Routledge
Taylor & Francis Group

Performance Research

A Journal of the Performing Arts

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/rprs20

Transgenesis as Art, Art as Infection

The case of Adam Zaretsky

Polona Tratnik

To cite this article: Polona Tratnik (2020) Transgenesis as Art, Art as Infection, Performance Research, 25:3, 88-94, DOI: 10.1080/13528165.2020.1807766

To link to this article: https://doi.org/10.1080/13528165.2020.1807766

Published online: 09 Nov 2020.

Transgenesis as Art, Art as Infection

The case of Adam Zaretsky

POLONA TRATNIK

Adam Zaretsky's performative art involving biotechnological methods occupies a particular place in this ever-growing field of practitioners: His highly subversive modus operandi unfolds as provocative *VivoArts* hands-on workshops and lectures sharing lab skills with the untrained. His purpose is to directly include a larger public in the processes of genetic engineering in order to demystify these procedures that usually take place in scientific laboratories, and to viscerally confront participants with the actual questions arising from experiencing transgenic technology as 'non-utilitarian research creation'. Considering that '[m]icro-body interventions have macro-effects on economic and political situations' (Tratnik 2017: xiv), in turn, Zaretsky stages macroscopic actions with kitchen and household products, blood, excrement or executed animals, and uses sexually connoted metaphors such as 'penetration' and 'injection', in order to address biopolitical issues on the microscopic scale. His strategy can be analysed in the light of philosopher Vilém Flusser's premonitory vision that molecular biology would become an everyday tool, and of molecular biologist François Jacob's claim that evolution needs to be considered a phenomenon of tinkering, rather than of engineering.

SOLAR-POWERED SPECIES AND THE POLITICS OF ART

In 2012, at the Lowlands Paradise music festival annually held in the Netherlands in August, Adam Zaretsky installed a lab within the framework of Llowlab, a platform where scientists and inventors try to reduce the gap between science and society. However, Zaretsky's workshop did not totally resonate with the paradisiacal ethos of innocuous citizen science. Rather, people were invited to microinject algae into zebrafish embryos. The embryos used were so-called Casper mutants, which don't have any pigment and are like glass fish. The injecting might result in producing a mutant zebrafish, which would become solar powered. Theoretically, the Solar Zebrafish would metabolize solar energy and leak the sugar into the body of the fish. It was, however, much more likely that the embryos would just die after getting injected with the algae than that they would become solar mutants, as the attendants of the lab were told. Still, people decided to do it. 'First they do it and then they respond' (Zaretsky 2013a: 14:10).

BioSolar Cells have been scientifically researched for establishing solar-powered species. Zaretsky has collaborated with Huub de Groot, the principal investigator of the research programme 'BioSolar Cells' launched in the Netherlands, which addresses the question of 'green energy' and the creation of sustainable biomass; it 'aims to understand photosynthesis and use synthetic biology or genetic engineering to increase the energy we can siphon from the sun through the enhancement of plants, algae and solar collectors' (Zaretsky 2013b: 1). The programme is about enhancing algae. But Zaretsky warns that if we utilize algae for food and pharmaceutics, we may also use them for bio-weapons one day (Zaretsky 2013a: 7:06). There are strong economic, military and pharmaceutical interests motivating the enhancement of plants, yet there might be risks we don't know or we minimize risk. Zaretsky emphasizes the capitalist drive inherent in the ambition towards such enhancements of the living world serving to achieve economic benefits, meanwhile disregarding the ecological damage, as a consequence of anthropocentrism (Zaretsky 2013a: 3:15–25).

Zaretsky's lab not only encouraged the public to partake in a hands-on experience to microinject algae into zebrafish embryos and, possibly, create a symbiosis, it also triggered a more far-reaching idea: if animals could get solar powered, eventually humans might also be solar powered. Should we therefore accept bioengineering? This is one of the questions posed by Zaretsky's art, while his

PERFORMANCE RESEARCH 25·3 : pp.88-94
http://dx.doi.org/10.1080/13528165.2020.1807766
ISSN 1352-8165 print/1469-9990 online

stance towards it remains deliberately ambiguous: he is offering people a chance to just 'do it', not necessarily to promote animal alterations, but to get people to know what it feels like to alter an organism. In his view, bioengineering can be considered partly natural, and beautiful. Yet it requires human responsibility. And what is the role of art in this regard?

