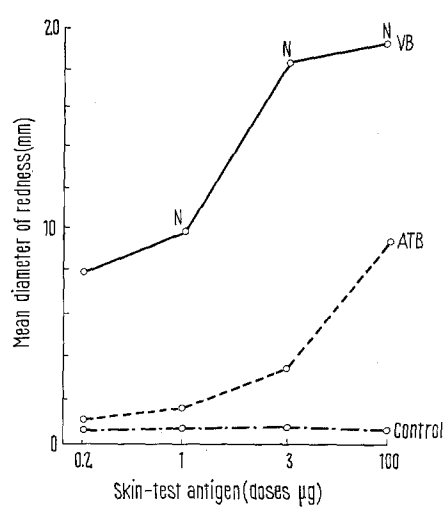
Influence of viable BCG and acetylation treated bacillus on the average number of plaque forming cells in F1 (DBA/2×C_{57}B1/6) mice 4 days after immunization with SRBC

	PFC/Spleen[a]	PFC/Spleen average number
SRBC (10^9)	24,000 22,000 26,000 20,000	23,000
SRBC (10^9)[a] WOE^{++} (0.1 ml)	29,100 33,600 30,200 35,200	32,000
SRBC (10^9)[a] VB (0.25 mg) in 0.1 ml WOE	56,200 68,000 52,000 64,100	60,000
SRBC (10^9)[a] ATB (0.25 mg) in 0.1 ml WOE	153,600 141,200 161,700 143,500	150,000

[a] Number of 19S plaque forming cells/spleen. 4 animals/group.
++ Water-in-oil emulsion which consisted of 1 part paraffin oil, 2 parts Tween 80 and 7 parts saline.



Graphic representations of the results of skin tests in guinea-pigs sensitized with 0.5 mg viable BCG (VB) and with 0.5 mg of its derivative, acetylation treated bacillus (ATB). The mean diameter of redness in guinea-pigs skin at sites of injection is indicated on the ordinate and the skin-test antigen doses are shown on the abscissa. N = central area necrosis.

number of spleen cells forming or releasing antibody to SRBC was determined by the JERNE technique[7].

Results. The Figure illustrates various degrees of DTH induced by 0.5 mg VB and 0.5 mg ATB. All animals sensitized with either 0.5 mg VB or 0.5 mg ATB showed positive skin reactions when 100 µg of skin test antigen were used. However, large diameters of redness and central areas of necrosis at injection sites were observed only in the group receiving 0.5 mg VB. When the skin test antigen was reduced to 0.2 µg, animals sensitized with 0.5 mg VB still showed positive skin reaction, while no visible skin reaction was observed in the group receiving the same dose of ATB (0.5 mg). The absence of skin reaction when small amounts of test antigen were used indicated that ATB was a weaker sensitizer.

The results shown in the Table indicate that animals treated with 0.25 mg ATB produced a significant increase in the number of plaque-forming cells 4 days after immunization with 10^9 SRBC (an average of 150,000 in contrast to 23,000 and 32,000 in controls receiving, respectively, antigen alone and antigen plus oily emulsion). Injection of 0.25 mg VB raised slightly the number of plaque forming cells.

Discussion. It has been reported that the composition of the glycopeptide of the cell wall of mycobacteria is similar to that of the glycopeptide obtained from wax D of various human strains of mycobacteria[8]. The glycopeptide of the wax D was shown to contain free hydroxyl groups which can be converted readily to ester groups by acetic-anhydride under conditions described above[9]. From these data, the ability of ATB to increase significantly antibody forming cells and to induce only a low degree of DTH appears to be related to the chemical changes of cell surfaces by acetylation of the hydroxyl groups of the cell wall glycopeptide.

Résumé. Le BCG, lavé à l'eau distillée, puis à l'ether-ethanol, puis au chloroforme, est traité par l'anhydride acétique. Le bacille ainsi traité par acétylation perd, à poids égal, par rapport au bacille vivant, de son pouvoir d'induire une hypersensibilité retardée spécifique, mais accroit son pouvoir de stimulation non spécifique des réactions immunitaires.

