

Austrian, R., and MacLeod, C.M. (1949) J. Exp. Med. 89:451-460
Acquisition of M protein by pneumococci through transformation reactions.

I - SVI }
III - A66 } used. { I -
 } { III - 3M

The "Dawson Rough" seems to correspond to Taylor's ER.

When ^{α-36A} II - R36NC } (II; 2'M) was transformed with
III - A66 TP, III 2'M was obtained.

do, ∈ TPI transformation.

Dawson^{ER} Roughs were obtained from R36NC.

Some of these were transformed to III 3M.
from cells which ^{obtained to} still had some 2'M (serologically detectable) III 2'M. These may arise

This dequiformation does not take place so regularly. Griffith Roughs not tested for TP.

In vivo: ER + vaccine I ^{2/10}
 + vaccine III ^{2/10}

Concomitant acquisition
of M3 protein noted in
one case each.

↓
R
↓
II.

Byatt, Pamela H., Jaun, B. J. & Salle, A. J. (1948) Variation in pigment production in *Staphylococcus aureus*.

Extracts of chromogenic *S. aureus* (strains??) ~~did~~ transformed white strains to colored. Transformed strains retained lac - character.

Bumelt, FM + McKie, M. (1929) Type differences amongst
Staphylococcal bacteriophages. Aust. J. EBMS. 6: 21-21.

SF: MR - Lact + gel - .

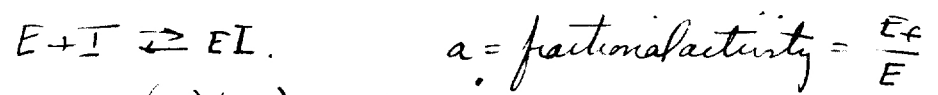
Phage B gave three kinds of SF/B: opaque white; colorless +
translucent; frankly aureus. 1B was also resistant to C.

SF/B was non-lysogenic, but after being kept on agar for some
weeks gave rise to papillae some of which were of the chalky white
type, others frankly aureus. Either in this way, or directly
... SF/B ... the aureus type of SF/B could be obtained.

Goldstein, Abram, (1944) The mechanism of enzyme-inhibitor substrate reactions. J Gen Physiol. 27:529-580

Non-competitive.

E = total enzyme
+ = free



(1) $K_I = \frac{(E_f)(I_f)}{(EI)} = \frac{(E - EI)(I - EI)}{(EI)}$

$E = E_f + EI$
 $= aE + EI$

(2) $I = K_I \frac{(1-a)}{a} + (1-a) E$

Let $I' = \frac{I}{K_I}$; $E_I' = \frac{E}{K_I}$

= "specific concentrations"

(3) $I' = \frac{1-a}{a} + (1-a) E_I'$ (zone B)

(free) (combined)

Zone A: $I' = \frac{1-a}{a}$ (i.e. $I \approx I_f$)
 $E < \frac{K_s}{10}$

Zone B: $I' \neq I_f' \neq EI$

Zone C: $I' = (1-a) E_I'$ ($I \approx EI$)



$a = \frac{v}{v_{max}}$ $v = k_D(ES)$
 $v_{max} = k_D(E)$

(3b) (4A) and $S' = \frac{a}{1-a} + a E_S'$

Most enzyme systems operate in zone A., i.e. $S' = \frac{a}{1-a}$ (MM equation)

They prefer to plot $\frac{v}{v_{max}} / \log_{10} S$. Consider 1.1×10^{-3} , 1.25×10^{-3} , 1.7×10^{-3} as good fits for K_s .

The zone B equation is fitted as follows:

$\frac{S}{a} = K_s \frac{1}{1-a} + E$ and $\frac{I}{1-a} = K_I \frac{1}{a} + E$

$$\frac{V_{max}}{v} = 1 + \left[K_s + \frac{I}{K_I} \right] \frac{1}{S}$$

For $I=0$, $\frac{V_{max}}{v} = 2$ when $\frac{K_s}{S} = 1$. ✓

otherwise, for a given, constant activity:

$$\frac{K_s}{S} + \frac{I}{SK_I} = C$$

$$C = \frac{1}{S} K_s + \frac{I}{S} \cdot \frac{1}{K_I}$$

$$SC = K_s + \frac{I}{K_I}$$

$$Sa = 1 + \frac{I}{K_s K_I}$$

$$aS - bI = 1.$$

Hoder, F. + Akano, R.; *Z. Naturf.* 85:423- (1935)

Foley, G.E. and Schwachman, H. (1950) ^{Den. M102} ~~Journal~~.
4: 141-149 Some observations on streptomycin-dependent
strain of *Staphylococcus aureus*. RR

Bawden, F.C., Kassanis, B., and Nixon, H.L. (1950) The mechanical
transmission and seroprevalence of *Epistata paracribile virus*.
JGM 4: 210-219.

