

4/21/49.

A) Prepare T(m) Stu. Add 1:5 deoxy pyridoxine (Dopy) 25mg/ml to make final level of 5mg/ml. Inoculate lightly W677

- 1. P21 A23: no growth. 10/10 $\lambda+$
- 2. P24 faint turbidity. Transfer to second tube and streak out on lacEMB.
- 3. A25. turbid - 3d transfer.
- 4. A26. Streak out P26. 15 tests all $\lambda+$ ↓
very thin growth in thick streaks. Isolated colo. OK.

B) Grow W677 at 44-45° in # 42 Stu, repeated transfer.

- 1. A22
 - 2. P22
 - 3. A23
 - 4. P23
 - 5. Late P23
 - 6. A24
 - 7. P24
 - 8. A25
 - 9. P25
 - 10. A26
- P26. Streak out B10 for examination of single colonies
- 15 tests all $\lambda+$!

Neither deoxy pyridoxine nor high temp. succeeded in disinfecting λ .

Differential phages.

4/22/49

Test plaques from Chi. sewage for differential as 518, 811 + 887

λ^- λ^+ λ^R

These were scored on lact EMB; as W 887 is lact⁺, they scored very poorly.
These tests are for λ^+ - differential only:

A22: No λ^+ - differentials noted in (100) tests

A23. Test plaques on λ^- , λ^+ and λ^R (mABA) (100) tests. No differentials
1 appeared lyogenic (filled center). Strains out as 527-1.

A24. As above. (60) tests No differentials.

→ Bacteria isolated not lyogenic; all clear & plaqueless.
Probably resistant bacteria were picked along i phage from initial plaque.

A25 (67) tests. No diff.

P26 (65) tests No diff.

P27 (28) " " "

420 tests No diff.

4/23/49.

- 1. 58-161 x W677
- 2. W478 x W677

Male EMS (0), (B₁), (B+B₁).

Lac:	Pick Malt to		EMS DB, Lac	Σ	Additional	Totals:
	+	-				
1 A	7	4	11	} Pool		
B	38	60	98			
C	41	44	85			
	86	108				
2 A	14	27	41	} Pool		
B	48	72	120			
C	38	99	137			
	100	198				

Mal.

Ratios from plate counts:

(by D.A.S.)

	+	-		+	-		+	-	
1A	3	16	10	19	146	1C	9	19	
	2	6		17	173		8	22	
	7	10		26	114		14	22	
	1	6		77	396		12	26	
	2	14		43	248		8	32	
Σ	15	52	24%+	182	1077	14.5%+	51	121	30%+
2A	9	19		85	232		51	248	
	8	22		47	208		58	244	
	14	22		60	192		65	228	
	12	26		71	244		70	226 236	
	8	32		86	332		59	192	
	51	121	30%+	349	1208	22%+	303	1148	21%+

Pick Mal+ lact and lac- from prev. tests separately to other sugars, and confirm Mal reactions.

		7 L+ Gal	3 L- Mal	MH	Xyl	My.	34- 35-					
1 A	1	+	+	-	-	+						
	2	+	+	-	-	+						
	3	+	+	-	-	+						
	4	+	+	-	-	+						
	5	+	+	-	-	+						
	6	+	+	-	-	+						
	7	-	+	-	-	-	+					
L+	1	-	+	-	-	+						
	2	-	+	-	-	+						
	3	-	+	-	-	+						
	4	-	+	-	-	+						
1 B.		Mal.							Mal	Xyl	Gal	MH
	1	+	+	-	-	+		29	+	-	+	-
	2	+	+	-	-	+		30	+	-	+	-
	3	+	+	-	-	+		31	+	+	+	+
	4	+	+	-	-	+		32	+	-	+	-
	5	+	+	+	-	+		33	+	+	+	-
	6	+	+	-	-	+		34	+	-	+	-
	7	+	+	-	-	+		35	+	-	+	-
	8	+	+	-	-	+		36	+	-	+	-
	9	+	+	-	-	+		37	+	-	+	-
	10	+	+	-	-	+		38	+	-	+	-
	11	+	+	-	-	+		39	+	-	+	-
	12	+	+	-	-	+						
	13	+	+	-	-	+						
	14	+	+	-	-	+						
	15	+	+	-	-	+						
	16	+	+	+	-	+						
	17	+	+	+	-	+						
	18	+	+	-	-	+						
	19	+	+	-	-	+						
20	+	+	+	-	+							
21	+	+	-	-	+							
22	+	+	-	-	+							
23	+	+	-	-	+							
24	+	+	-	-	+							
25	+	+	-	-	+							
26	+	+	-	-	+							
27	+	+	-	-	+							
28	+	+	-	-	+							

