

ABSTRACTS

1. STUDIES ON ATYPICAL ACID-FAST BACILLI

PART 1. PAS BLACK REACTION AND ITS PRACTICAL USE FOR CLASSIFICATION OF ACID-FAST BACILLI

YUZO FUKUYAMA

*Department of Bacteriology and Immunology, The Research
Institute of Tuberculosis, Kanazawa University
(Director : Prof. Masamichi KAKISHITA)*

Received for publication, July 1, 1964.

When a medium containing PAS is inoculated with some strains of acid-fast bacilli, the medium turns brownish black.

The author named this phenomenon "PAS black reaction".

The coloration is most intense when the concentration of PAS is 1,000 μ gm/ml and increases in proportion to the incubating time.

This phenomenon is observed whether the bacilli are in the active state or in the resting state, but only they are alive.

Tested for the PAS black reaction, the 43 stock cultures of acid-fast bacilli kept in our laboratory were found to be clearly divided into positive (8 strains) and negative (35 strains) groups, and the former strains were found to have many biological and biochemical characteristics in common.

Therefore this phenomenon seems to be useful for classification of acid-fast bacilli.

Media containing salicylic acid or acetyl salicylic acid instead of PAS show the same phenomenon by inoculation with any of the strains positive to PAS.

2. A HEMAGGLUTINATION PHENOMENON BETWEEN TANNED ERYTHROCYTES AND THE SERUM OF GUINEA PIGS

PART 3. COMPARATIVE EXPERIMENTS ON THE TE-AGGLUTINATING ACTIVITY OF THE SERA OF GUINEA PIGS INOCULATED WITH VIRULENT TUBERCLE BACILLI, BCG, AND HEAT-KILLED TUBERCLE BACILLI AND OF NORMAL GUINEA PIGS

OTO-O MIYAMOTO

*Department of Pharmacology, The Research Institute of
Tuberculosis, Kanazawa University
(Director : Prof. Ryo ITO)*

Received for publication, March 5, 1964

In a previous report a description was given of the hemagglutination of tannic acid-treated erythrocytes by the serum of guinea pigs. Data were also given to indicate that the serum from tuberculous guinea pigs was noticeably stronger than that from normal animals in causing tanned-erythrocyte agglutination (TEA). The present study is concerned with further extensive investigations on the TEA-producing activity of guinea pig serum. The following groups of guinea pigs were employed ; (a) infected with virulent human tubercle bacilli H37 Rv (0.5 mg, subcutaneously), (b) vaccinated with BCG (0.4 mg, intracutaneously), (c)

inoculated with heat-killed H37Rv (5 mg, intraperitoneally), and (d) untreated (normal). At one month intervals after infection, three animals of each group were bled by heart puncture. The sera obtained by letting the blood samples clot at room temperature were assayed for their TEA-producing activity by the methods described previously. The experiments were terminated after 4 months.

The results of comparative titrations of the serum activity may be summed up as follows :

1. The majority of the sera from normal guinea pigs either failed to give TEA or did so only to a low level.
2. All the guinea pigs infected with virulent tubercle bacilli gave sera showing much stronger TEA-producing activity than the normal serum did. The increase in the serum activity was demonstrable as early as one month following infection.
3. On the contrary, the guinea pigs vaccinated with BCG or heat-killed H37Rv developed no significant enhancement of the serum activity.

3. A HEMAGGLUTINATION PHENOMENON BETWEEN TANNED ERYTHROCYTES AND THE SERUM OF GUINEA PIGS

PART 4. EFFECTS OF IONS ON TANNED-ERYTHROCYTE AGGLUTINATION

YOSHIO UENO

*Department of Pharmacology, The Research Institute of
Tuberculosis, Kanazawa University
(Director : Prof. Ryo ITO)*

Received for publication, June 20, 1964

This paper describes the results of experiments on the effect of the ions, including alkali-metal ions and certain anions, and of the drugs which affect the biological transfer of physiologically important cations, on tanned erythrocyte (TE)-agglutination by the serum of tuberculous guinea pigs.

