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Monocytes and tissue macrophages produce at least two groups of protein mediators of inflammation, interleukin 1(IL-1) and tumor necrosis factor(TNF). Recent studies have emphasized that TNF and IL-1 modulate the inflammatory function of endothelial cells, leukocytes, and fibroblasts. The effects of linarin, the main compound from *Chrysanthemum zawadskii*, on the mouse macrophage cell line, RAW 264.7 cells, were therefore investigated. It was found that linarin could stimulate macrophage activation by the production of cytokines. The production of TNF- $\alpha$  by macrophage treated with linarin was examined in dose dependent manner. The production of IL-1, however, was not the case by this natural product. The herb of *Chrysanthemum zawadskii*, which is called Gu-Jul-Cho, has been used in traditional medicine for pneumonia, bronchitis, cough, common cold, pharyngitis, bladder-related disorders, women's diseases, gastroenteric disorders, and hypertension. These results suggest that linarin may function through macrophage activation.

[PB4-7] [ 04/19/2001 (Thr) 15:30 - 16:30 / Hall 4 ]

### IL-12 expression effects of macrophage by the lectin-conjugated praecoxin A

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It has been understood that in cytokines there is a IL-12, which acts as T-cell growth and differentiation factor, secreted from macrophage, which is a natural immune-response cell and where it attacks and destroy the target cells in response directly to an antigen. This research was designed to see the broad immune activity reaction such as in anti-virus and anti-HIV other than the direct anti-cancer activity by combining the praecoxin A having a specific anti-cancer activity of Ellagitamins, a hydrolytic tannin with many immune activities, with the wheat germ agglutinin(WGA) specifically binding to melanoma. For the analysis of IL-12 mRNA expression in vitro and in vivo, we added lectin 10 $\mu$ g/ml, praecoxin A 10 $\mu$ g/ml, lectin-conjugated praecoxin A 1, 10, 100 $\mu$ g/ml to macrophage and analyzed total RNA at 4, 8, 12, 24 hour after the incubation. It is expected to obtain the increase outcomes of IL-12 mRNA expression in lectin, praecoxin A and lectin-conjugated praecoxin A in accordance with the dose and the time but is not expected that the lectin-conjugated praecoxin would show much stronger increase outcomes than lectin or praecoxin A does.

[PB4-8] [ 04/19/2001 (Thr) 15:30 - 16:30 / Hall 4 ]

### Immune activity effects by the Lectin-conjugated praecoxin A

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Lectin-conjugated praecoxin A is a compound that is combined the praecoxin A having a specific anti-cancer activity of Ellagitamins, a hydrolytic tannin with many immune activities, with the wheat germ agglutinin(WGA) specifically binding to melanoma. In order to see an immune activity other than anti-cancer activity of this compound, we have studied the IL-6 mRNA expression in cytokine (especially in proinflammatory), which is secreted by macrophage in vivo and in vitro. The analysis was done by using RT-PCR for IL-6 mRNA expression in the total RNA extracted from macrophage after the incubation for 4, 8, 12, 24 hours after adding the lectin-conjugated praecoxin A of 1, 10, 100

$\mu\text{g}/\text{mL}$ , lectin  $10\mu\text{g}/\text{mL}$ , praecoxin A  $10\mu\text{g}/\text{mL}$  to normal murine macrophage. Both in vitro and in vivo, lectin-conjugated praecoxin A did not show stronger effects than lectin and praecoxin A even though lectin-conjugated praecoxin A showed an increase in IL-6 mRNA expression in accordance with the dose & the time, and showed the similar increase with lectin or praecoxin in IL-6 mRNA expression

[PB4-9] [ 04/19/2001 (Thr) 15:30 - 16:30 / Hall 4 ]

### Effects of Lectin-conjugated Ellagitannin on the IL-1 $\beta$ gene expression of macrophage

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Lectin-conjugated praecoxin A, which is conjugated the praecoxin A, a kind of tannins extracted from plants, with the wheat germ agglutinin(WGA) that specifically binds to melanoma, of carbohydrate-binding proteins(lectin), is a compound aiming the development of the missile antitumor drug selectively being activated in cancer cells. Besides the direct antitumor effect of this compound, we have tried to prove an immune activity as a tannin through the macrophage activation by Lectin-conjugated praecoxin A. This has been done by conducting the IL-1 gene expression in vivo and in vitro. We analyzed the total RNA by using RT-PCR at 4. 8. 12. 24 hours after the incubation after adding the lectin-conjugated praecoxin A of 1, 10,  $100\mu\text{g}/\text{mL}$ , lectin  $10\mu\text{g}/\text{mL}$ , praecoxin A  $10\mu\text{g}/\text{mL}$  to normal murine macrophage. As a result, the lectin-conjugated praecoxin A increased the IL-1 $\beta$  mRNA expression according to the time and the dose. However, no outstanding increase effect (great superiority) comparing to lectin and praecoxin A has been seen through out the study.

[PB4-10] [ 04/19/2001 (Thr) 15:30 - 16:30 / Hall 4 ]

### Hydroquinone enhances the levels of interleukin-4 production and IgE in antigen-primed BALB/c mice

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Hydroquinone (HQ), a major metabolite of benzene, is present in large quantities in cigarette tar and represents the predominant form of human exposure to benzene. In this study we investigated the ability of HQ to enhance the production of IL-4 in antigen(alum)-primed BALB/c mice. HQ was found to enhance IL-4 production by keyhole limpet hemocyanin (KLH)-primed lymph node cells in a dose-dependent manner. The enhancing effect of HQ on IL-4 production was approximately maximal at a concentration of  $50\mu\text{M}$  with 10-fold increased levels of IL-4 production. HQ enhanced KLH-induced IL-4 mRNA expression, suggesting that the enhancing effect of HQ on IL-4 production may occur at the transcriptional level. To determine whether HQ could up-regulate IL-4 production in vivo, HQ was given i.p (10 mg/kg for 14 days every other day during KLH immunization) in BALB/c mice. HQ treatment resulted in significant increase of IL-4 and IgE levels in KLH-primed mice. These findings provide an evidence that HQ enhances allergic immune responses in cigarette smokers.

[PB4-11] [ 04/19/2001 (Thr) 15:30 - 16:30 / Hall 4 ]

### Inhibition of interleukin-12 p40 production in lipopolysaccharide-stimulated mouse macrophages by costunolide, a sesquiterpene lactone