

The injection of viable *T. pallidum* (Nichols strain) intratesticularly in the rabbit, causes a specific orchitis and a strong antibody reaction against *T. pallidum* in toto and its components. Antibody titres increase until the 30th day after challenge, then remain almost unchanged.

RNA extracted from the serum of rabbits infected with *T. pallidum* is able, if administered i.v., to induce antibody response within 48 h. This is perfectly comparable, qualitatively, with that of directly infected rabbits 30 days after challenge, although it is lower in absolute value.

Therefore, there seems to be present in the blood of syphilitic rabbits a RNA carrier of the antibody template able to induce precocious antibody synthesis in the recipients. Otherwise in preliminary experiments the RNA extracted from non-syphilitic rabbits had no action and antitreponemal RNA loses its inducing power when treated with ribonuclease.

The antibody production cannot be considered as passive transport of preformed antibodies from the serum of the infected rabbits because: (1) the protein content of the RNA preparation used by us was very little; (2) RNA preparation, before use, was subjected to every diagnostic test with negative results; (3) besides, even if a minimal trace of antibody substance was present, it would be so diluted in the recipient animals that it would be unable to give an evident reactivity; (4) on the other hand, if traces able to give reactivity were present, these would appear at once and not after 48 h, as we always found both in this case and in our previous work on this subject⁶.

Antibody production cannot be determined by the transport of antigenic substances from syphilitic rabbits

to the recipient ones. In fact, even if traces of antigens were present in the RNA preparation they would be very little and unable to give such an evident and precocious response; and even if RNA conjugated antigens had a high antigenic capacity, the antibody response would be detectable only several days after challenge¹⁰. Also, it is well known that active immunization due to the presence of *T. pallidum* or its constituents occurs, usually, in the following way: first appear fluorescent antibodies, then antiprotein antibodies, the antilipidic antibodies and, lastly, the immobilizing antibodies (see Table 1). In our case every type of antibody appeared simultaneously and likewise simultaneously disappeared, while it is known that in active immunization some antibodies (e.g. fluorescent and immobilizing) disappear later. So the hypothesis of an active immunization following the introduction of antigenic residues can be rejected.

Zusammenfassung. Es wird bestätigt, dass die i.v. Injektion von RNA aus dem Serum Syphilis-infizierter Kaninchen in gesunde Kaninchen die Bildung der Abwehrstoffe gegen *T. pallidum* verursacht.

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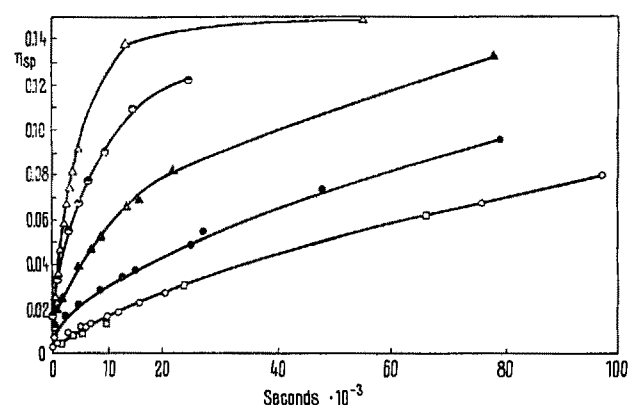
¹⁰ B. A. ASKONAS and J. M. RHODES, *Nature* 205, 470 (1965).

The Low Temperature Reaction of Poly U and Poly A

It has been shown that, in the reaction of polyribonucleic acid (poly U) with polyriboadenylic acid (poly A) at room temperature to form a 2-stranded helical complex^{1,2}, a slow increase in the radius of gyration of the product, as measured by light scattering³, persists for several hours, an effect that has been attributed to the annealing of imperfect bonding resulting in a molecule in which the maximum number of hydrogen-bonded base pairs have been formed. Since poly U undergoes a low temperature coil \rightarrow helix transition⁴, it was of interest to see the effect of varying helical content of poly U upon the reaction.

Accordingly, solutions of poly U and poly A (obtained from Miles Laboratories) in 1M KCl, pH 7, were incubated at various temperatures and mixed in a viscometer in approximately a 1:1 ratio. Under these conditions only the 1:1 complex is formed at equilibrium. The viscosity was then read as a function of time. The results are shown in the Figure and clearly show that low temperature decidedly slows the annealing reaction. Parallel measurements of the absorbance ($A_{260\text{ nm}}$) changes of identical but diluted reaction mixtures showed that almost all of the final absorbance value is reached within about a minute even at the lowest temperature studied.

A further effect of the helicity of poly U on the reaction between poly U and poly A is the monotonic decrease in the change in apparent hypochromism as the temperature



Time dependent changes in viscosity of mixtures of poly U + poly A as a function of temperature. Concentration (U + A) about 2 mg/ml. Solvent: 1M KCl, 0.01M lysine, pH 7.0. In this solvent the T_m of poly U's coil-helix transition as measured by several techniques is 7.5°C, in good agreement with the results of LIPSETT⁴. All curves eventually reach the same limiting value ($\eta_{sp}/c = 0.15$) though at -2°C it takes nearly 5 days to do so. $\circ = -2^\circ\text{C}$, $\square = +0.05^\circ\text{C}$, $\bullet = +3^\circ\text{C}$, $\blacktriangle = +6^\circ\text{C}$, $\triangle = +9^\circ\text{C}$.

¹ R. WARNER, *Ann. N.Y. Acad. Sci.* 69, 314 (1957).

² A. RICH and D. DAVIES, *J. Am. chem. Soc.* 78, 3548 (1956).

