

# Research Abstracts

Panax Ginseng, Siberian Ginseng, Licorice, Whole Adrenal, Adrenal Cortex, Calcium Pantothenate (B<sub>5</sub>)

## Pharmacodynamic properties of adrenal cortical extracts in comparison to synthetic corticosteroid mixture in the rat

The effects of a total extract of adrenal cortex on corticosterone and ACTH plasma levels have been studied in the rat, either during circadian rhythms or in conditions of stress, in comparison to the effects of a synthetic corticosteroid mixture. A total extract of adrenal cortex, acutely and chronically administered at low and high doses, showed an inhibitory effect on plasma steroids and ACTH, whereas a synthetic corticosteroid mixture was more effective in producing such an inhibition. On the other hand, rats treated with a total extract of adrenal cortex responded better to stress than animals treated with a synthetic corticosteroid mixture. This difference may be due to the presence in the total extract of the adrenal cortex of certain substances having stimulatory properties on the steroidogenesis and/or on the activity of the hypothalamus-hypophysis-adrenal axis. Bernardini R, De Ambrosi L. *Arch Int Pharmacodyn Ther* 1985 Aug;276(2):287-300.

## Antistress and antifatigue properties of Panax ginseng: comparison with piracetam

The antistress and antifatigue properties of a Chinese ginseng preparation were tested on Swiss albino mice, exposed to various experimental models of stress, and were compared with those of piracetam. Both ginseng and piracetam were administered chronically in drinking water for 16-18 days as well as acutely, by injection, 30-60 min prior to the experiments. Reactivity of the mice, loss in body weight, amount of faeces, length of endurance and incidence of mortality were graded and measured. Both piracetam and ginseng treatment provided good protection against electroshock stress when compared to the untreated mice; fighting scores, incidence of tonic convulsion and mortality were significantly less in the treated groups. In the heat stress experiments, both piracetam and ginseng provided significant protection to the treated mice against exposure to heat. In the fatigue stress of forced swim test, ginseng treatment provided effective adaptation to fatigue and increased endurance in both male and female mice; piracetam showed some antifatigue effects on the male mice only. In the locomotor activity tests, ginseng did not depress motility, while piracetam did so in the later part of the tests. Banerjee U, Izquierdo JA. *Acta Physiol Lat Am* 1982;32(4):277-85.

## In vitro effects of echinacea and ginseng on natural killer and antibody-dependent cell cytotoxicity in healthy subjects and chronic fatigue syndrome or acquired immunodeficiency syndrome patients

Extracts of *Echinacea purpurea* and *Panax ginseng* were evaluated for their capacity to stimulate cellular immune function by peripheral blood mononuclear cells (PBMC) from normal individuals and patients with either the chronic fatigue syndrome or the acquired immunodeficiency syndrome. PBMC isolated on a Ficoll-hypaque density gradient were tested in the presence or absence of varying concentrations of each extract for natural killer (NK) cell activity versus K562 cells and antibody-dependent cellular cytotoxicity (ADCC) against human herpesvirus 6 infected H9 cells. Both echinacea and ginseng, at concentrations  $\geq 0.1$  or 10 micrograms/kg, respectively, significantly enhanced NK-function of all groups. Similarly, the addition of either herb significantly increased ADCC of PBMC from all subject groups. Thus, extracts of *Echinacea purpurea* and *Panax ginseng* enhance cellular immune function of PBMC both from normal individuals and patients with depressed cellular immunity. See DM, Broumand N, Sahl L, Tilles JG. *Immunopharmacology* 1997 Jan;35(3):229-35.

