sponse was blocked by hyoscine (10^{-7} g/ml), while the nerve-mediated relaxation was abolished by propranolol (5×10^{-7} g/ml).

Discussion. The present study has provided the first direct demonstration that the renal portal valve in the domestic fowl has an excitatory, cholinergic and a noradrenergic inhibitory innervation. Previous work[2] has shown that, when the renal portal valve is open (i.e. inhibited), blood flows into the inferior vena cava; functional studies[7] have provided evidence that the inferior vena cava receives a dense noradrenergic innervation that causes contraction of the muscle in its walls. The vasomotor control of the vasculature in this region is thus such that a generalized noradrenergic nerve discharge would cause opening of the renal portal valve and hence flow of blood into the inferior vena cava, the capacity of which would be reduced by contraction of its musculature. This would seem to be an efficient means of facilitating venous return. The dual innervation of both the renal portal valve and the inferior vena cava would clearly permit very rapid adjustments in the volume of blood returning to the heart.

Summary. Electrical stimulation of the intrinsic nerves of the renal portal valve of the domestic fowl demonstrated the presence of noradrenergic inhibitory, and cholinergic excitatory fibres. They may be involved in the control of venous return.

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Ultraviolet Light-Induced Miniature End-Plate Potentials in Frog Neuromuscular Junction

Several physico-chemical conditions and biochemical agents have been known to induce an experimental increase in the rate of appearance of miniature end-plate potentials (MEPP)[1-3]. Their contribution to the study of the releasing mechanism of acetylcholine (ACh) vesicles is considerable. Ultraviolet (UV) irradiation has often been used to obtain selective changes in specific cellular components[4,5]. This preliminary communication describes the increase in the discharge frequency of MEPPs following the application of UV light to the frog neuromuscular junction (NMJ).

The experiments were performed on preparations of the sciatic-sartorius NMJ of *Rana nigromaculata*, in a few cases *Xenopus laevis*, at room temperature. The bathing solution had a standard composition of K^+ 2.5, Ca^{++} 1.8, Na^+ 116.5, Cl^- 117.1, $H_2PO_4^-$ 0.45, HPO_4^- 2.55 in m*M*. The MEPPs with a rise-time of 1 msec or less were recorded by the use of 3 *M* KCl-filled microelectrodes of 5–10 MΩ resistance. They were displayed on an oscilloscope through a FET-operating preamplifier. Light, supplied by a mercury lamp of 100 *w*, (USH-102D, Ushio) was focused through a quartz lens. The spectrum range shorter than approximately 300 nm could be removed, when needed, by a glass filter. Recordings were mostly made from relatively deeper fibres after the more superficial ones were removed to ensure more effective irradiation. After identifying and recording the spontaneous MEPPs, the center of the light spot was adjusted to hit the tip of the recording electrode. The size of the spot was large enough to give approximately equal amounts of irradiation to both pre- and post-synaptic elements from which the recording was taken.

From 3–6 min after the onset of continuous application of the unfiltered light, an abrupt and transient increase in the MEPP frequency was consistently produced. When the wave-lengths shorter than 300 nm were cut off by a filter, the increase in discharge frequency could no longer be produced, even after irradiation for 10 min. It follows

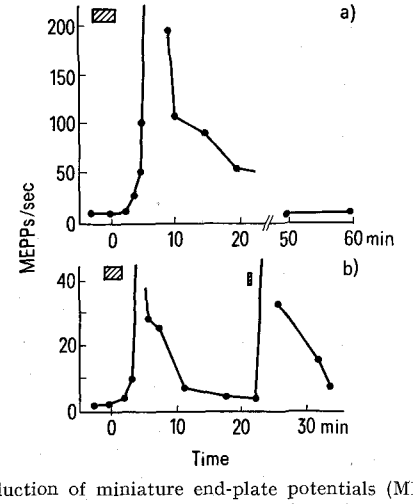

Fig. 1. Induction of miniature end-plate potentials (MEPP) from *Rana* neuromuscular junction by irradiation with UV-light. The UV application time is indicated by the hatched block. a) 4 min; b) 1st application, 3 min; 2nd application, 10 sec.

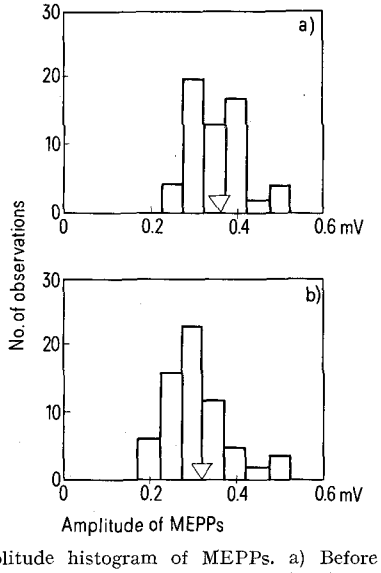

Fig. 2. Amplitude histogram of MEPPs. a) Before irradiation; b) as the MEPP discharge rate was increasing (measurement was started at 4 min after onset of UV application). ▽, Mean value.

that it is the light in the UV-range that induced the increase of MEPP frequency.

