

Na-Young Kim\*, Jae-Hoon Jeong,  
Chae-Young Lim and Jung-Sup Lee

Division of Biological Sciences, Research Center for  
Proteinaceous Materials, Chosun University,  
Kwang-ju 501-759

This study was performed to examine the effects of natural products produced from herbs on the cell proliferation in cultured mammalian cells. The cell proliferation were assayed using CellTiter non-radioactive cell proliferation assay kits (Promega) in mouse (NIH3T3) and two human cancer cell lines (HeLa and SW480). The natural products were extracted from 12 kinds of Korean herbs with methanol (M), methylene chloride (D), ethylacetate (E), buthanol (B), and water (W). Among the fractions, the methylene chloride ones from *Carthamus tinctorius* L., *Rehmannia glutinosa*, and *Angelica gigas* Nakai inhibited the cell proliferation to 56.2%, 71.5%, and 57.4%, respectively, at 80  $\mu\text{g}/\text{ml}$  for 72 hr in HeLa cells. In addition, the same fractions inhibited the cell proliferation of mouse NIH3T3 cells to an average of 87.8% at 20  $\mu\text{g}/\text{ml}$  for 72 hr. Six kinds of fractions from *Rheum coreanum* Nakai (B), *Caesalpinia sappan* L. (B), *Cyperus rotundus* L. (E), *R. glutinosa* (E), *A. gigas* Nakai (E), and *Paeonia moutan* Sims (E) exhibited the cytotoxicity to an average of 29.3% at 80  $\mu\text{g}/\text{ml}$  for 72 hr in NIH3T3 cells. However, these fractions did not show the cytotoxicity against the two human cancer cell lines, HeLa and SW480. Interestingly, all fractions from *Achyranthes japonica* Nakai and *C. rotundus* L. even more increased the cell proliferation to 126.7% and 110.9% in the two human cancer cell lines, respectively, compared to that of untreated control. These results suggest that natural products from herbs can exert their cytotoxic effects or even accelerate the cell proliferation on normal and cancer cell lines.

## E112

## Molecular Cloning of the New Type

3 $\beta$ -Hydroxysteroid Dehydrogenase  
(3 $\beta$ -HSD) in Human Fetal Heart

김 수주\*<sup>1</sup>, 오선희<sup>2</sup>, 김원신<sup>2</sup>, 이희섭<sup>1</sup>  
원광대학교 의과대학 산부인과<sup>1</sup>, 원광대학교  
자연대학 생명과학부<sup>2</sup>

3 $\beta$ -HSD는 steroid hormone 생성에 중요한 단계에 작용하는 효소로서 human에서는 3 $\beta$ -HSD를 encoding하는 2개의 상동성이 매우 높은 유전자 Type I과 Type II가 존재한다. Type I은 주로 태반과 말초조직에서 발현되며, Type II는 주로 부신과 성선에서 발현된다. Rat에서는 4가지의 type이 존재하며, rat heart에서 aldosterone과 corticosterone이 생성된다고 알려져 있다. 따라서 본 연구에서는 human fetal heart에서도 3 $\beta$ -HSD가 발현되고 있는지를 조사하였다. Western blot analysis에서 human fetal heart에 3 $\beta$ -HSD가 존재를 확인하였고, RT-PCR을 이용해 그 효소를 cloning하고 분석하였다. Human fetal heart에서 cloning된 3 $\beta$ -HSD는 human type I과 II에 각각 91%와 90%의 상동성을 보였다. 따라서, human fetal heart에서 새로운 type의 3 $\beta$ -HSD가 발현되고 heart에서 steroid hormone 생성에 중요한 역할을 것으로 보인다.