1B
L + 36-21
L - 40 -

	Mal	Gal	Xyl	MHL		Mal	Gal	Xyl	MHL
36	+	+	-	-	78	+	-	-	-
37		+	-	-	79		-	-	-
38		+	-	-	80		-	-	-
39		+	+	+	81		-	+	+
40		-	-	-	82		-	-	-
41		-	-	-	83		-	-	-
42		-	+	-	84		+	-	-
43		-	-	-	85		+	-	-
44		-	-	-	86		-	+	-
45		-	-	-	87		-	-	-
46		+	-	-	88		-	-	-
47		-	-	-	89		-	-	-
48		+	-	-	90		-	-	-
49		-	-	-					
50		+	-	-					
51		-	-	-					
52		-	-	-					
53		-	-	-					
54		-	-	-					
55		-	-	-					
56		+	-	-					
57		-	-	-					
58		-	-	-					
59		-	-	-					
60		-	-	-					
61		-	-	-					
62		-	-	-					
63		-	-	-					
64		-	+	-					
65		-	-	-					
66		-	-	-					
67		+	-	-					
68		-	-	-					
69		-	-	-					
70		-	-	-					
71		-	-	-					
72		-	-	-					
73		+	-	-					
74		-	-	-					
75		-	-	-					
76		-	-	-					
77		-	-	-					

↓
-?

↓

↓

16
 1-40+
 41-82-

	Mal	Gal	Xyl	M+D		Mal	Gal	Xyl	M+D
	+	+	-	-		+	-	-	-
1					1				
2					2				
3					3				
4					4				
5					5				
6					6				
7					7				
8					8				
9					9				
10					10				
11					11				
12					12				
13					13				
14					14				
15					15				
16					16				
17					17				
18					18				
19					19				
20					20				
21					21				
22					22				
23					23				
24					24				
25					25				
26					26				
27					27				
28					28				
29					29				
30					30				
31					31				
32					32				
33					33				
34					34				
35					35				
36					36				
37					37				
38					38				
39					39				
40					40				
41					41				
42					42				
43					43				
44					44				
45					45				
46					46				
47					47				
48					48				
49					49				
50					50				
51					51				
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68					68				
69					69				
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71					71				
72					72				
73					73				
74					74				
75					75				
76					76				
77					77				
78					78				
79					79				
80					80				
81					81				
82					82				

2A
 14L+
 15-41L-

	Gal	Gal	Xyl	MHL						
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										
32										
33										
34										
35										

think plate scores well!

2B
 1-45+ (loc)
 46-83-

	Gal	Xyl	MH		Gal	Xyl	MH
1	+	+	-		1	+	+
2		-	-		2	+	+
3	↓	+	-		3	+	-
4		-	-		4	-	-
5		+	-		5	-	-
6		-	-		6	-	-
7	↓	-	-		7	-	-
8		+	+		8	+	-
9		-	-		9	-	-
1	+	-	-		10	-	-
2	+	+	+		11	-	+
3	+	+	+		12	-	+
4	+	+	+		13	+	+
5	-	+	-		14	-	-
6	+	+	-		15	-	-
7		-	-		1	+	-
8	↓	+	-		2	-	↓
9		+	-		3	-	↓
10		+	+		4	-	↓
11	↓	+	-		5	-	↓
12		-	-		6	+	↓
1	+	-	-		7	-	↓
2		-	-		8	-	↓
3	↓	+	-		9	-	↓
4		+	-		10	-	↓
5		+	-		11	-	↓
6		+	-		12	-	↓
7		+	+		13	-	↓
8		+	+		1	-	↓
9		+	+		2	-	↓
10		+	+		3	-	↓
11		+	+		4	-	↓
12	↓	+	-		5	-	↓
13		+	-		6	-	↓
14		+	-				
1	+	+	-				
2	+	+	+				
3	+	-	-				
4	-	+	-				
5	+	+	+				
6	+	-	-				
7	+	+	+				
8	+	+	+				
9	-	+	-				
10	-	+	-				
11	-	+	-				
12	-	+	-				
13	+	-	-				
14	+	+	+				

