



Exploring the Intersection of Biology and Art: A Study of Bioart

Tumusiime Nabirye K.

Faculty of Business and Management Kampala International University Uganda

ABSTRACT

This study delves into bioart, an emerging field at the confluence of biology, art, and new technologies. It examines the historical roots, key concepts, and principles of bioart, exploring its development from the late 20th century to contemporary practices. The study highlights notable examples and the scientific foundations underpinning bioart. Furthermore, it addresses the ethical and societal implications of bioart, emphasizing the importance of critical reflection on its impact. The investigation concludes with future directions and potential innovations, proposing that bioart has the potential to redefine both artistic and scientific landscapes through its interdisciplinary approach.

Keywords: Bioart, Biotechnology, Art and Science, Ethical Implications, Interdisciplinary Art.

INTRODUCTION

One of the most interesting and controversial disciplines that has arisen at the intersection of biology, art, and new technologies is the so-called bioart, or biotech art. This term has not only brought together artists that cultivate the same or similar expressive languages, but also scholars from various fields who are jointly exploring its many multiple implications. Life Sciences challenge art in so many ways that it is difficult to sum them all up in a few terms. To speak of life sciences implies an interdisciplinary territory intimately linking art, science and technologies, with a great diversity of approaches, strategic priorities, expectations, aspirations, hopes, concerns, skepticism. Speaking about bioart also opens up many political, ethical, environmental dilemmas, social disputes [1, 2]. Even those from the artistic community who question the very legitimacy and consistency of such new expressive territories acknowledge the emergence of an “extraordinary current” in contemporary bioart praxes involving cultural issues traditionally neglected by its classical predecessors. There is something big and significant happening since 2000 that is worth considering and that has to be taken very seriously. Within a few years, some would-be-invisible-life scientists, bioengineers, technologists, artists, bioartists, and practitioners of biotechnology-art-life-transgenic-genetic-culture began to get through the doors of international life/lab-culture exhibitions, symposiums and conferences devoted to these themes. It is reported that people with scientific anti-artistic backgrounds began to consider such things as aesthetics, politics, ethics, representation, interpretation, cavemen technology and art, etc. and alarming numbers of artists keeping an eye on and getting involved in the cloning of living commercial products, deliberately infecting eye-tissues, making transgenic ecologies and feeding ceaselessly growing ubiquitous new lifeforms on (mostly) netted city spawn wastes appeared on the scene. The newcomer and culturologists response to this insurgence is a immediate excitement, fear, rage and anxiety. It seems that science and art are trying to reinvent themselves within a common entertaining set while wholly new transgenic natural-cultural hybrids are widely sprayed in their labs, galleries, fields and gardens.

DEFINITION AND ORIGINS

In 2004 the term bioart was coined and published on the website of the project Contagious. Since then it has been adopted by many artists, curators, historians of art, scientists, and critical theorists to identify works of an increasingly autonomous avant-garde movements, which have to do with life itself, the intersection of biology and art. However, this term, and all the others that are of the same group,

biotechnology art, life art, genetic art, transgenic art, is problematic. There is not a consensus on its definition, nor on a delimitation of the works it consists of. Some artists and theorists are really engaged in this problem, and because of that the concept bioart seems to be a black box, a term that can contain very diverse interpretations and works [3, 4, 5]. The starting point for this research is the desire of looking at the problem of bioart. The general question that is proposed is: What is bioart? From this question some specific or subquestions arise. When and where did it first occur? What are the historical developments and milestones of this discipline? Because of which cultural and social background did bioart emerge? What are its roots? What are the concepts of life, technology and art that underlie this practice? What attributes do bioartists use to view the world? These questions can be transformed in another way: What do bioartists want to tell about life, technology and art? This can be seen as a debate between both technocentrist and biologist tendencies to view the world [6, 7].

KEY CONCEPTS AND PRINCIPLES

The intersection of art and biology is a new emerging paradigm in the global art scene, fostering the birth of artists that explore biological systems as a new medium. The diverse practices of an international cohort of these new artists, collectively known as bioartists, have generated interest beyond art. This development has raised interest in the growing field of bioart, with a particular focus on the art and science intersection. An ethnographic understanding of the development, challenges and concerns of biodesign also contributes to the debate. Given this emerging field, an examination of the various bioart practices and a comparative analysis of these practices will help delineate bioart in terms of art and other mediums of practice [8, 9]. The theoretical framework will delineate and interrogate bioart and its convention in terms of epistemology, ethico-political considerations and artistic practices. Since science and art are fields of complex and encompassing socio-political systems both delimiting and facilitating subjectivities, knowledge and practice, the foundation of bioart convention extends far beyond aesthetic concerns and implications. Its discourse unfolds in a complex and comprehensive field of practices, which include the subjectivities and knowledges of the various actors involved in the making and observing of these works, as well as the broader assemblage of societal, cultural, economic, historical and political complexities and relations at play. The aim here is to explore the theoretical framework in terms of meta-discursive considerations such as scientists and artists engagement, documentation conventions, and the constitution of new publics [10, 2].

