

Keepers of the Bio Art Laboratory: Mangling Methods and Curating Critically

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Cet article se concentre sur la pratique en plein essor du bio-art, afin d'envisager les possibilités de faire du commissariat au sein de deux sphères de productions culturelles en apparence disparates, celles du laboratoire scientifique et du musée. Dans une analyse des œuvres du Tissue Culture & Art Project (TC&A), de Kathy High et de Jennifer Willet, il décortique les méthodes commissariales qui s'attachent à relocaliser le laboratoire dans le musée et vice-versa. En explorant ce phénomène de transversalité à travers les figures du «mangle» et du «biotheatre», le texte fait valoir que les pratiques du bio-art font intrinsèquement appel à des stratégies créatrices et commissariales qui ébranlent la perception de stérile objectivité des laboratoires et qui permettent de critiquer les paradigmes de la culture scientifique.

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The field of bio art is relatively new and emerged in concert with expansions in biotechnology; these include tissue culturing, which only came in to development at the turn of the twentieth century. Artists took up such practices at the beginning of the 1990s, following the pioneering bio-artist collective Tissue Culture & Art Project (TC&A). Bio art, which takes living matter as a starting point for material production, remains unfamiliar to many. Those who encounter live matter for the first time in a gallery or museum setting often recall an initial shock, which is followed by an uneasy, queasy, and uncanny feeling. In one of bio art's earliest definitions, Robert Mitchell notes that medium specificity—the use of living materials, such as live tissue, bacteria, or living organisms—unified early understandings of art engaged with emerging biotechnologies.¹ In his theoretical account of bio art, he proposes that a shared use of living materials and bio-technologies underpins the art form, which seeks to transform relationships between science, medicine, corporate interest, and the public at large. While Mitchell's framing of the field allies the bio-art form with medium specificity, in contrast, I define bio art both by its themes and materials, and by how it often moves along a spectrum between these two imposed poles. At the same time, I prioritize a categorical distinction: a work of bio art must use “wet” or biological matter as its medium. In line with the work of bio art curator Jens Hauser, I suggest that the bio-art form is not solely allied by formal use to a specific set of bio media, but rather that it can—as in the debates around the framing of “new media art” and its shared material, conceptual, and formal language—be a more malleable categorization, one that links artworks and practices that employ all types of “wet” or bio matter, that share a thematic interest in bio technologies, ecology, and the environment, and that can be categorized using a variety of terms, including vivoarts, transgenic art, wet art, and biotech art.

Liveliness and presence has also been identified as a key feature of bio art. The latter generates a “presence” through this liveliness, as well as through the visceral responses it produces. In bio art, liveliness is mobilized through the presence of human and nonhuman bodies, what Hauser refers to as “the literal mingling of ‘art and the living’ and with it a general trend towards physicality and bodily perception.”² This relationship between the human body and a present work of bio art generates visceral and embodied modes of viewing that are necessary to consider in the context of critically curating art-science practices.

1. Robert Mitchell, *Bioart and the Vitality of Media* (Seattle: University of Washington Press, 2010).

2. Jens Hauser, “Biotechnology as Mediality: Strategies of Organic Media Art,” *Performance Research* 11, 4 (2006): 131.

This article will unpack such relationships, but particularly those between the spectator and the work of bio art, and begins with a discussion of two fundamental concepts in the field—“presence” and liveliness—and their relevance to curating. Through three case studies, I will focus on the importance of care as an ethical position for curating and making works of bio art. I will then explore the feminist implications of performance studies scholar Adele Senior’s notion of “biotheatre”³ as a mode of engaging with bio art, and argue that, as a curatorial method for approaching cross-disciplinary work, it enables both embodied modes of experience and a critique of dominant science paradigms.

In order to ally the curatorial with the lively and present quality of bio artworks, one should address their shared interest in the communication of new forms of knowledge through the mobilization and visualization of research by way of creative practice. Through its presence, as well as its tendency towards physicality, context-driven exhibition, and the presentation of scientific research to a wider public, bio art becomes a form of research-creation practice enacted through art and exhibition making. Through the activity of research and experimentation, the curatorial enacts different forms of public address.⁴ As Canadian cultural theorist, political philosopher, and artist Erin Manning suggests, “What research-creation can do is propose concrete assemblages for rethinking the very question of what is at stake in pedagogy, in practice, and in collective experimentation.”⁵ From this perspective, the curated exhibition of bio art could act as a form of knowledge production that can illuminate something new about science for the public. This work is done, in part, by way of its liveliness, which may compel audiences to engage and, in the case of Tissue Culture & Art Project’s practice, to participate in scientific experimentation through literal consumption.