40

- #C
 1-22L+
 23-70L-

	Mal	Gal	Xgl	MHL		M	S	X	MHL
1	+	+	+	-	1	+	-	-	-
2	+	+	+	-	2	+	-	+	+
3	+	+	+	+	3	+	-	-	-
4	+	+	+	+	4	+	-	+	+
5	+	+	+	-	5	+	-	-	-
6	+	+	-	-	6	+	-	-	-
7	+	+	-	-	7	+	+	-	-
8	+	+	-	-	8	+	-	-	-
9	+	+	+	-	9	+	+	-	-
10	+	+	+	+	10	+	-	-	-
11	+	+	+	+	11	+	-	+	-
12	+	+	+	+	12	+	-	-	-
13	+	+	+	+	13	+	-	-	-
14	+	+	+	+	14	+	-	+	-
15	+	+	+	+	15	+	-	-	-
16	+	+	+	+	16	+	-	-	-
17	+	+	+	+	17	+	-	-	-
18	+	+	+	+	18	+	-	-	-
19	+	+	+	+	19	+	-	-	-
20	+	+	+	+	20	+	-	-	-
21	+	+	+	+	21	+	-	-	-
22	+	+	+	+	22	+	-	-	-
23	+	+	+	+	23	+	-	-	-
24	+	+	+	+	24	+	-	-	-
25	+	+	+	+	25	+	-	-	-
26	+	+	+	+	26	+	-	-	-
27	+	+	+	+	27	+	-	-	-
28	+	+	+	+	28	+	-	-	-
29	+	+	+	+	29	+	-	-	-
30	+	+	+	+	30	+	-	-	-
31	+	+	+	+	31	+	-	-	-
32	+	+	+	+	32	+	-	-	-
33	+	+	+	+	33	+	-	-	-
34	+	+	+	+	34	+	-	-	-
35	+	+	+	+	35	+	-	-	-
36	+	+	+	+	36	+	-	-	-
37	+	+	+	+	37	+	-	-	-
38	+	+	+	+	38	+	-	-	-
39	+	+	+	+	39	+	-	-	-
40	+	+	+	+	40	+	-	-	-
41	+	+	+	+	41	+	-	-	-
42	+	+	+	+	42	+	-	-	-
43	+	+	+	+	43	+	-	-	-
44	+	+	+	+	44	+	-	-	-
45	+	+	+	+	45	+	-	-	-
46	+	+	+	+	46	+	-	-	-
47	+	+	+	+	47	+	-	-	-
48	+	+	+	+	48	+	-	-	-
49	+	+	+	+	49	+	-	-	-
50	+	+	+	+	50	+	-	-	-
51	+	+	+	+	51	+	-	-	-
52	+	+	+	+	52	+	-	-	-
53	+	+	+	+	53	+	-	-	-
54	+	+	+	+	54	+	-	-	-
55	+	+	+	+	55	+	-	-	-
56	+	+	+	+	56	+	-	-	-
57	+	+	+	+	57	+	-	-	-
58	+	+	+	+	58	+	-	-	-
59	+	+	+	+	59	+	-	-	-
60	+	+	+	+	60	+	-	-	-
61	+	+	+	+	61	+	-	-	-
62	+	+	+	+	62	+	-	-	-
63	+	+	+	+	63	+	-	-	-
64	+	+	+	+	64	+	-	-	-
65	+	+	+	+	65	+	-	-	-
66	+	+	+	+	66	+	-	-	-
67	+	+	+	+	67	+	-	-	-
68	+	+	+	+	68	+	-	-	-
69	+	+	+	+	69	+	-	-	-
70	+	+	+	+	70	+	-	-	-
71	+	+	+	+	71	+	-	-	-
72	+	+	+	+	72	+	-	-	-
73	+	+	+	+	73	+	-	-	-
74	+	+	+	+	74	+	-	-	-
75	+	+	+	+	75	+	-	-	-
76	+	+	+	+	76	+	-	-	-
77	+	+	+	+	77	+	-	-	-
78	+	+	+	+	78	+	-	-	-
79	+	+	+	+	79	+	-	-	-
80	+	+	+	+	80	+	-	-	-
81	+	+	+	+	81	+	-	-	-
82	+	+	+	+	82	+	-	-	-
83	+	+	+	+	83	+	-	-	-
84	+	+	+	+	84	+	-	-	-
85	+	+	+	+	85	+	-	-	-
86	+	+	+	+	86	+	-	-	-
87	+	+	+	+	87	+	-	-	-
88	+	+	+	+	88	+	-	-	-
89	+	+	+	+	89	+	-	-	-
90	+	+	+	+	90	+	-	-	-
91	+	+	+	+	91	+	-	-	-
92	+	+	+	+	92	+	-	-	-
93	+	+	+	+	93	+	-	-	-
94	+	+	+	+	94	+	-	-	-
95	+	+	+	+	95	+	-	-	-
96	+	+	+	+	96	+	-	-	-
97	+	+	+	+	97	+	-	-	-
98	+	+	+	+	98	+	-	-	-
99	+	+	+	+	99	+	-	-	-
100	+	+	+	+	100	+	-	-	-

