		S
3	v	+ +	+		S
4	v	+ +	+	−	S
5	v	+	+	−	S
6	v	+	+		S
7	v	+	+	−	S
8	v	+	+	−	S
9	v	+ v	+		S
10	v	+ v	+		S
11	v	v	+		S
12	v	v	+		S
13	v	v	+		S
14	v	v	+		S
15	v	+ v	+		S
16	v	+ v	+		S
17	v	vv	+		S
18	v	v	+		S
19	v	v	+		S
20	v	v	+		S
21	v	v			
22	v	+ v			
23	v	v v			
24	v	v			
25	v	v			
26	v	v			
27	v	v			
28	v	v			
29	v	v			
30	v	v			
31	v	+ v			
32	v	+ v			
33	v	+ v			
34	v	v			
35	v	+ v			
36	v	+ v			
37	v	v			
38	v	v			
39	v	+ v			
40	v	+ v			

all S^s

16 others all S^s

These are uniformly Mal+ or Malv carrying the Mal factor from the diploid parent!
Study 833E1 for Mal− homozygotes

H245 x W1602. Purified on EMS Lac.

TL Lacv Malv x BM Lac - Mal - S^R

	Lac	Mal	Mtl	S
1	v	+v	v	
2	v	+v	v	
3	v	+v	v	
4	v	+v	v	
5	v	+v	v	
6	v	+v	v	
7	v	+v	v	
8	v	+v	v	
9	v	+v	v	
10	v	+v	v	
11	v	+v	v	
12	v	+v	v	
13	v	+v	v	
14	v	+v	v	
15	v	+v	v	
16	v	+	v	
17	v	+v	v	
18	v	+v	v	
19	v	+v	v	
20	v	+v	v	
21	v	+v	v	
22	v	+v	v	
23	v	+v	v	
24	v	+v	v	
25	v	v	v	
26	v	v	v	
27	v	v	v	
28	v	v	v	
29	v	v	v	
30	v	v	v	
31	v	v	v	
32	v	v	v	
33	v	v	+v	
34	v	v	+v	
35	v	v	v	
36	v	v	v	
37	v	v	v	
38	v	v	v	
39	v	v	v	
40	v	v	v	

all S^s on EMB Xyl

These diploids resemble those of 833B and 833/D.

Evidently, the BM parents do not contribute to the Mal-S factors of these heterozygotes. The possibility that these are 3n-2n aneuploids remains open. (cf. B or D). → when H245 is one parent.

Pustules +v colonies from certain Mal plates. All but 10 and 23 showed apparently only Mal+, these also had rare Mel −. It is possible that these are all Malv but that segregants occur rarely. Appropriate S^R markers would facilitate the characterization of these diploids.

Compare original and derived Lac v Mal v 833 Ca

April 21, 1951.

Compare original & derived (selected as Mal v) from 833:

1 A9 – σ Lac v
2 – d

Plaques noted in thick streak. Mostly lac –; + or ? background.

3 B3 – σ Lac v
4 – d Lac – only

Restreak 1 & 2 on EMS Lac to recover heterozygote. Source of λ^S?!

✓ Plaques may be unique phage, rather than λ^S

This is confirmed. The phage attacks all λ^+, λ^R types and resistant mutants are not attacked to λ (E.M.L.)

May be merely a contaminant see EML 163

conc/4 3/10 4 3.

		BM	TL
A	H245 x H290	‖ Lacv Mal−	‖ Lacv Malv
B	H245 x W1367	≠ Lac−^{m} Mal+ S^R	‖
C	H290 x W1595	‖ Lacv Mal−	‖ Lac− Mal+ S^R
D	H245 x W1490	‖ Lac+ V_1^R S^R	‖ Lacv Malv
E	H245 x W1606.	S^D	‖ Lacv Malv
F	~~H290~~ H245? x W1602	‖ ~~S^R Mal− Lac~~	~~‖ Lacv Malv~~

A. No Mal− seen. Many are clearly Malv, but with scarce Mal− segregants.
?? Are Lac− haploid or diploid segregants??

B. Majority are Mal+, probably not Malv. Also, seemingly S^S, including #2 Malv.
Some would be expected to be S^R/S^S.

C. Many Lac−. Of Lac+, (mostly) Malv S^Rv.

D. Mostly Lacv Malv. ~~S?~~

E ditto no S^D

F. ditto no S^R. Malv+.

The Malv complex of H245 is retained intact in crosses with BM. Review H290 behavior.

H245 = TL Lacv Malv
H290 = BM Lacv Mal−

Deplaced SRP xx. 234

March 30, 1951.

			mEMS Lac sm.	
A	H283	x W1177	Sterile	
B	"	W1490	ca 20-30 Lac+	→ pure Lac+
C	"	W1387	1 Lac?	→ Lac−

Should be repeated if a reason to carry out this experiment can be thought of.

Linkage aberration study

April 2, 1951.

a) Inheritance through addnl. crossing → 2 Lac^v / 40 tests. = 835 C1 – C2

b) Linkage relationships – preliminary survey.

A. 58-161 × W1022 ± B$_1$ } on EMS Lac, Mal, Mtl

~~B W1490 × W1022 ± B$_1$~~ }

C 58-161 × W1178 EMS Lac to isolate Lac^v.

		+	−
A:	Lac	49 61	2? 2?
	Mal	29 2 2 0	2? 0 0 1
	Mtl	65 34	21 10
	Xgl	62	6-(>?)
A (+B$_1$):			
	Lac	110 49	7 7
	Mal	2 1	0 0 0
	Mtl	19 16	4 12
C	Lac	35 23	3 2
	Mal		
	Mtl		
C +B$_1$,	Lac		
	Mal	41 46	2 5
	Mtl		

C1, C2 are two Lac^v isolated from 40 tests. Both are Mal − Purify and segregate

L	M	Mtl	
+	−	−	
+	−	−	
−	−	−	A
−	+	−	Mtl −
+	+	−	
+	+	−	
+	−	+	A Mal −
+	+	−	
+	+	−	
−	−	−	
+	+	−	A' Mtl −
−	−	−	
−	−	−	
+	−	−	
+	−	−	
−	−	−	
−	−	−	
−	−	−	
−	−	−	
			A' L −
−	−	−	
−	−	−	
−	−	−	
−	−	−	
−	−	−	

