and gallop and the position of the forelimbs relative to that of the hindlimbs was not relevant.

Zusammenfassung. Eine elektromyographische Untersuchung über die Aktivitätsmuster verschiedener Extensormuskeln am Hinterbein einer frei laufenden Katze ist mit Korrelation zu den Bewegungsphasen der Extremität ausgeführt worden.

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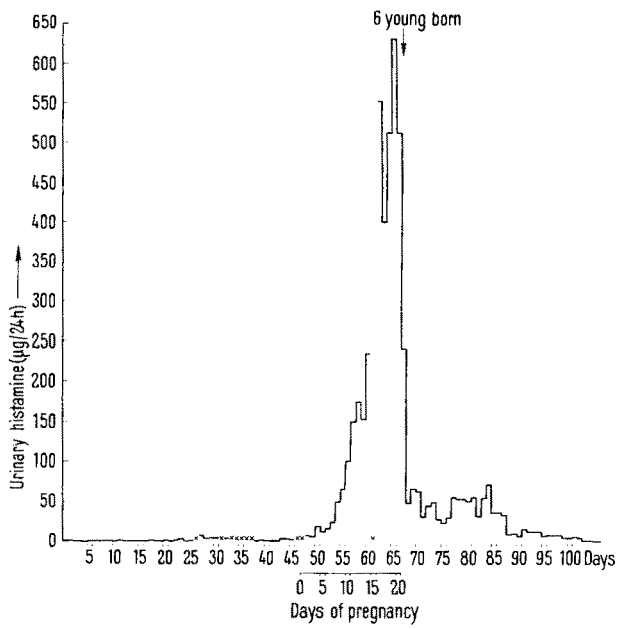
Formation of Histamine in the Pregnant Mouse

An increased urinary excretion of histamine has been observed in the pregnant rat. The increase was found to be associated with an exceptionally high level of histidine decarboxylase activity in the foetuses[1-3]. Little is known about the histamine metabolism during pregnancy in other species. *In vitro* studies of histidine decarboxylase in tissues of mice recently revealed an elevated enzyme activity in the kidney of the pregnant mother[4].

The present experiments show that in the mouse the urinary excretion of histamine is considerably increased during pregnancy, and that this increase may be due partly to a high histidine decarboxylase activity in the foetuses and partly to an elevated level of histidine decarboxylase in the kidney of the mother.

The mice were kept in metabolism cages and fed *ad libitum* a semi-synthetic diet free from histamine (< 0.02 µg/g). Urine was collected in 24 h samples and free histamine was estimated on the guinea pig's gut as previously described for rats[1]. Aminoguanidine sulphate, a histaminase inhibitor, was given in some of the experiments in a dose of 20 mg/kg subcutaneously once daily. Histidine decarboxylase activity was determined *in vitro* with a modification of Schayer's technique[2].

The pregnant mouse excretes abundant amounts of free histamine in the urine (Figure). The rise of histamine excretion begins already in the first week of pregnancy and reaches its peak 2–3 days before term. After delivery the urinary histamine decreases at first sharply, then more gradually and not until 3 weeks after parturition is the non-pregnant level restored. Administration of aminoguanidine before and during pregnancy does not cause a noticeably larger histamine excretion. In the rat an increase in the urinary excretion of histamine begins on the 14th day of gestation and subsides to the non-pregnant level immediately after parturition[1]. Thus, the onset of excess histamine formation is earlier and the termination later in the mouse.



Urinary excretion of free histamine in a mouse before, during and after pregnancy. * stands for sample not examined. The arrow indicates the day of parturition. The mother was deprived of her young immediately after parturition. Aminoguanidine was administed in a dose of 20 mg/kg once daily between 9th–102nd day of observation.

During the period of elevated urinary histamine excretion a high histidine decarboxylase activity is observed *in vitro* in the kidney of the mother mouse, attaining peak values around the 15th day of pregnancy, then gradually decreasing, and remaining elevated for some time after parturition. The histamine forming capacity in other tissues of the mother (skin, lung, stomach, small intestine, liver, and spleen) was of the same order of magnitude as corresponding tissues in non-pregnant animals. Preliminary results indicate that mouse foetuses also are capable of producing histamine and that the foetal histidine decarboxylase activity steadily increases during gestation.

The enzyme responsible for the formation of histamine in the mother's kidney as well as in the foetuses is largely inhibited when α-methyl histidine in a concentration of $10^{-3}M$ is added to the incubation mixture. α-methyl-DOPA, however, is less effective (Table). Studies of the pH-optimum of the histidine decarboxylase in the mother's kidney and the foetuses reveal a maximum around pH 7.2. These findings seem to indicate that here we are dealing with a rather specific histidine decarboxylase.

Inhibition of histidine decarboxylase activity in mouse tissues

Experiment No.	Enzyme source	C^{14}-histamine (µg) formed per g tissue without inhibitor	with α-methyl histidine $10^{-3}M$	with α-methyl histidine $10^{-4}M$	with α-methyl-DOPA $10^{-3}M$	with α-methyl-DOPA $10^{-4}M$
1	Pregnant mouse kidney	24.3	3.1	–	20.8	–
2	Pregnant mouse kidney	14.2	1.8	–	9.7	–
3	Mouse foetuses	5.8	1.3	5.5	5.2	5.6
4	Mouse foetuses	4.3	1.0	2.9	3.5	3.9

The incubation beaker contained ^{14}C-histidine in a concentration of $0.8 \times 10^{-4}M$

[1] G. KAHLSON, E. ROSENGREN, and H. WESTLING, J. Physiol. *143*, 91 (1958).
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Zusammenfassung. Untersuchungen der Histaminproduktion bei der trächtigen Maus ergaben eine Steigerung, die in der ersten Woche beginnt und bis zu 3 Wochen nach der Geburt der Jungen anhält. Die Aktivität des Enzymsystems, Histidindecarboxylase, ist während dieser Zeit erhöht, zuerst in der Niere der Mutter und danach in den Foeten. Die foetale Enzymaktivität ist am 19. Tage maximal. Versuche mit Substanzen, die die Enzyme hemmen, deuten auf eine spezifische Histidindecarboxylase hin.