For Jens Hauser, the performative nature of bio art allows it to exude “presence,” which is felt by viewers when encountering the liveliness and agency of nonhuman living matter. In his words:

It generates *presence* ... the observer of bio art must shift between the symbolic artistic space and the “real life” of the presented processes suggested by the organic presence. These processes draw their significance not only as semiotic cultural signs, but also through their own performativity, which suggest to the recipient the existence of a “bodily co-presence” through the materiality of the presentation.⁶

Hauser’s understanding of “presence” is derived from literary theorist Hans Ulrich Gumbrecht’s proposed cultural paradigms, which distinguish between “meaning cultures” and “presence cultures.” The meaning cultures paradigm refers primarily to the beginning of Protestantism and the modern age, and connotes a human detachment from the rest of the world related to the production of knowledge (placing humans at the top of the liveliness hierarchy). In contrast, “presence cultures” are aligned with medieval and early Catholic ritualistic cultures, in which “humans consider their bodies in their surrounding space to be rhythmically part of a cosmology that makes inherent, magical sense, and in which knowledge is revealed.”⁷ The presence generated by bio art, with its potential to gain magical qualities, creates a host of new possibilities and challenges for curating, including rethinking the relationship between the artwork and the viewer in an exhibition context. For example,

3. Adele Senior, “Towards a (Semi-)Discourse of the Semi-Living; the Undecidability of a Life Exposed to Death,” *Technoetic Arts: A Journal of Speculative Research*, 5, 2 (2007): 97–112.

4. Simon, Sheikh, “Circulation and Withdrawal, Part II: Withdrawal,” *e-flux* 63 (March 2015), <https://www.e-flux.com/journal/63/60924/circulation-and-withdrawal-part-ii-withdrawal> (accessed September 10, 2018).

5. Erin Manning, “Ten Propositions for Research-Creation,” in *Collaboration in Performance Practice: Premise, Workings and Failures*, eds. Noyale Colin and Stefanie Sachsenmaier (New York: Palgrave Macmillan: 2016), 133.

6. *Ibid.*, 131–132.

7. *Ibid.*, 131.

there is the danger of essentializing and further mystifying scientific practices employed by artists through the presentation of technophillic and aestheticized representations of scientific processes that aim to stun and confuse the public rather than illuminate something new. Thus, it remains the role of both artist and curator to create a generative space for viewing, one that results—not in awe, terror, and disgust—but rather a thought-provoking site for audiences to encounter scientific practices outside of the specialized and sometimes exclusionary culture of the lab.

Some of the generative potentials and possible curatorial pitfalls of exhibiting bio art largely concern the performative nature inherent to the work's living quality. According to Hauser, it is by means of this quality that bio art makes "presence" felt—such presence is enacted through encountering the liveliness and agency of nonhuman living matter. The works of Tissue Culture & Art Project (tc&a), Kathy High, and Jennifer Willet play with modes of encountering liveliness, and seek to inform publics, generating questions and critique. Jennifer Willet's creative production course *InsideOut: Laboratory Ecologies* (ongoing since 2008) employs a multitude of creative practices (performance, photography, installation) in order to blur the lines between institutional sites, specifically the museum and the laboratory, quite literally turning them inside out. Willet's work questions the ecologies of the laboratory and the museum by lifting the boundaries between them, brining artistic performance into the lab and laboratory performance into the gallery. Willet, like tc&a before her, questions the performative nature of *doing* science by creating a space for scientific experimentation in the fine art museum. tc&a's *Disembodied Cuisine* (2001–2003) engages with living matter and human subjects through a performance of growing, caring for, culturing, and then finally eating lab-grown meats in a museum. Their work allows for the communication of a more tangible knowledge of tissue-culturing technology and a more practical view of what it means to make and consume lab-grown meats. Kathy High's installation *Embracing Animal* (2005) at the Massachusetts Museum of Contemporary Art (MASS MOCA) | **fig. 1** | became a gesture of care towards three rats, bred to be sick, and used in laboratory medical testing. Her installation and the live rats' performance of living and being in the museum sought to open up public assumptions about rats, as well as medical testing on animals, by confronting viewers directly with the lab participants themselves—the sick and tormented rats—as a means of generating a dialogue about, and for, these creatures. The embodied feeling generated by the presence of a work of bio art opens up a new mode of experiencing artworks. When presented with nonhuman liveliness, such as through High's work with rats and tc&a's semi-living, lab-grown meats, publics are opened up to the possibilities of new understandings of life. When working with living, non-human matter to create performative works, artists must consider what it means to co-create a work of art with other lively forces. What does it mean for living matter to perform in a gallery?

tc&a: The "Biotheatre" Model

In her theoretical analysis of works by the Australian artist collective tc&a, which was founded in 1996 by Oron Catts and Ionat Zurr, Adele Senior



Figure 1. Kathy High, *Embracing Animal*, 2005–2006, installation shot, *Becoming Animal: Art in the Animal Kingdom*, May 2005–February 2006, Massachusetts Museum of Contemporary Art. Photo: Adrian Garcia.

Figure 2. Tissue Culture & Art Project, *Disembodied Cuisine*, installation, *L'art biotech*, March 14–May 4, 2003, Le Lieu unique, Nantes, France, 2003. Photo: Axel Heise, courtesy of the artists.



proposes the notion of a “biotheatre”⁸ to describe the modes in which bio art reorients spectatorship and calls for a thinking, acting audience, thereby demanding new forms of curatorial practice and engagement for new types of spectators. The “biotheatre” as a curatorial method for displaying and encountering works of art has ethical implications for audience interactivity and modes of encountering scientific practices, specifically with respect to the use and exhibition of lively, nonhuman matter as collaborators. In her analysis of what it means for a work of art to be semi-living in the bio-art field, Senior discusses how transdisciplinary artists who use living matter are creating their own discourses about science and technology. For example, TC&A artists Catts and Zurr coined the term “semi-living” matter, which Senior defines as,

constructed by growing living tissue over/into three dimensional scaffolds within an environment which, in effect, emulates the body of the complex organism from which the tissue originally derives. ... The artists keep these Semi-Living “sculptures” alive and assist their growth with a nutrient solution, an appropriate temperature and sterile conditions. The sculptures are exhibited (both alive and dead) in galleries and other public spaces to prompt “the re-evaluation of what life is and our treatment of other life forms.”⁹