L	M	Mtl	
−	−	−	
−	−	−	A Mtl − ↓
−	−	−	
+	+	−	
+	+	−	
+	+	−	
+	−	−	
+	−	−	
−	−	−	
−	−	−	
+	+	−	
−	−	−	
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−	−	−	
+	−	−	
+	+	−	
+	+	−	
−	−	−	
+	+	−	
−	+	−	
−	−	−	
+	+	−	
+	−	−	
+	−	−	
−	−	−	

Mtl – occurs relatively frequently, not necessarily associated with Lac −, Mal −

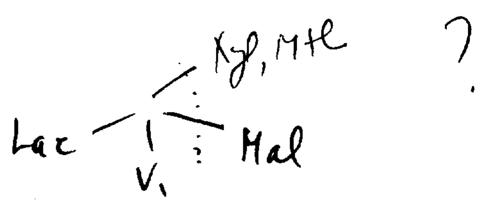
	Lac	Mal	Mtl	Xyl	TS	TS
1		+	+	+	S	S ?
2		+	+	+	S	?
3		+	+	+	S	S
4		+	+	+	R	S
5		+	+	+	S	S
6 (Lac+)	+	+	+	+	S	S
7		+	+	+	S	S
8		—	+	+	S	S
9		+	+	+	R	S
10		+	—	—	S	S
11			+	+	S	S
12			+	+	S	R
13			+	+	S	S
14			+	+	S	S
15			+	+	S	S
16	+	+	+	+	S	S
17			+	+	S	R
18			+	+	S	S
19			+	+	S	?
20			+	— ✓	S	S
21			+	+	S	
22			+	+	S	
23			+	+	S	
24			+	+	S	
25	+		+	+	S	?
26		+	+	+	S	S
27			+	+	S	S
28			+	+	S	S
29			+	+	S	S
30			—	—	S	S
31			+	+	R	R
32			+	+	S	S
33			+	+	S	S
34			+	+	S	S
35			+	+	S	S
36	+	+	—	—	S	S
37			+	+	S	R
38			+	+	S	S
39			?+	—	S	S
40			+	+	S	S
Lac– 1	—	+	—	—	S	S
2	—	+	+	+	S	S
3	—	+	+	+	S	S

See 845

~~Anlecta TS tests~~.

~~Xyl — Mtl.~~

No Lac– V_1 linkage seen.



58-161 x W1022

Picked random from D(0). Benshan EMS Lac

9- : 111+.

Pool with lac- from EMS lac cross plates
Streak out on EMS lac to purify and complete
characterization:

	Lac	Mtl	Xyl	Mal	TS
1	−	−	−	+	S
2	−	+	−	+	S
3	−	+	+	+	S
4	−	+	+	−	S
5	−	+	+	−	S
6	−	−	−	−	S
7	−	+	+	+	S
8	−	+	+	+	R
9	−	−	−	+	S
10	−	−	+	+	R
11	−	+	−	+	R
12	−	+	+	+	S
13	−	−	−	+	S
14	−	+	+	+	S
15	−	−	−	−	S
16	−	−	−	−	S
17	−	+	+	−	R
18	−	+	+	+	S
19	−	−	−	+	R
20	−	+	+	+	S
21	−	−	−	+	S
22	−	+	+	+	S
23	−	+	+	+	S
24	−	−	−	−	R
25	+	−	−	−	R
26	+	−	−	−	S
27	+	+	+	−	S
28	+	+	−	−	R

Mal- from EMS Mal

% 1022 parent among

	Lac	Mal	Mtl	Xyl	TS
Lac+	1/90 ca.	1/40	3/40	5/40	3/40
Lac-		7/24	10/24	11/24	6/24

Lac+ not greatly different from Lac- except for slight increase in

835 C

	B⁻	M⁻	T⁻	L⁻	+	hat	
1	+	+	−	+	+	+	T⁻
2	+	+	+	+	+	−	
3	+	+	−	+	+	+	T⁻
4	+	−	+	+	+	−	M⁻
5	+	+	−	+	+	+	T⁻
6	+	+	−	+	+	−	T⁻
7	+	+	+	+	+	+	
8	+	−	−	−	+	−	M̄T̄L⁻
9	−	+	+	+	+	+	
10	+	−	−	−	+	−	M̄T̄L⁻
11	+	−	−	−	+	+	M̄T̄L⁻
12	+	−	+	+	+	−	M⁻
13	+	−	−	−	+	+	M̄T̄L⁻
14	+	+	+	+	+	−	

Aberrant linkage

[redacted] 835 a.

April 26, 1951

58·161 × W1022

EMS Lac: +	−
55	1
48	1
57	1
20	0
30	0
210	3

1½% − !

EMS Mal +	−	
46	0	
22	0	
38	1	(see) s.o.
22	0	
128	1	

Stockout 70 EMSlac+ → EMSlac.

3 −

s. sectored col.

Place new markers MH —
W1509 — 13.

April 2, 1951.
W1490 x

A 1508 → lac v : MH −, v, +.
B 1511
C 1512
D 1513.
E

Most tests known definitive EMB! Repeats likely lac v from EMS and Retest!

A 1-8 lac v 1 MH+ v 2 MH v 3, 4, +v 5 v 6, 7 − 8 +
9 10 11 12 15 lac v)) 9 + v 10 11 12 v ~~13 MH −~~
B No peculiarity this cross (cf. 831 A) 35-40 are lac v.

1 MH+ lac v ?
2 " "
3 " "
4 MH − lac v ?
5 MH − lac + ?
6 MH − "

C 1512 } No clear lac v. Repeat cross on
D 1513 } EMS lac.

B. 4 single colonies / prototrophs streaked. EMS lac →

1	abcd	lac +	MH+	all Mal+
2		v	+ (+ mottled)	" " −
3		v	+	+
4		+	− (Lac somewhat faded)	−
5		+ faded	−	−
6		+ faded	−	−

W1511 MH− has some epistatic effect on lac+. cf 831A

C : Repeat cross 4/8/51. EMS lac.
Pen guilt.

D :

April 4, 1951. ff

W1508 × W1490.

16 picked and tested as lac v from 40 initial tests.

1-10 lac v Mtl v (or +). 11-13 Lac v Mtl − ✓ Apply for hemizygosity tests.