Fleming, A., Vouche, A., Kramer, I.R.H., & Hughes, V.H. (1950) The
morphology and motility of *Proteus vulgaris* and other organisms cultured in
the presence of penicillin. JGM 4: 257-269.
RR

Eriksen, K.R. (1949) Studies on the mode of origin of penicillin resistant staphylococci. Acta path 26: 269-279.
From Univ Inst General Path. Copenhagen.

Broth is various P inoculated with varying amounts (10^{-1} to 10^{-6}) of a 24 hr. broth culture. Later plated loopful (ca. 0.02 ml) on ~~agar~~ agar. With large inocula, secondary growth is found up to $1/4$ O.U./ml; with initial bacteria of 10^{-3} , no sec. gr., but eventually comes up.

"Demesee is not correct and that the resistant bacteria appear only after contact with penicillin for some ~~time~~ length of time."

Reasoning?? Note that with ca. $1/8$ O.U./ml and perhaps 10^{-5} ml, any secondary growth was delayed 24-48 hours.

In 6 ~~days~~^{tubes}, it appeared only after 6 days. "In these cases where the secondary growth appears at such a late primitive, presumably it can be taken ~~that~~ for granted that the growth does not originate from resistant bacteria present in the original culture."

(Some confusion about isolation of pure resistant cultures in testing for stability.)

Found variance in mutant numbers only in 3 ml cultures, not in 15 ml cultures.

Treatment of recombination in texts since 1948

1950 Clifton Introduction to the bacteriophage pp 73-75

"Possibilities of recombination of genes by other than sexual mechanisms may exist, and our original definition of bacteriophage as 'apparently sexless' organisms is still valid." Fair statement of facts. T+L 1947

1949 Burrows et al. p. 184 passing reference
extensive ~~text~~ for general analysis of variation L 1947.

Stern, C. 1936 Somatic crossing over and segregation in *Drosophila melanogaster*
Genetics 21: 625-730.

Mimite flies (M/m) show m spots. Originally interpreted as elimination of M-carrying (deficient chromosome). By use of θ -translocator, it was shown that the M phenotype (not merely deficiency, covered by duplication) was necessary for spotting. bobbed (bb) spots not found: interpreted as partial elimination.

Autosomal M also cause X-mosaics (~~sn~~ sn^3 (singed))

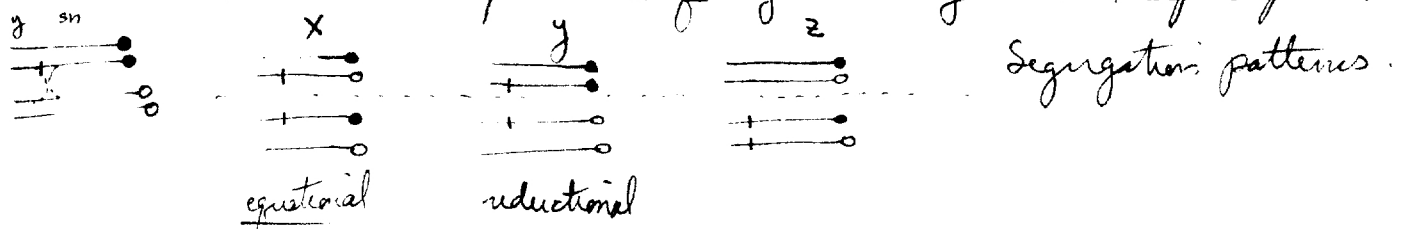
However, the Bld ~~re~~ Mimite causes X-spots, but not III-spots!!!!

Effect of autosomal Mw on Notch⁸ cf. was studied:

N^8/y ♀ X $sn^3; Mw/+$ ♂ Among females:
 N^8/sn^3 9/280 y/sn^3 15/381 No difference.
 sn setae (elim? N^8) ↓ 2 y spots
 2 sn^3 spots

No y sn spots. ∴ 2-strand and no reduction. $(y sn)$ suggesting segregation of X-chromosome.

y $sn/+$ flies → 110 y sn 43 y sn spots. y and sn simply somatic crossing-over as well as segregation. But no y - sn twin spots were found, ruling out two-strand crossing over. Complete reduction is ruled out by absence of y sn - sn - y - (+) triple spots.



