different from FRGPs in urine and parotide saliva[18–20]. Substances of this type found in ovarian cyst material seem to be a kind of blood-group substance type[21]. It has been shown that this FRGP from ovarian cyst content shares a common antigenecity with spleen tissue.

Zusammenfassung. Fucose-reiches Glykoprotein wurde aus Eierstockpseudomucin isoliert. Mit Hilfe spezifischer Anti-Glykoprotein-Seren wurde die Antigenizität der Pseudomucine mit Immunoelektrophorese und die Ouchterlony Methode untersucht.

M. H. Hamazaki[22] and K. Hotta[23]

School of Hygienic Sciences, and Department of Biochemistry, School of Medicine, Kitasato University Asamizodai, Sagamihara, Kanagawa (Japan), 12 July 1974.

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[22] School of Hygienic Sciences, Kitasato University.
[23] Department of Biochemistry, School of Medicine, Kitasato University, to whom correspondence should be directed.

Effect of Removing one Ovary and a Half on Ovulation Number in Cycling Rats

The Law of follicular constancy indicates that a given number of follicles mature during each estrous cycle regardless of the amount of ovarian tissue present. Whether this same generalization applies to the number of ova shed, remains to be answered. If it does, then the ovulation number for an animal should not change when ovarian tissue is removed or when extra-ovarian tissue is added. In agreement is the fact that unilateral ovariectomy in intact 4- and 5-day cycling rats resulted in the remaining ovary doubling the eggs shed[1]. However, conflicting with this idea is the finding that two extra-ovarian allografts in Fischer 344 rats caused a decrease in the number of eggs ovulated from the in situ ovaries (Chihal and Peppler, unpublished).

At 7–8 weeks post-operative in hemicastrated rats or those in which one ovary and a half had been removed, the remaining ovarian tissue contained the same number of large follicles[2]. However, hypertrophied half ovaries left in situ only contained 6 fresh corpora lutea 5 weeks after the removal of one ovary and a half[3]. Because of the implied discrepancy between these two reports, this investigation was performed to determine if removing one ovary and a half for 1 estrous cycle resulted in the normal number of eggs being ovulated (compensatory ovulation) at the next estrus.

Holtzman, female virgin rats were received at 50 days of age and divided into control ($N = 8$) and experimental ($N = 10$) groups. The animals were maintained in groups of 2 per cage with water and laboratory chow provided ad libitum. The lighting schedule was regulated for 14 h of illumination and 10 h of darkness. Daily vaginal smears were taken until 3 cycles were observed. Day 1 of the cycle refers to estrus.

Seventy-five percent of the ovarian tissue was removed on day 2 of the cycle by a dorsal-lateral approach. One ovary (18.5 ± 1.7 mg/100 g body weight) was completely removed and half (7.9 ± 1.5 mg/100 g body weight) of the other ovary was removed either by making a transverse cut across both the superior and inferior ends of the ovary or by making a lateral parasagittal cut. The ends of the ovarian bursa were pulled around the remaining ovarian fragment and pressed together.

Animals were killed 1 vaginal cycle later on day 2 (metestrus). Body weight and various organ weights were recorded. Each oviduct was dissected from the ovary (control group) or ovarian fragment (experimental group) and flushed with normal saline to determine ovulation number.

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Effect of removing one ovary and a half on ovulation number and various organ weights

Group	Body weight (g) ± S.E.	Eggs ovulated per rat ± S.E.	Organ weights (mg/100 g body wt. ± S.E.		
			Ovary[a]	Uterus	Adrenal[b]
Control ($N = 8$)	216.7 ± 2.8	9.5 ± 0.6	16.1 ± 0.8	117.5 ± 2.8	26.1 ± 1.2
One ovary and a half removed ($N = 10$)	212.3 ± 2.8	5.1 ± 0.6[c]	18.8 ± 1.4	114.3 ± 4.7	30.2 ± 1.0[c]

[a] Mean ovarian weight is one-half of the sum of both ovaries for control rats and the weight of the remaining ovarian fragment for the experimental group. [b] Mean adrenal weight is both adrenals for all rats. [c] $P < 0.025$ when compared to value for control rats.

At autopsy (Table), control rats ovulated the normal complement of eggs but those with only the ovarian fragment showed a 50% reduction in the expected ovulation number for the animal. Compensatory ovulation did not occur although the remaining fragment had hypertrophied to the weight of 1 ovary from control rats. Adrenal weight of the experimental rats was increased over control values; uterine weight did not differ.