Check single EMS Lac colony reisolates:

	Lac	Mtl	Mal	
1	v	~~v~~ ?	+ ✓	Mtl+ ✓
2	v	v	−	
3	v	v+	−	
4	v	v	−	
5	+	v	−	
6	v	v ✓	+ ✓	
7	v	v	−	
8	+	+	−	
9	v	v +?	+	✓ Mtl v
10	v+	~~v~~ v	−	
11	v	−	−	
12	v	−	−	
13	v	−	−	

Reisolates 1, 9, ~~10~~ on Mtl, Mal

∴ of 3 Mal+, 2 are Mtl+

(very shiny vac v!)

Linkage data

	Mtl +	−
Lac +	2	18
+	1	19

no linkage to Lac — very low ratio.

Streak out 11-13 on EMS Mtl for reversions.

Reversions apparently pure Mtl+ ! ✓ Mtl+ Lac v.

The Mtl+ may well be a suppressor mutation.

April 5, 1951.

C W1490 x W1512.

- ① Check linkage Mtl/lac (Quick transfer Lac+, Lac- colonies to EMS Mtl

Mtl	lac	+	−
	+	5	2
	−	15	18

no clear interaction.

Picked 40 colonies, streaks on EMB Lac for V. ~~(15 −, 25 +)~~ (0 4, 26 9)

Lac+, smears of lighter tint.

No Lac V !!

Check Mtl character for further linkage tests to EMS Mtl

D W1590 x W1513 36 colonies for Lac V.

		lac	Mtl	Mal
1	2?	+	−	−
2	3	V	~~+~~ +	−
3	5	V	+	−
4	22	+	+	−
5	28	V	~~+~~ +	−
6	33	+	−	−

Restreak these on EMS Lac

V on EMB Mtl.

Quick transfer linkage tests as above.

	+	−
+	13	7
−	4	14
	16	6
	1	0

clear linkage to Lac (probably to right

BM V_6 Lac Mtl V_1 TL....

(rev)

under suboptimal conditions

Lac	MH
+	−
+	−
+	+
+	−
−	−
−	−
−	−
+	−
+	−
−	−
+	+
−	−
+	−
−	−
+	+
−	+
+	−
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+	+
+	+
+	+
+	+
−	+
−	+
−	+
+	−
−	−
+	+
−	+

MH \ Lac	+	−
+	11	4
−	11	14

Lac	Mtl
−	+
+	+
+	+
+	+
−	+
+	+
+	+
−	+
−	+
+	+

Lac	Mtl
+	+
−	+
−	+
+	+
−	+
−	+
+	+
−	+
+	+
−	..

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Lac	Mtl
+	+
−	+
−	+
+	+
−	+
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−	+
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−	..

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..	+
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−	+
−	−
+	+
+	+
+	+

Auxotroph lysol pac seg. 837

April 12, 1951

A. H257 suspensions from D(lac) streaked out on EMB Lac, Mal or and possible S^R Lac v or Mal v repicked for test as auxotrophs. 2 apparent Lac v (from several hundred S^R) recovered; both auxotrophic 837A-1 and A-2. Check nutrition, S^R, etc. Both are Mal –

1. eventually grows on D(0), but faster on D(TLB$_1$) or D(BM)
B-? or prototrophic?

2. D(0) –
D(BM) –
D(TLB$_1$) –
D(BMTLB$_1$) +.

B. H267, through Permassay. Plated → ca 10% Lac v.
Test colonies from EMB to D(0).

30 Lac v.	# all prototrophic	#16 ?v Mal 3 Xyl MH Lac v
20 MH v		#16.
6 Mal v		# 3 ?

C. H257

35 Lac v.	#17 auxotr.	others X^+	Lac v Mal v
31 Mal v	#7 ? "	" "	Lac – Mal +, –

B1 (L)T – Mal Xyl MH Lac$_{1/4}$ $S^{R/S}$ v. n.g. for crosses.
C1 Mal Lac M+ T+ L+ ... ~~prototroph~~ not heterozygous

H257 - 267 partial segregants

April 20 ff. 1951.

Irradiate H257, 267 30 secs. UV 50 cm. ca 50% survival.
Pick lacV centers and streak out on EMB lac.
Repick lacV or +(?) and ~~streaks~~ spot on D(0); EMB lac (or brush organisms). Earlier platings gave ca 2% S^R lacV. Immediately after UV, this [illegible].
Some "lac+" gave very scarce lac - S^R segregants! (details??)

B check for prototrophy:

H267.

	lac	Sn	D(0)		lac	Sn	D(0)
1	V	R	+	11	V	S	+
2	V	RS	−	12	V	R	
3	V	RS	+	13	V	S	+
4	V	RS	+	14	V	RS	+
5	+	RS!	−	15	V	RS	−
6	+	S	±	16	V	RS	+
7	+	RS	−	17	V	S	
8	V	S	−	18	V	RS	+
9	V	RS	−	19	V	RS	−
10	V	RS	+	20	V		

~~From~~ i.e., ca 9/19 auxotrophs.] 9 S^S (maybe either S/S or S/R lethr.)
also add'l. 4/8.] 4 S^R
8 S^{RS}

Note very high frequency of "rearrangements" here (original H267 was S^{RS})

A H257. 8 x⁻ /38 tests.

4/24 Restreak centers of 40 lacV each (usually ⊕) from H257, 267 uv on EMB lac. Pick possible lac+ (stable lacV) for test with sm

D) UV - on ~~SF~~ sm medium. Reisolate single lacV.

(over)

Natural and tests on auxotrophs.

A	1	T−	S_V
	2	M−T−	S_V
	3	MTL+	S_V
	4	MTL+	S_V
			~~S^S~~
			S^R
			S^S
			S^R
			?

B	1	M−	S^S
	2	M−L−	S^R
	3	MTL+	S_V
			S^S
			V
			R
			V

W64 S^{RP} tester

April 16, 1951.

A series of S^R mutants isolated from W1483. (A - F)
(Leu Trp Lac- Mal- S^R)

(1) Grown separately

A K12
B. A
C A+K12
} EMS sm

D SD-161 x A on EMS Lac.

(2) Grown together K12+

A ... F

3/20/51. 1 A 0
B 0
C 1 Lac+ Some very tiny papillae.
D ca 40 small clones, mostly lac+ or very small.

