Der Golgiapparat ist gut ausgeprägt; seine Zisternen sind unterschiedlich stark erweitert und enthalten stellenweise schwach osmiophile Substanz. In seiner Nähe liegen Vesikel und homogene Granula unterschiedlicher Form, Grösse und Elektronendichte. Die Häufung von Vesikeln sowie ihrer Übergangsformen zu homogenen Granula im Bereich des Golgikomplexes deutet auf die Entstehung der Granula in diesem Organell. Die Bildung von Granulummaterial im Golgiapparat wurde schon bei heterophilen Myelozyten des Leghornkükens[5], Progranulo- und Myelozyten des Kaninchens[6] und Neutrophilen des Pferdes[7] beobachtet. Die Entstehung der 3 beschriebenen Granulumtypen in bestimmten Zonen des Golgikomplexes, wie z. B. bei den Myelozyten des Kaninchens[6], wurde nicht festgestellt.

Eine Umwandlung von Mitochondrien in Granula, wie es RINEHART[8] für die Granula der Neutrophilen des Menschen postulierte, dürfte bei den Heterophilen des Haushuhns auszuschliessen sein, da entsprechende Übergangsstadien fehlen.

Die physiologische Bedeutung der Granula in den Heterophilen ist noch ungeklärt. Durch bereits eingeleitete zytochemische Untersuchungen soll das Vorkommen von bestimmten Enzymen in diesen Granula studiert werden.

Summary. Ultra-thin sections of heterophil granulocytes of clinically healthy, laying hybrid-hens were examined by electron microscope. Within the cytoplasm of these cells, round, oval or fusiform granules (rods) of different electron density were found. Osmiophilic and electron light areas (cores) were seen, either together within the same granular body, or separately in different granules.

K. KRIESTEN und H. ENBERGS

Institut für Anatomie und Physiologie der Haustiere der Universität, 53 Bonn (Deutschland), 30. September 1968.

[6] D. F. BAINTON und M. G. FARQUHAR, J. Cell Biol. *28*, 277 (1966).
[7] M. SONODA und K. KOBAYASHI, Jap. J. vet. Res. *14*, 71 (1966).
[8] J. F. RINEHART, Am. J. clin. Path. *25*, 605 (1955).

Lack of Immunological Specificity of Heterologous So-Called Antilymphocyte Serum

On the one hand, heterologous antiserum represents a common reagent for studies on tissue specifity[1]; on the other hand, heterologous immunization mostly results also in formation of antibodies directed against a variety of other antigens, which may be species-specific and thus common to many different structures and cell types in the organism of any individual of that species (see, e.g.[2]). It appears to be of special interest for the understanding of possible in vivo activity of an injected heterologous anti(lymphocyte)-serum – as of its γ-globulin fraction – to check its cross-reactivity with various tissues or cells under relatively physiological conditions, i.e. involving intact cells rather than extracts.

Therefore, we studied, amongst other things, 2 main aspects of reactivity of rabbit antisera against rat thymocytes, namely (a) decrease of thymocyte agglutination and cytotoxicity titers after exhaustive absorption with other cells, and (b) cytotoxicity on different rat cells. Our observations, the details of which are to be published, may be summarized as follows:

(a) The mean of thymocyte agglutination titers of 11 non-absorbed antisera ranged between 1:512 and 1:1024; it dropped about 2 twofold dilution steps after absorption with rat erythrocytes, about 1 step further after subsequent absorption with liver-cell or with kidney-cell suspensions; and 5 steps further after combined absorption with both cell types (thymocytotoxic titers fell correspondingly). Equally exhaustive absorption of previously erythrocyte-absorbed antisera by the vascular network of perfused livers or kidneys (after having ruled out the interaction of white blood cells) reduced titers by about 4 steps; and finally, a combination of all absorption procedures (cell suspensions plus perfusions) resulted in the most pronounced drop of titers, down to values of about 1:1.

(b) Cytotoxic efficiency on macrophages, thyroid cells, ovarian cells, and testicular cells was studied after incubation of undiluted erythrocyte-absorbed antisera and freshly prepared normal rat sera as source of C′ with the cell suspension at a ratio of 1:1:1 by counting the percentage of dead cells in trypan blue exclusion tests after various lengths of incubation. All types of cells were killed almost as fast as thymocytes (reaching about 100% mortality after maximum 60–90 min). This was in sharp contrast to survival times of the various cells in normal rabbit serum, which did not differ significantly from those of isolated rat cell control suspensions in normal rat serum.

These data show the extent to which heterologous so-called antithymocyte antibodies may be able to react with antigens located at apparently easily accessible sites on cells or in tissues quite different from lymphoreticular. This may, at least in part, help to explain some of the experimentally (see, e.g.[3]) or clinically (see, e.g.[4]) observed (side-)effects after in vivo application of the so-called antilymphocyte sera, as well as such effects as may only be clarified after prolonged application and/or purposeful investigations.

Zusammenfassung. Thymozyten-Agglutinations- und Zytotoxizitäts-Titer von Kaninchenantiseren gegen Rattenthymozyten sanken nach erschöpfender Absorption mit Nieren- oder/und Leberzellen oder/und Organperfusionen stufenweise bis etwa 1:1 ab. Suspendierte Makrophagen, Thyreoidea-, Hoden- oder Ovarialzellen von Ratten wurden nach Inkubation mit diesen Antiseren fast ebenso rasch abgetötet wie Thymozyten.

W. MÜLLER-RUCHHOLTZ and H. G. SONNTAG

Hygiene-Institut der Universität, 23 Kiel (Germany), 30 October 1968.

[1] F. MILGROM, Ann. N.Y. Acad. Sci. *129*, 767 (1966).
[2] W. MÜLLER-RUCHHOLTZ, W. A. LIEB and E. F. PFEIFFER, Z. ImmunForsch. exp. Ther. *125*, 3 (1963).
[3] H. G. SONNTAG and W. MÜLLER-RUCHHOLTZ, Verh. dt. Ges. inn. Med., in press *74* (1968).
[4] T. E. STARZL, Symp. immun. klin. Fragen Organtranspl., Bonn, in press (1968).