column. The second Sephadex G-100 solution was not shown PO activity by microgram order of LPS and B-1,3-glucan. Nanogram quantity of soluble PG was specifically quantified by using this G-100 solution in vitro. Also, I purified and characterized specific PG recognition proteins from G-100 solution by using Dextran sulfate CL-6B column and Butyl-Toyopearl FPLC.

[PC1-40] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Down-regulation mechanism of Senescence Marker Protein 30 by ROS during aging

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The senescent changes in the expression of functional proteins affect multiple deteriorative factors for various cellular activities and homeostasis. As the cause of deterioration during aging, reactive oxygen species (ROS) are well-known factors. Senescence marker protein 30 (SMP-30) plays an important role as a calcium binding protein that is known to be identical to regucalcin. The expression of SMP-30 that is preferentially exhibited in hepatocytes and renal tubular epithelia significantly declined during aging. It has been demonstrated that SMP-30 rescues cell death by enhancing plasma membrane Ca^{2+}-pumping activity. However, recently, there is no information on the SMP-30 modulation by the anti-aging action of calorie restriction (CR). To characterize the status of SMP-30, the study explored the effect of aging on SMP-30 modulation by CR. The kidney and liver were isolated from Fischer 344 rats at 6, 12, 18, and 24 months of age fed ad libitum (AL) and CR rats. Results showed that SMP-30 expression markedly decreased during aging, whereas this decreased expression was clearly blunted by CR, showing a comparable level of 6 month-old AL rats. To investigate an aspect that age-induced ROS are related with SMP-30 gene expression, it was examined whether LPS-induced ROS affect gene expression of SMP-30 and DNA binding activity for nuclear protein. These results suggest that down-regulation of SMP-30 is reconciled with both age-related ROS and experimentally LPS-induced ROS.

[PC1-41] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Regulation of Redox-sensitive Transcription Factors in aging process

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Oxidative stress is considered to be the major cause of aging and many age-related diseases. Calorie restriction (CR) is known to retard the aging, and age-related deleterious processes. Recent studies documented that CR retards the aging process with its anti-oxidative ability by regulating the intracellular redox balance. Among key cellular components exquisitely sensitive to the redox status are transcriptions factors such as nuclear factor kappa B (NF-κB), activator protein-1 (AP-1), and hypoxia inducible factor-1 (HIF-1). Currently, there is a limited information available on the age-related and dietary modulation on these factors. In this review, major focus was placed on whether age affects the regulation of NF-κB, AP-1 and HIF-1, and further to delineate how the age-related changes are modulated by CR. It is concluded that the age-related increases in redox-sensitive NF-κB, AP-1, and HIF-1 binding activities are associated with increased ROS, and further that CR modulates their activations by suppressing oxidative stress. Data on molecular regulation provides better molecular insights into the mechanisms underlying the cellular redox maintenance, which may reveals the cross-talk between the aging and age-associated pathogenic processes.

[PC1-42] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Participation of Protein Disulfide Isomerase in Molecular Fate of Thyroglobulin and its Regulation by Endogenous Oxidants and Reductants

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Molecular fate of thyroglobulin (Tg) is controlled by oligomerization, and deoligomerization. Here, we investigated the protein disulfide isomerase (PDI) and/or peroxidase-induced oligomerization of unfolded thyroglobulins, which were prepared from the treatment of bovine thyroglobulin with heat, urea or thiol/urea, on the basis of SDS-PAGE analyses. In addition, the enzymatic oligomerization was compared with non-enzymatic oligomerization. The thermally-induced oligomerzation of Tg, dependent on GSH redox state, was affected by ionic strength or detergent. Meanwhile, the PDI-catalyzed oligomerization, time-dependent, was the most remarkable with unfolded/reduced Tg, prepared from the treatment with urea/DTT, while thermally-unfolded Tg was less sensitive. Similarly, the oligomerization of unfolded/reduced Tg was also mediated by peroxidase/hydrogen peroxide. However, PDI showed no remarkable effect on the peroxidase-mediated oligomerization of unfolded or unfolded/reduced Tg. Additionally, the reductive deoligomerization of oligomeric Tg was exerted by PDI in excessively reducing state. Based on these results, it is suggested that PDI catalyzes oligomerization of thyroglobulin through the formation of disulfide bond, and its deoligomerization in the molecular fate, and this process may require a specific molecular form of thryglobulin, optimally unfolded/reduced, in proper redox state.

[PC1-43] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Influence of Aging on MAPKs Activity in Rat Kidney

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Mitogen-activated protein kinases (MAPK), which include the extracellular signal-related kinases (ERK), the c-Jun N-terminal kinases (JNK), and the p38 MAPK, are important regulatory proteins by which a wide variety of extracellular signals are transduced into intracellular sites. Recent studies report that reactive oxygen species (ROS) regulate mitogenic signal transduction in various cell types. In the present study, we investigated the effects of aging and calorie restriction (CR) on ROS generation and MAPK activity in rats using kidney isolated from Fischer 344 rats, ages 6, 12, 18, and 24 months fed ad libitum (AL) and CR diets. Results showed that total ROS generation increased with age in the AL rats, while little change occurred in CR rats, even in senescent, 24-month-old rats. Results also showed that the aging process strongly enhanced all three of the MAPK activities studied, ERK, JNK, and p38 MAPK, in a fashion parallel to increased ROS generation. Conversely, we observed CR to markedly suppress the age-related activation of MAPKs. Based on these data, we concluded that an age-related increase in MAPK activity is associated with increased ROS and that CR modulates the MAPK activity.

[PC1-44] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Collaborative study for establishment of KFDA standard for human recombinant Interferon alpha-2a for potency

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The complexity of human recombinant interferon alpha made by different manufacturers can show various biological activities and raise a number of scientific issues with regard to biological standardization. Therefore, individual standards were required for biological standardization and potency determinations of individual interferon alpha subtypes. To establish KFDA standard for human recombinant interferon alpha-2a, KFDA organized a collaborative study. KFDA and other 4 manufacturers participated in this study. Participants were asked to assay the candidate standard in their own bioassay, which was an antiviral assay using MDBK/VSV system, in terms of the 2nd international standard for recombinant interferon alpha-2a (NIBSC 95/650). For each assay, all raw data were analysed by their own analytical methods and the same data were analysed by methods of parallel line analysis with assessment of regression, linearity and