Semi-living sculptures reside on the cusp of aliveness; they are composed of living tissues but require the help and care of human artists to keep them alive. When it comes to displaying such lively and living works, a unique approach is required, one that takes into consideration their durational nature. Does the work of art live out its lifecycle in the gallery, as a reflection of the processual nature of research-creation? Who takes care of the living sculpture or art object, and how does this influence the display? Do the care and maintenance of a bio artwork become part of the exhibition? To what extent should complex systems of background knowledge and textual or descriptive accompaniments be provided?

TC&A work out of SymbioticA, an artistic laboratory established in 2000 at the University of Western Australia’s School of Anatomy and Human Biology and dedicated to the research, learning, and critique of the life sciences. The collective’s primary medium for research and artistic production is tissue culturing, which is presented in a variety of sites, including the gallery, the lab, and through literary and theoretical writings. By evoking the “biotheatre” as a spectatorial mode particular to bio art, Senior points to the ways in which the experience of a bio artwork is often split across a variety of sites and media. The work may comprise an object, perhaps a sculpture, as in the case of TC&A’s work, as well as a performance. According to Senior,

biotheatre therefore refers to and initiates a language (place of viewing/place for viewing) for the critical consideration of bio(techno) logical “artworks” and their objects/subjects that are placed for viewing, according to a particular theoretical and/or methodological framework, by their artist/academic to be looked at and speculated upon from a particular place or places of viewing.¹⁰

For Senior, a bio artwork is framed through viewing, as well as in the written academic context. The merging of art and academic production through bio art creates a symbiosis. She writes:

Perhaps what a symbiosis of the two approaches attempted here ultimately calls for is a “semi-discourse” of the Semi-Living—one that enables both its creator and its spectator to occupy a place of viewing that contaminates, acknowledges and challenges its own

8. Adele Senior, “Towards a (Semi-)Discourse of the Semi-Living.”

9. *Ibid.*, 97.

10. *Ibid.*, 99.

limitations, its own “sovereign” forces: a semi-discourse that is both academic and artistic, neither living nor dead and always already undecided.¹¹

The cross-disciplinary and multi-material outcomes of bio art production offer new multi-channel modes of encounter, evocative of, and intimately intertwined with, research-creation practices.

Likewise, TC&A’s bio art contaminates, acknowledges, and challenges its own limitations through the production of artistic objects and critical thought. Much of TC&A’s work focuses, in fact, on curatorial practice and creating an entire environment or experience (*Semi-Living Worry Dolls*, 2000, or *Victimless Leather*, 2004). *Disembodied Cuisine* (2001–2003) is particularly evocative when considering curatorial methods and the importance of display. *Disembodied Cuisine* began in 2000, when TC&A conducted a residency at the Laboratory for Tissue Engineering and Organ Fabrication at Harvard Medical School. In this project, their research was focused on culturing animal tissue to create edible meat that could be consumed without concern for harming animals. The prototype “victimless” steak was grown from prenatal sheep cells, harvested from an unborn animal to be cultured in the lab. Realized in 2003, as part of the exhibition *L’Art biotech*, which was curated by Hauser, the project presented to the public was grown from frog cells. *L’Art biotech* was among a handful of early, curated bio-art exhibitions, and it was on display during the spring of 2003 at the Scène Nationale du Lieu Unique in Nantes, France.¹² According to TC&A, their installation played on notions of edibility, provoking questions around what is and is not considered tasty. Semi-living, tissue-culture steaks were grown from frog tissue—a play on fancy French cuisine and the notion of frog’s legs as a delicacy—and displayed in a transformed gallery that was both an art space and a science lab. | **fig. 2** | The exhibition space consisted of “a black dome punctuated by round portholes through which visitors [could] peer into the tissue culture laboratory. From another vantage point, the sterile hood [became] visible in its entirety, revealing the artists at work with the tissues.”¹³ The dark laboratory section, with a working area for the public to observe the artists growing tissue, was set in contrast to the well-lit dining space, which was enclosed in a clear, plastic tent emblazoned with bio-hazard symbols, thus reversing the traditional lighting schemes associated with these spaces. Thus positioned in opposition to one another, each space allowed the artists to conduct a different performative processes: in once case, they were feeding semi-living tissue, and, in the other, they were feeding the public audience.

An important curatorial strategy for the artists was to make public the regular maintenance schedule for their semi-living sculptures. Both the artists and art objects were thus performers in the exhibition space, and the practice of tissue culturing became a part of the exhibition, rather than solely a maintenance practice conducted behind closed gallery doors. The installation culminated in the artists inviting a small selection of guests to the gallery to dine on the cultured-tissue steaks. | **fig. 3** | The dining area was located adjacent to the lab, allowing visitors to glance over at the place where their semi-living meal was grown. A small group of frogs were held in glass aquariums overlooking the dining space. At the end of the installation, a “feast” was held and the frog-tissue cultured steaks were prepared in a garlic and honey sauce. Diners ate the

11. *Ibid.*, 110.