The zebrafish injected with algae in the Llowlab were released into a kitschy pool, which Zaretsky called the 'Errorarium', an 'experimental device'. The whole milieu did not look scientific, but rather unserious, while the action addressed, in a broader sense, serious concerns about the release of genetically altered organisms into an environment. Adam Zaretsky, dressing-up and grimacing, might often seem clownish as a figure, which he performs with extreme absurdity[1] – but this character needs to be read as a critique, employed to attack the seriousness ruling the discourses of biotechnology. Establishing a seemingly funny and careless atmosphere in his labs, Zaretsky opens up a rich palette of antinomies surrounding the discourse of biotechnology and enquires how art should react to these: 'Are our artists slaves to the rhythm of the latest big boom/bust bubble, the biotechnological fad market?' (Zaretsky 2004: 91). This awareness preserves him from falling into the trap of naïve serviceability of his art to the big games of economic and political power. While the non-professional audience of Zaretsky's labs may tend to engage easily with the proposed manipulations, through the very material work and experiences, participants are faced with difficult ethical questions, to which there are no simple answers. For Zaretsky, to stimulate ethical questioning with regards to genetic engineering should be the role of art.

THE ART OF MAKING TRANSGENIC HUMANS

Genetic engineering has spurred specific beliefs about designing humans according to one's wishes. In his pioneering analysis of the biotechnological century, Jeremy Rifkin asked: 'What will it mean to be a human being in a world where babies are genetically designed and customized in a womb and where people are identified, stereotyped, and discriminated against on the basis of their genotype?' (Rifkin 1998: xiii). Just twenty years later, on 25 November 2018, the birth of the first genetically modified babies, Lulu and Nana, announced by Chinese university professor He Jiankui, seems to confirm Rifkin's prediction. The deoxyribonucleic acid (DNA) of the twins was modified to prevent human immunodeficiency virus (HIV) infection using the CRISPR-Cas9 technique discovered in 2012 (Jinek *et al.* 2012), which allows for removing and replacing a piece of a genome with extreme precision. The ambition to intervene in the early stages of development of a human body in order to prevent potential illnesses can be seen as part of a larger programme to get the 'desirable' people to breed, as a mode of enhancement. Who will draw the line and define significant differences between what is acceptable and what is not? Between designing an eye to see sharply, to cope with the standard of 'normal' visibility (in which case biotechnology consolidates the norms and standards of the human population) and designing one's length of the legs in order to attain a higher speed of locomotion. Rifkin ascertained that '[g]enetic engineering technologies are, by their very nature, eugenics tools' (1998: 116). Against the grain of contemporary belief, eugenics did neither begin nor end with Nazi-Germany. While it was popularized there, the concept was indeed invented in the nineteenth century by Sir Francis Galton, the cousin of Charles Darwin. Eugenics was publicly advocated even by the twentieth-sixth president of the USA, Theodore Roosevelt, who claimed he did 'wish very much that wrong people could be prevented entirely from breeding', therefore 'the emphasis should be laid on getting desirable people to breed' (Rifkin 1998: 117). In art that engages in actual biological practices,

Adam Zaretsky, 'Errorarias: Concert for Bipolar Flowers'. Performance with the Biopolar Flowers produced at the Sylvius Lab at Leiden University in the Netherlands, 2014.

[1] See, for instance, Zaretsky (2014b).

this question of purposeful breeding has been addressed by George Gessert – but engaging in plant breeding. In his systematic breeding of iris hybrids, Gessert selects plant phenotypes to his personal taste, whereas these are often not adapted to the 'laws' of the market, being diametrically opposed to current predominant aesthetics – and this aesthetic choice actually determines the hybrid plants' survival and existence.