2 A 2+ 3-?
B 2 tiny+; papillae in background. → W1611
C 6+ 1-
~~E~~ 1+
D 12+ 1-
F 6+ 1-

Heat-stable "gametes"? : K-12

April 17, 1951.

"B" "C"

Grow 68-161 and W-1177 together overnight.

AM. Heat shocks → "A". Into Permessay 2:15 PM

1. A .5 ml (broth, could not be effectively sedimented)
2. B .5
3. C .5
4. B + A .5 each
5. C + A .5 each
6. B + C .5 each.
7. 1 + 2
8. 1 + 3

Heating inadequate. A was not sterile.

A. (1) No prototrophs, but lac− (W1177) only survived.

B. }
C. } − gave prototrophs. W1177 contaminated. Expt. worthless.

$S^D \times S^R / S^S$ 840

April 20, 1951.

~~W1606~~ W1606 x 837B1 (W47B $A_2{}^R S^D$ x T(L)-lacv $S^{R/S}$ Malv...)

Plate on EMSlac, EMSlac+sm.

837B1. EMSlac heavily streaked

+sm: faint colony background; 2 Lac+

streak also gave Lac+ prototrophs. e.g. from crosses

Better stock needed

2 Lac- 1 Lac+ grew out. Test on sm; streak out on EMBMal.

April 21, 1951.
W1394 x M290

EMS lac. (see 833C).

Mostly lac+. 11 — (ca 1-2%)

lac − 2 of these are Mal+ — no EMS Mal (= 4 total).
2 are Mal −
7 Mal+.

✓ for S^V

---

20 lac+ : all lac+ S^R. (not V)
of lac − : 8 Mal+ S^R 4 Mal− S^S 1 Mal− S^S (paired Mal+ S^S).

Most of these are ~~are~~ evidently not diploids.

~~Repeat with form~~

Balanced ~~but~~ lethals from H267?? 842

See ~~840~~ 837B.

(1). At least one lac "+" noted which gave lac − in cross back with sm. Restrick: Apparently pure lac +. Test single colonies against sm.

→ ~~Here~~ No lac − formed in 8 streaks.

(previous lac − may have been spattered!)

Repicks from boundary of sm inhibition and plate on E/B lac sm.

If these are hybrid lac+, UV must greatly increase rate of crossing over.

9 additional H267 lac+	5	S^V*	3 S^S	1 S^R
4 " H267	5	S^V	2 S^S	2 S^R.

(2) * 1 gave relatively few S^R Restreak + compare with H257. ↓ not more stable!

(1) auxotroph diploids from H26 / UV. 843

Repick auxotrophs of series B. Streak out and prepare for nutritional characterization

A S^R
B S^S
C S^RS

Final ret:

							Kup:
1	M-	S^R	Mal-	✓	Mal-	S: R	
2	M-	S^R	Mal+		V	R	✓
3	M-	S^R	Mal V?		—	R	✓
4	M-	S^V	Mal V		V?	V	✓
5	TL-	S^R	Mal-		—	R	Lac->Lac+.
6	TL-	S^R	Mal+		+	R	✓
7	TL-	S^V	Mal V		V	V	✓

UV effect on M267

April 27, 1951.

Fresh D(Lac) suspension. Dilute 10^{-6}, irradiate 30 secs.

A. Control ● predominates Plate .1 ml on EMB Lac.

B. UV 30s. ca 50-60% survival. ⊙ predominates
Isolate Lac v from centers.
From one set 843-1 and 843 isolated as M-Lac v S^R.
on EMB Lac Sm.

Isolate Lac v from centers of 40 cols. Test for auxotrophy, S^R.

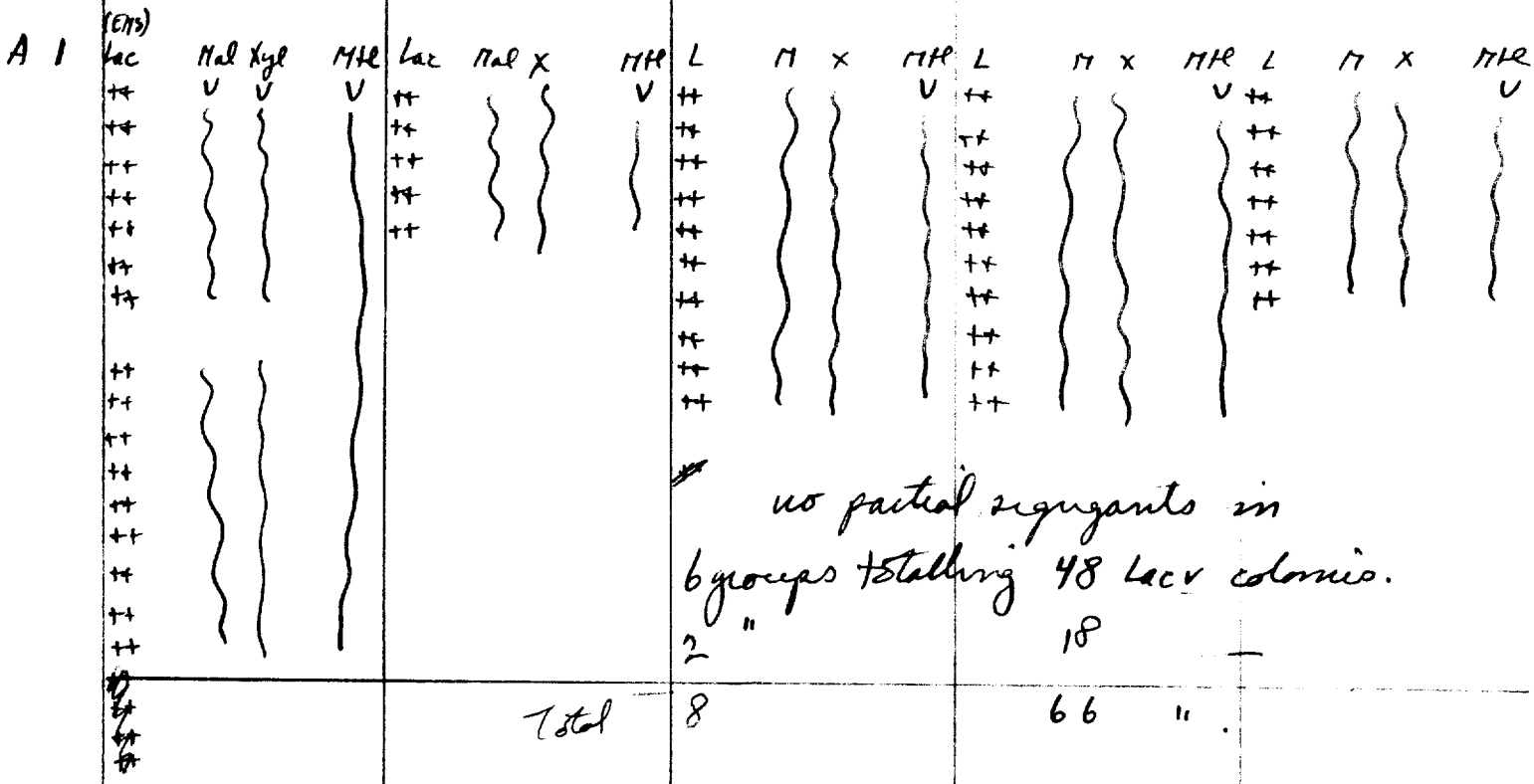
	Lac		S		Nutrition		Lac	S	Nutr
1	+	V	R	RS		11 •	V	SR	
2 •	V	V	R	R		12 •	V	SR	+
3 •	V	V	R	S		13 •	V	SR	
4 •	V	V	RS	S		14 •	V	R	+
5 •	V	V	R	SRS	+	15 •	V	R	+
6	– ?	–	S	–		16 •	V	SR	
7 •	V	V	R	RS or S		17 •	V	SR	+
8 •	V	–	RS	–		18 •	V	R	+
9 •	V	–	S	–		19 •	V ?	S	+
10 •	V	–	S	–	+	20 –	V ?	S	