All the techniques used were the same as in previous studies, except the buffered saline, which consisted of 10 volumes of 0.85% NaCl solution and one volume of 0.1 M veronal-HCl buffer pH 7.0.

The results obtained are summarized as follows :

1. Addition to the serum of monovalent cations, K^+ , Li^+ , Rb^+ , Cs^+ and NH_4^+ , tended to promote TE-agglutination in higher concentrations (about $10^{-1}M$). On the contrary, addition of divalent cations, Mg^{++} , Ca^{++} , Sr^{++} and Ba^{++} , led to complete inhibition of hemagglutination in concentrations of about $10^{-2}M$, while they tended to stimulate it in lower concentrations.
2. The anions, Br^- , I^- , SO_4^{--} , NO_3^- , NO_2^- , ClO_3^- , SCN^- , and CH_3COO^- , exhibited little or no effect on TE-agglutination even in a concentration of $10^{-1}M$.
3. K-Strophanthin, antihistaminics (promethazine, dimenhydrinate, chlorhetramine and Diphenhydramine), procaine and quinidine were all found to inhibit the hemagglutination in concentrations of about $10^{-3}M$, but ouabain did not exert similar inhibitory effect.

4. EXPERIMENTAL ANTICANCER STUDIES

PART 22. ON THE APPEARANCE OF RNA IN THE MEDIUM AS THE RESULT OF CANCER CELL DAMAGE BY HEMOLYTIC STREPTOCOCCI

RYUSAKU SHIMIZU, NOBUYOSHI NISHIDA,
KAORU BANDO AND SABURO KOSHIMURA*Department of Chemistry, The Research Institute of
Tuberculosis, Kanazawa University
(Director : Prof. Saburo KOSHIMURA)*TOSHIO HAYASHI AND TAKASHI KOBAYASHI
*Department of Pharmacology, School of Medicine,
Kanazawa University
(Director : Prof. Hajime OKAMOTO)**Received for publication, June 1, 1964.*

It was recently observed in our laboratories that clear supernatant obtained from a mixture of Ehrlich ascites carcinoma cells and living hemolytic streptococci, which had been incubated at 37°C for an hour, showed a intense UV-absorption at 260 m μ .

Since this observation was thought to be of very interest in that UV-absorption substance (s) may release from tumor cells contacted with hemolytic streptococci, a series of analytical experiments on this phenomenon was performed, and following results obtained so far :

1) In experiments, in which a suspending mixture of Ehrlich carcinoma cells and living hemolytic streptococci in phosphate buffered saline was incubated at 37°C, there observed a gradual increase in the UV-absorption intensity of the supernatants with increasing incubation time of the mixture.

The UV-absorption curve of the supernatants was very similar to that of RNA.

However, in experiments on suspension of carcinoma cells alone in the same medium, only a slight degree of UV-absorption could be detected even in the case of the supernatant obtained from the suspension incubated at 37°C for 180 minutes, and in this respect, suspension of streptococci alone gave entirely negative results.

2) Presence of a large amount of polyribonucleotide, but only a little amount of acid-soluble nucleic-acid components was demonstrated in the supernatant fluid of the mixture of cocci and cancer cells, which had been incubated at 37°C for 180 minutes.

3) Experiments carried out on the mixture of cancer cells and cocci in relation to its incubation time have shown that a parallelism existed between values of UV-absorption at 260 m μ of the supernatants, degrees of streptolysin-S formation in the mixture and degrees of damage of the cancer cells in the mixture.

4) Thus, it was supposed that a) by contact with living hemolytic streptococci, there may occur the destruction of cancer cells, and thereby the release of the intracellular constituents, such as RNA and protein etc., into the medium and that b) the RNA thus released was directly detected by UV-absorption measurement.

