The Inductive Action of Alcohol-Killed Chick Hensen's Node on Amphibian Ectoderm[1]

Recent studies have shown that Hensen's node of avian blastoderm exerts an inductive influence on competent avian ectoderm, even when killed by alcohol or heat. In the experiments of LEIKOLA and MCCALLION[2], in which the ectoderm was cultured in vitro for 24–28 h, the killed Hensen's node induced neural structures with a relatively high frequency. In subsequent experiments by VISWANATH et al.[3], the ectoderm was cultured for 10–12 days in chick coelomic cavity, and both endodermal and neural structures were induced, although with lesser frequency. Since Hensen's node is in many respects comparable, if not homologous, to the amphibian upper blastoporal lip, it has appeared to us of interest to apply the killed Hensen's node on competent amphibian ectoderm, which is known to be readily induced by different dead inductors, including the killed blastoporal lip.

Hensen's nodes were excised from blastoderms of White Leghorn eggs incubated at 38 °C for 16–18 h (Hamburger-Hamilton stage 4). The nodes were killed by immersing them in 70% alcohol for some minutes, whereafter they were rinsed thoroughly with Holtfreter-Ringer solution. The competent ectoderm was obtained from young *Triturus vulgaris* gastrulae. 'Sandwiches' were made with the killed node between 2 pieces of ectoderm, and these explants were cultured for 7–10 days at 18 °C in Holtfreter-Ringer solution. They were fixed in Bouin's fluid, sectioned, stained with Borax-Carmine and Picroblueblack and examined histologically.

Of a total of 25 explants, 18 survived. In all of them archencephalic structures, including forebrain parts and, more frequently, eyes were found. In addition to them, only undifferentiated epidermis and, in some cases, more regular epidermis had been formed. Hindbrain, spinal cord or mesodermal structures were never present.

This result indicates that the alcohol-killed avian Hensen's node acts as a typical neuralizing inductor in amphibian ectoderm. Its action is thus comparable with that of various other heterogenous inductors, such as liver or different other heat-treated tissues, which contain only a neuralizing inductive agent and thus cause only archencephalic inductions[4]. On the other hand, the action of a killed Hensen's node on competent avian ectoderm seems to be more varied[3]. Thus it seems reasonable to conclude that the undetermined avian and amphibian ectoderm does not react in a similar way if the same inductor is used as a primary trigger. This conclusion is well in accordance with the results of ROSTEDT[5,6], who has applied different heterogenous inductors on avian blastoderm and obtained inductions that are remarkably different from those obtained earlier in amphibian ectoderm with the same heterogenous inductors.

Résumé. Le nœud de Hensen du blastoderme du Poulet a été tué par l'alcool et appliqué comme inducteur sur l'ectoderme des gastrules de *Triturus vulgaris*. Seules des structures archencéphaliques ont été induites, ce qui indique que l'ectoderme des Amphibiens réagit au même inducteur d'une manière différente de celui du Poulet.

J. R. VISWANATH, A. LEIKOLA and S. TOIVONEN

Laboratory of Experimental Embryology, Department of Zoology, University of Helsinki (Finland), 14 August 1968.

[1] Supported by grants from the Finnish National Research Council for Medical Sciences and from the Finnish National Research Council for Natural Sciences.

[2] A. LEIKOLA and D. J. MCCALLION, Can. J. Zool. *46*, 205 (1968).

[3] J. R. VISWANATH, A. LEIKOLA and I. ROSTEDT, Annls zool. fenn. *5*, 384 (1968).

[4] L. SAXÉN and S. TOIVONEN, *Primary Embryonic Induction* (Logos Press, Academic Press, New York 1962).

[5] I. ROSTEDT, Scand. J. clin. Lab. Invest. *21*, Suppl. *101*, 49 (1968).

[6] I. ROSTEDT, unpublished.

Responses of Resistance and Capacitance Vessels at Various Frequency Electrical Stimulation of Sympathetic Nerves

It is known that maximal reactions of resistance and capacitance vessels are induced by various frequencies of sympathetic stimulation. One group of authors[1] observed maximal response of cat's hindlimb resistance vessels at 16 cps and greatest reactions of capacitance vessels in the same preparation at 6 cps. The other group of authors[2], in experiments on dogs, noted the same value of changes at 10–20 cps for resistance vessels and at 10 cps for capacitance vessels. It was also shown[3] that maximal changes of capacitance vessels in the skin of hindlimbs arose at 15–20 cps. It should be stressed, however, that the results noted above were observed in experiments on hindlimb preparation, and it was not quite clear whether the parameters were of equal value for all vascular zones or whether the induction of maximal reactions in each of them needed particular frequencies. The purpose of this work was to elucidate the optimal frequency parameters for inducing maximal reactions of resistance and capacitance vessels of brain and lungs, as compared to reactions of resistance and capacitance vessels situated below the abdominal aorta bifurcation.

Technique. Experiments were performed on cats (49) anaesthetized with urethane (1 g/kg). Reactions of resistance vessels were identified by the changes of perfusion pressure and reactions of capacitance vessels by the value of maximal output or storing of blood. A vascular zone under investigation was perfused by means of a constant blood flow pump. Venous outflow from this zone was directed into the measuring cylinder from which the blood

[1] S. MELLANDER, Acta physiol. scand. *50*, suppl. 176 (1960).

[2] N. L. BROWSE, R. R. LORENZ and J. T. SHEPHERD, Am. J. Physiol. *210*, 95 (1966).

[3] W. D. KELLY and M. B. VISSHER, Am. J. Physiol. *185*, 453 (1956)