	Lac	S	Nutr		Lac	S	Nutr	
21	+	R		31	– ?	R ?	+	
22 •	V	R	+	•	V	R ?		
23 •	V	R			O	O	+	sic
24	V •	RS	+	•	V	R	+	
25 •	V	RS		•	V	RS		
26	= ?	S			=	S		
27 •	V	R	+	•	V	RS ?	+	
28 •	V	RS		•	V	RS		
29 •	V	S		•	V	RS		
30 •	V	S		40 •	~~V~~	~~SR~~	–	

Most surviving diploids are unorganized. 27 •• (8 –) : nonparental – [illegible] / parental
5 • most are changed!

LUV sensitivity of uv-surviving diploids? (

② UV - [illegible] - control



no partial segregants in
6 groups totalling 48 Lac v colonies.
2 " 18 —
Total 8 66 " .

A2

Colonies streaked from plating of H207 (without = A; with UV 30s - B)
Each group are lac v from one colony
Needle spot to EMB lac in rows —
Velvet transfer.

(2) UV effects

B1 –

	Lac S	Mal	X	Mtl
(1)	–	V	+	–
	–	V	+	–
	–	V	+	–
	–	V	+	–
	–	V	+	–
	–	V	V (11)	V
	–	–!	V (12)	–?
	–	V	V	V
	–	V	V	V
	–	V	V	V
	–	V	V	V
	–	V	V	V
	–	V	V	V

	Lac S	Mal	X	Mtl
(2)	–	V+	+	+V
	–	+	+	+
	–	+	+	+
	–	+	+	+

	Lac S	Mal	X	Mtl
(3)	+	–?		–?
	–	+	–	–
	–	+	–	–
	–	+	–	–
	–	+	–	–
	–	+	–	–
	–	+	–	–
	–	+	–	–

Lac S	Mal	X	Mtl
+	+	V	V+
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V

Lac	S	Mal	X	Mtl
V	±	–	V (4)	V
	–	–	V	V
	–	≠	V (5)	V
	–	–	V	V
	–	V	V	V
	–	V	V	V
	–	–	V	V
	–	–	V	V
	–	±	± (6)	V?
	–	–	V	V
		–	V	V

all same

B2.

Lac S	Mal	X	Mtl
+	+	V (7)	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V	V
+	+	V (8)	V
+	+	–	–
+	+	–	–
+	+	V	V
+	+	–	–

Lac S	Mal	X	Mtl
+	V	V (9)	V V
+	V	V	V
+	–	– (10)	V
+	–	–	V
+	V	V	V
+	V	V	V
+	–	–	–
+	V	V	V
+	V	V	V
+	V	V	V

see 843 A. Velvet transfer.
Cultures should be checked to verify lac v.

Check possible discrepancies within groups. Note incidence and uniformity of auxotrophy (twotype?).

Residuals on EMB Lac

	LAC	D/O	MAL	XYL	MTL
1	+	–	+	+	+
2	+	–	+	+	+
3	+	–	+	–	+
4	– ?	–	–	?	+
5	+		–	+	+
6	+		–	+	+
7	+	+	+ –	–	–
8	+	+	+	–	–
9	+	+	+ –	+	+
10	+	+	–	–	–
11	+	–	+	+	+
12	+	–	+	+	+

(1) – Isolation of auxotroph diploids

Nutritional tests by decalomania (velvet)

		−M	−T	−L	+			
A	1	−	+	+	+	(B)M		1
	2	+	+	+	+			
	3	−	+	+	+	(B) M		2
	BM	−	+	+	+			
B	1	−	+	+	+	M	S^S	3
	2	−	+	+	+	M	S^S	4
	3	+	+	+	+			
	4	+	+	−	+	L	S^S	
	T+B,	+	+	−	+			
C	1	+	±	−	+	L	S^{RS}	5
	2	−	+		+	M	S^{RS}	
	3	−	+	±	+	ML	S^{RS}	
	4	+	+	+	+			
	5	+	+	−	+	L	S^{RS}	6
	6	+	+		+			
	7	+	+	±	+	L	S^{RS}	7
	8	+	+	+	+			
	9	+	±	+	+			
	10	−	+	+	+	M	S^{RS}	

