

factor—a production from RPMC. These results indicate that PVAE inhibits immediated–type allergic reactions in rats.

[PD3–9] [ 10/19/2000 (Thr) 15:00 – 16:00 / [Hall B] ]

**Inulin synergistically stimulates interferon–gamma–induced nitric oxide synthesis through NF–kappa B activation in RAW 264.7 cells**

**Koo HN<sup>o</sup>, Na HJ, Kim HM, Lee YM**

Department of Oriental Pharmacy, College of Pharmacy, and Center of Oriental Medicinal Science, Wonkwang University, Iksan, Chonbuk, 570–749, South Korea

**ABSTRACT**

Nitric oxide (NO) mediates a number of the host–defense functions of activated macrophages, including antimicrobial and tumoricidal activity. We examined the effect of inulin on NO release in the cultured murine macrophage RAW 264.7 cells. Inulin alone had no effect, whereas inulin with recombinant interferon– $\gamma$  (rIFN– $\gamma$ ) synergistically increased NO release from and iNOS expression in RAW 264.7 cells. Inulin–mediated NO release were inhibited by the tyrosine kinase inhibitor, genistein. Also, protein kinase C (PKC)– $\delta$  were involved in the inulin–induced NO production. Since iNOS gene transcriptions have been recently shown to be under the control of nuclear factor kappa–B (NF–kappa B)/Rel family of transcription factors, we assessed the effect of inulin on NF–kappa B/Rel using an electrophoretic mobility shift assay. Inulin strongly induced of NF–kappa B/Rel binding, whereas AP–1 binding was slightly induced in RAW 264.7 cells. Inulin also stimulated phosphorylation and degradation of Ikappa B– $\alpha$ . Taken together, these results indicate that inulin stimulates IFN– $\gamma$ –induced NO synthesis through NF–kappa B activation in RAW 264.7 cells.

[PD3–10] [ 10/19/2000 (Thr) 15:00 – 16:00 / [Hall B] ]

**Isolation and anti–thrombotic activity of phenolic components from *Magnolia obovata***

**Pyo MK, Lee YY and Yun–Choi HS**

Natural Products Research Institute, Seoul National University, Seoul 110–460, Korea

*Magnolia obovata* (Magnoliaceae) has long been used for the treatment of the thrombotic stroke, typhus fever, headache, gastrointestinal disorders, asthma and urinary problems. In the course of continuous work for the discovery of anti–thrombotic constituents from plants, several phenolic compounds were isolated from the methanol extract of bark, leaves and fruit of *Magnolia obovata*. The compounds were identified as methyl caffeate, syringin, magnolol, honokiol, and obovatol with the spectroscopic data. And the effects of them on platelet aggregation induced by sodium archidonate (in the presence of threshold concentration of collagen) were evaluated.

[PD3–11] [ 10/19/2000 (Thr) 15:00 – 16:00 / [Hall B] ]

**Regulation of proinflammatory cytokines gene expression by oleanolic acid in mouse peritoneal Macrophages**

**Choi CY<sup>o</sup>, Kim JY, Jeong HG**

It has been known that the oleanolic acid, triterpenoid saponins produced from some oriental herbs, have anti-inflammatory activity. IL-1 $\beta$ , IL-6, and TNF- $\alpha$  are major proinflammatory cytokines inducing the synthesis and release of many inflammatory mediators. They are involved in immune regulation, autoimmune diseases, and inflammation. In this study, the effects of oleanolic acid on the expression of proinflammatory cytokines were investigated in mouse peritoneal macrophages. Oleanolic acid alone significantly increased IL-1 $\beta$ , IL-6, and TNF- $\alpha$  production and the expression of their genes as determined by immunoassay and reverse transcription-polymerase chain reaction analysis, respectively. However, when murine macrophages stimulated with bacterial lipopolysaccharide were treated with oleanolic acid, the production of these proinflammatory cytokines and their gene expression were suppressed in a dose-dependent manner. Taken together, these data indicate that oleanolic acid has potent anti-inflammatory and immunomodulatory effects by regulating IL-1 $\beta$ , IL-6, and TNF- $\alpha$  production. [Supported by KOSEF Grant 1999-2-214-001-5]

[PD3-12] [ 10/19/2000 (Thr) 15:00 - 16:00 / [Hall B] ]

**Regulation of inducible nitric oxide synthase gene expression by oleanolic acid in murine macrophage RAW 264.7 cells**

Choi CY<sup>o</sup>, Kim JY, Jeong HG

Department of Pharmacy, Chosun University, Kwangju, Korea

The effect of oleanolic acid on the inducible nitric oxide synthase (iNOS) gene expression was investigated in the mouse macrophage cell line RAW 264.7. Oleanolic acid significantly induces nitric oxide production and iNOS level in dose dependent manner. Quantitative reverse transcription-polymerase chain reaction analysis demonstrated that inducible nitric oxide synthase gene expression is increased by oleanolic acid treatment. Since iNOS transcription has recently been shown to be under the control of NF- $\kappa$ B family of transcription factors, we assessed the effect of oleanolic acid on NF- $\kappa$ B activation using a transient transfection assay and electrophoretic mobility shift assay (EMSA). Transient expression assays with NF- $\kappa$ B binding sites linked to the luciferase gene suggest that the oleanolic acid-induced increase in transcription is mediated by the NF- $\kappa$ B transcription factors. Using DNA fragments containing the NF- $\kappa$ B binding sequence, oleanolic acid was found to activate protein/DNA binding of NF- $\kappa$ B to its cognate site as measured by EMSA. Collectively, this series of experiments indicate that oleanolic acid up-regulates iNOS gene expression through activation of NF- $\kappa$ B. [Supported by KOSEF Grant 1999-2-214-001-5]

[PD3-13] [ 10/19/2000 (Thr) 15:00 - 16:00 / [Hall B] ]

**Hepatoprotective Effects and Acute Toxicity Test of the Extract of Jejo, the powder of *Protactia brevitarsis***

Lee J<sup>o</sup>, Yeon JD and Kim JY

R&D Center, Daewoong Pharm. Co.,Ltd.

"Jejo" is the powder of *Protactia brevitarsis* and known to be effective on hepatitis and hepatic disorder in folk remedy. We performed hepatoprotective and acute toxicity test. Hepatoprotective effects were tested in Sprague-Dawley rats with 70% ethanol extract of Jejo and