Response of mice to a test skin graft given at different intervals after pretreatment with viable spleen cells

Interval (days)	Fate of test skin grafts (No./total) after stated cell dose									
	(H-1 + H-3)					H-2 (antigen 2 only)				
	5×10^7 [a]		8×10^8 [b]			5×10^7 [a]		8×10^8 [b]		
	FSR	SSR	Tolerance [c]	FSR	SSR	FSR	SSR	Tolerance [c]	FSR	SSR
3	–	–	8 [d]/15	7/15 (15–20.3–27) [e]	0/15	–	–	0/15	0/15	15/15 (8–8.8–10) [e]
4	5/5 (12–14.4–16) [e]	0/5	–	–	–	2/5 (15–15.5–16) [e]	3/5 (11–11.3–12) [e]	–	–	–
10	6/6 (12–13.8–15) [e]	0/6	–	–	–	0/5	5/5 (8–9.0–10) [e]	–	–	–
40	0/6	6/6 (9–9.2–10) [e]	–	–	–	0/6	6/6 (10–10.8–12) [e]	–	–	–

FSR, first set rejection; SSR, second set rejection; [a], 5×10^7 i.p.; [b], 1.10^8 i.v. + 7.10^8 i.p.; [c], graft rejection time at least 30 days; [d], permanent survival in 3 of these; [e], minimum, average and maximum rejection time.

did not affect the skin grafts made after 4 or 10 days and accelerated rejection of only those made after 40 days.

The dose of 8×10^8 spleen cells induced second-set rejection of all H-2 incompatible grafts (transplanted after 3 days) and of none of the (H-1 + H-3) incompatible grafts where 3 were even permanently tolerated (Table).

From these results it may be concluded that in spite of a comparable first set graft rejection time they induce, the H-2 and non-H-2 antigens may turn out to be qualitatively different when tested by means of skin grafting after antigenic pretreatment with viable spleen cells. Similar cell doses can induce sensitization when a single H-2 antigen is involved, whereas prolonged survival or tolerance may result in a weak non-H-2 system.

Zusammenfassung. Gezeigt wird, dass «schwache» Histokompatibilitätsantigene weniger sensibilisieren als «starke», auch wenn beide eine quantitativ ähnliche Transplantationsbarriere darstellen. Auf qualitative Unterschiede zwischen diesen Antigenen nach Vorbehandlung des Rezipienten mit lebenden Milzzellen von Mäusen wird hingewiesen.

I. HILGERT

Czechoslovak Academy of Sciences, Institute of Experimental Biology and Genetics, Praha 4 (Czechoslovakia), 28th October 1966.

On the Antimutagenic Effect of Spermine

It has been reported [1] that the inclusion of the aliphatic tetramine, spermine, at a non-inhibitory concentration (150 μg/ml) in the medium significantly decreases spontaneous mutation to streptomycin resistance in *Escherichia coli* and *Staphylococcus aureus*, and decreases spontaneous reversion of a tryptophane-requiring strain of *E. coli*. The antimutagenic effect to streptomycin resistance in *E. coli* is claimed to be even more apparent on induced mutation when spermine is present either during treatment with caffeine [1], or during growth prior to UV-irradiation [1]. Subsequently, the same workers [2] have demonstrated a similar antimutagenic effect on mutation to streptomycin resistance when spermine is present during growth of Yanofsky's mutator gene-containing strain of *E. coli*, and during treatment of a wild type strain of *E. coli B* with 2-aminopurine.

Observations that spermine reacts with DNA [3], and protects DNA against breakage by hydrodynamic shear [4], suggest that the binding of spermine to DNA could be involved in the antimutagenic effect. The present paper reports preliminary experiments designed to detect an antimutagenic effect of spermine on spontaneous reversion of nucleic acid base analogue-induced and acridine induced *r*II mutants of *E. coliphage T4*: no antimutagenic effect of spermine is apparent.

The mutants used were *N*11, which is 5-bromouracil induced [5], occurs at a 5-bromouracil 'hot spot', and is revertible by 5-bromodeoxyuridine but not by proflavine or 5-aminoacridine [6]; and *FC*47, which is proflavine-induced, and revertible by proflavine, but not by base-analogue type mutagens [7].