12. Jens Hauser, *L’Art Biotech* (Trézélan: Filigranes Éditions, 2003).

13. Lindsay Kelly, *Bioart Kitchen: Art, Feminism and Technoscience* (London: I.B. Tauris, 2016), 83.

steaks as the live frog “onlookers” observed from their aquariums. The dining experience made real the fact that meat can be grown from animals while they are still alive, and brought diners into what feminist food-studies scholar and bio artist Lindsay Kelly calls a “relationship of responsibility.”¹⁴ The gallery space was set up to play with and subvert the comfortable and domestic feeling of more traditional eating performances in exhibition spaces. Rather than insert a comfortable dining setting into the gallery, TC&A opted to design an eating space that was emblematic of the sterility of the lab, thereby transforming the communal atmosphere of the dining room into a scientific and experimental space for sampling specimens and enacting a discourse around edibility and sustainable and ethical meat consumption.

By enacting science labour in the lab, and evoking the “biotheatre,” TC&A called for an intervention into curatorial practice that, on the one hand, merges the relational aesthetics of communal eating with participatory art and performance, and, on the other hand, creates a lasting impact through documentation and written work. The written and visual ephemera generated during the exhibition allows TC&A to further problematize eating as a relationship between humans and nonhumans through the written and visual ephemera generated during the exhibition.

The “art lab” (to borrow Lindsay Kelly’s concept) and Senior’s “biotheatre” are thus intimately entwined. Together they encompass a variety of media to produce an entire art environment characteristic of bio art. Both Senior and Kelly are interested in the cross-disciplinary nature of bio-art practices. Hybridity is key to bio art’s ability to cross boundaries and address key developments in scientific practice in a way that is more accessible to audiences, while promoting a critical view of new scientific technologies. In the case of TC&A’s *Disembodied Cuisine*, the new technology was in-vitro meat. For Kelly, “Art laboratories encourage hybrid work environments. ... [They] address tensions by employing the rhetoric of public experimentation, so the status of public experiments in art and culture becomes important to their definition.”¹⁵ I would also argue that they are important to the conception, creation, and reception of bio art more generally. Bringing the living materials of a bio lab into the gallery space encourages public engagement with science:

Artists employ “wetware” to encourage [a] type of responsible care for the living things nurtured by labs, human and nonhuman alike. ... Conversations between artists and scientists yield new ways of doing and thinking about science. ... Bio art introduces audiences to situations that demand ethical engagement and care.¹⁶

The merger of scientists and artists in a wet, messy art laboratory, which contrasts with more traditional laboratory sites that prioritize cleanliness and containment, yields potential discoveries for both artists critical of scientific practice and for scientists looking to push boundaries and explore subjective, creative impulses. As Kelly asserts, “Bio art crosses spatial and disciplinary zones in its collaborative production.”¹⁷ In the case of *Disembodied Cuisine*, TC&A was able to cross disciplinary zones by facilitating collaborations between artists, scientists, and theorists that focus on animal suffering and the future of food growth and consumption. Here, the awe and disgust of eating tissue-cultured meat were met with the presentation of maintenance practices conducted by artists in the gallery. By presenting all aspects of the work’s

14. *Ibid.*, 85.

15. *Ibid.*, 77–78.

16. *Ibid.*, 77.

17. *Ibid.*, 79.

lifecycle, and by facilitating consumption within this context, the veil over scientific practices of growing in-vitro meat was lifted. Although diners were still skeptical of the meat, TC&A's interdisciplinary and multi-modal biotheatre approach to curating a durational exhibition environment allowed for a pedagogical spectatorial experience, as opposed to simply a demystification of tissue-culture technology.

Irony is key to TC&A's approach to curatorial and artistic practices, as it helps them remove the veil of scientific objectivity and make their work accessible to the public through performance and writing. They explain their use of irony in this way:

As part of our practice we employ irony as an artistic and philosophical response to technological determinism. We are very aware of the paradoxical statements of artists using certain technology while critiquing its use. Irony is one device to avoid self-righteousness, and it can be used as an attempt to keep the critical aspects of artistic expression once it is out of the studio (or laboratory) and into the free market. In the *Disembodied Cuisine* installation, we ironically offered the possibility of eating meat without killing animals, creating a victimless meat.¹⁸

TC&A is quite literally “staying with the trouble,” an expression Donna Haraway uses when discussing multispecies relationships in which we must keep ourselves in the messiness of critique and consider our human and non-human “kin.”¹⁹ For their installation *Disembodied Cuisine*, TC&A created an ironic compost of art practice, science, cooking, and eating in one gallery space with humans and nonhumans alike. The stickiness of symbiotic worlds was enacted through troubling a curated space of science, art, and food.

