

Identification and Functional Analysis on the Salt-Sensitive Element of Oyster Osmo-Responsive Gene

Haruhiko Toyohara

Graduate School of Agriculture, Kyoto University

Summary

In order to elucidate the implication of amino acid transporter against osmotic adaptation, we investigated the expression of oyster amino acid transporter gene in response to the environmental osmotic changes. When oysters were exposed to hyper-osmotic stress, the expression of the amino acid transporter gene was increased to elevate the intracellular osmolality as expected from the amino acid importing function. Unexpectedly, expression was increased by hypo-osmotic stress as well and the degree of expression was more intense than that by hyper-osmotic stress.

To elucidate the regulatory region on the salt-sensitive expression of the oyster amino acid transporter gene in response to the changes in environmental osmolality, we cloned the approximately 2.3 kb upstream region from the translation start site. Then, we constructed the expression vectors with a luciferase as a reporter gene driven by a different length of the 5'-flanking region. Then, we compared their promoter activity in order to identify the regulatory region in response to the osmotic stresses. As a result, the salt-responsive regulatory region responding to both hyper- and hypo-osmolality is restricted within 132 bp from the transcription start site.