

result was found in all cats examined. In Figure 1 the difference of the thresholds for 462 and 605 m μ is about 0.8 log units at 1 min in the dark. This difference then becomes gradually slightly smaller until, after the break in the curve at about 10 min in the dark, the relative sensitivities for 462 and 605 m μ are practically the same as in the dark adapted state. As calculated from the relative spectral sensitivity measured with fast flicker and with single flash stimulation, the total Purkinje shift in the electroretinographic response of the cat corresponds to a difference in change of relative energy for 462 and 605 m μ of about 1.6 log units (DODT and WALTHER⁶). Therefore, the separation of dark adaptation curves of Figure 1 by only 0.8 log units does not correspond to a total Purkinje shift and suggests that there is visual purple activity already before the break in the curve. This view is supported by the experiments where the cat's eye was light adapted with 0.6 log units weaker light. In this case, there was no separation of the 'cone phases' of the dark adaptation curves (Fig. 1, filled symbols). In rabbits, this type of result was found in all animals examined. As illustrated in Figure 2, the break in the rabbit's dark adaptation curve appears later than in the cat.

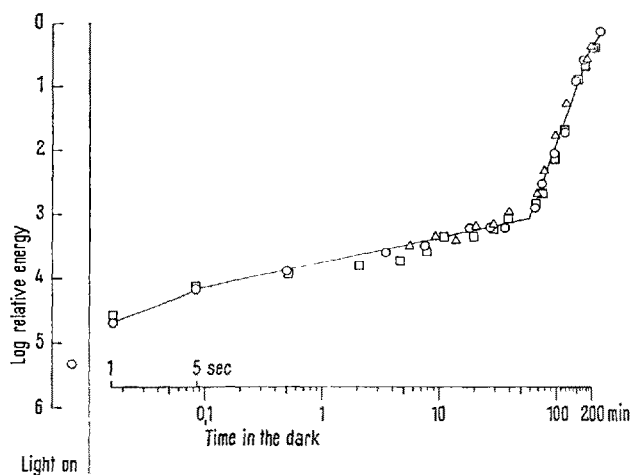


Fig. 2. Rabbit, Urethane anesthesia, Flaxedil and artificial respiration, pupil dilated with Homatropine and Veritol drops. Dark adaptation curve plotted as in Figure 1 but using 25 μ V b-wave as a constant index. Preliminary dark adaptation for 4 h. Light adaptation (white light, duration 15 min, retinal illumination about 7.5×10^5 Trolands). Test light: white (circles), 462 m μ (squares) and 605 m μ (triangles)

It must be concluded *either* that the so-called 'cone phase' in the electroretinographic dark-adaptation curve of the cat and rabbit is not mainly due to cones, *or* that in both these species the electroretinographic spectral sensitivity curve can be almost the same when determined by cones as when determined by rods.

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Zusammenfassung

Bei Kaninchen und Katzen wird während Dunkeladaptation die für schwelennahe Antworten konstanter Amplitude im Elektroretinogramm notwendige Lichtenergie bestimmt. Nach Helladaptation (15 min, Reizschwelle am

Ende der Helladaptation 10^{-5} bis 10^{-6} der Dunkelkontrolle) zeigt sich in der Dunkeladaptationskurve ein Knick ähnlich dem, der beim Menschen den Übergang der Zapfen- zur Stäbchenadaptation anzeigt. Beim Kaninchen sind die für 462 und 605 m μ gemessenen Reizschwellen vor und nach dem Knick mit den im dunkeladaptierten Zustand erhaltenen Werten identisch. Unter gleichen Bedingungen wird bei der Katze bis zum Knick eine Purkinje-Verschiebung gesehen, jedoch fehlt diese nach Helladaptation an ein schwächeres Licht, während der Knick nachweisbar bleibt.

pH-Dependant Action of NaCl on Isolated Guinea Pig's Ileum

NaCl solutions added to small strips of guinea pig's ileum, isolated in an oxygenated Tyrode bath at 36°C, elicit quite opposite reactions depending on the acid or alkaline pH.

At pH values ≥ 8.0 , the administration of small volumes of a 10% solution (in Tyrode) of NaCl (final concentration: 2×10^{-3} – 1×10^{-2}) is followed by a reversible contracture; by adding graded quantities of NaCl solution, it is possible to obtain a 'characteristic curve' for NaCl; a plot of $1/\text{concentration}$ against $1/\text{effect}^1$ for NaCl is given in Figure 1.

At pH values ≈ 5.3 , the introduction of NaCl solution (in Tyrode at the same pH) in the bath does not elicit any contracture; on the contrary, NaCl decreases the effects of well known stimulants such as acetylcholine and histamine. By using the same transformation as in Figure 1, it is possible to demonstrate that the antagonism of NaCl is competitive against both acetylcholine and histamine: actually in presence of NaCl the straight lines describing the action of the agonist show an increased slope with identical intercept (Fig. 2 and 3).

