

Looking back over the course of the past half-century, the advent of new technology, whether it be video or the internet, has always opened whole new avenues for art. Biotechnology, which has been developing since the start of the 21st century at a rate far surpassing that of IT, has proved no exception.

Unlike genetic breeding of goldfish or *bonsai*, fermentation of miso or cheese, and improvement of livestock and vegetables, the new areas of biotechnology—in particular synthetic biology—are at odds with society's traditional values at this very moment. At the heart and fore of the fierce debates is technology that can target and reconfigure specific DNA of organisms and radically alter their living conditions, such as genome editing and gene drive. The benefits and damages that such technology will bring mankind is yet unfathomable. However, the scopes of the applications and the debates have largely focused on healthcare and agriculture. Other repercussions of this technology on wider culture and on social systems, and thence on our psyche, have received next to no investigative attention.

However, if we look at the world of art, we see that artists are using biomedial materials that are literally alive—and inventing ideas and forms that were impossible until just recently. Currents with such labels as “bioart,” “genetic art” and “critical design” are gradually gaining momentum and experiencing a rise in societal demand, and they are constantly raising new questions about

the relation between nature and mankind. The manipulation and modification of living materials recall the classical motif of mythical “synthetic creatures”—such as the chimera and the *nue* [an animal in Japanese legend with a monkey's head, a raccoon's body, and a tiger's legs]—but updated into real beings, not imaginary ones. It conjures up again in a more radical form the image of the artist as God, an issue that has been around since the Renaissance.

The collection *Signs of Life*, published by the MIT Press in 2007, elucidated the issues created by the artistic currents that have emerged in these early days of the technologies. It is seen as an essential reference in the English-speaking world, a comprehensive collection of essays on bioart theory. In order to share its discussion in Japan too, we have selected two essays that we deemed will grow in significance in future discourse on methodology, bioethical regulations and other aspects. This special issue is composed of four essays: two essays from the collection on specific topics in the field; and two general essays on bioart that address “transhumanism,” a contemporary concept that has gone largely unstudied in Japan, as well as issues that have arisen since the publication of *Signs of Life*.

Eduardo Kac is the originator of the term “bioart,” an artist who is coming to be recognized as a historic pioneer. Tracing the course of bioartistic practice so far, his essay outlines the transition from digital technology to biotechnology, and the historic

and social implications of the act of literally creating new life. Use of materials as highly undefined and subject to chance as living organisms, is not a facile form of resistance against modern formalism. In fact it is a valuable act that presages the coming of an ultra-modern “deformalism,” which only comes after active affirmation of modernistic attitudes, exemplified by anthropocentrism, rationalism and so on.

Paradoxically, the world has now become so thoroughly modernized, and rendered convenient to the point of sorcery by advanced and complex science, that it has given rebirth to a pre-modern element of “enchantment,” albeit in an ultra-modern form. Joe Davis, Harvard researcher and genetic art pioneer, points out the classical imagination latent in today's society, a world generally thought to have divested itself of such notions of the supernatural, and discusses the innate monstrosity of life. The commentaries on his artworks—with their poetic concepts and their span that reaches from mythology to outer space—demonstrates how artists and curators should confront the disconnect between science and art that which has surfaced in real-life issues, such as bioethics and the handling of genetically modified organisms.

Behind the ever-accelerating progress of biotechnology and AI lies the idea of transhumanism, a huge current in contemporary thought. The first of the comprehensive essays is by Nick Bostrom, a philosophy professor at the University of Oxford who is one

of the key proponents of the idea. This essay unravels, philosophically and sociologically, why we humans harbor an irresistible desire to transform living organisms, including ourselves. His essay prophesies that even the closed-off world of self-proclaimed “fine art” will become inevitably swallowed up by the torrential currents of the age. It can be regarded as an essay that reconsiders from a universal perspective how to confront the shifts in what it means to be human.

Meanwhile, this author’s essay focuses on the distinct function and aesthetic characteristics of biological media in art, while giving an overview of issues that have surfaced since *Signs of Life*. In 2015—ten years since the development of iPS cells, and also the year that saw the burgeoning of CRISPR/Cas9, the staggering gene-editing tool—this museum held the exhibition *Ghost in the Cell*, becoming the first museum in the world to present works involving iPS cells. The essay highlights various issues actually faced at the exhibition, and after an outline of how Kac’s definition of bioart can no longer contain the present situation, discusses future possibilities.

The theme of this special issue is not “bioart” but “biotechnology and art.” This is a statement on the attitude by which any artwork involving science and technology is instantly labeled “media art,” a legacy of the pre-modern formalistic tradition of categorizing all art by its material. Distancing itself from art that blindly affirms and applies science, the articles herein question what significance the use of living organisms as a medium takes on within complex historical

and societal contexts, and inquire how one might establish works and exhibitions that rise above such “significance.” It would bring us the greatest happiness if these pages were to prompt discussions about art in the 21st century, a period that will see the rise of biotechnology and artificial intelligence.

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