TC&A continue to play with the art laboratory construction to build entire environments and to engage with performance practices that further instigate the characteristic *presence* of bio art. Another important example of this kind of environment is the installation *Pig Wings* (2004), hosted at the Art Gallery of South Australia as part of the Adelaide Biennale for Australian Art. Built in situ, the laboratory performance was composed of three wing sculptures produced by way of tissue engineering and stem cell technologies. The latter were used to grow pig bone tissue in the shape of the three wing styles: a bird wing (representing goodness), a bat wing (representing evil), and a Pterodactyl wing. These sculptures were displayed and grown in a small lab situated in the art gallery, in which the artists would periodically conduct regular care and maintenance actions on the semi-living wings. TC&A would get “dressed in costumes specifically designed to evoke both a mechanic’s coveralls and a scientist’s lab coat, enter the space, unzip the laboratory’s door, put on the apron, and engaged in the complicated task of feeding the wings.”²⁰ Bio art theorist Kelly Rafferty notes these acts of maintenance and care for the semi-living sculptures were not theatrical or stylized.

They were simply the gestures and actions of scientists going about their daily work. ... Incapable of caring for themselves, the pig wings relied on people and technologies to maintain them. Maintenance’s dual meanings—the action of keeping something in working order and the action of providing the means of subsistence or necessities of life—are appropriate here.²¹

This everyday labour of care is reminiscent of the legacy of early, feminist performances in the 1970s. Mierle Laderman Ukeles is one of the artists who brought care and maintenance to the fore of socio-political and artistic

18. Oron Catts and Ionat Zurr, “The Ethics of Experiential Engagement with the Manipulation of Life,” in *Tactical Biopolitics: Art, Activism and Technoscience*, eds. Beatriz da Costa and Phillip Kavita (Cambridge, MA: The MIT Press, 2008), 131.

19. Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke University Press, 2016).

20. Kelly Rafferty, “Regeneration: Tissue Engineering, Maintenance, and the Time of Performance,” *TDR: The Drama Review*, 56, 3 (2012): 86.

21. *Ibid.*

Figure 3. Tissue Culture & Art Project, *Tissue Engineered Steak No. 1*, 2000. A study for *Disembodied Cuisine*. Photo courtesy of the artists.

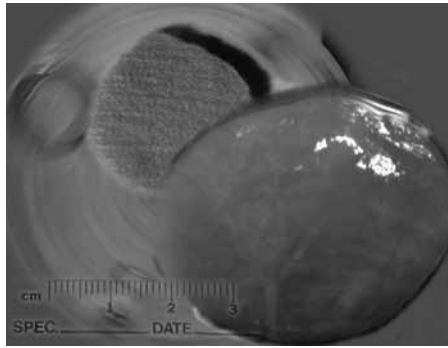


Figure 4. Kathy High, *Embracing Animal*, 2005–2006, detail of rat housing, *Becoming Animal: Art in the Animal Kingdom*, May 2005–February 2006, Massachusetts Museum of Contemporary Art. Photo: Kathy High.



Figure 5. Artist Kathy High with fellow rat, Echo. Photo: Olivia Robinson.

concerns. Her first major work after writing *The Maintenance Art Manifesto* (1969) consisted of three, live performances staged at the Wadsworth Athenaeum in Hartford, Connecticut, in 1973, during which she cleaned display cases, scrubbed floors, and celebrated “basic human operations” that supported the functions of the museum.²² In her three performances, Ukeles enacted the basic functions of the museum during its opening hours as a means of provoking questions about why some labours, such as domestic and other feminized labour, are concealed and others are not. Her performances played on public consciousness about what performance art can be, and suggested the mundane and domestic as spaces for critique and art production. Ukeles’ feminist art practice signalled “that these basic *human* operations are in fact gendered practices. The fact that maintenance work is ‘women’s work’ when it is done in private, is part of why we denigrate and hide the work when it is done in public, even when it is performed by men.”²³ Ukeles made public the domestic care work of basic human operations, drawing attention to the fact that care has been devalued and feminized in problematic and unproductive ways. Bio artists are also embracing care and maintenance activities, albeit in lab-cum-exhibition spaces, to promote feminist engagements with networked human/nonhuman ecologies. Ukeles’ most recent exhibition *Mierle Laderman Ukeles: Maintenance Art* (2016), organized by the Queens Museum, uses public programming to illuminate themes in her earlier work and further explore the concealment of certain types of labour. The museum’s public programming engaged public discourses around themes of care and peace. They included, for example, the public forum *Care as Culture*, which was held on February 12, 2017, and looked at links between service work, ecofeminist art, and issues of climate change. Speakers included representatives from the Natural History Museum and ecoartists Newton Harrison, Natalie Jeremijenko, and Mary Mattingly; respondents included Carol Becker, Francesco Fiondella, Allan Frei, Hope Ginsburg, Alicia Grullon, Klaus H. Jacob, Amy Lipton, Lisa Marshall, Jennifer McGregor, Aviva Rahmani, Jason Smerdon, and Marina Zurkow. Bio artists such as TC&A are foregrounding the mundane labour of scientific practices, such as feeding live tissues. They take cues from a long history of performance practices that includes Ukeles work and make different forms of labour visible and open to critique and inquiry.

In displacing mundane feeding protocols for tissue culturing from the lab to the public gallery, TC&A call for a more responsible and nuanced engagement with scientific processes, thereby promoting and prompting public critique. Both research methodologies of tissue culturing and the networked relational entanglements produced beyond the more closed system of the lab are valued. Feminist science and technology studies scholar María Puig de la Bellacasa writes, “Care [is] an everyday labour of maintenance that conveys ethical obligations: we must take care of things in order to remain responsible for their becoming.”²⁴ TC&A’s on-site actions demonstrate the “everyday non-spectacular labour”²⁵ that goes into keeping semi-living entities alive. Their maintenance procedures also implicate audiences in a way that enables them to perceive and conceive of semi-living creatures—possibly for the first and only time—through the care and labour they require.