Salmonella – F. titrate activity

May 4, 1951

		5/5 5PM	5/6	5/8
5PM	streaked on EMBlac			
A.	Tetrathionate Broth.			
(2 tubes) 1.	Filtrate .5 ml	no colonies on sh.	1 tube turbid	0 0
2.	K-12 .5 ml	Lac++		++
3.	Filtrate + K-12 "	Lac++		++
4.	T2	~~Lac-~~		Lac-
B.	Permeassay 10 ml			
1.	Filtrate .5 ml	0	0	0
2.	" + Boone serum 1 ml	0	0	0
3	Serum (sterility control)	0	0	0
4.	+ Serum + loopful T2 (Toxicity control)	++++		
C.	SS-Agar.			
1-2	streaks K-12, T2	Turbid		SS does not inhibit K-12 markedly
3	Plate Filtrate .1 ml	0	0	
4	Filtrate + K12.	"		
D	D(0)			
1.	T2 Filtrate	0	0	streaked EMBMtl → Mtl – Xyl – only recovery of salmonella
2	" + W677	0	Numerous minute cols. + background + pinpoints	
3	T2 cells	~~+++~~		
4	W677	0	Few pinpoints.	
E-F	EMB			
1	~~T2~~ Filtrate			
2	Filtrate + 677			
	~~" + K12 (Lac)~~			

E: Mtl 1, 1 + col. → Lac – Mtl +; 2 T, 0 pop.

F: Xyl 0, 0; 2 T, 0 pop.

probably Salmonella? (does not agg. in O Serum)

papillae Mal slow Xyl – not Salmonella! but spont. mutations

G = E 6/6 2 T + W677

Salmonella – E. coli combinations 844a.

ctd.

A. Grow W1577 ± T2F (.5ml) in Penassay (10ml) overnight. Plate washed cells: all sterile

B. Incr. W1577 .1ml + ~~T2F~~ S414F .1ml on EMS lac, D(0).

a. 1577 control } no colonies
b. S414F " }

c. ~~mixture~~ mixture: ca 2 very tiny "lac+" per plate. Replica to EMB lac

↓

only Lac+

D. T2F } + SW 435 → } prototrophs on D(0)
S414F } SW 414 → no prototrophs

No ~~recombinants~~ of Salmonella with E coli could be found

May 8 ff. 1951.

58-161 x W1619 EMS.

	+	−
Lac	141	3
	111	3
	81	8
Mal	40	5

A Pick 60 Lac+ } ± EMS. Test by decal. transfer to Lac, Mal, MH, EMB Xyl
B 40 Mal+ }

C. EMS Mal plate. 8 Mal − 40+. Decal to EMS Lac Mal MH:

MH: 4− Mal+ Lac+
Lac: 3− 2 + MH+
1 − MH+
Mal: 7− 1
6 + +.

∴ of 47 tests by transfer, 34 Lac+ Mal+ MH+

4	+	+	−
1	−	−	+
2	−	+	+
6	+	−	+

No evidence of linkage of Mal, MH. of below 4 !!

B. Transfer test : 40 all Mal+
#6, 19, 37 Lac −
#12 MH −
None Xyl −

somewhat smeared.

	MH	MH	MK	36	3	9	5	6
1	+	+	+	+	+	−	− +	+ + +
2	+	+	+			+	+ +	− − +
3	+	+	+	−	+	−	+ +	− − −
4	+	+	+	+	+	+	− +	− − −
5	+	+	+	+	−	−	+ +	− + +
6	+	+	+	+	+	+	+ +	− −
7	−	−	+	−	−	+	+ +	+ +
8	−	−	−	−	+	+	− +	− +
9	+	+	+	+	−	−	+ +	+ −
10	−	−	−	−	+	−	− −	+ −

Lac and Mal –

Mal–	LAC	[redacted] GAL	XYL	MTL	[redacted] MAL	EMS	SM
1	+	+	+	+	–		
2	+	+	–	–			
3	+	+	+	+			
4	+	+	–	–			
5	+	+	–	–			
6	+	+	+	+			
7	+	+	+	+			
8	+	+	–	–			
9	+	+	+	+			
10	+	–	–	–			
11	+	+	+	+			

Lac –

1	–	+	+	+	+
2			–	–	–
3			–	–	+
4			+	+	+
5			+	+	+
6			+	+	+
7	+		–	–	–
8			+	+	+
9			–	–	+
10			–	+	+
11			–	–	–
12			+	+	+
13			+	+	+
14	+		+	+	+
15			–	–	+
16			+	+	+
17			?	–	+
18			+	+	+
19			+	+	+
20			+	+	+
21			+	+	+
22			+	+	+
23			–	–	–
24			+	+	+
25			+	+	+
26	+		–	–	–
27	+		+	+	+
28	–		+	–	+
29		+	–	–	+
30		+	+	+	+
31		+	+	+	+

A. Ratios: lac− : lac+ ([illegible])

14 333 5.2%

Mal− lac+

5 40 11%

[illegible] transfer: lac 3− 44+ Mal 7− 40+ Mtl 4− ([illegible])

B. Lac+ (60)

Mal	Mtl	
+	+	35
+	−	8
−	+	6
−	−	11 ✓
		60

Mal− : + 17 : 43

Mtl− : + 19 : 43

Mal+ (40)

3 lac− + + 3

37 lac+ + − 1

+ + 36

C Lac−

+	+	20
+	−	6
−	+	0
−	−	5

Mal−

6 Mtl+
5 Mtl−

[illegible] Mtl − Mal [illegible] indicated

Attempts at λ⁻ diploids

H291 x W1027 on EMS Lac.

A) 20 isolated to EMS Lac. - Retest on W578 streak EMS Lac) all lysogenic

B) 20 addnl. Lac+. Purify.

all lysogenic.

May 15, ff. 1951.

A. W1606 x 843-6 EMS Lac 5 plates $S^R S^R / S^D$; Mal+, +

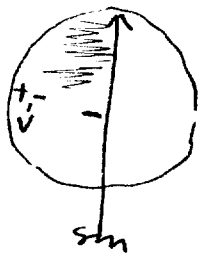
B " x 843-7 " " . S^{RS} / S^D ; Mal+, +

A. 13 Lac v. all S^R. #12 shows some apparent sensitivity to sm. Recheck.

Smear all to Permassay for later v on S^D.

B. 20 Lac v. All S^S on EMS Lac. with sporadic S^R Lac+, Lac-.

On EMB Mal plates:



sm "bleaches" colonies in its vicinity.

after 36 hours, Mal+, and papillae are seen.

