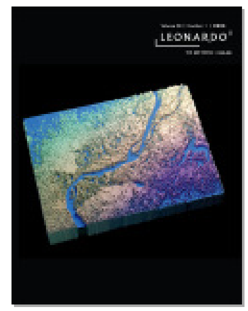
Placing Art Practice into the Field of Bioimaging: Testing Play as a Methodological Tool to Explore and Reflect upon Art Practice



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WORK BENCH

Placing Art Practice into the Field of Bioimaging

Testing Play as a Methodological Tool to Explore and Reflect upon Art Practice

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ABSTRACT

Bioimaging experiments are carried out in discrete labs, and artists are rarely granted access. The author finds that they are an underused resource for artist-researchers. In this article, she demonstrates how an artist-researcher can contribute to artscience initiatives in pharmacological research by working in an advanced imaging and microscopy lab and responding innovatively to current circumstances in bioimaging. She does this by thinking about scientific and artistic interdisciplinary practice in a playful way. Informed by established play theories and practices from the literature, she has reviewed, studied, and adapted. Here she discusses research conducted at the School of Life Sciences at the University of Nottingham, where she evaluated play as an insightful concept to provoke a reaction to scientific methods.

PLACING ART PRACTICE INTO THE FIELD OF BIOIMAGING

I am an artist-researcher. Below, I report on research into the question: How can incorporating art practice into the field of pharmacology, along with testing play as a methodological tool, help to develop a framework for exploring and reflecting on art practice?

For over 10 years, I have collaborated with scientists who employ advanced imaging and microscopy in life science. The focus of this article is my research at Cell Signalling Imaging (CSI), the Centre for Membrane Proteins and Receptors (COMPARE), and the School of Life Sciences, Queen's Medical School, the University of Nottingham. At these sites, I observed, participated in, and documented scientists' use of basic pharmacology and novel approaches to advanced imaging and microscopy. I noted a lack of understanding between scientists and artists—a separation between the disciplines in terms of methodology, processes, terminology and representation techniques. I wanted to address this gap in knowledge creation by constructing a framework for understanding and representing science—one that advocates the vital role of an artist working in conjunction with individuals and small groups of scientists.

My objective is to learn how to be a bridge between my coworkers and establish significant links between the laboratory and this department, highlighting the necessity for new institutional research structures in which artists embed themselves in the lab to break down silos. I identified a lack of knowledge in biomedical science regarding play as a productive concept that I engaged as an alternative methodological tool for guiding and understanding my art practice while immersed in this field. I noted that play's significance is rarely expressed through scientific methods or principles. My collaborators were unaware of play's ability to aid innovation because it was beyond their normal sphere of reference; it was a concept they had no experience of, nor did they comprehend it. My aim was to trigger a reactionary response from scientists regarding their approach to the scientific method. My intention to create a kind of conditioned response to their own training, testing how they might react when confronted with my creative idiosyncratic approach that challenges traditional scientific norms. I also wanted to explore the potential of play in extending my creative process, drawing on Winnicott's ideas about the relationship between play and creativity [1]. Essentially, I was experimenting with how artistic expression interacts with scientific thinking and how this interplay could influence both my creativity and these scientists' inquiries. I aimed to test play's potential to extend my creative process and learn about the ramifications of an artist collaborating with positivist, fact-checking life scientists through an interpretative study. This partnership would allow me to explore the implications of blending artistic perspectives with scientific methods.

MOTIVATION TO PLAY

I selected three twentieth-century scholars who recommend additional debate regarding play: Johan Huizinga (1895–1945), Donald Winnicott (1896–1971), and Hans-Georg Gadamer (1900–2002).

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I considered Gadamer's primary aim in *Truth and Method* [2] to provide a methodology for expressing claims, thoughts, and judgments in the arts and humanities that could not be reduced or dismissed by basic scientific approaches. I embraced Gadamer's characterization of art as play, which recognizes the limitations of positivism, the dominant framework in the sciences, and instead encourages the imaginative exploration of science. I examined Gadamer's [3] viewpoint on the progressive nature of play and the fundamental nature of a game as I committed to a collaborative game with scientists. I invested in Huizinga's idea of the "magic circle" [4]: a separate, independent space in which the totality of an experience is enhanced through play inside several zones. Like Winnicott [5], I sought to explore how creativity and play thinking might enhance my understanding of the connections (internal and external) that exist in artscience in terms of image-making.

CONTEXT

My practice is grounded in the long-established tradition and culture that exists in artscience collaboration elucidated by such writers on art and science as Lorraine Daston [6], Siân Ede [7], Peter Galison [8], Caroline Jones [9], Martin Kemp [10], Bruno Latour [11], and David Rothenberg [12], as well as contemporary artists deeply involved in science, such as Andrew Carnie [13], Anna Dimitriu [14], and Robert Kesseler [15].

The research I have conducted supports Latour's concept that comprehending science beyond the ordinary or practical level implies transforming knowledge, removing it from its material form, and remaking it, which is an essential process of thinking and progress [16]. My approach is supported by Ede's [17] assertion that creativity, innovation, and reinterpretation are as vital as our ability to analyze and defend scientific fact. Ede [18] states that the ethical implications of scientific research and the use of cutting-edge technology must be considered in a broader context, as our perspectives on information and knowledge creation evolve. Dimitriu's [19] work on ethical dilemmas resulting from the interaction of art and science within public scientific discourse details how artists, scientists, and institutions need to rethink their roles and duties so that artscience partnership can take on new significance.

