

2. bottomed plate 2x10⁶ cells/well
 48 37 °C, 5% CO₂ incubator

2.1 50 μl PBS 50 μl
 6-8 Balb/c (20 ± 2g) C3H/HeN 96 well-flat bottomed plate Griess reagent (1%
 (20 ± 2g) () Charles sulfanilamide, 0.1% naphthylethylenediamine dihydrochloride,
 River Breeding Laboratory (Charles River Japan, Inc., Atsugi 2.5% phosphoric acid) μl 50 가 5
 Breeding Center, Yokohama, Japan) 540 nm (multiskan EX,
 22 ± 0.2, 55-60% Thermo LabSystems). (Na)NO
 12 (NIH-7-open formula) (Nitric oxide, NO)

2.2 2.7 AK
 6 (300 g/pack,) 4 ⁵¹Cr
 3 4 °C 24 well plate (Corning, New York, USA) 1.5
 , 80% 가 RPMI1640-5% FBS
 (12,000) , 2 ml 37 °C, 5% CO₂ 5
 30 ml/ recombinant
 mouse IL-2 , 5
 5 X 10⁶ cells/ml . Murine leukemia cell line
 YAC-1 Na₂CrO₄ 200 μCi 가 37 °C,
 HCl 가 2M-NaOH 0.5M/L 5% CO₂ 60 5 x 10⁴ cells/ml
 PMP-MeOH 10 μl 가 70 °C 30 100:1, 30:1 10:1 96 well round-
 . PMP(1-phenyl-3-methyl-5-pyrazolone) CHCl₃ bottomed microplate (Corning, New York, USA) °C, 37
 HPLC System, USA) HPLC(Agilent 1100 5% CO₂ 4 2,200 rpm 5
 D(+)-mannose (Man), L(+)-Rhamnose (Rha), D(+)-Glucose 0.1 ml - counter
 (Glu), D(+)-Galactose (Gal), L(+)-Arabinose (Ara), D(+)- % (cytotoxicity)
 xylose (Xyl), D-glucuronic acid (GluA), D(+)-Galacturonic acid (GalA), D(+)-Fucose (Fuc) (%) = (experimental release-spontaneous
 100nM release/ maximum release-spontaneous release) x 100
 PMP 2.8 Endogenous CFU-s
 100 mg/kg (5
 /) , 24 98 cGy/min
 9 μl ⁶⁰Co ⁶⁰Co theratron-780, 9
 Atomic Energy of Canada, Ltd., Canada). Bouin
 GIBCO BRL (Gaithersburg, MD, USA)

2.5 ANOVA mean ± SEM one-way
 0.05 (p value) 0.01
 96 well flat-
 bottom microplate 1.5x10⁵ cells/0.2 ml
 37 °C, 5% CO₂ 3 . CCK- 3.
 8(cell counting Kit-8, Dojindo molecular tech., USA) well
 10 μl 4 450 nm 3.1
 3 3 , ,
 가
 2.6 가
 Raw 264.7 96 well-round

Table 1. Monosaccharide Composition of Panax Ginseng Extracts.

Batch	Man	Glu	Gal	Ara	UID ¹⁾
Sam 1	2.0	64.1	26.6	5.4	2.0
Sam 2	2.8	75.9	16.1	2.1	3.1
Sam 3	1.2	86.2	9.4	2.2	1.0
Sam 4	2.4	81.8	11.7	2.2	1.9
Sam 5	2.2	70.5	24.8	0.6	1.9
Sam 6	2.3	80.0	10.4	0.9	6.4
Sam 7	2.1	79.7	15.0	2.5	0.7

1)

가
[14,15]

가
1 Kg

7

arabinose 90%
(1).
yeast,

mannose, glucose, galactose,
glucose galactose
-glucan

가 [17],
glucose가
1
galactose
galactose 가

galactose 가 (sam1)
(sam2), 가 (sam3)

T cell mitogen concanavalin . Sam1 : 30:1
A(Con A, $\mu\text{g/ml}$) B cell mitogen lipopolysaccharide(LPS), $p < 0.001$ sam2, 3 $p < 0.01$
10 $\mu\text{g/ml}$) 100:1 , sam3 sam1 sam2 $p < 0.001$

(stimulation index, SI) Sam1 SI (2).
119.7 con A 101.5 LPS 59.88
($p < 0.001$) sam2 71.69 sam3 SI 19.61

(1).
가
가

⁵¹Cr-released cytotoxic assay sam1 sam2 sam3
35%가 $p < 0.001$ IFN- (50U/ml) 가 sam3

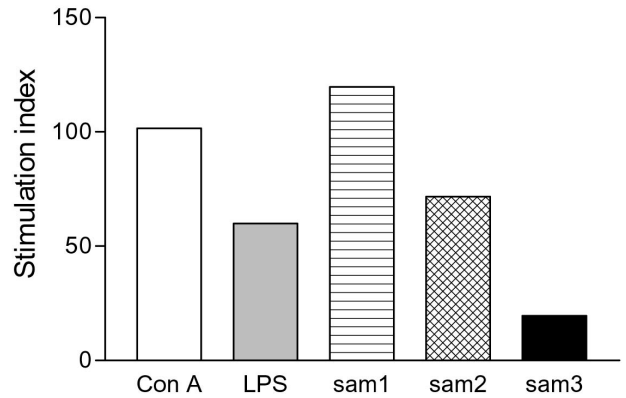


Fig. 1. Mitogenic activity of Panax ginseng extracts
Murine spleen cells (NS, 1.5×10^5 cells/well) were cultured with several doses of polysaccharides on microtiter plates. After 72 h incubation, the cells were treated with $10 \mu\text{l}$ of the CCK-8 solution for 4 h, and measured the absorbance at 450nm using a microplate reader. Results are presented the stimulation index (SI).

monitored for the *in vitro* immunological assay, and endogenous colony-forming unit (e-CFU) was measured as *in vivo* radioprotective parameter. The immunological activity was increased by the galactose contents of ginseng polysaccharide dependently. The result of this study suggests that mitogenic activity of splenocytes demonstrated a good correlation with *in vivo* radioprotective effect, and may be used as a representative parameter to screen the candidates for radioprotector.

Keywords : Immunostimulator, Mitogenic, Nitric oxide, Activated killer (AK) cells, Endogenous-colony forming unit (e-CFU)