5. MANAGEMENT AND RESULTS OF TREATMENT OF TUBERCULOUS CHILDREN

TETSUO TAKANO, HISAKATSU YAMADA, TATSUE TAKAHASHI,
SHIGERU NAKAGAWA AND TAIRA KAGIMURA

National Sanatorium Hurusato Hoyoen

Received for publication, July 10, 1964

A study was made on education and treatment of 120 tuberculous children at Hurusato Hoyoen sanatorium.

The conclusions were as follows:

(1) Most of the patients showed evidence of secondary tuberculosis on their chest X-ray pictures.

(2) It is significant that 19 patients out of the 120 showed primary drug resistance at the opening of chemotherapy.

The results of chemotherapy showed the treatment combined with INH to be more effective than others.

(3) Surgical treatment was performed on tuberculous children, when it was thought desirable, and the results have led to the conviction that pulmonary resection is the most effective operation.

(4) Our observation seems to indicate that education of tuberculous children can go on side by side with medical treatment, and that the feasibility should be explored more widely.

6. A CASE OF CONGENITAL ESOPHAGOBRONCHIAL FISTULA

HIDEYUKI TAKATA and TOKIO KAMIHARA

*Department of Clinical Division, The Research Institute of
Tuberculosis, Kanazawa University*

(Director : Prof. Tetsuji MIZUKAMI)

Received for publication, July 1, 1964

We successfully performed an operation on a woman of 44 for congenital esophagobronchial fistula. The patient had long suffered—since her childhood—from severe attacks of coughing, occasionally accompanied by expectoration of bloody sputum, at meal time, even when the food was in the liquid form. Her case had been always diagnosed as asthma till she came to our clinic, where X-ray examination revealed its true nature. The findings at the time of operation and the pathological examination of resected lung tissue confirmed the fistula to have been congenital.

7. A CASE REPORT OF PULMONARY ACTINOMYCOSIS

YASUSHI KONDA AND TAKESHI YOKOI

*Department of Bacteriology and Immunology, The Research
Institute of Tuberculosis, Kanazawa University
(Director : Prof. Masamichi KAKISHITA)*

KENSUKE MURASAWA

*Department of Clinical Research, The Research
Institute of Tuberculosis, Kanazawa University
(Director : Prof. Tetsuji MIZUKAMI)*

SOTOHIRO MINAMI AND AKIRA HANDA

*Kanazawa City Hospital
(Director : Kenzo YURI)*

Received for publication, July 11, 1964

The authors came across a case of pulmonary actinomycosis in the right upper lobe in a 46 year old, male stationer.

Before operation, this case was diagnosed and treated as pulmonary tuberculosis, but the treatment was without effect on the cough, bloody sputum and the chest X-ray picture. No tubercle bacilli or malignant tumor cells were ever found in the sputum.

Suspecting malignant tumor of the right lung, we resected its upper and middle lobes.

Histological and histochemical examination showed it to be pulmonary actinomycosis. The postoperative course was satisfactory and the patient was released in a fine condition.

8. EXPERIMENTAL ANTICANCER STUDIES

PART 25. EFFECT OF 1,6-DIHYDROXY-7-n-HEXYLFLUORONE ON EHRlich ASCITES CARCINOMA

TOSHIMITSU UJIE

*Department of Chemistry, The Research Institute of
Tuberculosis, Kanazawa University
(Director : Prof. Saburo KOSHIMURA)*

Received for publication, September 10, 1964.

Both fluorone derivatives, 1,6-dihydroxy-7-n-hexylfluorone and 1,6-dihydroxyfluorone, were synthesized and tested for their effect on Ehrlich ascites carcinoma in mice.

The results of anticancer experiments showed that 1,6-dihydroxy-7-n-hexylfluorone was tested to be moderately effective in inhibiting the growth of both ascites and solid forms of Ehrlich carcinoma in mice, while 1,6-dihydroxyfluorone was entirely without effect.