

## Special lecture

### 1. What is vitrification and how can it extend life?

Robert. J. WILLIAMS, Allen G. HIRSH, Tsuneo A. TAKAHASHI, Harold T. MERYMAN

## Articles

### 1. Studies on Mechanisms of Frost Crack Formation in Tree Trunks

Yuzou SANO, Seizo FUJIKAWA and Kazumi FUKAZAWA

### 2. Effects of Abscisic Acid and High Osmolarity of Culture Medium on the Development of Freezing Tolerance of Suspension-Cultured Cells of Wheat (*Triticum monococcum* L.)

Takayuki SAITO, Akihiko ICHI-ISHI and Yasutake SUGAWARA

### 3. A Possible Mechanism for Freezing Adaptation in Plant Cells

Seizo FUJIKAWA

### 4. Effect of Glycine on Glass Transition Temperature of Sucrose Solution

Toru SUZUKI, Rikuo T AKAI, Tsuneo KOZIMA and Felix FRANKS

### 5. A Study of the Mechanism of Ice Crystallization during Rewarming of Polymer Gels

Norio MURASE and Seiji IWAI

### 6. The Volume Change on Freezing: Aqueous Solutions of Alkali Metal Chlorides

Kazuhito KAJIWARA and Takusei HASHITANI

### 7. Melting Behavior of the Quenched Emulsions for Dilute Aqueous Solutions of Mixed Alkali Halides

Hitoshi KANNO

### 8. Vitrification of Tobacco BY2 Cells

Keiko NISHIMATSU, Satoru TAMURA, Masami SEKINE and Mitsuo TAKANO

### 9. Role of Ethylenediamine in the Protection of Cell Membrane of *Aquaspirillum metamorphum*

Subjected to L-Drying (Part 2) : Effect of ethylenediamine on the change of polyamine content in the cells by L-drying

Takeshi SAKANE and Akira YOKOTA

**Lectures Presented at the Seminar of Japanese Society for Research of Freezing and Drying:  
"Responses of Living Organisms to Various Kind of Stresses"**

1. Injury and Repair from Injury of Membranes in Heat-Stressed Bacteria

Tetsuaki TSUCHIDO

2. Adaptational Responses of Microorganisms to Hypersalinity

Hisayo ONO

3. Ecology of Deep-Sea Microorganisms and Their Response to High Hydrostatic Pressure

Kouichi OHWADA

4. Heat Shock Induces Cross Protection Against Various Stresses in Yeast

Yasuhiko KOMATSU and Katsuhide FUJITA

5. Regulation of Gene Expression by Oxygen Stress in *Escherichia coli*

Shuji YONEI and Qiu-mei ZHANG

6. Roles of Lipids in Low-Temperature Adaptation of Plants

Hajime WADA and Norio MURATA

7. A Facet of Adaptive Mechanisms to Cold Climate in Insects: Freeze Tolerance and Ice -Crystallization Temperature

Kimio SHIMADA