## E113

P-type Calcium Current in a  
Crustacean Motoneuron Undergoes  
Seasonal Fluctuation

Sungwon Hong\*

Department of Physiology, School of Medicine,  
Dongguk University, Kyungju 780-714

It has been shown that P-type  $\text{Ca}^{2+}$  channels in the crayfish abdominal motoneuron F3 undergoes activity-dependent inactivation *in vitro*. In order to determine whether the inactivation of P-type  $\text{Ca}^{2+}$  channel occurs naturally, seasonal changes in o-agatoxin IVA-sensitive P-type  $\text{Ca}^{2+}$  channels were determined by measuring the current amplitudes through

P-type  $\text{Ca}^{2+}$  channels of the cell body using conventional two-electrode voltage clamp techniques over a 4-year period. The  $\text{Ca}^{2+}$  in the bath was replaced with  $\text{Ba}^{2+}$  to reduce the inhibitory effect of high extracellular  $\text{Ca}^{2+}$  on o-agatoxin IVA. The activation voltage and kinetics of the P-type  $\text{Ca}^{2+}$  channel were constant during all seasons. However, the density of P-type  $\text{Ba}^{2+}$  current was the smallest during the summer ( $15.6 \pm 2.2$  nA/nF, n=63) and the greatest during the winter ( $23.7 \pm 3.7$  nA/nF, n=29), whereas the P-type  $\text{Ba}^{2+}$  current densities were intermediate during the spring and the fall. These results indicate that there were seasonal changes in the number of functional P-type  $\text{Ca}^{2+}$  channel, not in the channel properties. These seasonal changes in the inactivation of P-type  $\text{Ca}^{2+}$  current are presumably due to seasonal differences in neuronal impulse activity since the animal activity is generally the greatest during the summer. Thus, activity-dependent inactivation of P-type  $\text{Ca}^{2+}$  channel may play a role in transmitter release from crayfish motoneuron in which inactivation of P-type  $\text{Ca}^{2+}$  channel appeared to be responsible for activity-dependent long-term depression in transmitter release.

#### E114

##### Effects of NAD<sup>+</sup> on the Stability of Soluble Proteins in the Pectoral Muscle of Neurotoxin 6-aminonicotinamide Treated Quail against the Proteolytic Digestion

Youn Bok Lee and In Kook Park

Department of Biology, Dongguk University, Seoul 100-715

The effects of neurotoxin 6-aminonicotinamide (6-AN) on the stability of soluble proteins of quail pectoral muscle towards trypsin treatment were studied. SDS-polyacrylamide electrophoresis showed

that in the control group the soluble proteins with molecular masses corresponding to 130, 109, 96, 62 and 47 kDa were decreased whereas those with molecular masses 35.3, 34, 30, 28, 27, 21.7 and 19 kDa were increased. In 6-AN treated group the soluble proteins with molecular masses corresponding to 130, 96, 67, 60, 57, 50, 47, 36 and 32 kDa were decreased whereas those with molecular masses 30, 27, 26 and 18 kDa were increased. In the pair-fed group, soluble proteins with molecular masses 130, 80, 76, 69, 59, 47, 35 and 28 kDa were decreased whereas those with molecular masses 28, 26 and 25 kDa were increased. In the presence of 3 mM NAD<sup>+</sup>, the soluble proteins with molecular masses in the control group corresponding to 58.5, 55, 49, 43 and 26 kDa were reinforced. In 6-AN treated group, the soluble proteins with molecular masses 58, 49, 43 and 32 kDa were reinforced. In the pair-fed group, the proteins with molecular masses 93.5, 58, 50, 49, 44 and 40 kDa were reinforced. The results suggest that NAD<sup>+</sup> exerts nonspecific effects on the stabilization of soluble proteins of varying size of masses against trypsin digestion.

#### E115

##### Effects of Cadmium (Cd) on Total Lipid Content in Developmental Stages of the Greater Wax Moth, *Galleria mellonella*

Byung-Sik Shin, Choong-Un Lee and Ri-Na Choi

Dept. of Biology, Changwon National

The beekeeping pest insect *Galleria mellonella* larvae (greater wax moth) were reared on an artificial diet contaminated independently with cadmium chloride at three different concentrations (5.0, 20.0, 40.0  $\mu\text{g/g}$  food fresh weight). Larvae were contaminated up to pupation, either from hatching or from pupae 2 days. Results of