Hokkaido University granted the degree of Doctor of Veterinary Medicine to the following graduate of the Graduate School of Veterinary Medicine on 24 March, 1979.

The title and other information are as follows:

SYNTHESIS ABILITY OF AMINO ACIDS AND PROTEINS FROM NON-PROTEIN NITROGEN AND ROLE OF INTESTINAL FLORA ON THIS UTILIZATION IN PIGLETS

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Original reports of this thesis appeared partly in "Journal of Nutrition" Vol. 108, 1572~1579 (1978), and in "Japanese Journal of Veterinary Research" Vol. 26, 68~73 (1978). Another has been in the contribution to "British Journal of Nutrition".

Hokkaido University granted the degree of Master of Veterinary Medicine to the following 18 graduates of the Graduate School of Veterinary Medicine on 24 March, 1979.

The authors' summaries of their theses are as follows:

THE EFFECT OF ULTRASOUND ON CALF THYMUS DNA AS A TEMPLATE FOR RNA SYNTHESIS

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The effect of 19.5 kHz ultrasound on calf thymus DNA was investigated by observing the template activity for RNA synthesis in vitro. The template activity of DNA decreased with increasing sonication time. The template activity decreased rapidly for a short period of sonication, and then decreased slowly with an exponential dependence on the sonication time.

Some experiments were carried out to clarify the physicochemical changes in soni-

cated DNA which were responsible for the reduction of the template activity. The average molecular weight of sonicated DNA was determined from sedimentation profiles in neutral sucrose gradients. The molecular weight of DNA markedly decreased by sonication for periods up to 2 min, and levelled off for longer periods than 2 min.

The alkaline sucrose gradient analysis showed the linear increase of single strand breaks in sonicated DNA with increasing sonication time. The template activity of sonicated DNA decreased with an exponential dependence on the number of single strand breaks, as seen in the curve of the template activity vs the number of single strand breaks. The increase in absorbance at 260 nm of sonicated DNA was observed when DNA was sonicated at high acoustic powers for a long period, indicating that the rupture of hydrogen bonds in base pairs of DNA was caused by sonication. Free radicals as measured by Fricke Dosimeter were produced linearly with the sonication time.

These results suggest that the reduction of the template activity of DNA for a short period of sonication was mainly due to the double strand breaks in DNA which were produced by the mechanical effects of ultrasound, and that the single strand breaks in DNA produced by the chemical effects of ultrasound caused the decrease in the template activity of DNA for longer periods of sonication.

THE EFFECT OF MERCURY COMPOUNDS ON THE RELEASE OF NORADRENALINE FROM GUINEA-PIG VAS DEFERENS

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The present experiment was carried out to investigate the effect of mercury compounds on the spontaneous and evoked release of noradrenaline from isolated guinea-pig vas deferens.

1) Methylmercuric chloride (MMC, 25 μM$\sim$0.2 mM), p-chloromercuriphenyl sulfonate (PCMBS, 0.25 mM$\sim$1 mM) and mercuric chloride ($HgCl_2$, 50 μM$\sim$0.2 mM) were found to be effective in increasing the noradrenaline output in a concentration dependent manner. The effect of MMC and $HgCl_2$ did not depend on extracellular calcium, but the response to PCMBS was reduced in the absence of extracellular calcium. Thiol, such as cysteine and penicillamine, reversibly inhibited the effect of mercury compounds, when added simultaneously with them in equal or twofold concentration.