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the effects of the ovarian status, oocyte morphology and hormone supplementation on *in vitro* oocyte maturation in domestic cats.

Pairs of ovaries recovered through ovariectomy were categorized into three phases (inactive, follicular and luteal) based on the presence or absence of follicles and corpora lutea. Oocytes from each phase were classified into five groups (class A; oocytes with dark ooplasm and compact cumulus cells, class B; oocytes with dark ooplasm and less compact cumulus cells, class C; almost naked oocytes with dark ooplasm and a part of the corona radiata, class D; oocytes with pale ooplasm, class E; oocytes with irregular ooplasm).

In the first experiment, all oocytes, except those of class E, were cultured in HEPES-buffered TCM199 supplemented with fetal calf serum (FCS), sodium pyruvate, FSH and 17β -estradiol (E_2) at 39°C for 48–49 hours. In class A and B oocytes, the proportion of oocytes that achieved metaphase II (M II) was significantly higher ($p < 0.05$) than those in classes C and D. There were no significant differences in the proportion of oocytes reaching M II among oocytes collected from inactive, follicular and luteal phase donors. Class A and B oocytes, with high meiotic competence, were collected from the follicular phase donors in higher proportion than from the inactive phase donors ($p <$

0.05). The proportion of oocytes from the luteal phase donors was not significantly different from the other two phases.

In the next experiment, the effect of hormone supplementation to the maturation medium was examined. Class A and B oocytes from luteal phase donors were matured in TCM199 + FCS with or without FSH, FSH and E_2 . The supplementation of FSH to the maturation medium increased the proportion of oocytes that reached M II ($p < 0.05$) compared to the control group. Adding E_2 with FSH did not result to a significantly different proportion of oocytes that achieved M II compared to that supplemented with FSH alone or those matured in the absence of hormones.

These data indicate that the *in vitro* maturation of domestic cat oocytes is affected by oocyte morphology. Namely, oocytes surrounded by cumulus cells show high meiotic competence. These oocytes with high meiotic competence were collected from follicular phase donors in higher proportion than those collected from inactive phase donors. The addition of FSH to the maturation medium promoted *in vitro* maturation of domestic cat oocytes. However, the variation of individuals was large, suggesting that other factors affect domestic cat oocyte maturation *in vitro*.

Histopathological study on pancreatic acinar atrophy in the dog

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The purpose of this study was twofold: (1) to evaluate the microscopic changes of the early stages of pancreatic acinar atrophy (PAA) and (2)

to investigate related changes of pancreatic islet cells in dogs with PAA by histopathological and immunohistochemical examinations.

Five dogs with spontaneous PAA and 4 clinically healthy dogs were used. These 5 dogs with spontaneous PAA were divided into 5 cases, case 1; early stages of PAA and cases 2 to 5; late stages of PAA.

Microscopically, atrophic and non-atrophic areas were observed from both biopsy specimens and necropsy samples collected from the pancreas of case 1. Atrophic areas were characterized by destroyed acinar structures, whereas in non-atrophic areas acinar cell structures could still be observed. The microscopic appearances of the pancreases in cases 2 to 5 coincided with those recognized in previous reports. In case 1 atrophic areas were located near the pancreatic duct and on the periphery of the lobuli. In the atrophic areas, metaplasia of ductal cells and hyperplastic changes of ducts were observed. In the non-atrophic area of case 1, almost all acinar cells of biopsy specimens had zymogen granules, but acinar cells of necropsy samples which had zymogen granules were rare. Furth-

ermore, the cytoplasm of acinar cells in the non-atrophic areas of case 1 were characterized by diffusely distributed vacuoles and atrophy.

Apoptosis of acinar cells was seen in non-atrophic areas of cases 1 and 3. In addition, apoptotic cells showed a positive reaction to TUNEL staining.

On immunohistochemical examination of the pancreatic islet cells in the non-atrophic area of case 1, a decrease in the proportion of pancreatic islets cells was found compared to the controls. In the atrophic areas of all cases, the appearance of islets of Langerhans and the ratio of islet cell structures was very different from that of the controls.

These results suggested that atrophy of the acinar cells in PAA develops near the pancreatic ducts and the periphery of the lobuli, and the possibility that apoptosis plays a role in the pathogenesis of PAA. In addition, it appeared that atrophy of acinar cells might have an effect on the composition of the islet cells.

Clinicopathological studies of serum adenosine deaminase activity in cattle

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The purpose of this study was to clarify the clinical usefulness of serum adenosine deaminase (ADA) activity in cattle.

The serum levels of ADA in 135 clinically healthy cattle and 128 cattle with various diseases were measured by an automated enzymatic method. Other blood chemical parameters that are measured routinely in clinics and bovine leukosis virus antibodies (BLVab) of the diseased cattle were assayed at the same time. Moreov-

er, 85 livers of diseased cattle were examined for routine histopathology.

The results obtained were follows :

Serum ADA levels of normal cattle were 5.4 ± 2.6 IU/l (mean \pm SD), which was lower than that of humans. Serum ADA levels of healthy milk cows were lowest during pregnancy. There was no statistically significant difference between milk cows and castrated Holsteins.

Serum ADA levels were high in most cattle