all Mal+

1A.	Lac+	Mal-Xyl - 4	Mal+Xyl+ 1	Mal-Xyl+ 1
	Lac-	3	0	1

1B	Lac+	All Mal+	Mal-Xyl-33	++5	-+ 1	39
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	Lac-	8 Mal+ 43 Mal-	--	++1	-+ 3	55
--	------	-------------------	----	-----	------	----

1C	Lac+	All Mal+	-- 37	++1	-+ 2	40
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	Lac-	6 Mal+ 35 Mal-	-- 38	++1	-+ 2	41
--	------	-------------------	-------	-----	------	----

No apparent linkage of Mal to Lac.

2A	Lac+	All Mal+	--3	8++	-+2	+ - 1
----	------	----------	-----	-----	-----	-------

	Lac-	9+ assoc xyl	--14	13++	-+2	+ - 1
--	------	--------------------	------	------	-----	-------

2B.	Lac+	40 Mal+ 5 Mal-	--19	12++	-+14	+ - 0
-----	------	-------------------	------	------	------	-------

	Lac-	3+ others -	--30	5++	-+2	+ - 1
--	------	----------------	------	-----	-----	-------

2L Lac+ 22 gal+ -- 11 ++ 7 -- 4

Lac- 8 gal+ 37 -- ++ 9 -- 1 + - 1
40 gal-

Clearly the Net cross has a higher proportion of Xyl+.

4/25/49.

		Y10	50 x 300	Gal EMS	4U 7 sec.	15,000	8 mutants.	
			Gal	Ar	ble	lac	Mal	Xgl
A.	W 909	1	-	++ ✓	++ +	+	+	+
	911	2	-	- ✓	- ⊕	- ✓	- ✓	-
	912	3	-	± ✓	++ +	± +	+	+
	913	4	-	- ✓	- -	- ✓	- ✓	-
	914	5	-	- ✓	- -	- ✓	- ✓	-
	910	6	-	++ ✓	++ +	+	+	+
	915	7	±	± +	+ +	-	-	-
	916	8	-	- thin ✓	- -	- thin	- ✓	- thin

good growth

		W 894	25 x 1000 =		10,000.	Ar EMS
B.	W 904	1	- ✓	++ +	- ✓	+
	905	2	-	+ +	-	-
	906	3	-	+ +	-	-
	907	4	-	- +	-	+
	908	5	-	- -	-	-

A1 and A6 are the only ones suitable for independent markers and B1

Use 904 for construction

4/27/49

1. Cross W898 x W518 ; 899 x 518. mEMS Lac. All Lac -.
 11(898x) tested. All $p20^S$ 10 λ^R 1 λ^S Apparent sign as genetic factor.
 32(899x) " All λ^R . 2 $p20^S$; 30 $p20^R$. Test for Mal, V_1 linkages.

2. Pick 898 at cross streak in λ . Streak out. Test 20 single colonies all were λ^- .

3. Test infectivity of λ^R ; $p20^R$: streak junction of W518 and W898, 9 mMal EMS. Test Mal+ (W518).

10 from W898 all λ^S $p20^S$
 10 " " " " "

\therefore Resistance of W899 is not infective.

2a. Do 899 All λ^- ϵ one ^{doubtful} possible exception. Streak this out as 533-2a. 6 colonies retested were λ^- .

