

# IMMUNOPOTENTIATOR IN CHINESE MEDICINAL GINSENGS

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The immune system comprises of different cell population which by interacting each other can eliminate the invading-microorganisms of other harmful substances. Through these mechanisms the immune system protects the host against various different diseases such as viral disease and tumor therapy.

Ginseng Radix(人蔘) is used to replenish the vital energy and to promote the secretion of body fluids for the treatment of shock, prostration etc. It has been shown to possess the effects of stimulating the central nervous system, cardiotoxic, antifatigue and stimulating the mechanism of blood formation.

The tonic Chinese drugs for replenishing for the vital energy and treatment of various disease is mainly based on their property to enhance the function of immune system. This concept is now re-emphasized by modern immunotherapy of tumor. In this paper, the immuno-regulative effects of Ginsengs on S 180 ascite tumor bearing inbred Balb/c mice will be discussed in this paper.

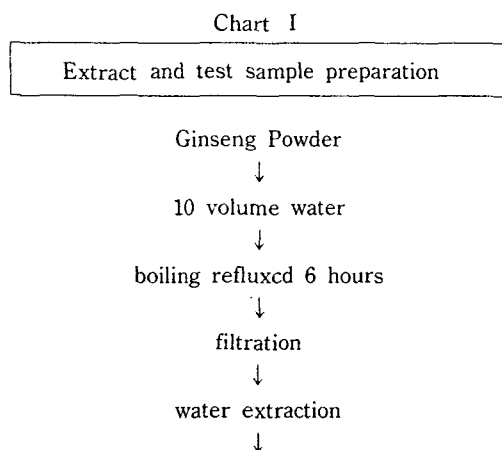
## EXPERIMENT AND METHOD

### 1. MATERIAL

Tonic chinese herbs: 白蔘·紅蔘 White and Red Ginseng; Ginseng Radix; Panax ginseng C.A. Mey.(Araliaceae)

### 2. EXTRACTION AND TEST SAMPLE PREPARATION

Each dried Ginseng material were blended and refluxed with distilled water. Combined the filtrates and concentrated under the vacuum. The extract and test sample preparation method show as Chart I.



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    graph TD
      A[concentration] --> B[freezing dry]
      B --> C[weighing]
      C --> D[dissolve in PBS]
      D --> E[sample solution]
  
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### 3. INDUCED TUMOR BEARING MICE

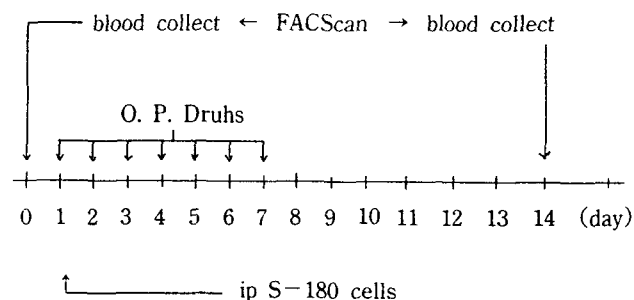
Animal: Inbred Balb/c mice(female; 8 weeks) were supplied from the Animal Center of Taiwan University.

Tumor cell line: S 180

Tumor bearing mice:  $1 \times 10^5$  cells was i.p. injected to each Balb/c mice for inducing ascite tumor model.

### 4. EXPERIMENTAL PROTOCOL

The protocol shows as the following figure.



### 5. DETERMINATION OF T LYMPHOCYTE AND ITS SUBPOPULATION

Reagent: Anti-Mouse Thy 1, 2 FITC(Becton Dickinson)  
 Anti-Mouse Lyt-2 FITC(Becton Dickinson)  
 Anti-Mouse L<sub>3</sub>T<sub>4</sub> PE(Becton Dickinson)  
 Lysing solution(Becton Dickinson)

Analysis instrument: Flowcytometry(Becton Dickinson)  
 Fluorescence Activated Cell Sorter, FACScan.

## 6. PROCEDURE OF COLLECTION OF CELLS

The heart was punctured to collect the fresh whole blood. And the T lymphocytes and its subpopulation were tested as the following procedure.

1. Add 20 ul of monoclonal antibody to a tube.  
To this tube add 100 ul of whole blood.
2. Mix gently and incubate 15 minutes at room temperature.
3. Vortex tube gently, then add 2 ml of lysing solution at room temperature. Vortex tube gently, then incubate for 5 to 10 minutes at room temperature in the dark

4. Wash cells twice and analyze with flowcytometer.

## 7. STATISTIC ANALYSIS

Each data was used student's t test with significant different from the control group.