Region of crossing-over varies with spot size (developmental stage). Crossing-over to the right of sn in y sn spots supported by expts. with θ translocator. Segregation is probably nearly always equatorial.

bb fails to show segregation in +/bb flies. Assumption of phenotypic masking seemed unlikely. \therefore Crossing-over to the right of bb considered very rare.

Determined X-ploidy of spots by color of 5-6th abd. segments.
Most spots in females were XX by color.

Autosomal mosaic

Under influence of autosomal M.

Secondary Sources:

1. Sorsby "Clinical Genetics"; pp/ 337-40; 313-15
2. Kallmann and Sander 1947. in Hoch & Knight, "Epilepsy". Chap. 3
3. Neel 1947 Medicine 26:115. at 123-125

Acc. (3) 25-30% of propositi have family history (5-6x as frequent in parents sibs and children of propositi). monozygotic twin correlation 70%. Quotes Lennox extensively on cerebral dysrhythmia. In 24% of families both parents showed dysr. Obvious complexity.

(2) Examples in animals; also audiogenic seizures. *From Conrad:* (incidence figures) %

gen. pop.	childr.	sibs	neph&nieces	dizyg. twins	monozyg cotwins
.3	6.3	4	1.2	3.1	66.6

concordance in twins:

	diz	monoz	
idipath.	4.3	86.3	Thus even sympt. epilepsy has a genetic component. Index twins were restricted to severe hospital cases.
symptoma.	0	12.5	

also found consanguinity correlations with mental deficiency, but not with schizophrenia.

From Lennox:

dysrhythmia

general pop	.10
epileptics	.9
par and sibs	.6

in twins, 85% show concordance of encephalo. if monozyg; 5% if dizyg.

(1) Similar to 2, but emphasizes consanguinity correl. with psychopathy.

Conclusions: inheritance not simple (probably several different mechanisms). Certainly a very large genetic component in severe cases, from Conrad's twin studies. Most frequent suggestion is dominant with low penetrance, but high incidence of dysrhythmia in both parents of propositi (Lennox) suggests recessive factors also.


(Lennox '47 is Res Pub Ass Res nerv ment dis 26:11)

CC: Dr. Javid

1954
1/2/54

copied
MAY 17 1985

Conjugation in yeast.

Fowell 1951 emphasizes dicauson: mating of cells gives  from which either haploid or diploid or dicauston (i.e. \rightarrow + and - haploid)

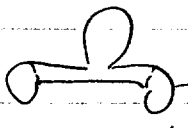
buds may be generated. Tools care to remove profusion buds.

paired 250+/- cells; 30 zygotes formed. 50% zyg. \rightarrow

only haploid. Other zygotes \rightarrow only 2n. "An investigation of spore fusion revealed that nuclear fusion apparently always occurs in zyg. formed by this proc." Renard 1946 also suggest dic.

Also discussed by Gaimann 16; (Pulthermond 25. Bot Rev 1940 6:1.) Comp. Morph. of Fungi 1928.

Winge: Roberts 1948. Unsuccessful crossing: spores may give haploid cells "before fusing"

W & L figure  spores. But W'35 also shows substantially complete conjugation and diploid buds. \therefore some variation.

But note analogy of Fowell's dic. i conjugation formation.

Karnada, H. Jbl. Bakter. I 118: 304-16 (1930)

S. para B + G+ soil bact → frequent antigenic variations
in Salmonella → enteritidis; breslau.

JPB 35:851

19 Burnett 1932 Lysogen.

Palauten 69. J Bact 34:285

Andrews 7. Pr. Roy Soc Med 33 Dec 39]

3 Kueger Physiol Rev 16:129

18 Burnett Arch Exp Biol 6:277

8/3

Delbrück JGP 23:443 Adsorption no. Ext. lysis -> loss of virus.
22,365 - temperature ~~same~~ as for cell lysis

Receptors: 63 - Lurie + Friedel JEM 59:213 ✓

See Burnett 9. AJEM 15:227

J Immun 46:281.

