

Z406 **Role of Protein Kinase C in  $\alpha_1$ -adrenergic Regulation of  $a_{Na}^i$  in Guinea Pig Ventricular Myocytes**

조수현<sup>1</sup>, 채수완<sup>2</sup>, 이진욱<sup>1\*</sup>

포항 공과 대학교 생명과학과<sup>1</sup>, 전북 의대 약리학 교실<sup>2</sup>

We investigated the role of protein kinase C (PKC) in  $\alpha_1$ -adrenergic regulation of intracellular  $Na^+$  activity ( $a_{Na}^i$ ) in guinea pig ventricular myocytes.  $a_{Na}^i$  and membrane potentials were measured with the  $Na^+$ -sensitive fluorescent indicator, SBFI and conventional microelectrodes, respectively, while myocytes were stimulated at the rate of 0.25 - 0.3 Hz. Stimulation of the  $\alpha_1$ -adrenoceptor with 50  $\mu$ M phenylephrine decreased the  $a_{Na}^i$  from  $6.1 \pm 0.3$  to  $4.6 \pm 0.3$  mM. The PKC activator, 4 $\beta$ -phorbol 12-myristate 13-acetate (PMA), also decreased  $a_{Na}^i$  in a concentration-dependent manner. 100 nM PMA produced a maximal decrease in  $a_{Na}^i$  of 1.5 mM from  $6.5 \pm 0.4$  to  $5.0 \pm 0.4$  mM. The PMA concentration required for a half-maximal decrease in  $a_{Na}^i$  was  $0.46 \pm 0.13$  nM. PMA decreased the  $a_{Na}^i$  to a similar extent when the membrane potential of the myocytes was held at -40 mV or -85 mV. An inactive phorbol, 4 $\alpha$ -phorbol 12-myristate 13-acetate, did not decrease the  $a_{Na}^i$ . The decrease caused by PMA could be blocked by PKC inhibitors, such as staurosporine and bisindolylmaleimide I (GF109203X). The decrease in  $a_{Na}^i$  produced by phenylephrine was blocked by pretreatment with PMA, staurosporine, or GF109203X. The decrease in  $a_{Na}^i$  produced by PMA was not prevented by pretreatment with tetrodotoxin, but it was blocked by pretreatment with either strophanthidin or high  $[K^+]_o$ . The results suggest that  $\alpha_1$ -adrenergic receptor activation results in a decrease in  $a_{Na}^i$  via PKC-induced stimulation of the  $Na^+$ - $K^+$  pump in cardiac myocytes.

Z501 **Morphological Recovery from Aging in Endothelial Cells**

Ji Yoen Lee\* and Won Chul Choi

Department of Biology, Pusan National University, Pusan, Korea

Peroxynitrite (ONOO<sup>-</sup>), a reactive nitrogen species (RNS) produced by oxidative stress, can cause aging by damaging cells. The aging promoting chemicals (t-butylhydroperoxide (t-BHP), 4-hydroxynonenal (HNE), 3-morpholinopyridone (SIN-1)) have a toxicity by producing peroxynitrite. In this study, the effect of aging promoting chemicals on bovine aortic endothelial cell (BAEC) and cell of pulmonary artery endothelium (CPAE) was examined. The cell-damage-recovery effects that 2,3,6-tribromo-4,5-dihydroxybenzyl methyl ether (TDB) and phloroglucinol, anti-aging substances analyzed by our coworkers, were investigated on the damaged cells. The TDB and phloroglucinol were analyzed from *Symphycarpha latiuscula* and *Echloia stolonifera* respectively. After the treatments of t-BHP (10  $\mu$ M), HNE (0.2  $\mu$ M), SIN-1 (500  $\mu$ M) to the cells, damage in the cytoplasm and nucleus occurred. Especially, the necrosis was occurred in the cytoplasm. After the treatments of these chemicals, the cells were treated with TDB (150  $\mu$ M) and phloroglucinol (150  $\mu$ M), we detected cell-damaged recovery through the time course. These results suggest that anti-aging substances are scavenger of peroxynitrites aging.