12 h following the removal of 1 ovary, there is a transient rise in FSH concentration in the plasma which returns to normal level within 36 h[4]. In turn, this rise in FSH causes an increase in the rate of proliferation of smaller sized follicles into larger ones by proestrus[5] and thus accounts for the doubling of ova shed by the remaining ovary in the unilaterally ovariectomized rat.

In the present study, the fact that the ovarian fragment hypertrophied to the weight of 1 ovary in control rats is indicative of FSH stimulation. However, why the ovarian fragment did not show an increase in the number of ova shed as the remaining ovary in the hemicastrate rat does is not known. Explanations such as disruption of the intra-ovarian blood supply, removal of the larger-sized follicles, steroid and gonadotropin imbalance or surgical stress can be postulated. However, even though the amount of ovarian tissue does not affect the total number of follicles which mature during each estrus cycle, the results do demonstrate that the number of ova shed is affected by the amount of ovarian tissue present. This finding indicates that the hypothalamic-pituitary-ovarian axis is specifically regulated for the existing conditions within the rat during each estrous cycle rather than being autonomous in regards to ovulation number.

Zusammenfassung. Nachweis, dass bei der Ratte nach Entfernung von $1^1/_2$ Eierstöcken das verblieben Fragmente trotz kompensatorischer Hypertrophie eine 50%ige Reduktion der Ovulationszahl zeigt, was dafür spricht, dass die Anzahl der abgestossenen Eier durch die vorhandene Gewebemasse beeinflusst wird.

R. D. PEPPLER

Departments of Anatomy, Obstetrics and Gynecology, Louisiana State University Medical Center, 1542 Tulane Avenue, New Orleans (Louisiana 70112, USA), 14 October 1974.

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Magnesium Status and Iodide Uptake by Thyroid Gland

The magnesium status of the rat has been found to affect the accumulation of iodide by the thyroid gland, magnesium deficiency decreasing and loading with magnesium salts increasing the uptake of ^{125}I from the blood in vivo[1]. This could be due to a direct action of magnesium on the thyroid, or it could be secondary to other effects produced by disturbances in magnesium metabolism, and experiments were undertaken to investigate the former possibility.

Two experiments were performed in which thyroid glands attached to fragments of trachea were excised from male Wistar albino rats weighing about 75 g and incubated individually for 6 h in 3 ml of medium using a procedure similar to that described previously[1], except that magnesium salts and potassium perchlorate were omitted from the basic incubation medium. 0.04 μCi of ^{125}I, obtained as sodium iodide from the Radiochemical Centre, Amersham, England, was added to the medium containing each gland. At the end of the incubation the gland was washed free from medium and the ^{125}I activity in both the gland and the medium was measured by scintillation counting.

Initially glands from stock rats were incubated in media containing magnesium concentrations of 0, 2, 4 and 10 mg/100 ml and the results are shown in the Figure. The only statistically significant difference in ^{125}I uptake from that observed at the physiological magnesium concentration of 2 mg/100 ml was a reduced accumulation by glands in media containing the very high concentration of 10 mg/100 ml ($p < 0.05$, Students t-test). This indicated that changes in extracellular magnesium do not produce the effects observed in vivo, but it did not exclude the possibility that they may be due to changes within the thyroid cells.

Three groups of weanling rats were therefore fed magnesium-deficient (0.3 mg/100 g), control (80 mg/100 g) and magnesium-loaded (350 mg/100 g) diets for 13 days, the composition of the diets being identical apart from their magnesium content. All rats received an amount of food equal to that consumed by the deficient animals and they were fed automatically[2] to prevent any differences in feeding pattern; distilled water was provided ad libitum. The rats were exsanguinated from the heart and the thyroid glands removed immediately. Glands from deficient animals were incubated in magnesium-free medium, those from control and loaded rats in medium containing 2 mg/100 ml of magnesium. The plasma magnesium concentrations were determined by atomic absorption flame photometry and indicate the development of magnesium deficiency and loading similar in magnitude to that obtained during the previous studies in vivo, but no

Accumulation of ^{125}I by thyroid glands of magnesium-deficient and magnesium-loaded rats (means ± SEM, $n = 7$ for each group)

Group of animals	Plasma Mg (mg/100 ml)	^{125}I uptake by thyroid (% of original amount in medium)
Control	2.45 ± 0.10	5.05 ± 0.32
Mg-deficient	0.73 ± 0.10[a]	5.09 ± 0.23
Mg-loaded	3.66 ± 0.16[a]	4.43 ± 0.21

[a] Significantly different from control $p < 0.001$.

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