I examined Kemp's [20] claim that art and science became divergent professions when science prioritized precise representation above creative interpretation. With the invention of the X-ray by Röntgen in 1895, the quest for scientific certainty resulted in new medical image invention, including techniques that reached beyond the human eye to microscopy, bringing new methods of visualization to the fore. I was inspired by Rothenburg's [21] emphasis on aesthetics and the evolution of beauty as a method to think and create beyond the constraints of a single system of knowledge. At the time, I was drawn to the aesthetic and complex quality of bioimaging and their use of scientific technologies, as well as to Carnie's [22] immersive moving-image installations and Kesseler's [23] multi-frame microscopic images, which reside in a realm between science and representation. My work adds to theoretical discourse on artscience collaborative practice and its use of cutting-edge technologies.

FOCUS

I spent a decade collaborating with scientists who work in the Cell Signalling Imaging (CSI) facility of the School of Life Science Imaging (SLIM), Nottingham University. I am the only artist-researcher to work in this lab. From this privileged position, I have built relationships over time to develop a framework and four-stage approach. I introduced the notion of play as an insightful concept to test its value in advancing my art practice while working with these scientists. Taking on board Huizinga's [24] concept of the "magic circle," I separated myself as the player from my artistic studio routine and instead participated in and documented scientific experiments in the lab and the advanced imaging lab. Thereafter, I made artwork from scientific data in the computer lab and art studio and subsequently disseminated my interpretative investigations at scientific conferences. I invented new rules for engagement that gave me flexibility to adapt. Understanding the subverting of scientists' exacting techniques was critical to challenging their methods. I took on the role of a conduit, taking on board scientific concepts and developing new conceptual ideas to convey an understanding of aspects of science that I found interesting, such as its aesthetic value and technological ingenuity.

FIRST CYCLE OF ART PRACTICE IN THE LAB (2016–2018)

I investigated the University of Nottingham's core-imaging labs as an underutilized (aesthetically, cognitively, and technically) artist-researcher resource. I embraced my role as conduit as I worked with individual and small groups of scientists. I was educated in numerous specialist techniques and empirical procedures to expand my knowledge of advanced imaging and microscopic system capabilities, computer visualization techniques, and software. I examined the methods, judgments, and reasoning of my colleagues, as well as their meticulous, rigorous statistical techniques.

Action research (AR) was selected as the methodological approach because of its cyclical, reflective nature; it encompasses contemplation, planning, action, observation, and reflection [25]. Kester's [26] dialogical aesthetics and his analysis of community play and ideation was useful as I "played out" the experience of masquerading as a scientist. My expertise developed through empathetic interaction while she acted as a scientist conducting scientific tasks. She combined scientific method with a performative, process-based approach sustained from a strong sense of curiosity that liberated me from prejudices [27]. I concentrated on the human side of science and utilized role-playing as I enacted technical tasks such as preparing cells. I dressed for performance, wearing a white lab coat for the lab and a blue one for the imaging lab. I encouraged my collaborators to switch roles and become documentary photographers, recording the interpersonal exchanges between myself and my collaborators without any prior organization or preparation. I was able to experience the creative processes in science by being rooted in it. I persuaded my colleagues not to limit their research to precise answers and comparable patterns, pointing out what I felt was unusual, unexpected, and surprising, much like a child in a sweet shop.

I convinced my colleagues to focus on their acts of noncompliance as a method to broaden their assumptions and ideas. I noted how play brought these scientists into a position to play [28]. My collaborators began to discuss how their knowledge of play was actively being created—how they experienced new things from integrating play thinking into their current knowledge system. They opened up and began to discuss their more radical, offbeat ideas. For instance, they seemed to give their cells personalities, developed attachments to their cell lines, and were naturally intrigued about the idiosyncrasies and erratic behavior of their cells. They concentrated on the technical issues associated with imaging, including pixels, resolution, distortion, and light behavior. Their experiments frequently yielded negative results (cell death, inaction, poor image quality), necessitating the use of scientific judgment and imaginative thinking. They acknowledged being excessively enthusiastic and making mistakes, as well as being chaotic at times, such as while doing four timed tests at once. At the same time, I assimilated scientific principles and worked hard to understand scientific terminology, which helped me build confidence. I discovered that science is an organically playful process, and scientists participate in play even if they don't call it that. I asked coworkers to submit written notes, sketches, and schematics. I also kept a lab diary in which I logged all my activities and included photos, videos, and drawings of the things I did.

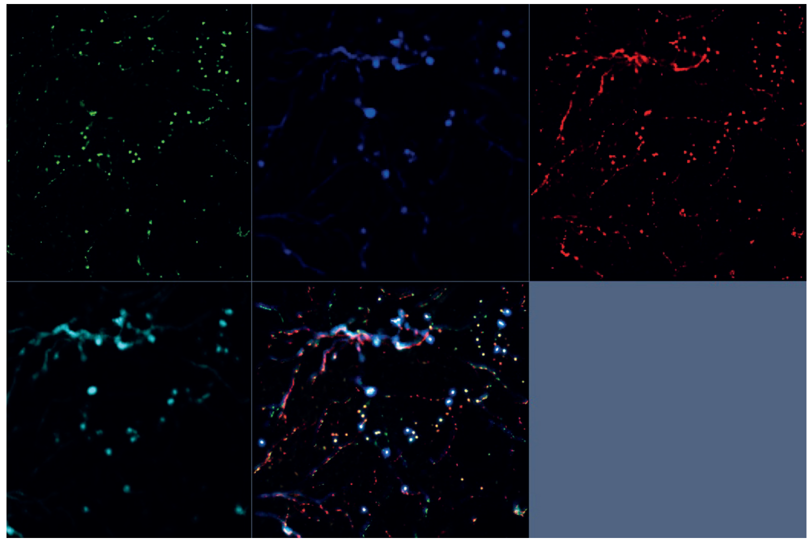

Fig. 2. R. Markus, SpinalCord63xW_7 seq STORM_PALM_PeakInt4_2.tiff, 1920 × 1080, 2018. Super-resolution in fluorescence microscopy is made possible by Photo-Activation Localisation Microscopy (PALM) and Stochastic Optical Reconstruction Microscopy (STORM). This technique allows for overcoming the resolution barrier caused by light diffraction. This is an example of this microscopy technique shown as a split screen image in different color channels. (© Joanne Berry-Frith)

