

Influences of NaCl on cell movement and adhesion in amphibian embryonic cells

Shinji Komazaki (Department of Anatomy, Saitama Medical School)

Kazuriro Takano (Department of Anatomy, Saitama Medical School)

Summary

Influences of NaCl on cell movement and adhesion were examined in the embryonic tissues and cells isolated from the newt, *Cynops pyrrhogaster*, gastrulae. In addition, changes in concentration of intracellular free calcium ions ($[Ca^{2+}]_i$) in the embryonic cells were examined following treatment with various concentrations of NaCl in the culture medium.

Increase in concentration of NaCl in the culture medium from 60 mM to 100 mM suppressed a folding movement of the isolated ectoderm layer and promoted an adhesion of embryonic cells dissociated from the ectoderm and mesoderm. On the other hand, decrease in concentration of NaCl from 60 mM to 40 mM promoted the folding movement and suppressed the adhesion of the embryonic cells.

Measurement of $[Ca^{2+}]_i$ in the embryonic cells showed that increase in concentration of NaCl in the culture medium from 60 mM to 100 mM raised the $[Ca^{2+}]_i$ both in the ectodermal and mesodermal cells. On the other hand, decrease in concentration of NaCl from 60 mM to 40 mM declined the $[Ca^{2+}]_i$ in the ectodermal cells. Treatment with the culture medium containing 100 mM NaCl without Ca^{2+} and Mg^{2+} ions had no effect on the $[Ca^{2+}]_i$. However, treatment with the culture medium containing 100 mM NaCl with thapsigargin abolished the increase in $[Ca^{2+}]_i$.

Treatment of Ca^{2+} -ionophore A23187 suppressed the folding movement of the ectoderm layer and promoted the adhesion of cells isolated from the ectoderm and mesoderm. BAPTA, a chelating reagent of Ca^{2+} ion, promoted the folding movement and suppressed adhesion of the embryonic cells.

These results showed that Na^+ ion in the culture medium influences $[Ca^{2+}]_i$ and behaviors in the tissues and cells isolated from amphibian gastrulae, and suggested close correlation between changes in the $[Ca^{2+}]_i$ and behaviors in the embryonic cells.