

**B-4****Inhibitory Effects of Monovalent Cations on the Microsomal  $\text{Ca}^{2+}$ -ATPase in Tracheal Epithelial Cells**

Kwang-Hyun Cho\* and Young-Kee Kim

Dept. of Agricultural Chem., Chungbuk Nat'l Univ.

Two types of vanadate-sensitive  $\text{Ca}^{2+}$ -ATPases have been characterized in the microsomes of tracheal epithelial cells, a high affinity vanadate-sensitive (HAVS) and a low affinity vanadate-sensitive (LAVS)  $\text{Ca}^{2+}$ -ATPases. The LAVS  $\text{Ca}^{2+}$ -ATPase was sensitive to thapsigargin, implying that it is an ER/SR-type  $\text{Ca}^{2+}$ -ATPase. Both HAVS- and LAVS-ATPases mediated microsomal  $^{45}\text{Ca}^{2+}$  uptakes and their  $^{45}\text{Ca}^{2+}$  uptakes were sensitive to vanadate with  $K_i$  values of 4  $\mu\text{M}$  and 700  $\mu\text{M}$ , respectively. When the effects of various monovalent ions were measured on the microsomal  $^{45}\text{Ca}^{2+}$  uptake,  $\text{K}^+$  and  $\text{Na}^+$  inhibited the uptakes by 50% and 68%, respectively. The monovalent ion-induced inhibitions were dose-dependent and corresponded to the most of the active uptake. The  $\text{K}^+$ -induced inhibition on the uptake was suppressed by thapsigargin and was independent of 100  $\mu\text{M}$  vanadate; however, the  $\text{Na}^+$ -induced inhibition was slightly decreased by 100  $\mu\text{M}$  vanadate and independent of thapsigargin. These results suggest that  $\text{K}^+$  prefers to inhibit LAVS-ATPase and  $\text{Na}^+$  dose to inhibit HAVS-ATPase.