In the same vein, Adam Zaretsky's research and education institute VivoArts School for Transgenic Aesthetics Ltd. (VASTAL) began as a residency at the Stichting Waag Society, Amsterdam, the Netherlands, in 2009. VASTAL is meant as a framework for his execution of artistic actions, workshops and lectures. Zaretsky sees 'bioartists' not as a homogeneous group with a common manifesto and a singular programme, but as a movement of different actors that 'instead have rifts, ethically, philosophically and politically, which keep them from any singular consensus' (2005: 1). Nevertheless, these artists, according to him, all have a tendency towards:

- 'Reminding people about the ever-present complexities of vitality, mortality and mutation all around us.
- Giving non-experts the ability to speak intelligently about science without having to be a scientist.
- Providing hands on labs or exhibitions designed to get rid of fears of complexity while maximizing debates on intelligent applications of technology.
- Exhibiting works which rework preconceptions about relationships between human culture, other living beings and the environment'. (Zaretsky 2005: 1)

Within the last decade Adam Zaretsky has conducted a great number of performative laboratory workshops, enabling participants to comprehend transgenesis or letting 'people know how genes are getting into their cells, where people are doing this' (Vacula 2017: 34:10). He started with microinjections – a microsurgical method to introduce DNA into either cytoplasm or nucleus, using a glass needle. Then he employed electroporation – a physical transfection method that uses an electrical pulse to create temporary pores in cell membranes through which substances like nucleic acids can pass into cells. Finally, he used biolistics – a kind of particle bombardment, used as a method for nuclear transformation – and lipofection – a set of techniques used to introduce exogenous DNA into cultured mammalian cells. All these are 'different actual, physical, mechanical ways of getting genes into the centre of the doughnut, the jelly doughnut, you know; to take your payload, your "program" and jam it into the genome' (Vacula 2017: 34:45–35:05).

In 2009, Zaretsky executed a VASTAL Public Radical Food Science Lab, within which he and the attendants of the school extracted genetic material from various samples to produce hybrid DNA, which he then got injected into his own body. The workshop was staged at the square in front of the Stichting Waag Society in the city centre of Amsterdam, next to the food market with a lot of people stopping, watching and joining the lab. The main attendants of the lab, the VASTAL students, who were dressed up in white protective overalls, set up a 'still life' display constituted by biological samples containing DNA – meat, live animals, such as a lobster, two eels and a flounder; a pheasant, a crow, meat balls, a cod, a salmon, vegetables (a red beet), fruits and plants (a tulip), fungus, bacteria (yoghurt), protists (swamp water with protists in an ice cooler) and a hair with its root. Then, they added salt and water, and mixed all that together in a blender. The eel was still alive when the blender was turned on …

> Yuck. That is the word that goes in for the fact that there is no name for what you are feeling…. We are scientists now. We are going to isolate the DNA from something new. It has never existed on Earth. A primordial soup of un-namability. (Zaretsky 2009c: 8:08–40)

The workshop participants filtered the mixture and got something new, a kind of mud, 'new media'; 'it is possible, if you want to be a very contemporary new media artist, that you could sculpt with this' (Zaretsky 2009c: 9:30). To the juice they added a 1:6 ratio of soap in order to explode the cells (10:41). The nucleus probably exploded, too. Then the DNA from the solution had to be extracted. Papaya enzyme could be used for this, yet contact lens solution works better. Finally, cold ethanol was added so that the DNA precipitated up. The extracted DNA appeared as a white substance coming up with bubbles. The attendants were then invited to name the DNA samples in their tubes.

