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講演要旨集

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supra-physiological blood levels. Its present regimen proves effective and appropriate against radiation-induced changes in the levels of MDA, GSH, GSSG, GSH-Px and phosphatase activities, an altered deposition of the level of reduced glutathione (GSH), as well as glutathione peroxidase (GSH-Px) and alkaline phosphatase activities were inhibited significantly by melatonin administration. Regression analysis of survival data yielded LD50/30 as 7.1 and 11gY for control (irradiation alone) and experimental (melatonin treated irradiated) mice, respectively. With a DRF = 1.40. Results also show an appreciable amelioration of radiation-induced tissue damage indicating its therapeutic and prophylactic application. It is hypothesized that regulation of AOE gene expression is likely to be receptor mediated, because 15 days treatment with MLT results in the sustenance same response for 30 days in mice. The melatonin influence on both SODs and GPx mRNA appears to be mediated by a de novo synthesized protein.

P-B-086 Radioprotective and antioxidative effects of Artemisia capillaris extract

ACRR

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Plants and herbs are known to have a great repertoire of bio-active compounds. Therefore, many studies have been focused on medicinal herbs and herbal formulations as radioprotective agents during the past decade. In this study, we investigated the in vitro radioprotective and antioxidative effects of Artemisia capillaris extract (AC extract). It was observed that AC extract protected DNA from oxidative damage induced by irradiation. Single-cell gel electrophoresis showed that DNA strand breaks in γ-irradiated lymphocytes were significantly reduced by AC extract (25-100 μg/mL). At these concentrations, AC extract also decreased micronucleus formation in γ-irradiated CHO cells and HGPRT mutation in UV-irradiated V79 cells. Then we investigated in vitro antioxidative activities of AC extract. AC extract showed radicle scavenging activity against DPPH radical (IC50 = 25 μg/mL) and superoxide anion (IC50 = 50 μg/mL). It was also observed that ROS production and NF-κB activation in TPA-treated cells was greatly reduced by AC extract (IC50 = 50-100 μg/mL). Two active antioxidant compounds were isolated from the ethyl acetate fraction of AC extract by a silica gel column chromatography and identified as chlorogenic acid and caffeine acid. These compounds showed strong radioprotection and antioxidative effects in a single-cell gel electrophoresis and a radical scavenging assay. These results suggest that AC extract may be used a good radioprotective and antioxidative agent.

P-B-087 EF2001の放射線耐弱効果と免疫増強効果に関する研究

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EF2001はEnterococcus Faecalisから作られた乳酸菌生菌体である。本研究では、EF2001に対する放射線耐弱効果および免疫増強効果の有無について検討を行った。SCC-7の腫瘍（2×10^6個）をC57B1/6のマウスの大脳部に移植した。実験群は、X線単独照射群とEF2001の腹腔内投与+X線照射群に対照群を設定した。腫瘍の成長を測定した。併せて、生存率を測定した。また、生存開始においての有意傾向をEF2001群において見出した。生存開始後においての腫瘍の増殖を測定した。EF2001群において腫瘍の増殖を観察した。さらに、免疫増強効果を測定した。放射線照射後の静脈内投与においても、EF2001群において腫瘍の増殖を観察した。さらに、免疫増強効果を測定した。放射線照射後の静脈内投与においても、放射線照射後における静脈内投与においても、EF2001群において腫瘍の増殖を観察した。さらに、免疫増強効果を測定した。放射線照射後における静脈内投与においても、放射線照射後における静脈内投与においても、EF2001群において腫瘍の増殖を観察した。さらに、免疫増強効果を測定した。
Enhancement of anti-tumor effects, immune-activity and radiation protection after injection of EF 2001

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Enterococcus Faecalis under microscope (left) × 20,
(right) × 12900
Material & Methods

- Anti-cancer effects
  - Seven-weeks-old male ICR (Crj) mice
  - Cancer cells: sarcoma 180 (2 \times 10^6)
  - EF 2001 5mg/kg of heat-killed EF2001 (EF2001) were injected interpretational (endoceliac) each for 2 weeks every other day

- Statistical methods: t-test
Materials and Methods

1. Radiation protection effects

Seven-weeks-old male C3H mice
12mg/Kg 24mg/Kg of heat-killed EF2001 (EF2001) were injected interpretational each for 2 weeks every other day

8Gy of whole body irradiation (Philips co. 200kV)

Change of body weight Survival after irradiation

Sections of the large and small intestines with a microscope
2. Assay of NK cell activity by $^{51}$Cr label YAC-1 cells

Injection of the EF2001, in the same condition using the examination of radiation protection effect.