A W1177 x ~~1619~~ 1632 D(0), EMS Lac.
B W1619 x 1632

A. 1 ~~From D(0) Lac Mal Mtl~~

B 1.

Lac	Mal	Mtl		
+	+	+	6	15
+	+	−	4	1
+	−	+	2	6
+	−	−	1	1
−	+	+		1
−	+	−	1	
−	−	+		
−	−	−		

A 2 A 1

4	2
~~1~~ 1	1
~~2~~ 2	1
5	4
	3
1	
1	
10	15

A1

COLONY NUMBER	LAC		MTL	MAL	XYL	MgC Sm	T1	T6
1	—	✓	—	—	—	—	S	S
2	+	✓	+	—	+	0 S	S	R
3	—	✓	—	0 +	—	0	S	R
4	—	✓	—	—	—	—	S	S
5	+	✓	+	—	+	—	S	R
6	+	✓	—	—	—	—	S	R
7	+	✓	+	—	+	—	S	R
8	+	✓	—	—	—	—	S	R
9	+	✓	+	+	+	0	S	R
10	—	✓	—	—	—	0	S	R
11	(+ —)	—	+	—	—	—	R	R
12	+	—	—	—	—	—	S	R
13	—	✓	—	—	—	0	S	R
14	+	+	—	—	—	—	S	R
15	—		—	—	—	0	S	R
16	—	✓	—	—	—	—	S	S
17	+	✓	—	—	—	—	S	S
18	+	✓	—	—	—	—	S	R
19	+	✓	—	—	—	0	S	R
20	+	✓	0	—	0	0	S	R
21	—	✓	—	+ ? —	—	0	S	R
22	0	—	0	—	0	0		

B1

1	+		+	+	+	0	S	R
2	+		+	+	+		S	R
3	+		0	0 +	0		S	R
4	+		0	0 +	+		S	R
5	+		+	+	+		S	R
6	—	✓	+	+	+		S	S
7	+	(—) ✓	+	—	—		S	S
8	+		—	—	—		S	R
9	+		+	+	+		S	R
10	+		+	0 +	+		S	R
11	+	✓	+	+	+		S	R
12	+	✓	+	+	+		S	R
13	+	✓	+	+	+		S	R
14	—	✓	+	+	+		S	R
15	0	+	+	0 +	0		S	R
16	+	✓	+	+	+		S	R
17	0	+	+	0 +	0		S	R
18	0	+	+	0 +	0		S	R
19	+	✓	+	+	+		S	R
20	+	✓	+	+	+		S	R
21	0	+	0	0 +	+		S	R
22	0	+	0	0 +	+		S	R
23	+	✓	[— (+)] +		+		S	R
24	+	✓	[— (+)] +		+		S	R
25	+	✓	+	+	+		S	R
26	0	+	+	0 +	0		S	R
27	+	✓	+	+	+		S	R
28	+	✓	+	+	+		S	R

848A Selected as Mal+ or Lac+.

	LAC	GAL	MTL	XYL	MAL	Sm
1	+	+	+	+	+	
2	−	−	−	−	−	R
3	+	+	+	+	+(−)	R
4	−	−	−	−	−	R
5	+	+	+	+	+	
6	+	+	+	+	+	R
7	+	+	+	+	+	
8	+	+	+	+	+	
9	+	+	−	−	+	
10	+	+	−	+	+	
11	+	+	−	+	+	
12	+	−	−	−	−	R
13	+	−	−	−	−	
14	+	−	−	−	−	R
15	+	−	−(+)+	+	+	
16	+	+	−	+	+	
17	+	−	−	−	−	R
18	+	−	+	−	−	
19	+	−	−	−	−	R
20	−	−	−	−	−	R
21	+	+	−	+	−	R
22	+	+	−	+	+	
23	−	−	−	−	−	R
24	+	+(−)	−	−	−	R
25	+	−	−	−	−	R
26	+	−	−	+	−	R
27	+	+	−	−	+	
28	+	−	−	−	−	R
29		−	−	−	−	R
30	−	−	−	−	−	R
31	+	−	−	−	−	R
32	+	−	−	−	−	R
33	+	+	−	+	+	
34	+	+	−	+	+	
35	+	−	−	−	−	R
36	+	−	−	−	−	R
37	+	+	−	−	+	
38	+	−	−	−	−	R

848B. Selected as lac −

#	MAL	LAC	MTL	GAL	XYL
1	+	−	−	+	+
2	+	−	−	+	+
3	+	−	−	+	+
4	+	−	−	+	+

Selected as MTL −

1	+	+	−	+	−
2	+	+	−	+	−
3	+	+	−	+	−
4	+	+	−	+	−
5	+	+	−	−	+
6	+	+	−	+	+
7	+	+	−	+	+
8	+	+	−	+	+
9	+−	+	−	+	−
10	−	+	−	−	−
11	+	+	−	+	−

B2

COLONY NUMBER	LAC		MTL	MAL		XYL	Sm	T1	T6
1	−	✓	0	+		0	0	R	S
2	−	✓	0	+		0		R	S
3	0	+-	0	−		0		S	R
4	0	+	+	0	+	0		R	R
5	+	✓	+	−(+)		+		S	R
6	+	✓	0	+		0		S	R
7	0	+	0	0	−	+		S	R
8	0	−	0	+		0		R	S
9	0	−	0	+		0		R	S
10	+	✓	0	−		0		S	R
11	−	✓	+	0	+	0		R	S
12	−	✓	+	+		+		S	S
13	−	✓	0	0	+	+		S	S
14	+	✓	+	+		+		S	R
15	+	✓	+	+		+		S	S
16	0	+	0	−		0		S	R
17	+	✓	+	+		+		S	R
18	0	+	+	0	+	0		S	R
19	0	−	+	0	+	0		R	S
20	0	+	+	0	+	0		S	R
21	+	✓	+	+		+		S	R
22	+	✓	+	+		−		S	R
23	+	✓	+	+		+		S	R
24	+	✓	−	−		−		S	R
25	0	+	+	0	+	3		S	R
26	+	✓	−	+		+		S	R
27	+	✓	+	+		+		S	R
28	+	✓	+	0	−	0		S	R

A2

1	0	−	0	0	
2	−	−	−	−	R
3	−	−	+	−(+)	
4	−	−	+	−	
5	−	−	−	−	R
6	+	+	+	+	
7	−	−	−	−	R
8	+	+	+	+	
9	0	−	−	0	
10	+(−)	+	+	+(−)	
11	−	−	−	+	R
12	−	−	−	−	R
13	−	−	−	−	
14	−	−	−	−	
15	0	−	0	−(+)	
16	−	−	−	−	R
17	−	−	−	−	R
18	−	−	−	−	R
19	−	−	−	−	
20	−(+)	−	−	−	R
21	−	−	+	−	R
22	+	+	−	+	R
23	0	−	?	0	
24	0	−		0	
25	0	−	−	−	R

Segregation of H267.