At that stage Zaretsky opened up a debate. 'What would a scientist do with this DNA?' (18:15) 'What do you think happens, if you inject this into a plant? It might die. What if it lives? Would it be a mixture of all these and the plant? Something new?' (18:39–50)

> Could be dangerous. What about injecting it into yourself? … It does not look dangerous…. Would you take a bunch of that and inject it into you? … The problem is if this DNA gets into the centre of your nucleus; not just into your blood stream, but into the centre of the blood cell. (Zaretsky 2009c: 19:00–19:20)

Zaretsky prepared a glass needle filled up with the hybrid DNA and punched it into his hand. If this would be injected into his testicle, Zaretsky commented, his sperm would be different and not only he would be different, but so would his kids (2009c: 20:50). Nobody else volunteered to get injected. 'What about a tree?' A woman from the audience objected: 'do it to yourself', but not to something taken from the environment (21:46). This is what that lab is about, Zaretsky responded. We don't know what the effect of it is; it might make the tree make more money, 'but we don't know the long-term effects of what we do' (22:18). 'Finally, someone said "stop". It takes so long sometimes. I am already deformed' (22:35). Yet, nobody stopped Zaretsky.

In *mutaFelch – Methods of transgenesis: Genetic gun (biolistics),* a VASTAL lecture performance held in Kapelica Gallery in Ljubljana in 2014, Zaretsky modified the human genome by bombarding a mixture of human sperm, blood and shit with raw, hybrid DNA, soaked into golden nanoparticles, using a do-it-yourself gene gun. The artist considers himself as anti-eugenicist, anti-pretty and anti-kitsch, as 'kitsch and fascism go together' (Vakula 2017: 36:30).

Zaretsky has conducted lectures and labs on making transgenic humans as art.

> The difference between a technical scientific learning session and a Vivo-artistic laboratory approach is mostly qualitative. While engaging in the technics, we also deal with the relational issues surrounding this type of process: pain, death, responsibility, curiosity, the meddlesome sadism of a personal genetic footprint/signature/graffiti, risk assessment between foreign species and the ecosphere, etc. (Zaretsky 2014a: 220)

As he presented in his lecture 'Transgenic Humans as Bioart', one can use lunatic fringe technology[2] in order to get the information flow return to the 'life world … You shoot it in, you inject it in, you electroporate it back into nuclei and you hope they take your little infectious doughnut into their heritage' (Zaretsky 2017: 1:15–35). Zaretsky has been interested in altering life from an embryological stage or even before, as an art form. He suggests we make transgenic humans as sculpture. The ultimate 'time-based new media conceptual information art' he refers to is transgenic humans or germline human edited humans. What if we would cut and paste DNA from different species into human embryos not only for research or for enhancement or curing, but actually because we were sculpting the future of humans? (5:15–5:30) With the CRISPR-Cas9 technique, a genetic modification with sperm at the very point of fertilization into a human egg is in practice. Not only is the human embryo influenced, but it influences their children and grandchildren – a hereditary cascade. This modification of the human embryo might be considered a kind of sculpturing or graffiti, or even just a signature and therefore art, in Zaretsky's provocative view: art imprinted on future generations, a multi-generational art.

Zaretsky's strategy seems to confirm the prospect that genetic engineering would enter the field of art as predicted in the late 1980s by philosopher and pioneer media theorist Vilém Flusser: 'Why hasn't the breeding of animals, still principally an economic concern, moved into the field of aesthetics?' (Flusser 1988c: 9) Flusser envisioned a scenario where artificial living beings become the domain of art. The idea to sculpt human beings has not arisen only with biotechnology – in Greek mythology Prometheus moulded people out of clay and taught them counting, writing and working; in Jewish folklore

[2] Lunatic fringe plasmid technology disrupts or enhances the body plan by deforming the cellular cytoskeleton (Zaretsky 2011a, 2011b, 2011c; We Make Money Not Art 2009).

