



Mobile Composition IV ©Hideo Iwasaki

2009 Number 1

■ RESEARCH TOPIC

Biomaterial Art Project Combining Bioscience Research and Contemporary Art

■ Key words

Bioart, Cyanobacteria, Art, Media



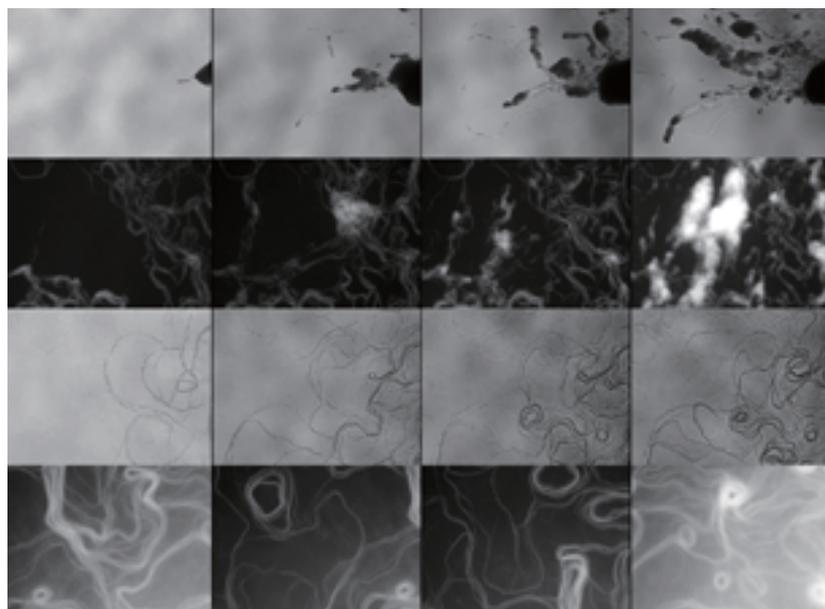
©WASEDA University

Center for Advanced Biomedical Sciences, Office / TWIns
Office of International Research Promotion

Biomaterial Art Project Combining Bioscience Research and Contemporary Art

There have been connections between science and art for a long time. Examples include (1) the connection between Escher's prints and mathematics and (2) the research of Dr. Ukichiro Nakaya, who showed great interest in snow crystals. In the modern era, this fusion of science and the arts can be seen in fractal art, where computational science is employed, and in fields such as architecture and industrial design. Here, at the Tokyo Women's Medical University / Waseda University Joint Institution for Advanced Biomedical Sciences (TWIns), one of the researchers—Dr. Hideo Iwasaki, an Associate Professor in the Department of Electrical Engineering and Bioscience, Graduate School of Sciences and Engineering—is engaged in a unique project involving the fusion and contrasting of bioscience and contemporary art.

Dr. Iwasaki specializes in microbiology and chronobiology. He has been using cyanobacteria to search for the clock genes that determine rhythms within organisms and to elucidate the principle of morphological pattern formations in the shapes of cells and colonies of cyanobacteria with the passage of time. Meanwhile, he has an extraordinary interest in the arts, and as a creator, he continues to produce contemporary kirie (papercut) art objects. Now, he is challenging himself to create a new form of expression in contemporary art through the use of cyanobacteria, the focus of his research, as a medium of expression. Regarding his motivation for this project, he says "for a long time there have been forms of expression in the world of art that use organisms and life as their motifs, and I became interested in the story behind this and these forms of expression."



Metamorphorest II (snap shot) / Cyanobacterial colonies pattern on the agar plate

Dr. Iwasaki's experiment can be termed "bio-art" because he is using biomaterials to create a work of art that is similar to works in modern painting and contemporary computer art. One tends to associate the word "biomaterials" with materials that are used for medical care and are made from organisms, but Dr. Iwasaki points out that "biomaterials" include microorganisms like cyanobacteria, cultured cells, and materials used in genetic engineering. Dr. Iwasaki began by collecting various cyanobacteria from a pond on the Waseda University campus. Next, he separated them into different strains and cultured them while observing the formation of their colonies on an agar plate. Finally, he selected those colonies for which the "pattern created on the agar plate under the microscope" was visually appealing, beautiful, and impressive.

Cyanobacteria were the first microorganisms on earth to become capable of oxidative photosynthesis, and therefore, they are thought to be the ancestors of plants. They are often used as experimental organisms because they offer many advantages in experiments. In specific, their forms and metabolic systems are extremely diverse, and it is easy to culture them and manipulate their genes; further, they never give off unpleasant odors.

Dr. Iwasaki says "I collected approximately 20 strains for my experiment but of these the *Lyngbia* and *Pseudoanabaena* strains showed particularly interesting patterns of movement." He used cutting-edge microscope technologies to film videos showing the processes through which these colonies created patterns, and he plans to screen the videos and display the kirie art objects that he has created at the Havana International Biennial Festival of the Arts (Havana, Cuba) to be held in late March and at the Spiral Independent Creators Festival in Aoyama, Tokyo, in May (the name of his exhibit is Metamorphorest II, III).

Dr. Iwasaki says "I think that the interface between science and the arts is very intricate. I will be happy if people can experience the complicated nature of the world we live in, and the multifaceted aspects of life, science and art through my exhibit." Now, he has begun performing a new analysis in his research laboratory, which he has transformed into an atelier. The goal of this new analysis is to understand the dynamics related to the pattern formation of the cyanobacteria used in his art exhibits.

Naoko Nishimura
Science Writer

■ Researcher Hideo Iwasaki / Associate Professor
 ■ Affiliation Department of Electrical Engineering and Bioscience, Graduate School of Sciences and Engineering, Waseda University