In the advanced imaging and microscopy labs, my attention was on the image. The proximity of others in these darkened spaces intensified the visualization process. I found this to be in stark contrast to the investigations at the scientific bench, which were light-filled spaces, full of intriguing scientific instruments. At this stage, I was interested in interrogating scientists' technological expertise as they carried out imaging experiments over an extensive period. I discovered that dialogue improved, and scientists began to discuss the aesthetic value of their picture-making procedures by focusing on aesthetics and technological creativity. I saw that my and the scientists' perspectives on our imaging approach evolved by exposing it to the exquisite qualities of image creation beyond the everyday routine. I observed how, why, and when play occurred, including its inventive and technological features, as well as the creativity of individuals conducting research. Figure 1 is a photograph of Robert Markus in the super resolution microscopy (SRM) lab at Nottingham University. Gadamer's [29] emphasis on the free play of understanding and imagination prompted me, over an extensive period, to encourage long-term collaborator Markus to try out wide-ranging visualization techniques.

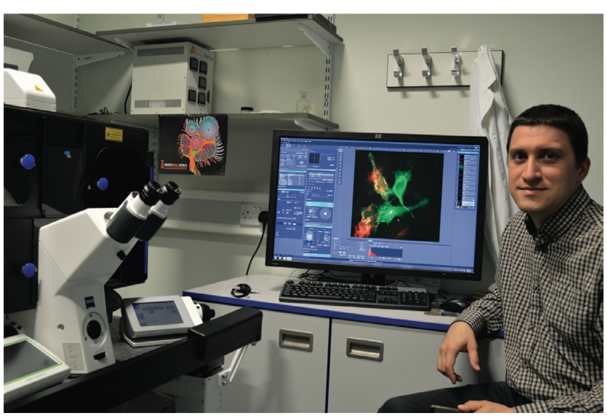

Fig. 1. Markus in the SRM Lab, 2018. (© Joanne Berry-Frith)

I was impressed by seeing real-time experiments live on screen—how complex biological images materialize, react, light up, and change shape when drugs are added and how a sample reacts to the laser beam. When producing and processing image data, Markus indicated that he was not looking at shape or form as an artist would look at a piece of art, such as a painting; rather, his selection techniques were governed by theory and utilized to solve a research topic. Markus was inspired by his agile conversations with me to investigate super resolution microscopy (SRM), a "pointillist" method, and confocal microscopy (CM), which produces sharp images of cells and cellular structures, to capitalize on this unique collaboration beyond standardized scientific visualization methodologies. I was intrigued to discover how and why Markus developed his visualization approaches by employing optical trickery and mathematical strategies, such as altering the light pattern and applying mathematical concepts and algorithms to analyze protein subcellular colocalization. For example, he wanted to demonstrate that he could target cells with low-enough power to capture a single molecule and analyze subcellular molecular interactions. Figure 2 is an image from a SRM imaging experiment tailor made for me of a mouse spinal cord, visualized as a photo-activated localization microscopy experiment. Markus explained how this experiment enabled biological processes to be illuminated at a molecular scale so that they could analyze the spinal cord's tissue and its depth.

I valued seeing the visual dynamism of a scientific sample at 10,000 times magnification and observing the differences and variations in image quality as pixel resolution and data rendering declined, even on high-quality imaging computer monitors. All these processes are usually hidden from artists, and this provided a one-of-a-kind experiential insight that could only be obtained by being present in the lab. Such exchanges became vital, and I came to realize that my presence enabled scientists to go beyond routine. Critically, my partnership with Markus grew as we experimented, explored different modes of representation, and addressed our opposing perspectives on images, resulting in a better understanding of Markus's and my disciplinary aspirations.

I noted how playfulness surfaced through interdisciplinary discourse, which spanned rational and irrational concepts. I observed that my collaborators' and my conduct altered from passive to assertive interaction by being personally invested in this field. Vitally, individual scientists such as Markus began to reveal how they felt about science, scientific representation, and their role within this system. Markus became aware that our interaction was influencing his work beyond the constraints of his singular disciplinary perspective. Aided by my research, which combined empirical research with firsthand interpretive observations, a unique set of connections came to light, allowing me to construct my own frameworks and generate a personalized set of correlations derived from the available data [30]. I realized that being there allowed me to articulate aspects of science that I found appealing, such as its subjective and supernatural connotations. Markus and I aimed to learn from one another and express complex terms in a more unconventional manner. Scientists such as Markus expressed frustration with a rigid approach to research that left little room for creativity, notwithstanding the fact that this partnership encouraged improvisation. "To voice things, which we had in our mind, just rarely spoken out loud" was what he wanted to do. He wanted me to understand "how we [scientists] work, think, and approach problems" to express concepts that went beyond theoretical convention [31].

Play's transformational effect highlighted its cultural potential. As a result, scientists became better equipped to collaborate with a nonscientist. They revealed their more personal thoughts and reflected upon their function and behavior as scientists at a deeper level. They wanted me to understand the essence of what they, the research group, and the wider field of science were trying to achieve. I gained insight into their longing for scientific freedom and a desire to expand complementary approaches to science. I wanted to highlight how breakthroughs in advanced imaging and microscopy are altering our perception and comprehension of images; my aim moving forward is to encourage artists to engage with biomedical scientists to have an impact in this field.

SECOND CYCLE OF ART PRACTICE IN THE SCIENTIFIC COMPUTER LAB AND STUDIO (2016–2018)

In the second stage, Kester's [32] description of incorporating play into creative work to foster invention took precedence. I applied my knowledge of performative learning in the lab by designing inventive visual methods that promoted creativity and innovation. I put myself in a position and adopted an attitude to play and as a result, the "magic circle" of the scientific computer lab became a crucial artistic environment [33].