HISTORICAL AND CONTEMPORARY EXAMPLES OF BIOART

The history of bioart can be read as three overlapping narratives. The first begins in the last decades of the 20th century, with artists reacting to biological and environmental concerns raised by 20th-century biotechnology and genetic engineering. Following mass public protests against these technologies, and in parallel with scientific advances in biology and genetic engineering, a subsection of mostly white, mostly male contemporary artists began engaging with living organisms and lab technologies to culturally examine, critique, and repurpose these developments. Artists working in this early bioart tradition included Fabrizio Plessi, Karsten Hoff, Eduardo Kac, Agnieszka Kurant, Heather Barnett, Jennifer Willet, and Oron Catts, among many others. The second narrative arc is associated with the beginning of the 21st century and with a sense of the emergence of consensual adjacent histories: a small community of artists, scientists, and bioethicists drew together artist-led initiatives like the Institute for Applied Autonomy in New York, whose workshops encouraged artists to hijack and repurpose surveillance technologies for epistemic and aesthetic ends. This second narrative may be diagnosed as one of assetting and legitimating expectancies for bioartforms within academia, science, and policy environments. The advent of formal award recognitions within certain art prize competitions in the late 1990s supported this sense of bioart emergent within certain countries only. Paralleling this development, here and there isolated art institutions began assembling funded/curated exhibitions of bioart. Popular media representation expanded as award-winning bioartists' initiatives and artworks operating at the social, political, and environmental heart of contemporary biopublics, like Eduardo Kac's Gfp Bunny, transgenic bunnies that glowed green under ultraviolet light, entered the public domain [7, 4].

THE SCIENCE BEHIND BIOART

Creativity and imagination are ubiquitous processes in all living organisms. They are meant for investigating, transforming, and shaping the environment to satisfy individual and group needs, which in turn, may determine survival or extinction. Historically, bioart has been classed as part of postmodern or contemporary art domains, and now presents its own identity with distinctive instruments, techniques, attitudes, and objects shaped by new sciences and technologies. Although there are personal ideas about its intrinsic nature, the two foremost features of bioart as a still-evolving process can be summarized as the exploitation of life forms and processes shaped by novel biological sciences and technologies and the

inevitable edge of questioning a lineage of art [11, 12]. In the 1990's, the "bio" prefix relished a renaissance in the fields of art and technology. Many artists and curators began investigating the relationships between newly emerging technologies and living organisms, and how the reshaping of this relationship and current climatic and environmental crises revealed an unstable world or unnatural environments hooked on hyper-real architecture or luxurious life-styles. The increasing preoccupations led to bioart, transgenic art, biotechnological art, genetic art, art involving living organisms and processes, and bio-media. This steadily formed a larger art domain most recently referred to as "bioart," which embraces these terms. Bioart is best defined as art that either involves living organisms or biological processes or reflects upon them. It is a defining feature of bioart as an art form that has fundamental distinctions regarding the life forms and processes utilized, which have no artificial, mechanical, or engineering embryo, and an agency that lies beyond human comprehension or design [13, 7]

ETHICAL AND SOCIETAL IMPLICATIONS OF BIOART

This section investigates the ethical and societal implications of bioart. It explores the impact of this interdisciplinary practice on society and the environment, aiming to provoke critical reflection on the ethical considerations and implications associated with bioart. By addressing the complex intersections between art, biology, and ethics, bioart has the potential to engage audiences in broader societal discussions, whether intentionally or serendipitously. However, the discussion must extend beyond the artist's intention and engage with the bioart object and its valuation. By examining the broader societal implications, this exploration hopes to enrich the discourse on the ethical dimensions of bioart [10, 14]. The ethical and societal implications of bioart are complicated because promises coalesce on multiple interfaces. There is an old-time-honored tradition to explore the societal implications of new technologies and sciences. In Hamburg, for instance, an Institute for the Society of the New Technologies has existed since the late nineteenth century. Historically, art has always played a significant role in challenging the perception of emerging technologies. As early as the 1930s, art was concerned with the social impact of the newly invented television. After World War II, avant-garde artists explored both aesthetic experimentations and the political and social implications of the newly emerging media, such as noise, video, and the Internet [15, 16].