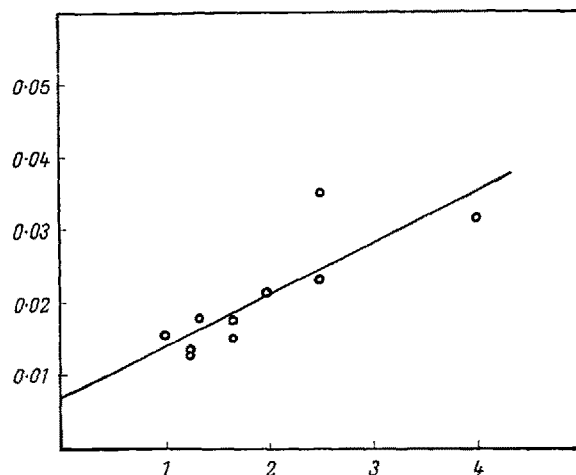


Fig. 1. Action of NaCl at pH = 8.1. — Ordinate: $y = 1/\text{effect}$ (height of contraction, in mm); abscissa: $x = 1/\text{concentration} \times 10^2$.

$$\text{Formula: } y = 0.00658 + 0.007236x. \quad r = +0.83153. \\ 0.001 < P(n=8) < 0.01$$

¹ H. LINEWEAVER and D. BURK, J. Amer. chem. Soc. 56, 658 (1934).

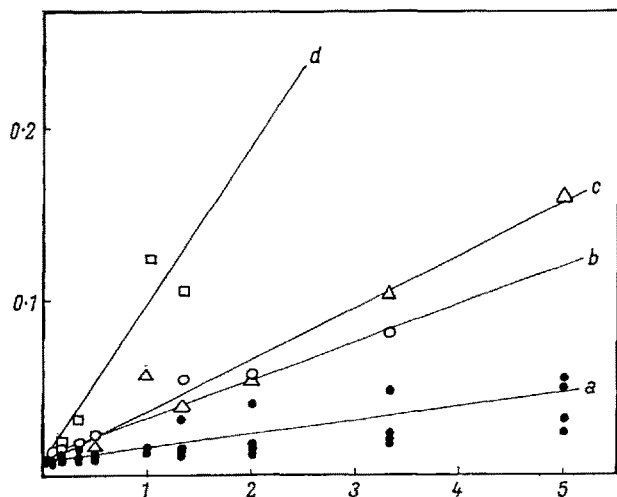


Fig. 2. Competitive antagonism between NaCl and acetylcholine at pH = 5.3. Ordinate: $y = 1/\text{effect}$ (in % of the maximal contraction); abscissa: $x = 1/\text{concentration of acetylcholine} \times 10^8$.

- (a) ● acetylcholine alone: $y = 0.0104 + 0.0061 x$, $r = +0.76351$, $P(n=30) < 0.001$.
 (b) ○ Id. plus NaCl 2×10^{-3} : $y = 0.0150 + 0.0215 x$, $r = +0.97743$, $P(n=5) < 0.001$.
 (c) △ Id. plus NaCl 5×10^{-3} : $y = 0.0058 + 0.0303 x$, $r = +0.97146$, $0.001 < P(n=4) < 0.01$.
 (d) □ Id. plus NaCl 6×10^{-3} : $y = 0.0058 + 0.0912 x$, $r = +0.91902$, $0.05 < P(n=2) < 0.1$.

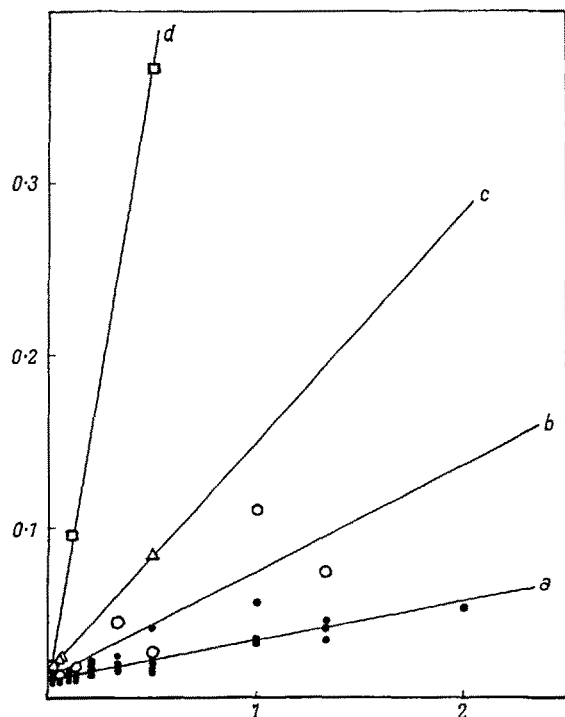


Fig. 3. Competitive antagonism between NaCl and histamine at pH = 5.3. Ordinate: $y = 1/\text{effect}$ (in % of the maximal contraction); abscissa: $x = 1/\text{concentration of histamine} \times 10^7$.