I discovered that this lab was a neglected space ripe for visual experimentation, noting that my collaborators adhered to a limited set of software commands. I examined their processing systems, software (Q capture Quo, Zen Black, and Zen Blue), user interface, and tools. I concentrated on the 80 percent of functional software tools that scientists in this lab do not explore. I conducted numerous visual experiments to test the boundaries of the software and examined previously ignored elements to expose their properties. I engaged in improvisation as a tactic, changing parameters and variables systematically, by adapting one visual attribute at a time and conducting random, offbeat visual experiments to test the boundaries of this technology and to reimagine data. I focused on basic pictorial elements such as color, view, offset, topology, and stereo projection, recording them in my lab notebook. Such methods are not part of scientific protocol, but by deploying play as an insightful concept, I demonstrated to my collaborators how they may circumvent scientific image protocols to expand their methods of representation. Figure 3 depicts a three-dimensional fly-through surface-rendered sequence. Figure 4 depicts the same data created as a projection moving image—a movie still preserved as a three-dimensional extruded projection, capturing a specific point in time.

Back in my studio, moving away from software play, I formed a unique dialogue with synthetic image data. Initially, I advanced an introspective, vector-drawing technique, using basic software tools to map pixel data. Then I developed a series of data montages and created experimental moving image work, which integrated documentary film footage and sound. I focused on time, juxtaposition, scale, opacity, transitions, and multi-layering moving-image sequences (0.04 seconds–10 minutes). In contrast to the strict image standards required by scientists for illustrating visual data in their research, using play (improvisation, subjective, experimental) as a creative method extended the range of possible outcomes.

Here I focus on my data montage method, constructed from multiple visual datasets sourced from the archive of raw image data collected in the lab and data generated in the scientific computer lab. To arrive at a state of playfulness, I formulated a new set of rules to disrupt familiar methods of visualizing data. Using Kant's [34] definition of free play as the capacity to use the nonpurposeful idea of "delight in the beautiful," I reflected on the pleasure I felt when constructing an image eclectically. Color Image A is a simulation that includes a mix of data sets, including: a Colar Cover Glass Correction image experiment used to check for optical faults in the cover glass, an Algae Snapshot Chlorine Oil DNA experiment of bacteria from an unknown sample, and a Halo tag VEGEFR2 Snapshot

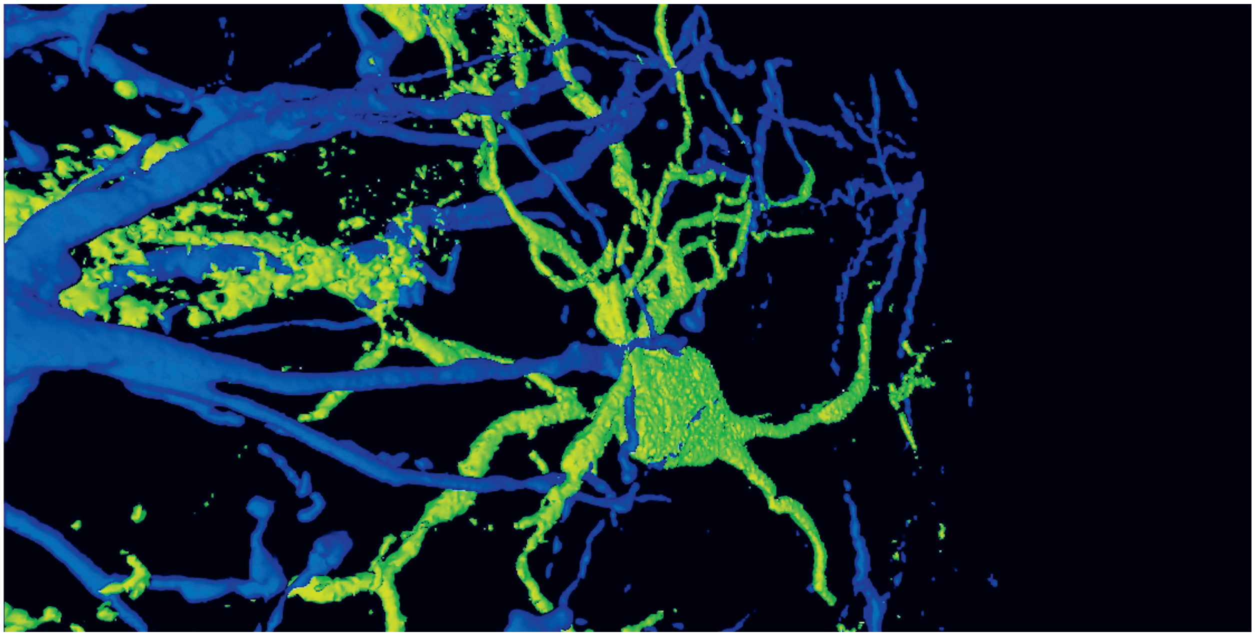

Fig. 3. J. Berry, Confocal SpinalChord2ch SeqFrame mode_Render_Series_dimensions_and_position.tif, 1920 × 1080 (1080p), 2016. A movie still from a textured angled spinal cord experiment where I played with color, texture, fly-through and speed. (© Joanne Berry-Frith)

SIM experiment in which empty HEK cells are introduced to a receptor with a HALO tag before a fluorescent label is added. The data montage combines three-dimensional image topologies with a precise linear vector drawing to produce a dynamic layered composition that is loaded with information but lacks a focal point. The viewer needed to examine both micro and macro parts of the image in a process similar to selecting the most suitable sample for microscopy.