FUTURE DIRECTIONS AND INNOVATIONS IN BIOART

The emergence of synthetic biology and biotechnologies unique to biodesign is dissected. From dystopian scenarios of commodified living systems to the advent of new discourses, philosophies, and speculative design recipes, works chosen for the 2008 BioTehna exhibition nudged a critique on the appetite for the design of artifice. Such critique was animated by calling into question the still-uncertain right- and wrong-ness of performing synthetic bioengineering. The virtual figures of speculative life forms, a highly manipulative image-sharing technique, were brought into the exhibition from the wider cultural landscape. Spins and parameters orchestrated on form, materials, color, and motion propelled in cypher consumer industries sealed any connection to the living as contingent planning in pursuit of unexpected outcomes. Such design methods, from both the artistic and scientific trajectories, of international competition-driven investment, followed accounts of competitive interest in nature and of science conducting agency via such elites.

CONCLUSION

Bioart represents a dynamic and transformative field where the boundaries between biology, technology, and art blur. This study has shown that bioart not only challenges traditional artistic practices but also provokes significant ethical and societal discussions. By exploring the historical context, key principles, and notable examples, it is evident that bioart fosters a unique dialogue between science and art. The future of bioart promises further innovations and interdisciplinary collaborations, highlighting its potential to influence both scientific inquiry and artistic expression. As bioart continues to evolve, it is crucial to maintain a critical perspective on its ethical implications and societal impact, ensuring responsible and reflective practices in this groundbreaking field.

REFERENCES

1. Elgheryeni A. Bio-art and the Environment: Complexity Within Interconnectedness. 2021. [\[HTML\]](#)
2. Suwara B. Toward a bioethical perspective for posthumanist aesthetics: Bioart as an example. *World Literature Studies*. 2021. [sav.sk](#)
3. Winnington L. A Mirror of Flesh: An Exploration of Materiality in Living Bioengineered Art. 2021. [auckland.ac.nz](#)

4. Oosthuizen D. Aesthetics of creating a postnatural world: science and art for a Pseudo Utopia. 2021. up.ac.za
5. Sünter E. For an echology of microbe-artworks: thinking in between art and science. 2021. umontreal.ca
6. Strehovec J. Contemporary Art Impacts on Scientific, Social, and Cultural Paradigms: Emerging Research and Opportunities: Emerging Research and Opportunities. 2020. [\[HTML\]](#)
7. Dömez E. Bioart and biodesign: The ethics and aesthetics of working with living systems. 2021. ieu.edu.tr
8. Babayan C. The Biological-Art Drawing Heuristic: Visualizing Complex Biological Systems in Biology Education & Research. 2021. temple.edu
9. Kauffman SA, Roli A. Beyond the Newtonian paradigm: a statistical mechanics of emergence. arXiv preprint arXiv:2106.15271. 2021. [\[PDF\]](#)
10. Melkozernov AN, Sorensen V. What drives bio-art in the twenty-first century? Sources of innovations and cultural implications in bio-art/biodesign and biotechnology. AI & SOCIETY. 2021. academia.edu
11. O'Doherty D. The Leviathan of rationality: Using film to develop creativity and imagination in management learning and education. Academy of Management Learning & Education. 2020. hecat.eu
12. Turner M. Constructions and creativity. Cognitive Semiotics. 2020. degruyter.com
13. Kovic A. Bio-art: an unlikely symbiosis of science and art in the case of Maja Smrekar's K-9_topology. XI Lisbon Summer School for the Study of Culture: Convivial Cultures. 2021. ucp.pt
14. Liukkonen P, Vartiainen H, Pöllänen S, Kokko S. Interacting with nature in and through boundary crossing learning: A case of bioart-making. Journal of the Learning Sciences. 2023 Oct 20;32(4-5):534-72. tandfonline.com
15. Bonenberg W, Rybicki SM, Schneider-Skalska G, Stochel-Cyunei J. Sustainable water management in a Krakow housing complex from the nineteen-seventies in comparison with a model Bio-Morpheme unit. Sustainability. 2022 May 3;14(9):5499. mdpi.com
16. Bhatia G. of Resistance "The materials, construction techniques and spatial spirit of Mahatma Gandhi's house at Sevagram embody the idea expressed in his statement researchgate.net. . researchgate.net

CITATION: Tumusiime Nabirye K. Exploring the Intersection of Biology and Art: A Study of Bioart. Research Output Journal of Education, 2024 3(2):53-56.