(leave out glucose in virus media)

Tryptose 2% glucose .1% NaCl 1% pH 7

AD Huey

$\frac{1}{8}$ [.6% agar smaller]

.5 ml phage

2 ml 12-24 h. bact. 10^8 / ml

3 > mins later; .5 ml mixture + 3.5 ml .7% agar

pour on plate =

works again!!!

Freundzel, J. + Z. Szymanowski, CRSB 117:543-546 (1934)

Recherches sur la Paragglutination: Différenciation des antigènes H et O.

They had shown that P. exhibits a different serological specificity from the "agglutination composite de Schütze". But the R strains do contain an antigen related to the producing strain. ~~The~~ paragglutinable strains are homogeneous + repeated resolution indicates that the modification is heritable. Only some E. coli are capable of paraggl.

coli-typhoid paragglutination:

The P. coli absorb H-antigen ^{agglutinin} from anti-typhoid sera. The original coli does not. anti-H was removed by absorption on Stanley. There was little further agglutinin absorption. However, there was still considerable aggl. of coli. ∴ Paraggl. coli has all H antigens, and a fraction of the O of typhi. anti-P coli serum has a low titer on heated typhi. Typhi phages do not lyse (P) coli.

Z. Balat (I), 121:448-451 (1931) Paragglutination des Bacc.

Bang mit Typhuserum. —

2. ironi - ctd.

Using para A and ~~the~~ triple, (P) is also obtained with cross-reactivity, but very little \bar{c} para B.

Could not transform steps.

Relates paraffinization to the

ps. transformations

Smith WE, J Barb. 47:417-418 (1944)

Wahlen + Almaden JID 65:147-55 (1957)

Appleby, J. C. J Bact 38: 641-51 (1939) Cytology and methods
of reproduction of two cocci and the possible relation of these organisms
to a spore forming rod.
~~Journal~~

Cocci appeared in a culture of the bacillus.

11

Ag. Bact Dept, Univ Reading England

Sex in Bacteria. Literature:

J. Bact 50

Nuclei - El. Micro.

(R)

Bayler, H. B., M. O. Appleman, O. H. Davis + G. L. Clark, J. Bact 50: 249-56 (1945)
Chem. + Agronomy Illinois

Some morphological characteristics of nucleole fact as shown by the electron microscope II. [See Soil Sci Soc Am. Pt. 7: 269-71 (1942)]

4-5 granules/cell untreated + \bar{e} .02% N_2HCO_3 , $2\frac{1}{4}$ hrs. Attempts
at staining n.g. M ^{15 min.} saline left mottled cells. (general transparency; corres-
ponding to nuclei? After N_2HCO_3 saline did not remove granules.
acetone removed granules. also HNO_3 , HCl

Krayci, B. J Biol 49:475- 1945. A study of ... factors... in ... of B lymphocytes.

low pH n.g.

zones are not found until sugar + glycolytic products are used up + also the autogenous comp.

" healthy cells, facing starvation, and ... "

See:
Green HC J Biol 35:261

Uchida, 1943

Kuwayi, G. + S. Mudd J Bact 45: 349-57 (1943)

Small.

The internal structure of certain bacteria:

Apparent ^{DR} nuclei or material in granular form in *S. glaucopurpurea*.

Most diploid cells contain 2 granules each.

R.R. Mellon, J. Bact. 10: 481-501 (1925) Studies in Microbic Heredity I Observations on a primitive form of sexuality (zygospore formation) in the colon-typhoid group.

B. coli (Nx) In patient being given urotropin appeared as filamentous form - "many very large coccus like forms were encountered developing from the filaments."

Broth, peptone-veal - 5% NaCl broth + 1% Na₂ glycerophosphate at pH 6.8 autoclaved; ppt. ~~added~~ filtered + reautoclaved. Ppt. redissolved in broth. Single cell isolate inoculated into broth 37° 72h. Then at R.T.; streaked out on Endo. (with broth - glyp base pH 8) was incubated at 37° 18-24 hours, periphery of colonies were fungoid & zygospore formation.

"no attempt has been made to study the fate of these spore like bodies".

Similar forms were found in smaller cells.

No convincing evidence of origin from > 1 cell.

Mystic on sexuality + variability
Does not understand basis of relationship.

Assumes that cell-fusion has taken place. Criticizes Almqvist.

"unless it necessary... to rule out the purely symbiotic influence of the accompanying strain."

10: 579-88 (1925)