Multimerization of thyroglobulin molecule

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Thyroglobulin molecule is known to undergo a multimerization, dimerization or oligomerization, during oxidative iodination, which is responsible for the biosynthesis of thyroid hormones in thyroglobulin molecule. The oxidative multimerization of thyroglobulin is reported to be ascribed to the formation of disulfide bond or dityrosine bond in thyroglobulin molecule. In an attempt to elucidate the involvement of the disulfide formation in the multimerization of thyroglobulin molecule, the protein was exposed to various redox conditions, where the concentration of reduced glutathione (GSH) and oxidized glutathione (GSSG), the temperature (38 ℃ ~ 60 ℃) and the pH (pH 6 - 9) were varied. Also, the effect of detergents, ionic or non-ionic, on the multimerization of thyroglobulin was examined. The change of molecular form of thyroglobulin was examined by SDS-PAGE under reducing and non-reducing conditions. Our present study demonstrates that thyroglobulin molecules go through the disulfide formation to produce dimeric or oligomeric forms in the presence of GSH (2 mM)/GSSG (1 mM) at 50 ℃ or higher temperatures. The multimerization was more favorable at acidic pH rather than alkaline pH. In addition, the inclusion of deoxycholate (0.5 %) or Triton X-100 (1 %) promoted the multimerization. From these results, it is suggested that the multimerization of thyroglobulin under the condition used is mainly due to the oxidative linkage of cysteine residues in thyroglobulin molecule.

[PC1-14] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Anticoagulant Activity of Sulfoalkyl Derivatives of Curdlan

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Curdlan is a natural β-1,3-glucan produced by Agrobacterium biovar 1. In this study, the anticoagulant activity of sulfoalkyl derivatives of curdlan was investigated by carrying out activated partial thromboplastin time (APTT) assay and compared with that of o-sulfonated curdlan. Approximately 100-fold higher concentration of o-sulfonated curdlan than heparin was required to obtain the same level of the clotting time. Anticoagulant activity of curdlan derivatives was dependent on the degree of sulfation in prolonging the clotting time. However, the chain length of the substituent did not play a role in prolonging the clotting time. The curdlan derivatives enhanced thrombin inhibition by mediating through antithrombin III. The inhibition of thrombin by o-sulfonated curdlan was found to be approximately 10-fold weaker than that by heparin.

[PC1-15] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Spontaneous Release of Renal Dipeptidase from Renal Proximal Tubules with Long Term Incubation : The Least Expensive Purification Method

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The long term Incubation (6 h or longer, 37 oC) of rabbit or porcine renal proximal tubules (PTs) that

had been prepared in the normal laboratory condition resulted in release of glycosylphosphatidylinositol (GPI)-anchored enzymes, renal dipeptidase (RDPase, EC 3. 4. 13. 19) and alkaline phosphatase (APase, EC 3. 1. 3. 1), from the membrane. This spontaneous release of membrane bound enzymes was inhibited by ampicillin, kanamycin and gentamicin. The release pattern of these GPI-anchored enzymes from the PTs and the inhibition by gentamicin were abolished in the presence of the long term incubation supernatant of PTs. The ammonium sulfate fraction (50 % saturation) of porcine 9h incubation supernatant, but not the 2h, caused time- and concentration-dependent release of RDPase and APase from the rabbit PTs suggesting the presence of transferable GPI-anchored protein hydrolyzing entity which is not limited to its own species. We identified Bacillus cereus, not identified its original source yet, as the causative factor. The porcine PTs were the better source of these GPI-anchored enzymes compared with the rabbit because of their availability in larger quantities. We report this simple and inexpensive method which may be applied for the solubilization of other GPI-anchored proteins as well.

[PC1-16] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Berberine induces interleukin-12 p40 production in mouse macrophages by promoting p38 mitogen-activated protein kinase pathway

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Interleukin-12 (IL-12) plays a pivotal role in the development of T helper type 1 (Th1) immune response, which may have potential therapeutic effects on diseases associated with pathologic Th2 responses such as allergic disorders and asthma. In this study we investigated the effects of on IL-12 production in mouse macrophages. Berberine, known as an antimicrobial and antitumor alkaloid, significantly increased IL-12 p40 production from mouse macrophages in a dose-dependent manner. The IL-12 production induced with berberine was significantly inhibited by p38 mitogen-activated protein (MAP) kinase inhibitors. Moreover, phosphorylated p38 MAP kinase was increased in the presence of berberine, implying the involvement of p38 MAP kinase in the induction of IL-12 p40 by berberine. Furthermore, berberine synergistically increased IL-12 production when combined with lipopolysaccharide. This immunomodulatory effect may explain some of the known biological effects of berberine and suggest berberine as an immunotherapeutic compound for induction of IL-12, which is potentially applicable for tumors, infectious disease, and airway inflammation.

[PC1-17] [04/19/2001 (Thr) 15:30 - 16:30 / Hall 4]

Effects of aging and dietary restriction on the apoptosis related genes of rat testis

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The purpose of this study was to determine whether the apoptosis related genes in rat testis alters with aging and dietary restriction. It was reported that apoptotic cell death of rat testicular germ cell increases with age. In this study, we investigated the changes of the apoptosis related genes such as p53, p21, bcl-2/bax, fas and caspase-3 in 6-, 12-, 18-, and 24-month old Fischer 344 rats which were fed ad libitum and diet-restricted. The protein level of p53 increased with aging. In 18 months, the protein level of p53 increased 5 times more than that of 6 month and in dietary restriction group, this increase was also modulated. P21 protein level was also increased with aging In 18 months, the protein level of p21 increased 40 times more than that of 6 month and it was modulated in dietary restriction group. The bcl-2, bax ratio was decreased after increase in 12 month. But dietary