- (a) ● histamine alone: $y = 0.0109 + 0.0236 x$, $r = +0.87383$, $P(n=31) < 0.001$.
 (b) ○ Id. plus NaCl 2×10^{-3} : $y = 0.0109 + 0.0634 x$, $r = +0.85590$, $0.01 < P(n=5) < 0.02$.
 (c) △ Id. plus NaCl 3×10^{-3} : $y = 0.0146 + 0.1370 x$, $r = +0.99993$, $P(n=2) < 0.001$.
 (d) □ Id. plus NaCl 8×10^{-3} : $y = 0.0088 + 0.7224 x$, $r = +0.99787$, $0.02 < P(n=1) < 0.05$.

In order to clear up these data, we suggest an abrupt difference in ileum permeability to Na^+ at different pH values, so that Na^+ penetrates in the cells at alkaline pH, acting as a 'labilizer', whereas at acid pH it does not penetrate and may act as a 'stabilizer'. Investigations with some other aspecific competitors are being worked out in this Department in order further to elucidate this point.

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Riassunto

L'NaCl, aggiunto a un bagno – in cui è sospeso un frammento di ileo di cavia – sino a concentrazioni finali comprese fra $2 \cdot 10^{-3}$ e 10^{-2} , agisce come contratturante a pH = 8,0 e come antagonista competitivo dell'acetilcolina e dell'istamina a pH = 5,3.

Hemmung der durch Proteuslipopolysaccharide gesteigerten Leukozytenemigration in vitro durch antiinflammatorische Corticosteroide

Es wurde gefunden und mehrfach bestätigt¹, dass cortisonartige Corticoide die Wanderung von Leucocyten *in vitro* leicht hemmen. In den Lipopolysacchariden aus gramnegativen Keimen haben wir andererseits eine Substanzgruppe gefunden, die die wirksamsten Förderer der Leukozytenemigration *in vitro* umfasst. In welchem Umfange Corticoide die durch LPS geförderte Leukozytenemigration zu hemmen imstande sind, schien deshalb wichtig zu untersuchen.

Das in den vorliegenden Versuchen verwendete Proteuslipopolysaccharid (PLPS) fördert die Auswanderung der Leukozyten über einen grossen Konzentrationsbereich von 10^{-3} bis 10^{-12} mit einem Wirkungsoptimum von 10^{-6} bis 10^{-8} . Höhere Konzentrationen als 10^{-3} hemmen die Auswanderung.

Methode. Blutleukozyten des Huhnes wurden in der früher beschriebenen gewebekulturähnlichen Anordnung in einem festen Plasma-Embryonalextrakt-Nährboden zur Auswanderung gebracht. Die PLPS- und Cortison-Lösungen wurden 2 h nach der Explantation gleichzeitig dem Nährboden überschichtet. Explantatgrösse und Auswanderungsareal wurden zu verschiedenen Zeiten bis 18 h planimetrisch erfasst.

Die Auswanderungsförderung durch PLPS ist bei gleichbleibender Nährbodenkonzentration von der explantierten Zellzahl², von zelleigenen Faktoren und in geringerem Umfang von Plasmafaktoren abhängig³. Da diese Faktoren naturgemäss von Tier zu Tier stark variieren, ist das Ausmass der mit PLPS zu erzielenden Auswanderungsförderung verschieden. Konstant bleibt jedoch das für die verwendete PLPS-Fraktion typische Konzentrations-Wirkungsoptimum.

¹ M. BARBER und A. DELAUNAY, J. Path. Bact. 63, 549 (1951). – M. HOLDEN, B. SEEGAL und J. RYBY, Amer. J. Path. 27, 748 (1951). – R. MEIER, F. GROSS, P. A. DESAULLES und B. SCHÄR, Bull. Schweiz. Akad. med. Wiss. 8, 34 (1952). – G. H. PFAFF und R. STEWART, Proc. Soc. exp. Biol. Med. N. Y. 83, 591 (1953). – M. M. KETCHEL, C. B. FAVOUR und S. H. SURGIS, J. exp. Med. 107, 211 (1958).

² R. MEIER und B. SCHÄR, Arch. exp. Path. Pharmacol. 234, 102 (1958).

³ B. SCHÄR, Helv. phys. Acta, im Druck.