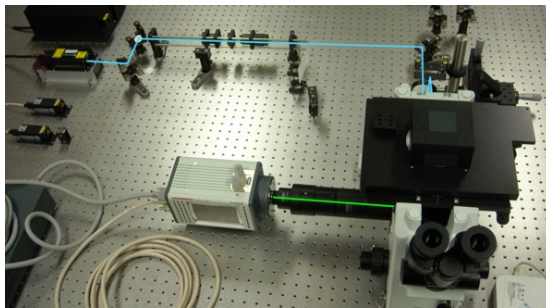


Bio-imaging with super-resolution fluorescence microscopy

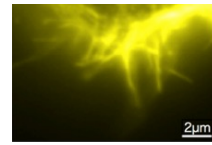
Associate Professor Jun-ichi Hotta

Illustration

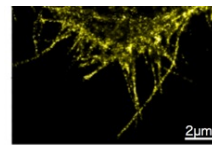
Super-resolution fluorescence microscopy



Super-resolution fluorescence microscopy system

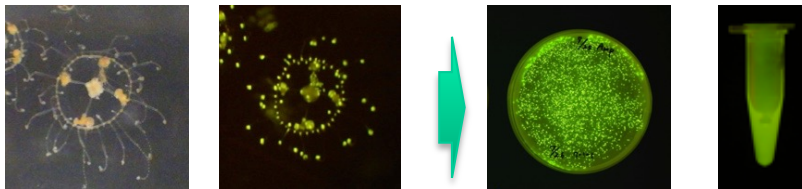


Fluorescence image



Super-resolution image

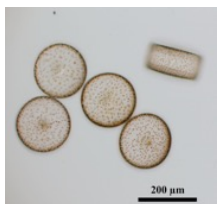
Development of new fluorescent proteins



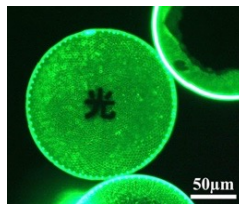
Scolionema suvaense

Fluorescent protein ScSuFP

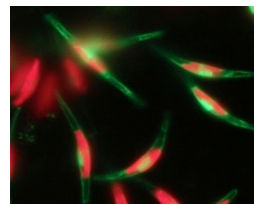
Application of diatoms



Coccinodiscus walleisii



Optical patterning on diatom flustules



Expression of fluorescent protein in diatom

Content:

We aim to develop new super-resolution microscope system with nanometer resolution and single molecule level sensitivity. Fluorescent proteins are widely used in bio-imaging to observe living organisms. By developing a new photoswitching fluorescent protein, we aim to realize a super-resolution fluorescent microscope with higher spatial resolution.

Diatoms are primary producers responsible for about half of carbon dioxide fixation in the ocean and are important photosynthetic organisms that support the marine ecosystem. We would like to clarify the mechanism of formation of the silica flustules of diatoms using gene manipulation technology and super-resolution fluorescence microscopy. We hope to contribute to the SDGs of energy and food problems in the future.

Appealing point:

Development of new optical measurement systems. Gene manipulation of micro organisms. Development of fluorescent proteins with unusual photophysical properties.

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