The mice was scarified and the spleen was extracted.

The spleen was smashed with stainless steel mesh, and then mixed PBS and the suspect ion was centrifuged three times.

The concentration of the spleen cells was adjusted to be $2 \times 10^7$ cells/ml. Then, $1.25 \times 10^6$, $2.5 \times 10^6$, $5.0 \times 10^6$, $10.0 \times 10^6$, $20.0 \times 10^6$ of the spleen cells were added to $1 \times 10^4$ of YAC-1 cell which labeled $^{51}$Cr of 1mCi and incubated 96 hole plate for 6 hours.

Only liquid component in each hole measured with liquid scintillation.
Change of body weight

The body weight loss was inhibited after injection of EF2001.
Survival after irradiation
Surviving fraction was increased after injection of EF2001.
Small intestines with a microscope

Control

8Gy

8Gy + 12mg/kg

8Gy + 12mg/kg
Large intestines with a microscope

Control

8Gy

8Gy + 12mg/kg

8Gy + 24mg/kg
Anti-tumor effect of BRM on Meth A fibrosarcoma (solid type) in BALB/c mice

* p<0.05 vs Control
Anti-tumor effect of EF-2001 on S-180 in ICR mice

**P<0.01 *P<0.05 vs Control group
C3H mice of IgG in the blood. Each histogram represents the mean value ±SE for 10 mice IgG (M). Significantly different *p<0.05 Control vs. EF2001.
Anti-tumor effect of EF-2001 on Meth A fibrosarcoma (solid type) in BALB/c mice

**P<0.01 *P<0.05 vs Control group
Tumor Size (Left F.)

- Control: Saline 0 mg/mouse × 3 days (IT)
- Sample: BRM 1 mg/mouse × 3 days (IT)

Tumor size (mm²)

Days after inoculation

Anti-tumor effect of BRM on Meth A fibrosarcoma (solid type) in BALB/c mice
C3H mice of IgM in the blood. Each histogram represents the mean value ±SE for 10 mice IgM (M) significantly different *p<0.05 Control vs. EF 2001.
NK cells activity
Activities of NK cells are enhanced 1.46 and 1.94 times in EF2001 12mg and EF2001 24mg groups respectively.
BLB/C mice of IgE in the blood. Each histogram represents the mean value ±SE for 10 mice IgE (M). Significantly different *p<0.05 Control vs. EF 2001.
Conclusion 1

- Anti-cancer effects: EF 2001 administration group: positive
- EF 2001 to the radiation protection effect: precision
- Immune activity effect: EF 2001 administration group: positive
- Anti-aging effect: EF 2001 administration group: positive
- Long life effect: EF 2001 administration group: positive
- It put the *Enterococcus Faecalis* dosage, and the level of total IgE in serum glutamic-oxaloacetic fell.
- The level of total IgM in serum glutamic-oxaloacetic increased the *Enterococcus Faecalis* dosage group. However, the level of total IgG in serum glutamic-oxaloacetic rather fell slightly.
Conclusion 2

1. It let cell-mediated immunity such as a macrophage and natural killer T cell activate, and the immunization activation action that Enterococcus Faecalis has does not become it, and promotion of humeral immunity anti-action is thought about.

2. In the dosage of Enterococcus Faecalis, an IL-2 level in blood rises, and it think that cytokine of the spleen changed from Th2 type into Th1 type. Therefore, it decrease IgG and an IgE level, and it is suggested that it showed an allergic restraint effect.