## Ultracytochemical Changes in the Distribution of Acid Phosphatase and Thiamine Pyrophosphatase Activity in the Nerve Cells of Vitamin E Deficient Rats

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The young male Wistarking rats were kept on vitamin E deficient diet for 4-13 weeks., and changes in acid phosphatase (ACPase) and thiamine pyrophosphatase (TPPase) were observed at the ultrastructural level in the nerve cells of the cerebrum and spinal cord.

Results:

1. In 4th week and onwards ACPase activity in the Golgi apparatus is increased.
2. In 4th week and onwards TPPase activity in the Golgi apparatus is decreased.
3. There is no remarkable change in lysosomes between 4 to 9 weeks. In 13 weeks, however, lysosomes seem to be increased twice in size. While ACPase activity is not significant but the number and size of the lysosomes seem to be increased occasionally in the later stage of deficiency.

## The structure of the proliferated smooth endoplasmic reticulum (SER) in hepatocytes of phenobarbital (PB)-treated mice

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Male and female DDD mice received 5 daily injections of sodium PB (100mg/kg, intraperitoneally). Livers were perfused with 2.5 % buffered glutaraldehyde (GA) for 15 min or sliced livers (about 0.3 mm thick) were immersed in the same fixative for 2 hr at 4°C, washed in buffer and fixed in 1% buffered $OsO_4$. Livers were also perfused with 2% buffered GA for 2 min washed in buffer and incubated Wachstein & Meisel' medium for glucose 6-phosphatase (G6Pase) for 17 min.

In hepatocytes fixed by the perfusion, proliferated SER consisted usually of tubular elements in animals of both sexes, but some cells showed proliferation of vesicular elements of SER in male animals. Vesicular elements of SER was thought to be presumably a type of the proliferated ER. However, in livers fixed by the immersion, the cells showing proliferation of vesicular elements of SER increased markedly in number. Therefore, vesicular elements of SER in hepatocytes of PB-treated mice is artifact originated probably from tubular elements of SER. Hepatocytes of both sexes showed the same localization pattern of G6Pase in SER-proliferated areas.

## Cylinderization of Golgi apparatus in cyclic AMP-perfused mouse hepatic cells and thiamine pyrophosphatase activity

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Previously we have reported the occurrence of lysosomal wrapping mechanism and the cylinderization of the Golgi apparatus(CG) in mouse hepatic parenchymal cells perfused with cyclic AMP at concentrations of $6x10^{-7}M \sim 3.3x10^{-3}M$ or dibutyryl cyclic AMP at concentrations of $4x10^{-7}M \sim 2x10^{-3}M$ (Acta Anatomica Nipponica 49, 15, 1974). CG in Kupffer cells was observed only with high doses of cyclic AMP. The cylinderized Golgi apparatus was considerably different in shape from the normal one.

In this investigation the demonstration of thiamine pyrophosphatase activity, a marker enzyme of the Golgi apparatus, was performed to confirm the Golgi apparatus nature of the cylinderized Golgi apparatus.

## Cytochemical study of glucose-6-phosphatase activity in Chinese hamster testis

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Glucose-6-phosphatase(G6Pase) activity was studied cytochemically in Chinese hamster testis. Seminiferous tubules were dissected and were fixed in 2% glutaraldehyde. 40μ frozen section were cut and incubated in the Wachstein-Meisel's medium (1956). 5min fixation and 30-60min incubation gave satisfactory results. The enzyme activity was demonstrated in germ cells, Sertoli cells and Leydig cells. It was localized within the cisternae of smooth and rough endoplasmic reticulum and nuclear envelope. The specialized portion of the nuclear envelope, e.g. acrosomal attachment region and articular fossa of the neck, showed diminished or no enzyme activity in the maturing spermatids. The plasma membrane and Golgi apparatus of the three kinds of cells in the testis were enzyme negative. Spermatids showed more intense G6Pase activity than the spermatogonia and spermatocytes. The data suggests the spermatids are metabolically more active than the young germ cells.