

### 1. Experiment Title

Crystal growth mechanisms associated with the macromolecules adsorbed at a growing interface –Microgravity effect for self-oscillatory growth-

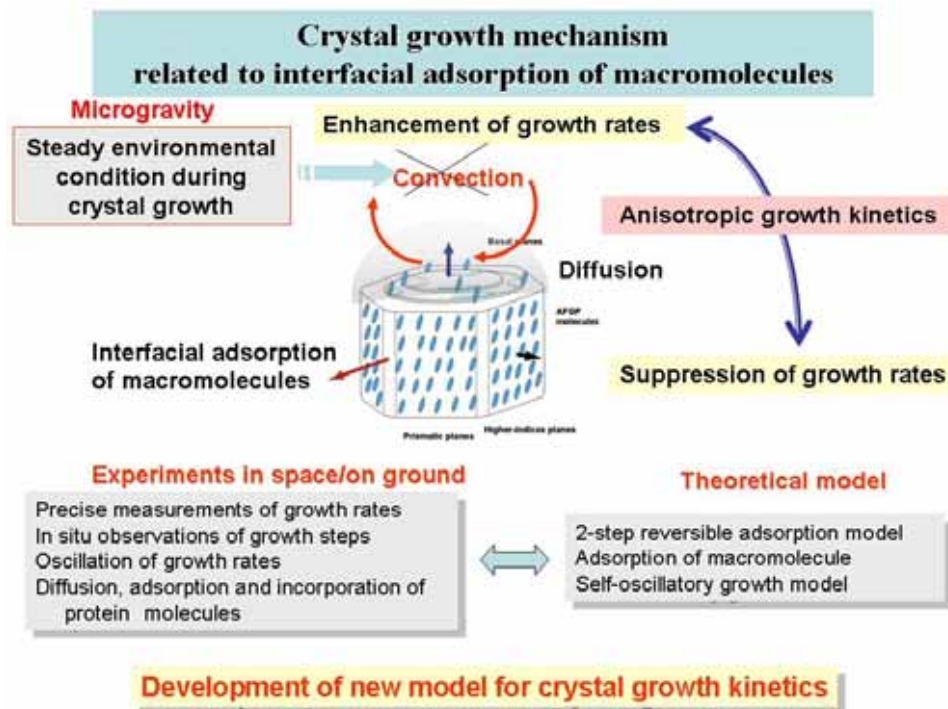
### 2. Principal Investigator

Yoshinori Furukawa

Professor, Institute of Low Temperature Science, Hokkaido University

### 3. Outline of Experiment

Ice crystal growth in supercooled antifreeze protein solutions is inhibited by their adsorption at the ice/water interface, and this phenomenon is a matter of vital importance for survival of living organisms in subzero environments. We propose a new model for growth kinetics affected by the adsorption of macro-molecules, which is called as a 2- step reversible adsorption inhibition model. In order to clarify this new crystal growth model, we propose a project of a new space experiment using the ice cell specimen developed by JAXA to carry out the space experiments of the morphological instability of ice crystals in pure supercooled water. Precise measurements of growth rates of ice crystals in AFGP solutions under the microgravity environment will make clear that self-oscillations of growth phenomena are a fundamental feature for the crystal growth controlled by the adsorbed macro-molecules such as the AFGP. This research project will open up a new research field related to the fundamental of crystal growth mechanism.



### 4. Experiment Facility

Solution Crystallization Observation Facility (SCOF)