³ R. STEINER and R. BEERS, *Biochim. biophys. Acta* 33, 470 (1959).

⁴ M. LIPSETT, *Proc. natn. Acad. Sci. U.S.A.* 46, 445 (1960).

of reaction is lowered. At 20°C the increase in hypochromicity is 25%; this value decreases until, at about 0°C, the increase in hypochromism is reduced to a value of 10%.

Since measurements showed that the absorbance of poly A decreases only 2–4% in going from 20–0°C, the above result may reflect the fact that there is little difference in the hypochromic effect of base stacking of the ordered regions in poly U in the helix form as opposed to the ordered regions of poly U when in the poly A + poly U complex. A plot versus temperature of the half-time of the viscosity change parallels the thermal profiles of the absorption, viscosity, and optical rotation of the poly U coil → helix transition as measured in this laboratory. This result clearly implies that it is the fractional helical content of poly U which at low temperatures reduces the rate of the annealing reaction.

It has been recently suggested⁵ that under certain solution conditions, the 3-stranded poly A + poly U complex may be transiently formed even in 1:1 mixtures of the polymers. The 3-stranded complex, however, is dismutated into the 2-stranded complex with time, so that at equilibrium the 2-stranded complex is the major product. This raises the possibility that some or all of the viscosity changes reported here may reflect the dismutation reaction.

It is apparent that reaction of helical poly U with poly A occurs at the expense of the ordered form of poly U,

demonstrating the higher thermodynamic stability of the poly U + poly A complex over the helical form of poly U. The rapidity with which the absorbancy attains its final value at 0°C raises the possibility that all of the uracil groups may not be incorporated into the helical structure of poly U under these conditions⁶.

Zusammenfassung. Es wurde die Temperaturabhängigkeit der Wechselwirkung von Polyriboadenylylsäure mit Polyriboridylylsäure viskosometrisch untersucht. Zeit- und Temperaturabhängigkeiten der Viskose deuten an, dass der Zustand der Polymer-Organisation die Reaktion beeinflusst.

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⁵ R. BLAKE and J. R. FRESCO, J. molec. Biol., in press.

⁶ From Bureau of Medicine and Surgery, Navy Department, Research task No. MR005.06.0001. The opinions in this communication are those of the authors and do not necessarily reflect the views of the Navy Department or the naval service at large.

Zur primären Schädigung vegetativer Ganglien nach Infektion mit dem *Herpes suis* Virus bei verschiedenen Tierarten

Veränderungen an den Ganglienzellen der sympathischen und parasympathischen Nervengeflechte sind bei Infektionskrankheiten bereits mehrfach nachgewiesen worden, sie zeichnen sich aber entweder durch geringe Intensität oder eine längere Entstehungsdauer aus^{1,2}. So fand sich bei 57 Haustieren mit verschiedenen Krank-

heiten nicht ein einziger Fall von *primärer* Zellschädigung in den vegetativen Ganglien, wobei den pathologischen Befunden stets eine zumindest 2wöchige Krankheitsgeschichte vorausgegangen war¹. Es wurden vor allem leuko-lymphozytäre Infiltrate und Angitiden mit ihren Folgezuständen bis zur Nekrose und Vernarbung an den

¹ H. KÖHLER, Arch. exp. VetMed. 6, 372 (1953).

² H. HERRMANN, Pathologische Histologie des peripheren vegetativen Nervensystems (Berl. Med. Verlagsanstalt 1956).

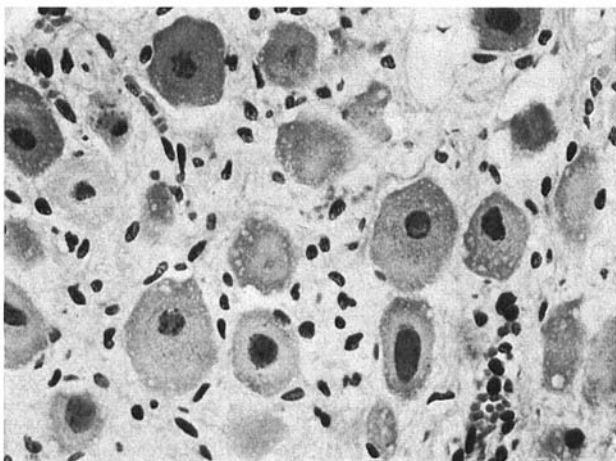


Fig. 1. Ganglion stellatum mit Kerndegenerationen und -einschlüssen. Schaf, spontane Infektion. HE.

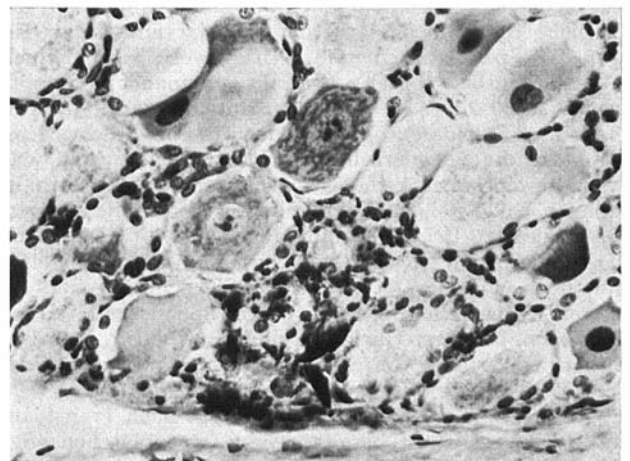


Fig. 2. Plexus solaris mit Herdnecrose und geringer Zellreaktion. Kaninchen, intramuskuläre Infektion im Lendenbereich. HE.