898 x #1 λ^S } Test Mal, T1.
 2-11 λ^R } Mal+ V_1^R
 6 Mal- V_1^R 4 Mal- V_1^S

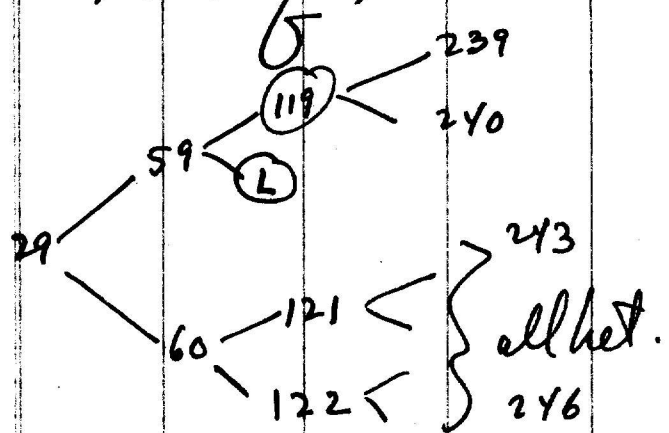
899 x 1-2 $p20^S$ } Mal- V_1^R ; Mal- V_1^S
 others $p20^R$ } 3 Mal+ V_1^R ;
 30 Mal- V_1^R ;
 13 Mal- V_1^S

 46

Zelle's series 5.

4/28/49.

Letter of 4/26



239 } Pure Lac+ Xyl- Hfr- gal- Ar-
 240 }
 check mutation, & responses. $V_{1c}^R V_1^S$ (TLB, BMT. / protot.)

Xylose - mutant run
 Mannitol - " "

April 30, 1949.

40 x 500 = 20,000 m Xyl EMPB. W904 7sec UV.

a) First sequence, readily isolated.

1-12 12 mutants, all Xyl - MHL + Glu +.

W917-928.

Use 1-6 for MHL- mutants.

b. Second sequence

W929-944

~~1-12~~
 1-16

May 2, 1949. Use 1-8 above (W917-924) for MHL EMPB - UV 7sec. irradiations

Mannitol Mutants:

Splates each x 300 = 1500 x 8 = 12,000

Tentative No.	From	
1	1	Slow
2	1	+
3	2	Mucoid
4	2	"
5	3	+
6	3	slow
7	3	slow
8	4	+
9	5	slow
10	5	slow
11	5	slow
12	6	-
13	6	slow
14	7	+
15	8	+

Glu MHL

from W922

W945

5

Differential phages.

537

5/5/49 ff

See:

(58) tests

⊙ action on W887 inhibited on T2 plates!

(21) tests.

5/7/49.

W826 x

#1 W466

2 W477

40 tested 5/9:

60+ cols. tested.

2 heterozygotes: 538/11, 12

No heterozygotes.

100+ cols.

108 tested 5/9

"

"

5% hits.

8 suspected.

Heterozygotes in series 2 confirmed.

538: 1-5.

8 additional in second set. 6-13

W826 x W477

~~Label~~

5/7/49

W478 x

EMSlac and β_1

a W477

b W945

a(B)	+	-	
	147	40	
	25	11	
	244	56	
	9	2	
	49	11	
	103	27	
	51	18	
	226	47	
	854	212	1066

a(O)	+	-	
	59	5	
	95	8	
	71	1	
	72	3	
	123	2	
	85	3	
	76	2	
	581	24	605

b(B ₁)			
	309	26	
	177	49	
	283	13	
	364	48	
	221	24	
	1354	160	1514

	163	11	
	239	26	
	278	18	
	115	4	
	179	3	
	158	7	
	84	4	
	1216	73	1289

Pick + colonies and test for lac^v.

A 100
B 148

11 certain 9 doubtful lac^v.

1-20.

off 12-20 #16 is not
others probably not.

Almost every streak has colonies which are doubtful lac^v: light reaction, mostly central, vaguely mottled appearance. Resuscitate next plates. Select most likely lac^v.

Many lac^v slow prototrophs! probably Lac⁺ β_1^- where β_1^- is β_1 !

5/13/49:

8 possible heterozygotes picked and tested on var. sugars:

	Lac	Mel	Sac	Xyl	MH	Glu
1			-		-	+
2			-	+ v?	+ v?	+
3			-	+ v?	+ v?	+
4			-	+ v	-	+
5			+	+	+	+
6			+	+ v	+	+
7			+	+	+	+
8			+	+ v	+	+

no clear explanation of the lac-slow segregants.

see 553

Sorbitol Mutation Run.

May 10, 1945

W945

40 plates x 300 = 12,000 tests. UV7 sees Sorbitol EMB
 chole on glucose.

	Glu	T5	Sorb.
1	±	P	± or -?
2	±	P	"
3	++	S	"
4	±	S	"
5	++	S	"
6	±	S	"
7	++	S	"
8	++	S	"

5/11/49.

