to bind DNA, were unable to suppress DNA synthesis in irradiated-sperm mouse zygote. In addition, p21−/− zygotes exhibited the same level of suppression upon fertilization by irradiated sperm. Therefore, the suppression is dependent on the DNA binding function of p53, but not on the transactivation function.

151 Enhanced Expression of Heme Oxygenase-1 Gene by Caffeic Acid Phenethylester in RAW 264.7 Mouse Macrophage Cell Line.
We have previously reported that the mRNA of heme oxygenase-1 (HO-1) gene in the liver was increased transiently by an X-ray irradiation of the rat. HO-1 is a stress-responsive gene with a cytoprotective function. In the present work we have examined the effectiveness of several natural compounds with redox activities upon the activation of HO-1 gene in a mouse macrophage-like cell line, RAW 264.7. Cells were cultured in a 35-mm dish. DMEM medium with FCS was changed to DMEM without FCS which was supplemented with various natural compounds. 4 hrs. later, total RNA preparations were obtained. The level of HO-1 mRNA was measured with an RT-PCR system. In the cells treated with caffeic acid phenethylester for 4 hrs. the level of mRNA of HO-1 was enhanced remarkably as much as the extent of stimulation by diethylmaleate, a typical inducer of HO-1 gene. However, no or little stimulation were detected with EGCG, resveratrol or ellagic acid.

Radio-protection and sensitization

152 Anti-cancer effect and radioprotection effect on chaga (Fuscoporia obliqua) and propolis
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In radiotherapy, it use to single and combination of radiation and chemotherapy by side effect becomes have a most problem. In this study, chaga and propolis investigated anti-oxidation action, SOD-activity, immunization activation activity and anti-cancer effect. Furthermore, we reviewed reduction of side effect by radiation protection in combination with radiotherapy. The rate that a patient is saved will be highest without lowering immunization action of a patient by putting these and an immunization effect with if a treatment is pushed forward. We think that which is an effective ingredient of flavonoids, beta-1,3D-glucan and alkaloid. Therefore, the immunization reinforcement action, anti-oxidation action, anti-inflammatory action and an indirectly anti-cancer effect were provided by self-healing power. In addition, we think that allethrin C and tritellenoid was effects by anti-cancer material of a propolis having a high anti-cancer effect of chaga acts on a direct tumor and an anti-cancer effect was provided.

153 Radioprotection by Edaravone Reagents against Radiation Intestinal Injury
We investigated the effect of epidermal growth factor(EGF), melatonin, and edaravone on the radiation intestinal injury. C3H/He female mice were X-irradiated to the whole body at the total dose of 15,17,19, or 18 Gy. Mice were administered subcutaneously with EGF or melatonin after irradiation. Edaravone was administered intraperitoneally before irradiation or after irradiation. Small intestine of the mice was removed at 3.5 day after irradiation and stained with haematoxylin and eosin. The numbers of regenerating crypts were measured. The survival ratio of crypts per circumference was calculated. There was no difference between EGF or melatonin, administering the group and the control group in the survival ratio. However, The survival ratio of edaravone, administered mice was significantly higher than that of the control group when mice were administered with edaravone 1 hour before irradiation. The result indicated that the premedication of edaravone protected the intestinal injury caused by the radiation.

154 Effects of hypoxia and doranzalazole on X-ray-induced apoptotic signaling pathway
Purpose: To examine effects of hypoxia and doranzalazole on apoptotic signaling pathway. Materials and methods: Immediately after human leukemia cell line MOLT-4 cells were exposed to X rays of 15 Gy under the normoxic condition at ice-cold temperature, cells were incubated under the hypoxic condition without or with doranzalazole. Apoptotic cell death, phosphorylation of SAPK/JNK, expression of Fas, activation of caspase-3 and intracellular glutathione concentration [GSH] were measured by morphological observation, Western blotting and fluorometric assay, respectively. Results: Induction of radiation-induced apoptosis was lowered by post-irradiation incubation of cells under the hypoxic condition. Suppression of radiation-induced phospho-