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Effect of Irradiation and Alkoxyglycerol Treatment on the Formation of Antibodies After *Salmonella* Vaccination

The alkoxyglycerols have proved to be of medical interest[1-3]. To some extent they prevent leucopenia and thrombocytopenia. The administration of alkoxyglycerols to patients with cancer of the uterine cervix results in higher survival rates than if radiation treatment alone is given[1,3]. Furthermore the alkoxyglycerols promote the growth of *Lactobacillus lactis*[1].

The body's ability to react against cancer cells that are not eliminated by radiation treatment could possibly depend upon an immunological process. In this context it would be relevant to know whether the capacity for forming antibodies after a vaccination can be influenced by treatment with alkoxyglycerols. Consequently 54 patients with cancer of the uterine cervix were vaccinated

Table I. Comparison of serological reactions in deceased and survived patients

Antigen	Deceased within 3 years						Survivors after 3 years					
	Controls (No. of deceased: 15)		Alkoxyglycerol treated (No. of deceased: 6)		Controls + alkoxyglycerols ($n = 21$)		Controls (No. of survivals: 13)		Alkoxyglycerol treated (No. of survivals: 20)		Controls + alkoxyglycerols ($n = 33$)	
	Effect	No effect	Effect	No effect	Effect	No effect	Effect	No effect	Effect	No effect	Effect	No effect
H	12	3	4	2	16	5	11	2	19	1	30	3
BH	3	12	5	1	8	13	8	5	13	7	21	12
AH	10	5	4	2	14	7	11	2	17	3	28	5
O	10	5	4	2	14	7	6	7	13	7	19	14
CO	11	4	4	2	15	6	9	4	15	5	24	9
BO	4	11	5	1	9	12	12	1	15	5	27	6
Total	50	40	26	10	76	50	57	21	92	28	149	49
Per patient	3.3	2.7	4.3	1.7	3.6	2.4	4.4	2.4	4.6	1.4	4.5	1.5

against typhus-paratyphus (TABC) on the day before and the day after implantation of radium. Every second patient was given alkoxyglycerols (0.3 g per day) immediately after the first vaccination. Samples for serological analysis (Widal's reaction) were taken before the vaccination and about 3 weeks later before the second implantation with radium. The alkoxyglycerol treatment was continued throughout the interval between the 2 samples. The agglutination effects for different antigens were determined for all patients. When demonstrating agglutinines against *Salmonella* antigens, 3 O-antigens and 3 H-antigens were examined. Each serological analysis thus comprises 6 agglutination reactions. The number of responses with an effect and without an effect was calculated for each patient and totalled for the entire group. The survival time was also recorded.

In order to distinguish between different effects, the material has been presented in different ways. Table I shows for the 6 antigens the sum of reactions with and without effects for patients who died within 3 years and survivors after 3 years. In both groups data are given on the number of reactions with and without an effect for the control group, the alkoxyglycerol group and the 2 combined.

Table II. Comparison of serological reactions in controls and alkoxyglycerol group

Antigen	Control group (No. of patients: 28)		Alkoxyglycerol group (No. of patients: 26)	
	Effect	No effect	Effect	No effect
H	23	5	23	3
BH	11	17	18	8
AH	21	7	21	5
O	16	12	17	9
CO	20	8	19	7
BO	16	12	20	6
Total	107	61	118	38
Per Patient	3.8	2.2	4.5	1.5

The patients who died within 3 years ($n = 21$) have 50 reactions without effect (2.4 reactions without effect per patient). The survivors after 3 years ($n = 33$) have 49 reactions without effect (1.5 reactions without effect per patient). This difference between reactions without effect for deceased and survivors is statistically significant ($P < 0.01$). Thus the surviving patients had a greater ability to form antibodies against TABC.

Table II gives the serological reactions for the control and alkoxyglycerol groups without distinguishing between deceased and survivors. It will be seen from the table that the formation of antibodies occurs to a greater extent in the patients who received alkoxyglycerol treatment. The number of agglutination effects per patient is given in Table II for the 2 groups. The difference between them is statistically significant ($P < 0.02$).

Résumé. La formation des anti-corps après vaccination contre le typhus et le paratyphus est plus marquée chez les malades qui survivent que chez ceux qui sont décédés au cours des 3 années de traitement. Elle est aussi plus marquée dans le groupe ayant reçu des alcoxyglycéroles avant et après radiation que dans celui qui a subi seulement la radiothérapie.

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