Normal development of 27 embryos was shown by autopsy in 23 does into which 94 ova had been transferred, and only two embryos succumbed in 1 doe. The greater number of ova had succumbed before implantation.

The method used in this work differs from Chang's method in several ways. The determination of the role of the particular factors in the process of storage and transplantation needs further comparative investigations.

The possibility of creating a stock of mammalian ova by means of storage at low temperatures makes possible increased research on ova development, transplantation and transport.

OLGA KARDYMOWICZ
Department of Animal Breeding,
Agricultural College,
Cracow.

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Metabolism of Phosphatido-Peptide and Phospholipid in the Supersensitive Submaxillary Gland of the Cat, *in vivo*

EARLIER work by Emmelin and Muren[1,2] has shown that section of the parasympathetic nerve supply to the submaxillary glands of cats renders them supersensitive to cholinergic and adrenergic agents producing a greatly enhanced secretion from the supersensitive gland when compared with the normal gland. Hokin and Sherwin[3] have suggested that the turn-over of phosphoryl units in the phospholipid fraction of acetylcholine-stimulated submaxillary gland slices may represent a carrier mechanism functioning in the secretory process. In addition Huggins[4] has shown that there is an increased incorporation of radiophosphorus into the phosphatido-peptide fraction of slices of chicken pancreas when incubated in the presence of acetylcholine. These observations suggest that the increased secretory activity seen in the supersensitive submaxillary glands might be related to increased metabolic activity in the phosphatido-peptide and phospholipid fractions.

Cats were denervated by aseptically removing 5–10 mm. of the left chorda lingual nerve 2–3 weeks before the acute experiment. For the acute experiment the animals were anæsthetized with 30 mgm./kgm. sodium pentobarbital (intraperitoneal). Fine glass cannulæ were inserted into Wharton's duct from the mouth. Retrograde injections of acetylcholine in demineralized water were made according to the procedure of Emmelin, Muren and Strömblad[5]. A dose of acetylcholine which elicited a threshold secretory response in the normal gland was used throughout the experiment on both glands producing 3–4 drops of saliva from the normal and 10–14 drops of saliva from the denervated glands. Phosphorus-32 (disodium hydrogen phosphate), 200 μc./kgm., was injected subcutaneously, 5 min. before starting the experiment. The test dose of acetylcholine was injected every 15 min. during a 2-hr. period and the drops of saliva were recorded manually with a signal marker. At the end of the 2-hr. period the animal was killed by an intravenous embolus and the submaxillary glands were quickly removed and separated into the different phosphorus-containing fractions as described by Huggins and Cohn[6]. Analyses for mucin[7], sodium and potassium were carried out on the pooled saliva.

Table 1. EFFECT OF ACETYLCHOLINE* ON THE RADIOPHOSPHORUS METABOLISM AND SECRETION IN THE SUPERSENSITIVE SUBMAXILLARY GLAND OF THE CAT, *in vivo*

Treatment	Specific activity†		
	Phosphatido-peptide	Phospholipid	Total acid soluble
Normal	121	28·5	994
Denervated	214	43·5	1,020
	μgm. hexosamine per ml. saliva	m.equiv. sodium per ml. saliva × 10^{-3}	m.equiv. potassium per ml. saliva × 10^{-3}
Normal	27	17	4·6
Denervated	61	114	8·2

* Acetylcholine dose sufficient for threshold secretion from normal gland.
† Specific activity = c.p.m. per μgm.P.

Results presented in Table 1 show that the turn-over of the phosphorus in the phosphatido-peptide fraction of the supersensitive gland is increased some 175 per cent while that of the phospholipid fraction is increased some 150 per cent. The specific activity of the total acid-soluble fraction does not change significantly. Also, the secretory data in Table 1 show an increase in mucin secretion of 225 per cent, in sodium secretion of 670 per cent and in potassium secretion of 180 per cent, when compared between supersensitive and normal glands. Work on the components of the phospholipid fraction has shown that phosphatidyl inositol and phosphatidic acid are the most rapidly metabolizing components. In the phosphatido-peptide fraction it is the phosphorus atom that forms the diester linkage between glycerol and inositol which is stimulated in this process. Atropine, 0·5 mgm./kgm., was found to inhibit the stimulatory effect of acetylcholine. Furthermore, atropine in this concentration inhibited the increased turn-over of phosphorus in phospholipid and phosphatido-peptide found in glands which had been caused to secrete by electrical stimulation. Results similar to those obtained with acetylcholine were found with adrenaline as the stimulating agent.

The results presented here suggest a relationship between secretory processes and the metabolism of the phosphatido-peptide and phospholipid fractions of submaxillary glands. Indeed, the supersensitivity to secretion which follows parasympathetic decentralization was paralleled by a marked increase in the metabolism of these fractions. The role of the components of the phosphatido-peptide and phospholipid fractions in the phenomenon of supersensitivity and secretory processes is under active investigation in this laboratory.

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H. BURFORD
C. G. HUGGINS
Department of Pharmacology,
University of Kansas Medical Center,
Kansas City 12.

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