7: Sent "Mass" cultures of 159-161; 175-181; 184-190; 368-8.
and "Nos. Col." " " 175-190.

Study on EMS Xyl; EMB Xyl; EMB lac:
Zello Clo.

			EMS Xyl	lac	Xyl.
1	159		not		
2	160		mostly		only - recovered
3	161		all-		"
4	181 Mass		g.		"
5	181 Nos. Col.		g.		only - recovered
6	184	Seq.	n.g.		
7	368	Seq.	n.g.		
8	367	Seq.	n.g.		
9	185	Seq.	n.g.		
10	186	Seq.	n.g.		
11	187	Seq.	n.g.	=	=
12	188	Seq.	n.g.	=	=
13	189	Seq.	n.g.		
14	190	Seq.	n.g.		

EMS lac

6: 56
58
111
112

n.g.
g.
g.
g.

8/22 1-6 only-recovered.
7,8 lac v
but not Xyl v !!

Is 6 a H168 st?

5/22. Recover Xyl+ colonies from EMS and S.O. EMB Xyl to check on heterozygous.

lac v recovered from 6:111 (7,8) streak out 7a, b 8a, b
a. from EMB lac v; b from EMS Xyl brush.

37 - segugants

541a

		lac	Xyl	Man	MH	Ar	Gal	T5		
1.	6-58	-	-	-	-		-	R		
2.	7-184	-	-		-		-	R		
3.	185	-	-		-		-	"		
4.	186	-	-		-		-	"		
5.	187	-	-		-		-	"		
6.	188	-	-		-		-	"		
7.	189	-	-		-		-	"		
8.	190	-	-		-		-	"		
9.	367	-	-		-		-	"		
10.	368	-	-		-		-	"		

all alike.

544.
Test Het x Het.

544

May 21, 1979.

W477x

<p>G D E</p>	1	W978	Gal -	<p>} 977 = Mal - W478.</p>
	2	979	Gal -	
	3	980	Gal -	
	4	981	Gal -	

IL = A 1-8 IM = B. 1-4.

C, D, E = 2, 3, 4 Lac

Test only 4 from 2 in C.
E3 = C5.

	Lac	Mal	Gal		Lac	Mal	Gal		
A	1	V	V	C	1	V	-		
	2	V+	V		2	V	V	+	
	3	V	V		3	V	V	+	
	4	V	V+		4	V	V	+	
	5	V	V		5	V	V	+	
	6	V	V		D	1	V	V	+
	7	V	V			2	V	V	V
	8	V	V			3	V	V	V
	V	V	4	V		V	V		
B	1	V	V	E	1	V	V		
	2	+	V		2	V+	V	+	
	3	-	V						
	4	-	V						

Struck out from EMS Lac

A6 H205
D4 H206

plates are present.
material is overabundant.
"reject" head

I. 48 on lac EMB.

8 distinctly lac_v.

* 12 colonies from Mal EMS
to Mal EMB.

5 Mal - (misread as EMS).
3 Mal +
4 Mal v !

II Some lac_v rather indistinct, probably owing to weak lac + Gal -.
56 EMS lac + to EMB.

5 definite lac_v picked,
5 additional held for further incubation

III ~~44~~ 56

Lilac II in general compartment
Pick 4
hold 8

IV 44.

Pick 2
Hold 2

May 22, 1949.

A. W990 (Y10 glu -) x W618 (BM gal -) (later ~~Flu~~ appears to be Lac stock).

canal.

check other gal - BM - stocks:

	glu	lac	gal	
619	++	-	-	} suitable for cross!
625	++	++	-	
626	++	++	-	
990	--	++	+	

Test 990 ~~kan~~ tested on Lac for fermentation: washed cells

3:55

	10m.
lac	+
glu	-
gal	++

5/24/49. Cross W625 and W626 \times W990 m EMS Lac.

5/24/49.

(A) Mg. Following Knaysi, inoculate 58-161 + W677 heavily into NSB + 1/2 MgSO₄. Shake 3 hours, wash and plate.

(2) Controls: saline. streak out on EMStac; (+, - no nitrous colonies.)

(B) Use A2 above. Plate on EMStac and T(0) and incubate at various temperatures. 30, 37 and 44.