## Effect of *Eleutherococcus senticosus* extract on human physical working capacity

Ethanol extract of *Eleutherococcus senticosus* Maxim. was discreetly examined as regards its effect on the maximal working capacity of man, using six male adolescents. Single, blind, cross-over studies were conducted where the extract treatment was compared with no treatment and with placebo treatment. Significant increase was noted in all four parameters recorded in the tests due to extract administration. Especially striking was 23.3% increase in total work due to the extract compared with only 7.5% rise due to the placebo. This increase in total work seems to be partially attributable to the improvement of subject's bodily oxygen metabolism that was reflected in the increase in maximal oxygen uptake and that in maximal oxygen pulse. Asano K, et al. *Planta Med* 1986 Jun;3:175-177.

## Effect of Panax ginseng extract on energy metabolism during exercise in rats

We examined the acute effects of ginseng extract (GS) administration on arterial plasma levels of glucose, free fatty acids (FFA), lactic acid (LA) and pyruvic acid (PA) in resting rats, and in animals that swam for 30 to 60 minutes. Compared to vehicle-treated (saline) control animals, GS did not significantly alter these parameters at rest. During exercise, GS-treated animals had higher blood glucose levels than control rats, and markedly lower concentrations of circulating LA and PA. Plasma FFA was also lower in the GS-treated animals at 30 minutes of swimming. These results provide evidence that ginsenosides can significantly alter mechanisms of fuel homeostasis during prolonged exercise, presumably by increasing the biochemical capacity of skeletal muscle to oxidize FFA in preference of glucose for cellular energy production. Avakian EV, Sugimoto RB, Taguchi S, Horvath SM. *Planta Med* 1984 Apr; 50(2):151-154.

## Adrenal cortex functional activity in pantothenate deficiency and the administration of the vitamin or its derivatives

Study of the corticosteroid content in the adrenals and blood of rats under pantothenate deficiency has demonstrated a decrease in adrenocortical function. A single administration of pantothenate in a dose of 3.3 mg/kg reduced the influence of hypovitaminosis on the adrenals. The pantothenate derivatives (pantethine, 4'-phosphopantothenate and CoA in particular) injected to intact animals in a single dose equimolar to 3.3 mg/kg calcium pantothenate per kg bw had a marked steroidogenous effect. Tarasov IA, Sheibak VM, Moiseenok AG. *Vopr Pitan* 1985 Jul;4:51-54.

## The in vitro effects of glycyrrhizin and the derivatives of glycyrrhetic acid on the activity of cAMP-dependent protein kinase and phosphorylation of cellular polypeptide by the kinase from Ehrlich ascites tumor cells

The effects of glycyrrhizin (GL) and the derivatives of glycyrrhetic acid (GA) on the activity of cAMP-dependent protein kinase (A-kinase) and the phosphorylation of cellular polypeptides by the kinase purified from Ehrlich ascites tumor cells had been investigated in vitro. It was found that (i) the derivatives [3 beta-hydroxy-olean-11,13 (18)-diene-30-oic acid Na, olean-9(11), 12 diene-3 beta, 30-diol-3 beta, 30-di-o-hemiphthalate 2Na and olean-12-ene-3 beta, 30-diol 3 beta, 30-di-o-phosphate 2Na] of GA inhibited the activity of A-kinase at the concentrations higher than 25 microM; (ii), at 10 microM, these derivatives and native GL stimulated the activity of the kinase significantly; and (iii) the inhibitory and stimulatory effects of some GA derivatives were clearly correlated with their chemical structures. Moreover, sodium dodecyl sulfate polyacrylamide gel electrophoresis and two dimensional gel electrophoresis followed by autoradiography detected several acidic polypeptides, including polypeptides with approximate molecular weights of 35,000 (pI 4.3), 27,000 (pI 4.5) and 18,000-21,000 (pI 4.5), phosphorylated by A-kinase, to be functioning as mediators in response to these drugs. This observation suggests that the GL-induced inhibition of phosphorylation of these cellular polypeptides by A-kinase may be physiologically implicated in the biochemical mechanisms involved in the anti-inflammatory effect of the drug. Shamsa F, Nagata N, Oh-Ishi M, Ohtsuki K. *Tohoku J Exp Med* 1991 Dec;165(4):305-18.