22. Robert C. Morgan, “Touch Sanitation: Mierle Laderman Ukeles,” in *The Citizen Artist: 20 Years of Art in the Public Arena*, eds. Linda Frye Burnham and Steven Durland (Gardiner, NY: Critical Press, 1998), 57.

23. Rafferty, “Regeneration,” 91.

Kathy High: The Sympoietic Collaboration

In her installation *Embracing Animal* (2005) at MASS MOCA, Kathy High created an environment for trans-species interaction and for thinking through human and nonhuman co-habitation and collaboration. She did this by building a contained world for former lab rats turned *art* rats. High built a labyrinth to house three, transgenic lab rats in the gallery. | fig. 4 | The experimental playground was composed of a variety of cages, play and leisure environments, tall glass tubes, and connecting pathways that were “built for surveillance, to make the unseen, seen.”²⁶ In her installation, High makes containment visible to the public. Her work began when she ordered three transgenic rats, which were bred to be sick and used in lab studies. The transgenic rats—Matilda, Tara, and Star—had undergone microinjected gene transfer (HLA B27) in order to be autoimmune challenged. After the injection, they exhibited a phenotype similar to that in humans suffering from B27-related rheumatic disorders.²⁷ The rats were born and developed to aid in pharmaceutical research studies in systemic inflammation; they shared a similar autoimmune disease with Kathy High herself. The artist shared an affinity with these rats, and sought to enact a collaboration with them for their shared, embodied feelings of pain and discomfort. Here, High’s caring collaboration and use of a caring ethical approach is bound to an emotive and embodied connection with her subjects turned collaborators. This caring approach to an ethical encounter between artist and science-lab rats enacts an emotional ethic, and contrasts with Kantian ethical theories based on morals.²⁸ While Kantian ethics suggests that moral action is based on abstract rules and universal principals, High’s work—as well as a care ethic—are rooted in the development of personal relationships,²⁹ in this case between the artist and the rats.

High built an elaborate home for the purpose of turning both the rats and their habitat into a work of art and to contain and exhibit them in a gallery. As she explained, “The rats will be on exhibit at the museum. Their house will become my artwork. They will no longer be lab products, but art products, again on display, again used as research.”³⁰ High’s display, though similarly about the study and visibility of the rats, is subversive and critical of the science lab’s containment of research specimens. Her act of caring for the rats is not only enacted through her gestures towards the specific rats making up her work, but also in making visible the unethical treatment of laboratory rats for a larger, mainly non-specialist audience. From their arrival at High’s faculty office, to the end of the installation, the artist and her rats had a rather fraught relationship, though this was something she had expected from the beginning. High began to question her proposal to work with rats from the outset: “I am afraid of them. And I don’t know how to relate to them. They make me nauseous and queasy. They make my skin crawl.”³¹ She was also aware of how her perception of the rats might be influenced by a complex web of socio-political relations in the West, ones that position rats as unclean, vermin, pests, and, above all, as disposable forms of life. High worked to push back against her own fears by observing the rats. While on display, the rats were given medical care and also participated in regular socializing exercises to enhance their mood and experience. High employed care as a method for relating to the rats.

24. María Puig de la Bellacasa, *Matters of Care: Speculative Ethics in More than Human Worlds* (Minneapolis: University of Minnesota Press, 2017), 43.

25. Rafferty, “Regeneration,” 88.

26. Kathy High, “Playing with Rats,” in de Costa and Philip, eds., *Tactical Biopolitics*, 473.

27. *Ibid.*, 468.

28. Josephine Donovan, *The Aesthetics of Care, On the Literary Treatment of Animals* (New York: Bloomsbury Academic, 2016).

29. *Ibid.*, 10.

30. High, “Playing with Rats,” 471.

31. *Ibid.*, 456.

Through a process of empathy, and identification, and in a gesture of revolt, our act of caring for transgenic rats honors our confused relationship. Our exchange with rats was obsessive care. We should make them live forever, cure their diseases in a real transgression, in an exchange unmeasured by power.³²

The network of curators, gallery attendants, rats, and the artist all performed together in harmony for the duration of the exhibition. Once again, the work's existence was limited by its collaboration with living creatures. After the rats' passing, the work of art ceased to exist and lived on only in the form of visual and written documentation, further illustrating the importance of the biotheatre model as a curatorial method for understanding the multiple channels through which a work of bio art may be disseminated and re-curated after the living components die.

For High, a mutual observation occurs in which “the rats observed us and we observed them,”³³ | fig. 5 | making the unseen seen by drawing attention to the concealed lives of laboratory rats. In removing the rats from the cool, clean, and sterile environment of the science lab and placing them in an art gallery, they remain contained but in entirely new conditions. Bred to be sick, these rats were never meant to leave the sterile confines of a lab. Though they remained contained, their new conditions in the gallery were far from the science lab's protocols for cleanliness and containment. As High proudly attests, “In my lab, the rats grew stronger under what would have been considered ‘improper’ conditions for them. They were exposed: they came from clean rooms and were then in a dirty environment. But this only proved to make them stronger.”³⁴ A new type of containment is achieved in which a multi-species network works to enhance the lives of these rats. Their former, small, sterile cages, which lacked stimuli, were replaced with a colourful, eclectic, and “artsy” home that was under friendly observation by a gallery-going public. In their new container, the rats were able to engage with distractions and elaborate visuals, foster new relations, and explore the world around them.