30° 9 Lac+ 15 Lac-

37° 12+ 12-

44° 10 Lac+ 14 Lac-

(C) Plate on T(Mg 1/3) 37°

12 Lac+ 12 Lac-

Counts / 4 plates

A1

573

/plate

143

A2

106 (x 1/2)

27

B 30

105

23

37

93

26

44

48 (1/3)

23

C

12

Streak out samples of prototrophs on EMStac to test for segregation.

A2 8 Lac+ 16 Lac-

A1 14 Lac+ 11 Lac-

No Lac^v noted in these tests. The effect of Mg should be checked.

Lac+	Lac+	Mal-	Xyl-	MH-	Ar-	47
"	"	"	"	"	Ar+	4
Lac-	Lac-	Mal-	Xyl-	MH-	Ar-	68
"	"	"	"	MH+	Ar-	1
"	"	Mal+	"	MH-	Ar-	1
+++++						7
+++++	Ar-					1
Lac-	Lac+	---				1
"	"	---	Ar+			2
Lac-	Lac+	Mal+	Xyl+	Ar+	MH-	1
Lac+	Lac+	Mal+	---			1
"	"	"	Ar+	--		1
Lac+	Lac-	---				2

Ar difficult to score. Lac/Lac; Xyl/MH generally linked as
 red test the 7 full +++++ for diploid tests. "546A"

	loc	Gal	Kyl	mtl	Mal	Arab
mg 504	1	+	-	-	-	-
	2	+	-	-	-	-
	3	-	-	-	-	-
	4	-	-	-	+	-
	5	-	-	-	-	-
	6	+	+	-	-	-
	7	-	-	-	-	-
	8	+	+	-	-	-
	9	+	-	-	-	-
	10	+	+	-	-	-
	11	-	-	-	-	-
	12	-	-	-	-	↓
	13	+	+	-	-	+
	14	+	-	-	-	-
	15	+	+	-	-	-
	16	+	+	-	-	+
	17	-	-	-	-	-
	18	-	-	-	-	-
	19	+	+	-	-	-
	20	+	+	-	-	-
nall	1	-	-	-	-	-
	2	-	-	-	-	-
	3	+	+	-	-	-
	4	-	-	-	-	-
	5	-	-	-	-	-
	6	+	+	+	+	-
	7	-	-	-	-	-
	8	+	+	-	-	-
	9	+	+	-	-	+
	10	+	-	-	-	-
	11	+	-	-	-	-
	12	-	-	-	-	-
	13	-	-	-	-	-
	14	-	-	-	-	-
	15	-	-	-	-	-
	16	-	-	-	-	-
	17	-	-	-	-	-
	18	-	-	-	-	-
	19	-	-	-	-	-
	20	-	-	-	-	-
	21	+	+	-	-	-
	22	+	+	-	-	-
	23	+	+	-	-	-
	24	+	+	-	-	-

x

	loc	Mal	Xyl	Mtd	Mal	Arab				
B-30° 1	-	-	-	-	-	-				
2	-	-	-	-	-	-				
3	+	+	-	-	-	+				
4	-	++	-	-	-	+				
5	-	-	-	-	-	-				
6	+	+	-	-	-	-				
7	-	-	-	-	-	-				
8	-	+	-	-	-	-				
9	+	+	-	-	-	-				
10	-	-	-	-	-	-				
11	+	+	-	-	-	-				
12	+	+	-	-	-	-				
13	+	+	-	-	-	-				
14	+	++	+	+	+	+				x
15	+	+	-	-	-	-				
16	+	+	-	-	-	-				
17	-	-	-	-	-	-				
18	-	-	-	-	-	-				
19	-	-	-	-	-	-				
20	-	-	-	-	-	-				
21	-	++	-	-	-	+				x
22	-	-	-	-	-	-				
23	-	-	-	-	-	-				
24	-	-	-	-	-	-				
B-37° 1	-	-	-	-	-	-				
2	-	-	-	-	-	-				
3	-	-	-	-	-	-				
4	-	-	-	-	-	-				
5	+	+	-	-	-	-				
6	+	+	-	-	-	-				
7	+	+	-	-	-	-				
8	+	+	-	-	-	-				
9	+	+	-	-	-	-				
10	-	-	-	-	-	-				
11	-	-	-	-	-	-				
12	-	-	-	-	-	-				
13	+	+	-	-	-	-				
14	+	++	+	+	+	+				x
15	-	-	-	-	-	-				
16	+	++	+	+	+	+				x
17	+	+	+	+	+	+				x
18	-	-	-	-	-	-				
19	+	+	-	-	-	-				
20	-	-	-	-	-	-				
21	-	-	-	-	-	-				
22	+	++	+	+	+	+				x
23	+	+	+	+	+	+				
24	+	+	-	-	-	-				
X	+	+	o	o	o	o				