Adam Zaretsky, VASTAL 'Public Radical Food Science Lab'. A workshop attendant is blowing the hybrid DNA produced at the workshop into Adam Zaretsky, 2009.

the golem, an anthropomorphic being without wisdom, was sculptured from mud and brought to life. Flusser discussed the molecular biologist as 'becoming godlike', inventing forms that have never existed before – true creation. Likewise, Zaretsky provokes with the trope of 'producing something totally new', which never existed before, as a notion now popular in science. The discourse accompanying the recent rise of synthetic genomics has re-opened that notion to create life 'from scratch'. For example, when Craig Venter announced his success in creating *Synthia*, a kind of bacteria, which never existed in nature, he referred to the transplantation of a computer-synthesized genome of the bacterium *Mycoplasma mycoides* into a *Mycoplasma capricolum* bacterium, from which the DNA had been removed. However, it is misleading to claim that life was 'created from scratch' since it was synthetized from pre-existing cells. It is helpful to remember that the Greek *synthesis* means composition (from *syn-*: together, and *tithenai*: to put, place), as well as *synthesis* in seventeenth-century Latin, and that only from the nineteenth century onwards *synthetic* refers to products or materials made artificially, for example, by chemical synthesis – hence being artificial. This artificial character of synthetic biology in particular, and biotechnology at large, re-opens the question about the actual specifics of these technologies compared to the work of evolution. In this regard, Flusser introduced a differentiation between true creation and variational creation, implying that true creation belongs to the domain of evolution, and variational creation to bio-engineering (Flusser 1988b: 18). However, Flusser also stated that 'biotechnics is doing the same thing natural evolution does – variational creativity, the sole difference being that it does its work not by chance but according to a deliberate program' (Flusser 1988a: 14–15). Variational creation operates within the given possibilities. Every particular realization within this programme exists as a potential, even if it will never be realized: 'Every shape in which Earth's living beings could manifest themselves is encoded within the existing genetic information as a potential, a virtuality' (Flusser 1988b: 18).

Here, it is possible to establish a parallel with biologist François Jacob who believed that 'evolution does not produce novelties from scratch. It works on what already exists' (1977: 1,164). Jacob re-addressed the notion of *bricolage* introduced to anthropology by Claude Lévi-Strauss who aimed to differentiate the mode of engineering, which corresponds to science, and the mode of bricolage, which corresponds to the 'science of the concrete' and that he ascribed to tribes. The *bricoleur*, or tinkerer, is a home master who, at the technical plane innovatively, and with improvisation passionately, solves problems that occur to them in everyday life. The engineer, on the contrary, acts exactly following the plan made in advance. They subordinate the tasks to the availability of raw materials and tools conceived and procured for the purpose of the project. The bricoleur works with whatever is at hand (Leví-Strauss 1994: 16–18). Jacob, when discussing the dynamics of evolution, argued that the action of natural selection is not suitably comparable to the action of an engineer. In evolution, natural selection 'works like a tinkerer – a tinkerer who does not know exactly what he is going to produce' (Jacob 1977: 1,163) but who 'gives his materials unexpected functions to produce a new object' (1,164).

Zaretsky's actions don't take place randomly, but are carefully planned and follow protocols. Yet, he distances himself from the engineering approach inherent in biotechnology. Zaretsky not only demystifies the scientific myth of producing novelties. His modus operandi does not reproduce the seriousness of the biotech culture but imports entertainment culture instead. Perhaps the main significance is that he is subverting the instrumental reason of the engineer in favour of the ethical re-consideration of the objectives and effects of biotechnology for society and the environment. He operates, on purpose, with erotic and sexual connotations when talking about 'transgenic penetrations' into the human genome, thus distancing himself from engineering talk.

INFECTING THE PUBLIC SPACE

While, on the one hand, Zaretsky is 'penetrating the genome', on the other, he is interested in 'penetrating' or 'sexing the environment', infecting it by the means of so-called 'seed broadcasting'. He conceptualized a genetic alteration of *Arabidopsis thaliana* plants, belonging to the mustard family, the first plant whose whole genome has been