Figure 5 is from a series of sequential image stills. The background derived from a human cardiomyocyte experiment of zed stack data. It formed an organic patterned backdrop of golden-orange stills. The amorphous imagery of the Cover Glass Correction movie was rotated, overlaid, and blended to generate flow. Adobe Illustrator's opacity tool was employed to soften the crimson Cover Glass Correction images, blending these organic shapes into the frame. A solid, black-and-blue, three-dimensional SIM Spinal Cord Sequential image acted as a compositional anchor to contrast the flow.

I made significant adjustments to the compositional frame. Figures 6 and 7 are remodeled compositions inspired by ancient scrolls. Unlike a traditional poster, the scroll format encouraged scientists to interact physically with images (as described in the next section). After I saw that scientists prefer to talk with other scientists about scientific research at scientific conferences rather than engage with experts from different disciplines, I created large-scale scrolls that could be seen on a tabletop and interacted with by the audience to counteract this dynamic.

Figure 6 is an illustration of an image compilation from the Colar Cover Glass Correction experiment. I experimented with repetition, composition, overlay, and rotation as I built, merged, and connected the luminous amorphous objects, highlighting the aesthetic qualities within a dark picture frame. I added a simple headline reminding viewers to refer back to the source.

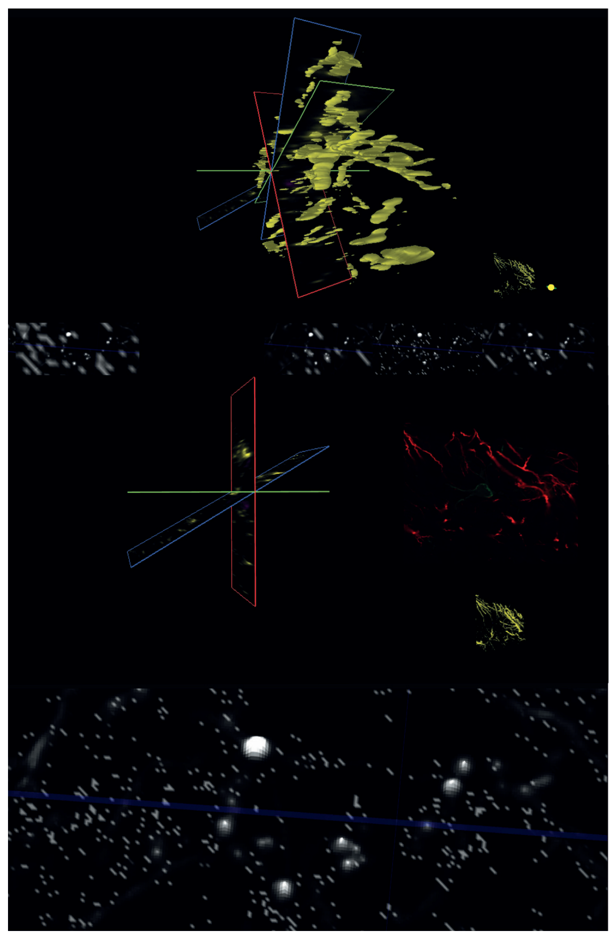

Fig. 4. Confocal SpinalChord2ch SeqFrame modesloweddownmarch1st_Render_Seriescreateimage1.jpg, 1920 × 1080 (1080p), 2018. Data collage projection image compilation with a pixelated image still from software play in the lab compiled as one image. (© Joanne Berry-Frith)

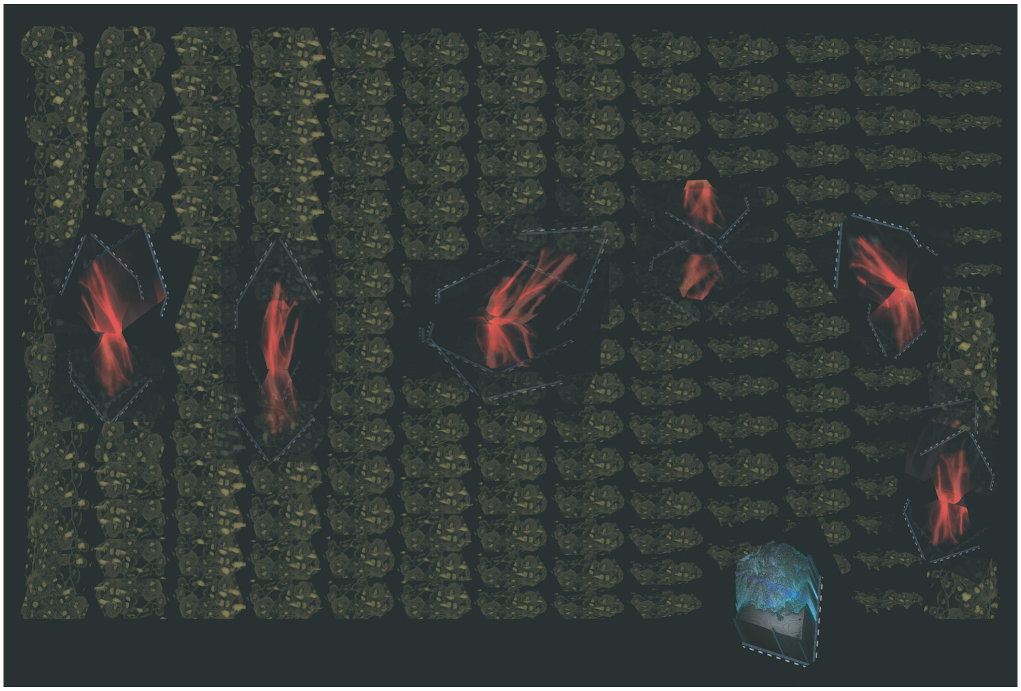

Fig. 5. Sequence compilation, 125 × 842 cm, 2018. I used Zed stack data from a human cardiomyocyte experiment to create a detailed background. The red Cover Glass Correction movie imagery generated dynamic flow, while the black-and-blue three-dimensional topology anchored the composition effectively. (© Joanne Berry-Frith)

Figure 7 mixed three-dimensional rotated topological stills from moving-image files employing repetition, layering, and rotation to give the illusion of a dynamic, off-balanced, and cluttered composition, in this instance integrating data taken at a molecular level using a 63× magnification objective lens to showcase perspective and view.