849a

May 14, 1951

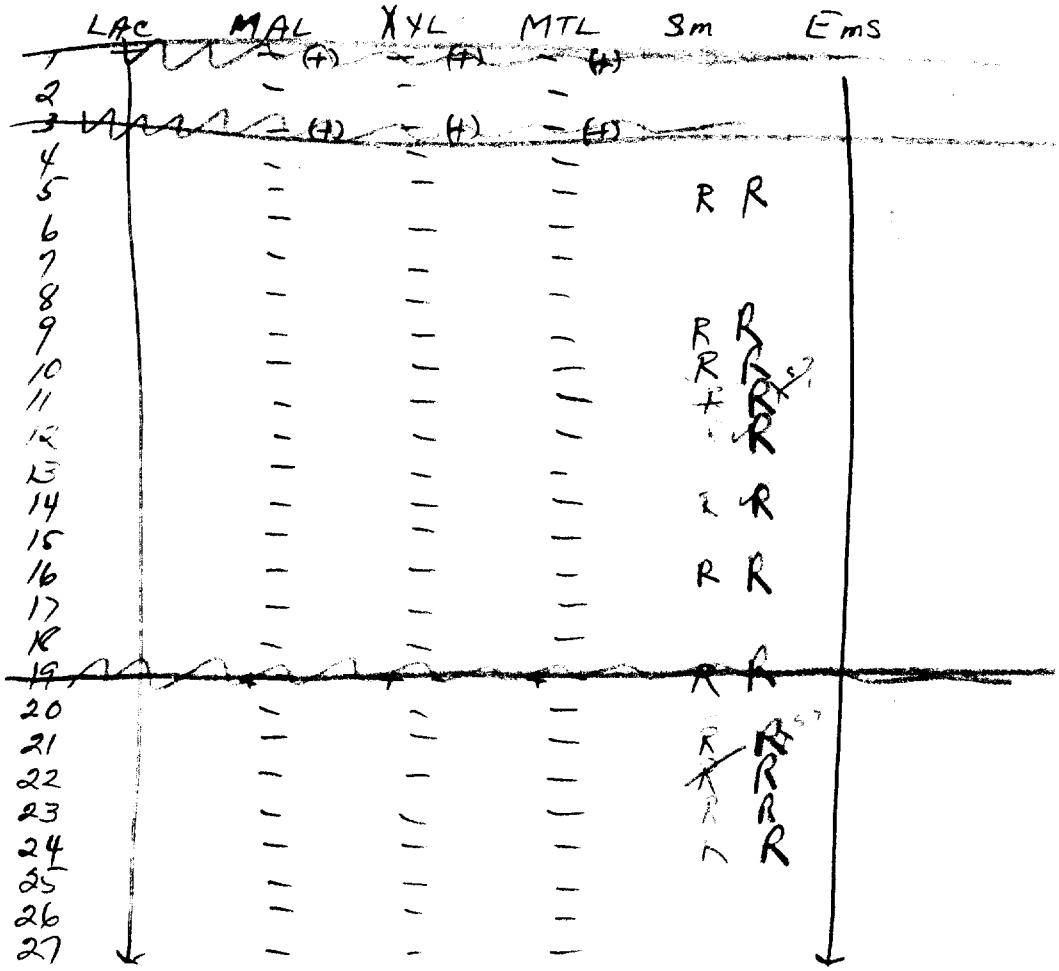
(from 843A. Mal+)

	LAc	MAL	XYL	MTL	sm	ENS	BHL	V_1	
1	−	+	−	−		−	−		T−L−
2	−		−	−					
3	−		+	+					T−L−
4	−		−	−					
5	−		+	+					
6	−		−	−					
7	−		+	+			+−		
8	−		+	+					
9	−		−	−					
~~10~~	−		−	−					
11	+		+−	+−	~~R~~	~~+~~ +	+−		
12	−	~~+~~	+	+					
13			+	−					L−
14			−	−					
15			+	+					
~~16~~	+	(−)	+−	+−	~~R~~	~~+~~ +	+−		
17			−	−					
18			+	+					
19			+	+	R				
20			+	+					
21			−	−					
~~22~~	+	(−)	+	+−	~~R~~	~~+~~ +	+−		
23			−	−					
24			+	+					
25			−	−					
26			+	+					
27			−	−					
28			+	+					
29			−	−					
30			− (+)	− (+)					
31			−	−	R				
32			+	+	R				
33			−	−					
34			+	+					
35			+	+					
~~36~~	+	(−)	+	+	~~R~~	+	+−		
37	+	(−)	+	+	~~R~~	+	+−		
38			−	−					

May 16, 1951

H267 is V, R Gal-

from 843 a Mal-



−	−	−	−	R	11
				S	13
−	+	+	+	S	14
−	+	+	+	R	2
−	+	−	−	S	16
−	+	−	−	R	1
−	+	+	−	S	1

Respreading microcolonies
UV - diploids

050

May 19, 1950?

H267 $.3 \times 10^{-6}$; .01 ml / plate

10^{10} AM Strobe ① all plates.

A = control
B = uv 20

1. 10^{20} AM. 2. 11^{05} 3. 11^{30} 4 1^{15}

5 200 6 320

1	0	(8,0) (18,2) (8,2) (6,1)		B 15,10 6,7 ① pink.	
2	45m	(16,2)		12	
3	1:20	14		7,9	
4	2:55	20		3,12	
5	3:40	~~10~~ 40 pinkish mostly 2m		~~4~~	
6	5:00	46,24 ca 6		32 -, v, ① 2-13 / film	