The contained environment that High built and exhibited as a work of art begs new questions about animal treatment and testing in laboratories. By creating a contained, though still messy sympoietic and trans-species world for the rats, she trained a critical lens onto scientific methods. By removing rats from their cages and productively re-caging them, she drew attention to their lives and the harmful lab procedures of animal testing. In this case, containment becomes messy and dirty. High's contained environment and curated space for the rats can perhaps be understood as an exercise in what critical theorist in race and queer studies José Esteban Muñoz would refer to as attunement, particularly with the nonhuman as a necessary “queer labor of the incommensurate.”³⁵ While this is a difficult task, Muñoz is aware of its importance:

The fact that this thing we call the inhuman is never fully knowable, because of our own stuckness within humanity, makes it a kind of knowing that is incommensurable with the protocols of human knowledge production. Despite the incommensurability, this seeming impossibility, one must persist in thinking in these inhuman directions. Once one stops doing the incommensurate work of attempting to touch inhumanity, one loses traction and falls back onto the predictable coordinates of a relationality that announces itself as universal but is, in fact, only substrata of the various potential inter-lays of life within which one is always inculcated.³⁶

32. *Ibid.*, 471.

33. *Ibid.*, 473.

34. *Ibid.*, 474.



Figure 6. Kira O'Reilly and Jennifer Willet, *Refolding (Laboratory Architectures)*, 2010, Arnolfini Museum, Bristol UK. Photo: Hugo Glendinning.

Figure 7. Jennifer Willet, *Trekking the Lab into the Field....*, 2009, Banff Centre for the Arts, Banff, Canada. Photo: Don Lee.



Figure 8. Jennifer Willet, *InsideOut: Laboratory Ecologies*, 2008, installation, Art Gallery of Alberta, 2008.

Though humans may be stuck in humanity—High may never know the desires of her three rats—we cannot negate the importance of working towards sym-poietic collaborations. We must remain aware of nuance and a multiplicity of experiences. High’s collaborative practices with her rats are key to thinking the nonhuman and fostering symbiosis in the space of museums. High is like many other bio artists who think through ethical modes of curating; who take care as a starting point for engaging with transversal relations; and who become entangled in the messy, socio-political webs of particular localities/sites of exhibition.

Jennifer Willet: Restaging the Scientific Laboratory

Although TC&A and Kathy High import living matter and scientific protocols into art spaces, such as galleries and museums, bio artists may also do the reverse and bring performative practices into scientific laboratories. Jennifer Willet is one such artist. In her research and creative production course *Inside-Out: Laboratory Ecologies* (ongoing since 2008), Willet has been composing installations, art objects, and performative works that consider the notion of “laboratory ecology”—the network of humans, nonhumans, equipment, environmental conditions, and sociopolitical conditions that exist inside a science lab. Her work was inspired by her own experiences as an artist and non-specialist navigating a variety of bioscience and biomedical laboratories in the pursuit of her artistic work. Willet is “interested in intervening in the ‘laboratory ecology’... the carefully balanced relationship between all organisms (and parts of organisms) inhabiting the lab—animal and human research subjects—cells, bacteria, enzymes, plants—the scientists themselves, and even unwanted contaminants.”³⁷ What most interests Willet about such spaces is how the laboratory ecology is seemingly, or aims to be, closed off from external ecologies. Willet’s production course took a three-pronged approach to addressing and working to dismantle the standards of scientific laboratories. Her research and artistic practice resulted in the following artistic interventions: (1) a series of performances and photo shoots in laboratory settings staged to draw connections between the scientist’s body and the specimen body; | **fig. 6** | (2) a public display or a working laboratory placed in direct contact with natural environments; | **fig. 7** | and (3) bringing this outside laboratory ecology inside a gallery environment for public display at the Art Gallery of Alberta in Edmonton | **fig. 8** | and at Exit Art Gallery in New York. These artistic and curatorial practices involved a mangling of different methods, disciplines, and practices. In rethinking the possibilities of both exhibitionary and scientific spaces, Willet’s artistic and curatorial performance work seeks to address the articulations of power in both sites and to play with the possibilities of mangling and merging seemingly disparate disciplines and their sites to critical and exciting ends.

Through curatorial practice, objects are placed into new orders, and standards subsequently emerge for institutional spaces. As English cultural theorist and curator Tony Bennett suggests, “In simultaneously ordering objects for public inspection and ordering the public that inspected, [exhibitionary forms] were to have a profound and lasting influence on the subsequent development of museums, art galleries, expositions, and department

35. José Esteban Muñoz, “Dossier: Theorizing Queer Inhumanisms,” *GLQ: A Journal of Lesbian and Gay Studies*, 21, 2–3 (2015): 209.