THIRD CYCLE OF ART PRACTICE DISSEMINATION (2017–2018)

During the third cycle of practice, I disseminated my interpretive artwork alongside scientific posters at two temporary exhibitions, enabling a wider community of scientists to view my findings. Dissemination as a method forced scientists to look at their data through my vision, from my field of expertise, and this created debate. Both COMPARE 2017 Annual Research Symposium and the formal launch of COMPARE 2018 provided abundant but challenging opportunities for engagement.

I discovered that the "magic circle" of the scientific conference was not ideal. As the only nonscientific researcher presenting practice at both events, I had to let go of my creative ego and go with the flow. I charted ludic activities, such as having little control over the format and placement of artwork, and organizers providing unstable exhibition boards and tables for displaying large-scale digital prints, scrolls, A2 and A3 portfolios, and questionnaires. I concluded that both conferences were mediocre exhibition spaces where personal relationships with scientists did not develop sufficiently—my game plan had faltered. Scientists I spoke with found the topic of play as a method of expanding scientific representation unusual. None-

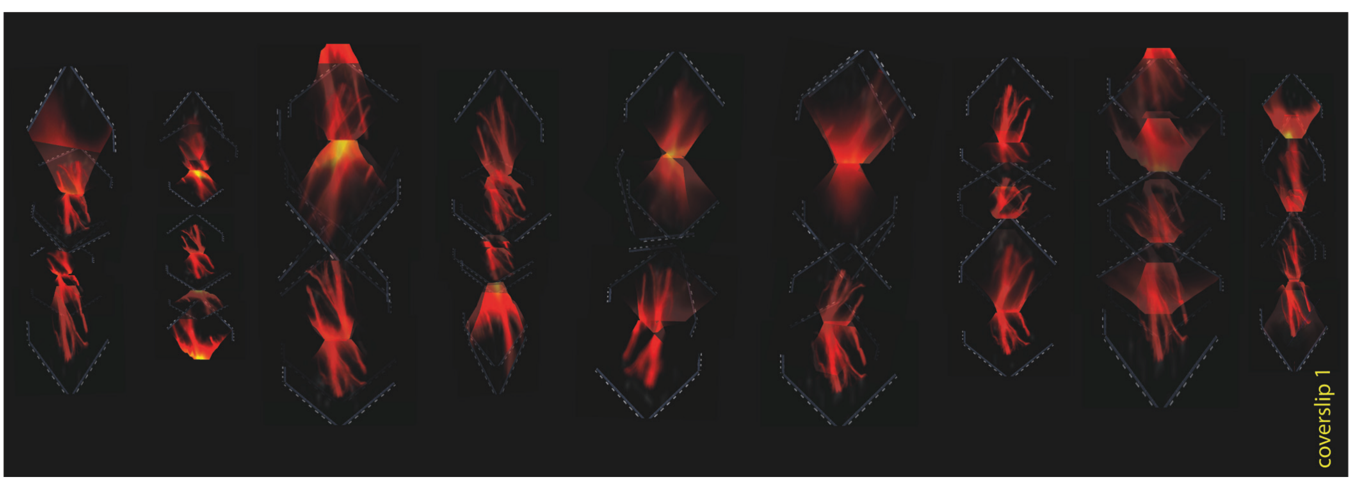

Fig. 6. Cover slip 1. 100 × 35 cm, 2018. I created an image from the Colar Cover Glass Correction experiment, exploring repetition, composition, overlay, and rotation. I highlighted the luminous amorphous objects within a dark frame and added a headline to direct viewers to the source. (© Joanne Berry-Frith)

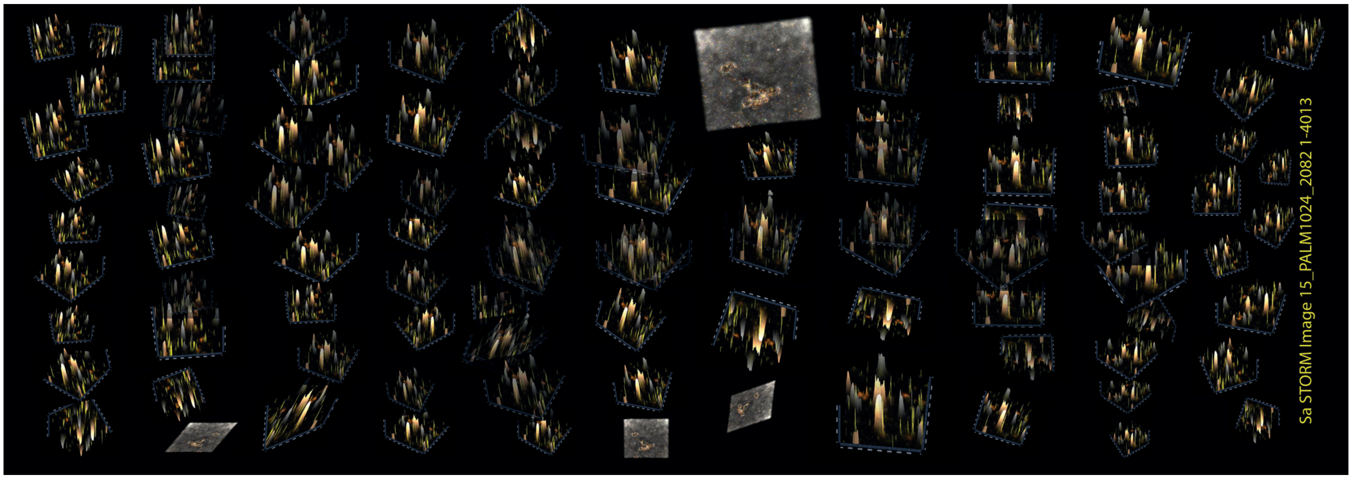

Fig. 7. Sa STORM Image 15_PALM1024_2082 1_4013, 100 × 350 cm, 2022. The three-dimensional topological stills from moving-image files. Repetition, layering, and rotation were used to create a dynamic composition. This showcases molecular-level data captured with a 63× magnification objective lens at different perspectives and focal points. (© Joanne Berry-Frith)

theless, the findings were enlightening; scientists reported that thinking playfully and working in a more imaginative fashion with an artist in the lab was novel, allowing them to perceive their research from a different disciplinary perspective.