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The effect of spermine on the spontaneous reversion of a base-analogue induced (*N*11) and an acridine induced (*FC*47) *r*11 mutant of the *Escherichia coliphage T*4

*N*11	Lysates prepared from an initial average phage titre of 3.6/ml									
Spermine concentration	–					250 µg/ml				
Lysates	*C*1	*C*2	*C*3	*C*4	Average of *C*1, *C*2, *C*3, *C*4	*S*1	*S*2	*S*3	*S*4	Average of *S*1, *S*2, *S*3, *S*4
Terminal phage titre $\times 10^{10}$/ml	1.26	1.45	10.0	14.9	6.9	1.48	4.8	14.4	5.35	6.5
Reversion index $\times 10^{-6}$	0.08	0.09	0.02	0.13	0.08	0.16	0.07	0.16	0.19	0.14

*FC*47	Lysates prepared from an initial average phage titre of 2.5/ml									
Spermine concentration			–			250 µg/ml				
Lysates	*C*1	*C*2	*C*3	*C*4	Average of *C*1, *C*2, *C*3, *C*4	*S*1	*S*2	*S*3	*S*4	Average of *S*1, *S*2, *S*3, *S*4
Terminal phage titre $\times 10^{11}$/ml	1.85	3.6	2.5	3.2	2.77	5.6	4.4	2.2	1.74	3.48
Reversion index $\times 10^{-6}$ for normal wild type plaques	0.55	0.66	0.52	0.53	0.56	0.26	0.40	0.62	0.53	0.54
Reversion index $\times 10^{-6}$ for tiny plaques	0.51	0.21	0.15	0.27	0.29	0.13	0.13	0.22	0.38	0.22
Overall reversion index $\times 10^{-6}$	1.06	0.87	0.67	0.80	0.85	0.39	0.53	0.84	0.91	0.67

E. coli BB was grown in glucose-salts (*M*9) medium to ca. 2×10^8 cells/ml and infected with a low multiplicity of the mutant 'phage to reduce the chance of introducing revertants already present in the mutant stock. Lysis was allowed to proceed overnight; since the reversion index in such experiments is subject to large fluctuations due to clonal growth of revertants, 4 separate lysates were prepared for each estimation. 'Phage titres in the lysates were determined on *E. coli B*; *E. coli K* (lysogenic for λ prophage) was used as the selective strain for the detection of revertants. The frequency of revertants is expressed as the reversion index[8], that is, the proportion of wildtype particles present in the lysate.

The Table illustrates the results obtained for these mutants in the absence and presence (250 µg/ml) of spermine. No significant effect of spermine is discernible on the terminal titre of the lysates or on the spontaneous reversion of either mutant. The 2 mutants chosen for study are representative of the 2 major classes of simple (revertible, by definition) mutational changes which occur in 'phage DNA[9], the base-analogue type transitional change and the acridine type frame-shift change, and spermine would appear to offer no protection against spontaneous reversion of such changes in 'phage[10].

Résumé. La spermine n'offre aucune protection contre la réversion des mutants de *r*II chez *Escherichia coliphage T*4, quoiqu'on ait constaté qu'elle antimutagénique chez *E. coli*.

TH. ALDERSON

Department of Genetics, Milton Road, Cambridge (England), 24th April 1967.

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Thymidine Teratogenesis and Mutagenesis in *Drosophila melanogaster*

KAPLAN and SISKEN[1] and STRÖMNAES[2] reported on the mutagenic effect of ^{3}HT (tritiated thymidine) mixed in the larval medium and fed to *Drosophila* larvae, either for a part or full period of the larval life. KAPLAN et al.[3,4] reported that the recessive lethals induced by ^{3}HT show a non-random distribution. The non-random distribution was considered to reflect the varying frequency with which thymidine base occurs along the length of the *Drosophila X*-chromosome.

To what extent the recessive lethals scored are due to the radiation damage caused by the β particles emitted from ^{3}H, is not clear. PERSON and LEWIS[5] suggest that, in strain 15 *Escherichia coli* at least, the mutagenic action

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