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Oscillatory Growth of Ice Crystals Observed in a Solution of Antifreeze Glycoprotein YOSHINORI FURUKAWA, YOSHIHIRO NISHIMURA, SALVADOR ZEPEDA, HIROYUKI NAKAYA, ILTS, Hokkaido University, ET-SURO YOKOYAMA, Gakushuin University — One-directional growth experiments of ice crystals in an aqueous solution of antifreeze glycoprotein (AFGP) were carried out using a growth cell made of thin glass capillaries. When the interface tips of ice crystals were constructed by prismatic planes, the interface position changed periodically with time. These phenomena were not observed for the growth of basal planes in the AFGP solution or for the growth of ice crystals in pure water. We first observed the oscillatory growth of ice crystals in the AFGP solution. Fluorescent labeled AFGP molecules were also used to observe the diffusion, incorporation, and segregation of the solute at the interface, in the solid and in solution. The periodic incorporation of AFGP molecules were clearly observed in conjunction with the growth rate changes.

Yoshinori Furukawa
Hokkaido University

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