## RESULT AND DISCUSSION

1. The immune regulative effects of Ginsengs on S - 180 tumor bearing inbred Balb/c mice shows as the following Table 1, Table 2, Table 3 and Table 4.

Table 1. Total T Lymphocytes Influences of Ginsengs on Tumor bearing mice

Group	Drug	N	Mean ± S.D.	Mean ± S.D. (%)
A	PBS	10	60.83 ± 3.81	110.32 ± 6.91**
B	S - 180 + PBS	10	55.14 ± 3.24	100.00 ± 5.88
C	S - 180 + 5 - Fu	10	56.57 ± 2.86	102.59 ± 5.19
D	S - 180 + White Ginseng	10	56.69 ± 7.90	102.81 ± 14.33
E	S - 180 + Red Ginseng	10	59.50 ± 3.77	107.91 ± 6.84*
F	S - 180 + Red Ginseng(Branch root)	10	57.95 ± 3.59	105.10 ± 6.51

Significant remarkable effect from the control(B) group

\* : p < 0.05, \*\* : p < 0.01

Table 2. Suppressor T Lymphocytes Influences of Ginsengs on Tumor bearing mice

Group	Drug	N	Mean ± S.D.	Mean ± S.D. (%)
A	PBS	10	14.36 ± 1.10	115.62 ± 8.86**
B	S - 180 + PBS	10	12.42 ± 1.02	100.00 ± 8.21
C	S - 180 + 5 Fu	10	13.02 ± 1.46	104.83 ± 11.76
D	S - 180 + White Ginseng	10	11.23 ± 1.96	90.42 ± 15.78
E	S - 180 + Red Ginseng	10	12.97 ± 1.18	104.43 ± 9.50*
F	S - 180 + Red Ginseng(Branch root)	10	13.02 ± 1.28	104.83 ± 10.31

Significant remarkable effect from the control(B) group

\* : p < 0.05, \*\* : p < 0.01

Table 3. Helper T Lymphocytes Influences of Ginsengs on Tumor bearing mice

Group	Drug	N	Mean ± S.D.	Mean ± S.D. (%)
A	PBS	10	46.42 ± 3.12	110.10 ± 7.40**
B	S - 180 + PBS	10	42.16 ± 2.21	100.00 ± 5.24
C	S - 180 + 5 Fu	10	43.47 ± 1.99	103.11 ± 4.72
D	S - 180 + White Ginseng	10	45.56 ± 6.48	108.05 ± 15.37
E	S - 180 + Red Ginseng	10	46.31 ± 2.40	109.84 ± 5.69**
F	S - 180 + Red Ginseng(Branch root)	10	44.11 ± 2.35	104.63 ± 5.57

Significant remarkable effect from the control(B) group

\* : p < 0.05, \*\* : p < 0.01

Table 4. Helper/Suppressor Lymphocytes Influences of Ginsengs on Tumor bearing mice

Group	Drug	N	Mean $\pm$ S.D.	Mean $\pm$ S.D. (%)
A	PBS	10	3.24 $\pm$ 0.22	95.29 $\pm$ 6.47
B	S - 180 + PBS	10	3.40 $\pm$ 0.12	100.00 $\pm$ 3.53
C	S - 180 + 5 - Fu	10	3.36 $\pm$ 0.23	98.82 $\pm$ 6.76
D	S - 180 + White Ginseng	10	4.08 $\pm$ 0.16	120.00 $\pm$ 4.71 **
E	S - 180 + Red Ginseng	10	4.56 $\pm$ 0.15	104.71 $\pm$ 4.41 *
F	S - 180 + Red Ginseng(Branch root)	10	3.40 $\pm$ 0.21	100.00 $\pm$ 6.18

Significant remarkable effect from the control(B) group

\* :  $p < 0.05$ , \*\* :  $p < 0.01$

2. The Lonic Chinese herbs of Ginseng, not only the white Ginseng but also the red also have immunopotential effects on the Tumor bearing mice. In view of the above result, Ginseng will be as a good adjuvant therapy source in the cancer therapy field in the future.

## REFERENCE

1. R. A. Hoffman and W. P. Hansen : Immunofluorescent analysis of blood cells by flowcytometer. Int. J. Immunopharmac., 3(3) : 249 - 254, 1981.
2. R. A. Hoffman, P. C. Kung, W. P. Hansen, and G. Goldstein : Simple rapid measurement of human T lymphocytes and their subclasses in peripheral blood. Proc. Natl. Acad. Sci. USA, 77(8) : 4914 - 4917, 1980.