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Salivary Secretion in Dogs during Degeneration of Postganglionic Parasympathetic Nerve Fibres

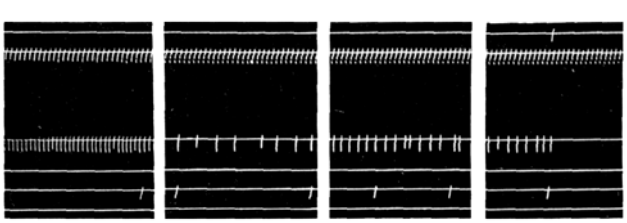
If the parotid duct of a cat is cannulated 1–3 days after section of the auriculo-temporal fibres, a flow of saliva is detected which occurs in bursts and is abolished by parasympatholytic agents[1]. A similar, though seldom paroxysmal, 'degeneration secretion' can be seen from the submaxillary and sublingual glands of the cat after postganglionic parasympathetic denervation. It is particularly rapid if the gland cells have been made supersensitive to stimulating agents by previous section of the preganglionic parasympathetic fibres[2]. The 'degeneration secretion' is assumed to be due to acetylcholine released from the endings of the degenerating cholinergic fibres.

It seemed of interest to determine whether 'degeneration secretion' could be found in other animals than the cat, and 14 dogs were chosen for the present study. In most cases the submaxillary and sublingual glands of one side were sensitized by preganglionic parasympathetic denervation (section of the chordalingual nerve). After a period of at least 3 weeks, a partial postganglionic denervation was then carried out by dissecting the chorda tympani along the salivary ducts and cutting it as close to the glands as possible. These two operations were carried out under pentothal anaesthesia (about 30 mg pentothal sodium/kg intravenously). The final acute experiment was started 27–67 h after the second operation and chloralose anaesthesia was used (about 80 mg/kg intravenously after induction with ether). The two submaxillary ducts, and in some cases the two sublingual ducts, were cannulated in the neck using fine glass cannulae. Saliva was always found to flow from the submaxillary and sublingual glands of the operated side. The Figure shows a typical experiment started 44 h after dissection of the chorda.

The secretion was irregular, as in the submaxillary and sublingual glands of the cat. Real bursts of activity with intervening periods of quiescence, as seen in the parotid gland of the cat, appeared in some dogs only. When the experiment was carried out 27–33 h after the postganglionic denervation, the flow of submaxillary saliva was extremely slow. After 42–52 h it seemed to be at its maximum. In a dog studied 67 h after dissection of the chorda, a relatively slow 'degeneration secretion' was still present but it decreased in rate during the following 6 h. In the cat the 'degeneration secretion' from the submaxillary gland reaches a maximum 25–30 h after postganglionic section and ceases after about 62 h[3].

The 'degeneration secretion' could always be abolished by a parasympatholytic agent, Hoechst 9980 ($\alpha\alpha$-diphenyl-γ-piperidinobutyramide). The effect of this drug is evident in the Figure. It suggests that the secretion, like that found in the cat, is caused by acetylcholine, and it would seem reasonable to assume this acetylcholine to originate from the endings of the degenerating postganglionic parasympathetic fibres.

The secretion described was not a result of the preganglionic denervation, carried out in advance in most cases in order to sensitize the glands. In two control experiments in which no dissection of the chorda was made but where the acute experiment was performed 3 weeks after section of the chordalingual nerve, there was no salivary flow from the decentralized glands. 'Paralytic secretion', described by BERNARD[4] as an effect of section of the chorda, is only obtained under experimental conditions which involve a pronounced release of catechol amines from the adrenal medulla. It is not seen in dogs or cats under chloralose anaesthesia (EMMELIN[5]). The sole effect of the preganglionic denervation in the present experiments was to render the gland cells more sensitive to the acetylcholine liberated from the degenerating postganglionic fibres. The 'degeneration secretion' was thereby made easier to detect. It was found, however, that sensitization is not an essential component of the phenomenon and that some secretion can be seen after dissection of the chorda, even if no preganglionic denervation has been made in advance.



'Degeneration secretion' from right submaxillary and sublingual glands. Right chorda-lingual nerve cut 5 weeks previously. Records from above downwards: signal; time in min; secretion from right submaxillary; left submaxillary; right sublingual; left sublingual gland. First section of the Figure started 14 h, second 16, third 19, and fourth 51 h after dissection of the right chorda. At the signal 1 mg Hoechst 9980/kg was given intravenously and the secretions have been abolished.

Zusammenfassung. Eine sogenannte Degenerationssekretion erscheint beim Hund in den Tagen nach der postganglionär-parasympathischen Denervierung der Submaxillaris- und Sublingualisdrüsen.

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[6] Visitor from the Department of Physiology, University of Melbourne (Australia).