The experience helped me understand the challenges of conveying to scientists the value of alternative interpretations of their data. An artist was seen as a positive new attribute, and organizers, collaborators, and attendees recognized me as a distinctive, thought-provoking presence. Exhibiting artwork at these events sparked discussion on the need for artists to collaborate with scientists in laboratories and provided opportunities for networking. Dissemination contributed to the creation of a third data set.

FOURTH CYCLE OF ART PRACTICE REFLECTION (2018–2019)

At this stage, I reviewed all three cycles of art practice above to form critical linkages through reflective analysis [35]. I recognized the advantages of conducting a long-term study spanning several years, reflecting on the significance of the entire experience. This reflection included how I reacted to empirical rationality to achieve a cultural breakthrough from both disciplinary perspectives. Research revealed a void, a desire from both cultures to collaborate, acknowledging that it was all right if artists and scientists did not always achieve the same aims or conclusions. It drew attention to a genuine desire from both disciplines to bridge the divide between art and science by working together productively. I conjectured that engaging in play as an insightful concept inside another cultural domain allowed the aesthetics of scientific image-creation to be examined from a distinct viewpoint, so that a unique system of engagement and production evolved as silo mentalities broke down.

CONCLUSION

Science and art are pillars of education and society; they involve equity, sustainability, productivity, empowerment, and cooperation, yet despite recent interest in artscience projects, science and art tend to be rigidly viewed as distinct fields. This hinders teamwork. My objective over the last decade has been to tear down silo mentalities. I regarded art as play; recognized the limitations of positivism, the prevalent paradigm in science; and encouraged innovative discovery while working as part of a team as a counterweight to a reductionistic approach. My approach to practice serves as a model for future scholars. It provides a structure within the norms of a scientific lab that allowed me, and will allow others, to facilitate cultural exchange. Introducing play as an insightful concept allowed scientists to step outside their prescribed frame of reference, shifting their field of view from microscopic to telescopic. Indicators of success were not what was expected; instead, more nuanced measures predominated, such as a shift in attitude and behavior—in myself, my collaborators, and the audiences to whom I presented my research. I discovered three advantages to such collaborations.

1. Play stimulated creative thinking, removing obstacles and creating a bridge between the laboratory and artistic inquiry.
2. Art as play increased appreciation for technical advances in scientific visualization.
3. Nonstandard scientific communication techniques (such as data montages) in scientific research and dissemination compelled scientists to examine their data from a different perspective, leading to different kinds of debate [36]. Scientists realized the benefits of collaboration and using art in their studies.

Dissemination opportunities with audiences interested in the arts, humanities, and technology, such as the recent exhibition *Art-Science Interplay* held at the Coningsby Gallery, London (see for example https://www.coningsbygallery.com/news/jo-berry-art-science-interplay-16-june-2023), shed light on the importance of this model of practice. I am building a network of specialist contacts, which is facilitating ongoing research and establishing my position within this field of expertise.

References and Notes

1 Donald W. Winnicott, Clare Winnicott, Ray Shepherd, and Madeleine Davis, *Physco-Analytical Explorations* (Routledge, 1989).

2 Hans-Georg Gadamer, *Truth and Method* (Cambridge University Press, 1994).

3 See Gadamer, *Truth and Method.*

4 Johan Huizinga, *Homo Ludens: A Study of the Play-Element in Culture* (Beacon Press, 2016).

5 See Winnicott et al., *Physco-Analytical Explorations.*

6 Lorraine Daston and Peter Galison, "The Image of Objectivity," *Representations* 40 (1992): 81–128, https://doi.org/10.2307/2928741.

7 Sîan Ede, *Art and Science* (I.B. Tauris, 2012).

8 See Daston and Galison, "The Image of Objectivity."

9 Peter Galison and Caroline A. Jones, *Picturing Art Producing Science* (Routledge, 1998).

10 Martin Kemp, *Structural Intuitions: Seeing Shapes in Art and Science* (University of Virginia Press, 2016).

11 Bruno Latour, *Networks, Societies, and Spheres: Reflections of an Actor-Network Theorist* (International Journal of Communication, 2010), http://www.bruno-latour.fr/sites/default/files/121-CASTELLS-GB.pdf.

12 David Rothenberg, *Survival of the Beautiful* (Bloomsbury, 2013).

13 "Andrew Carnie," Andrew Carnie, accessed 1 October 2024, https://www.andrewcarnie.uk.

14 Anna Dimitriu, *Trust Me, I'm an Artist: Towards an Ethics of Art and Science Collaboration* (Blurb, 2014).

15 "Science from the artistic perspective," Zoe Jackson, 25 March 2020, accessed 1 October 2024, https://nano.oxinst.com/library/blog/science-from-the-artistic-perspective.

16 See Galison and Jones, *Picturing Art Producing Science.*

17 See Ede, *Art and Science.*

18 See Ede, *Art and Science.*

19 See Dimitriu, *Trust Me, I'm an Artist.*

20 See Kemp, *Structural Intuitions*.

21 See Rothenberg, *Survival of the Beautiful.*

22 See Carnie.

23 Rob Kesseler, *Up Close* (Papadakis, 2010).

24 See Huizinga, *Homo Ludens*.

25 Linda Dickens and Karen Watkins, "Action Research: Rethinking Lewin," *Management Learning* 30, no. 2 (1999): 127–40, https://doi.org/10.1177/1350507699302002.