During prolonged irradiation with light containing UV, the MEPP frequency continued to increase in a few minutes to a level more than 200 Hz, and thereafter declined to re-attain the control level. The minimum irradiation time required for the production of this effect was 3–4 min (Figure 1a).

The NMJ irradiated by UV was not completely disrupted, since the MEPPs persisted for at least 3–4 h after the cessation of irradiation. Furthermore, when UV was re-applied during the period of declining frequency of MEPP following initial application, high frequency discharge of MEPPs could be reproduced. In this case, however, the latency of this second burst was as short as 10 sec (Figure 1b).

Now the question is whether UV affected only the pre-synaptic terminals or also the post-synaptic membrane, by increasing its sensitivity to ACh. It was difficult to make precise measurements of individual MEPP amplitudes during high frequency discharges (more than 100 Hz). However, during the period when the MEPP discharge rate was increasing and measurement of the amplitude of single MEPPs could still be accurately done, the shape of single MEPPs and their amplitude histogram showed no definite change from control (Figure 2); nor did the resting potential of the post-synaptic membrane fluctuate significantly. These facts can be taken as strong evidence to exclude the possible involvement of the post-synaptic membrane. Hence, it is more likely that UV affected exclusively the pre-synaptic terminal, resulting in an enhanced release of ACh vesicles.

Examination of the possibility of calcium dependency of the induced MEPP burst is currently in progress. We have preliminary data that the extracellular calcium level does not influence the MEPP burst phenomenon.

Summary. The discharge frequency of miniature end-plate potentials was increased by the UV-light application. This phenomenon can be attributed to the effect on the presynaptic terminal[6].

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Untersuchungen über den Einfluss von Thrombozyten und Temperatur auf die Vollblut- und Plasmaviskosität als Vergleichsmessung zwischen einem Kapillar- und Platte-Kegel-Viskosimeter

Investigations on the Influence of Thrombocytes and Temperature the Whole Blood- and Plasma-Viscosity as Comparative Measurements Between a Capillary- and a Plate-Cone-Viscosimeter

Viskositätsmessungen am Vollblut und Plasma gewinnen in der Medizin zunehmend an Bedeutung[1–3]. Die derzeit gebräuchlichsten Konstruktionsprinzipien – das Kapillar- und Platte-Kegel-Viskosimeter – sollten hinsichtlich ihrer Reproduzierbarkeit und Genauigkeit untereinander verglichen werden. Gleichzeitig sollte dabei das Ausmass der Veränderung der Fliesseigenschaft des Blutes bei physiologischen Temperaturänderungen sowie unterschiedlichen Thrombozytenkonzentrationen dargestellt werden.

Material und Methodik. Zur Prüfung der Messgenauigkeit beider Geräte wurde ein Eichöl mit einer Viskosität von $\eta_{20^\circ C} = 4{,}51$ cps und einer Dichte von $\varrho = 0{,}826$ g/cm³ (PTB Braunschweig) genommen, da nur durch diese beiden Angaben ein Vergleich zwischen den unterschiedlichen Messeinheiten möglich ist (s. Berechnung).

Da Vollblut im Gegensatz zum Plasma als Nicht-Newtonscher Flüssigkeitstyp charakterisiert ist, sind Aussagen über die Fliesseigenschaft des Vollblutes nur unter gleichzeitiger Angabe der Fliessbedingungen, d. h. der Schergrade sinnvoll und Messungen nur in Geräten, die diese Bedingungen erfüllen, erlaubt. Das Fliessverhalten des Plasmas ist dagegen schergradunabhängig, so dass hierfür einfache Kapillarviskosimeter ausreichen.

Als Kapillarviskosimeter wurde der Viskotimer (Firma Jenaer Glaswerk Schott und Gen. Mainz) benutzt, der aus einem Thermostaten (Messgerätewerk Lauda) besteht, und einem Ubbelohde-Viscosimeter[4], das einem automatischen Zeitregistriergerät mit Drucker angeschlossen ist. Für die Überprüfung der Messgenauigkeit wurden drei verschiedene Kapillarviskosimeter verwendet (Kapillare 1: ⌀ 0,32 mm, Kapillare 1c: ⌀ 0,42 mm, Kapillare 2: ⌀ 0,57mm). Zur Prüfung jeder Kapillare wurde je 30mal die Durchlaufzeit bei konstanter Temperatur von 20 °C gemessen. Bei den Plasmauntersuchungen wurden die Kapillare 1 mit dem Durchmesser 0,32 mm verwendet und jeweils 10 Einzelmessungen pro Probe durchgeführt. Die Materialproben wurden von 5 gesunden Normalpersonen gewonnen.

Die Vollblutviskositätsmessung erfolgte mit einem Wells-Brookfield Microviscosimeter (Firma Brookfield Engineering Laboratories, Massachusetts, USA), das vorher nach Firmenangabe mit dem Eichöl (Lot No. 042872, Temp. 25 °C, Viscosity 8,9 Centipoises, Fluid 10) eingestellt wurde[5]. Die Messung erfolgte bei den Schergraden 230, 115, 46, 23, 11,5 und 5,75 sec^{-1} bei 20 °C. Die Messung bei einem Schergrad bestand aus 12 Einzelmessungen, wobei zwischen jeder Messung der Teller abgenommen und das Eichöl durch Schütteln neu um-

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