36. *Ibid.*

37. Jennifer Willet, “InsideOut: Laboratory Ecologies,” *September* 7, 2017, <http://jenniferwillet.com/home/projects/insideout-laboratory-ecologies>.

stores.”³⁸ Just as the museum or gallery is encoded with a specific set of norms and behavioural standards, the bio laboratory is also disciplined through coded norms and standards for scientific practice. Willet’s photo series from *InsideOut: Laboratory Ecologies* depicts the artist performing in science labs, moving her naked body in and through the laboratory as though she were a specimen. She infiltrates the space and breaks with scientific norms, integrating artistic performance and restaging the laboratory in the gallery.

Willet notes of her performance: “I wish to produce a series of works that purposefully breaks with [lab] conventions—reconnecting the closed laboratory ecology with external ecologies—revealing the ‘bodies in biotechnology’ to viewers and participants as interconnected orders of life on this planet.”³⁹ In their book *Laboratory Life: The Construction of Scientific Facts*, anthropologists Bruno Latour and Steve Woolgar similarly work to unpack culturally coded laboratory conventions by critiquing the ways in which facts are constructed through the daily observation of Roger Guillemin’s laboratory at the Salk Institute for Biological Studies over a two-year period. They explored the ways in which laboratory activities are transformed into published “facts,” a process they term “literary inscription.” They then go on to observe the complex networks of socio-political actors that give credit to and canonize these facts until they are uncritically accepted as truth and no longer call for new research or inquiry. Latour and Woolgar assert that “science is entirely fabricated out of circumstance.”⁴⁰ As anthropologists of science, they observe that once a scientific process is deemed a fact it is often black boxed and “taken for granted as just one of the many tools utilized as part of long research programs.”⁴¹ This black boxing, or the uncritical acceptance of the concepts and terminology used by some scientists, can serve to make processes more mysterious rather than accessible. By thinking critically, and approaching the study of scientific process in an embodied way, we can gain a better understanding of our work in and outside the scientific community. Interdisciplinary investigations, such as those conducted by Latour and Woolgar (ethnography/science) and Willet (artistic practice/science laboratory), show how working across research cultures allows for new insights and critical interventions.

“This type of interdisciplinary research-creation practice shows a slower, yet deeper process and methodological development that is necessary to enhance intensive interdisciplinary research and new knowledge sets.”⁴² The mangle of science and art allows Willet to reinvent both laboratory spaces and gallery spaces in order to critique the structures of power inherent to both spaces, to break down the perceived objectivity of the science lab, and to point to the performative nature of science itself. Willet explodes the notion that a laboratory ecology is closed off from other ecologies, thereby articulating the implications of power in art and exhibitions spaces, as well as laboratory spaces.

Conclusion

Like High and tc&A, Willet’s work involves an ethics of care and an investment in the awareness of nonhuman life. This caring ethic is present in the production of her works, the way they are curated, and the collaborations that occur between artist and curator. It is deployed as an ethics for dealing with intimate, lively, and present bio artworks and for considering larger networks of

38. Tony Bennett, “The Exhibitionary Complex,” *new formations*, 4 (1988): 74.

39. Willet, “InsideOut.”

40. Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts* (New Jersey: Princeton University Press, 1986), 239.

41. *Ibid.*, 139.

42. Tagny Duff, “Mangling Methodologies Across Performance Research, Bio-logical Arts and the Life Sciences,” *Media-N: Journal of the New Media Caucus* 11, 3 (fall 2015), <http://median.newmediacaucus.org/research-creation-explorations/mangling-methodologies-across-performance-research-biological-arts-and-the-life-sciences> (accessed September 10, 2018).

human and nonhuman habitation and liveliness. Exploring decentered circulations of ethics across human and nonhuman ecologies, the caring ethical ethos is imperative to the curating of living works of bio art. I see care ethics as an approach for curating and working collaboratively with artists in a way that prioritizes interconnection and interdependency—a mangle of sorts that evokes the multi-modal productions of a “biotheatre model.”

Bio art and curatorial practice produce new modes of presenting knowledge. A work of bio art, like an exhibition, seeks to enact new connections and illuminate new ideas about culture, technology, politics, and so forth. tc&a, Kathy High, and Jennifer Willet’s work is able to draw new connections between scientific knowledge and performance and artistic institutions. tc&a and High, by way of inviting nonhuman liveliness (or semi-liveliness in the case of tc&a’s practice) into the museum, are able to engage with lab rats in an otherwise impossible manner and consume semi-living “victimless” meat in all its impracticality through caring acts of connecting us to our nonhuman allies. Just like exhibition curators who care for and put art objects into new relations, art-science practitioners are able to reveal the complexity of relations between humans and lab-grown meats, humans and laboratory rats, and artistic and scientific institutions. Such transdisciplinary work suggests that bio art and curatorial practice share affinities through their production of new knowledge in order to illuminate something new about art, science, and culture.

The mangle continues to permeate bio-art practices of production and display through the borrowing of skill sets across disciplines and in the melding and cross-pollinating of curating across seemingly disparate spaces (the gallery/museum and the laboratory). In traversing formerly distinct zones, and remaking/reimagining them through artistic and curatorial practices, bio artists are able to critically assess scientific and cultural practices that have been all-too-often ignored by the eyes and analyses of artists. New curatorial methods have, and continue to, develop in light of the transgressive translations of bio artists across cultural spheres that mangle the lab and museum. ¶