26 Grant H. Kester, *Conversation Pieces: Community and Communication in Modern Art* (University of California Press, 2013).

27 Mehri Takhvar, "Play and Theories of Play: A Review of the Literature," *Early Child Development and Care* 39, no. 1 (1998): 221–44. https://doi.org/10.1080/0300443880390117.

28 See Takhvar, "Play and Theories of Play."

29 Hans-Georg Gadamer, *The Relevance of the Beautiful and Other Essays* (Cambridge University Press, 1998).

30 Julian Stallabrass, *Internet Art: The Online Clash of Culture and Commerce* (Tate Publishing, 2003).

31 "Robert Markus," University of Nottingham, accessed 1 October 2024, https://www.nottingham.ac.uk/Life-Sciences/people/robert.markus.

32 See Kester, *Conversation Pieces*.

33 See Huizinga, *Homo Ludens*.

34 See Gadamer, *The Relevance of the Beautiful*.

35 Donald A. Schön, *The Reflective Practitioner* (Grune & Stratton, 2013).

36 Estelle Barrett and Barbara Bolt, *Practice as Research: Approaches to Creative Arts Enquiry* (I. B. Tauris, 2007).

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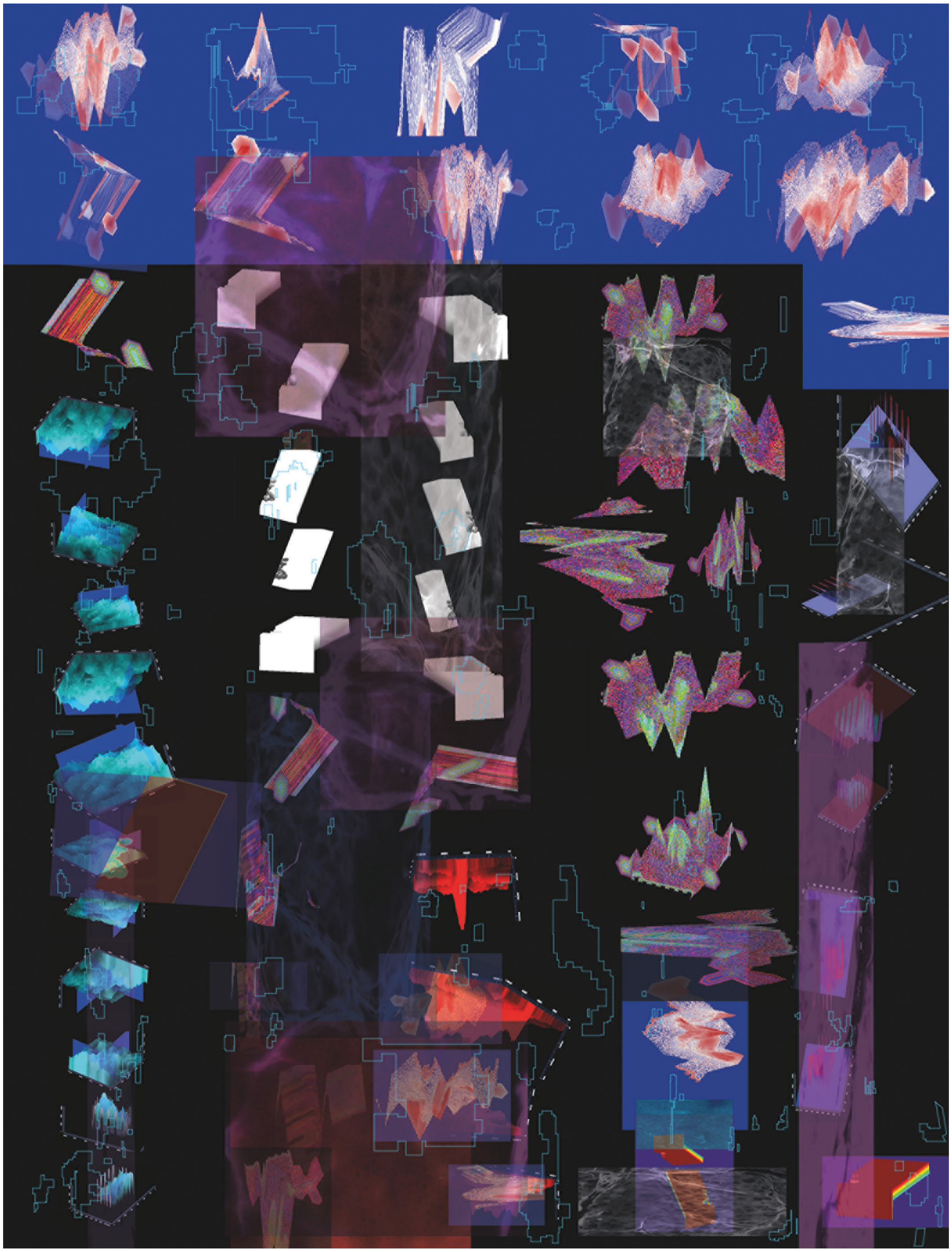
COLOR IMAGE A: PLACING ART PRACTICE INTO THE FIELD OF BIOIMAGING: TESTING PLAY AS A METHODOLOGICAL TOOL TO EXPLORE AND REFLECT UPON ART PRACTICE



A simulation of data montages, 95 x 125cm, 2016. The data montage is a celebration of color and the beauty of the data collected. It mixes three-dimensional picture topologies (a linear vector drawing) to create a dynamic image with a flattened perspective. (© Joanne Berry-Frith) (See the article in this issue by Joanne Berry-Frith.)