B-44°

	loc	Yul	Jyl	Mal	Mal	Arb
1	-	-				
2	-	-				
3	-	-				
4	+	+				
5	+	+				
6	+	++				
7	-	-				
8	-	-				
9	-	-				
10	-	-				
11	-	-				
12	+	+				
13	+	+				
14	-	-				
15	-	-				
16	+	+				
17	+	++				
18	+	++				
19	-	-				
20	+	+				
21	-	-				
22	+	+				
23	-	-				
1	-	-				
2	+	+				
3	+	++				
4	+	++				
5	+	++				
6	+	+				
7	+	+				
8	+	+				
9	+	+				
10	+	++				
11	+	++				
12	+	++				
13	+	+				
14	+	+				
15	-	-				
16	-	-				
17	+	+				
18	+	++				
19	-	-				
20	-	-				
21	-	-				
22	-	-				
23	+	+				
X	+	+	0	0		0

X

c

Pool data from protoplasts secured in various treatments.

	Gal	Mal	Xyl	M	A	
Lac -	Gal +	Mal +	Xyl +	 	M -	A +
	Gal +	+	-			
	Gal +	-	+			
	Gal +	Mal -	+	 	M -	A -
	Gal -	+	+	 	M -	A -
	Gal -	-	+			
	Gal -	-	-			
Lact +	Gal +	+	+			
	Gal +	+	-			
	Gal +	-	+		M -	A +
	Gal +	+	-			
	Gal -	+	+			
	Gal -	+	-			
	Gal -	-	+			
Gal -	-	-		M -	M	

~~||||~~

~~||||~~

Fermentation Tests

W	Mal	Lac	Glu	Gal	Mtl	Xyl	Arab
958	-	S	+	-	S	S	+
959	-	+	+	-	-	-	S
960	-	S	+	+	+	+	+
* 961	-	+	+	+	+	+	+
962	-	-	+	-	-	-	+
963	-	-	-	+	-	+	+
964	-	-	+	-	-	-	+
* 965	-	+	+	+	+	+	+
* 966	-	S	+	+	+	+	+
* 967	-	+	+	+	+	+	+
968	S	+	+	+	+	+	+
not pure 969	-	S	+	+	-	-	+
970	-	S	+	+	-	S	+
* 971	-	+	+	+	+	+	+
* 972	-	+	+	+	+	+	+
* 973	-	-	+	-	-	-	+
* 974	-	+	+	+	+	+	+
975	-	-	+	-	-	-	+
976	-	-	+	-	S	-	-
977	-	S	+	+	S	+	+
978	Gal	Lac	Glu	Mtl	Xyl	Mal	Arab
978	-	S	+	S	+	-	+
979	-	S	+	S	+	-	+
980	-	-	+	-	-	-	+
981	-	-	+	-	-	-	+
990	Glu	Gal	Lac	Mtl	Xyl	Mal	Arab
990	-	+	+	-	+	-	+
991	-	+	-	-	+	-	+
992	-	-	-	-	+	-	+
993	-	-	-	-	+	-	+
994	-	+	S	-	+	-	+
995	-	-	-	-	+	-	+
996	-	+	-	-	+	-	+
997	-	-	-	-	+	-	+
998	-	-	-	-	+	-	+
999	-	+	-	-	+	-	+
1000	-	+	-	-	+	-	+
1001	-	+	S	-	+	-	+

* suitable as malices.

* light centers, also in others to some extent.

W977 *Gal mutatorum*

549

5/31 ff/49.

45EMB } Galactose. 150 scoreable colonies.
30 TZ }

1 good Gal - mutant

~~W97~~

W977 x W677 (Mal alleles)

16 possible + 1493 -

Many Mal_x . Restriction = 4 on Mal₅.

9, 12, 11, 1, 2, 6, 8, 3?

Het

13, 19, 5, 7

-

others? . There may be Mal₁ + Mal_x . Hold momentarily.

551A4 neutralized from brush on EMS lac.

No Mal+ colonies, but papillated background.

Mal+ probably contaminant, not part of heterozygote.

Ca 90% lac^v

check \bar{c} single colo. from lac EMS.

4 \rightarrow lac^v pure Mal-