sequenced. But instead of producing a genetically modified organism Zaretsky's idea was to use zinc fingers[3] to stimulate or hold back the expression of genes. The application of zinc fingers to the plant's buds through dipping equals a kind of infection of the plant, turning it 'up' and 'down', as Zaretsky calls this way of affecting genes – to prompt those in dormitory state for thousands of years to express in the phenotype, and those usually expressed to recede. Zaretsky called the result *Bipolar Flower*, referring to manic depression (Zaretsky 2020). The effects of this intervention are not to be discernable so much in the phenotype of the plant exposed to dipping into the zinc fingered solution, but rather in the future generations that will grow from the seeds. The idea – suggested already in the Public Radical Food Science Lab described earlier – to inject hybrid DNA into a tree, is here brought to another level. Zaretsky produced the altered seeds in the Sylvius Lab at Leiden University in the Netherlands. The seeds were sent to New York in the USA from the Sylvius Lab through FedEx, but without papers. Then, the artist took the time to ask the United States Department of Agriculture (USDA), Food and Drug Administration (FDA) and Animal and Plant Health Inspection Service (APHIS) if he could move these seeds across US state lines, from New York to North Carolina. Finally, the service established that the seeds could be considered for an exemption, therefore they advised Zaretsky to withdraw his application. Touching the real grounds to which regulation politics concerning genetically modified organisms apply, Zaretsky suggests that the *Bipolar Flower* may even no longer be accurately classified simply as a plant in a classical sense, because it has become a biotechnological product that can get copyrighted. In addition, the project showed that in the real world, outside of the laboratory protocols for transportation, it is not difficult to transport or release genetically modified organisms without control or official approval. The project further demonstrated that within the apparatus of the state it is difficult to evaluate and manage genetically modified organisms beyond the confines of laboratory, agricultural, pharmaceutical or industrial purposes.

In another eco-educational project 'Public EcoArt Lab' at the Stichting Waag Society, Zaretsky (2009a) conducted 'Seedbombing with Living Sculptures'. Together with the attendants Zaretsky sculptured seed balls from clay and soil with 1:10 amount of a wide variety of plant seeds: conventional, organic, mutated. With throwing those balls in the public space he showed how public space can get easily contaminated with genetically modified organisms. Zaretsky (2009b) speaks of such dissemination as a kind of 'seed broadcasting', a sort of radio that just instead of radio waves emits seeds – 'new media' that consist of biological media, broadcasting altered organisms, including potentially dangerous biological material, in the environment.

Zaretsky has recently written about *Bipolar Flower* in a special issue of *Drain Magazine*, pointedly titled 'Ecology of bad ideas' as a reference to Gregory Bateson's statement: 'There is an ecology of bad ideas, just as there is an ecology of weeds, and it is characteristic of the system that basic error propagates itself' (Bateson 1987: 492). Already in the late 1960s Bateson warned that Homo sapiens exterminated some species or introduced others, which became weeds and pests, altered the water supply and has been rapidly destroying all balanced natural systems in the world (436). Humans have only done all that more intensively and with stronger technological support since then. Bateson suggested to correct the Darwinian unit of survival in order to include the environment and the interaction between organisms and environment. Instead of the former units of survival, such as the individual, family line, subspecies and species he proposed to consider other units, such as gene-in-organism, organism-in-environment and ecosystem. When you 'make the epistemological error of choosing the wrong unit: you end up with the species versus the other species around it or versus the environment in which it operates' (491–2) If you narrow down your epistemology and act just on egoistic premises, you chop off consideration of other loops, considered Bateson. If you decide to get rid of the by-products of human life and put them to a particular place, the eco-mental system of that particular place is part of your wider eco-mental system – if that place 'is driven insane, its insanity is incorporated in the larger system of *your* thought and experience' (492). Accordingly, Zaretsky's zebrafish released into the 'Errorrarium' of the Llowlab and the genetically modified organisms released

[3] Short chains of amino acids with finger-like appearance that act as stabilizers

into the environment all over the world are all part of our wider eco-mental system, upon which the artist intends to act: 'One of the conceptual goals of ULS [Unstill Life Studies] is meant to aid the public in understanding the socio-cultural and ecological reverberations that gene insertion into living systems might bring into our lifeworld experience' (Zaretsky 2014a: 220).

In 2010, he released mutant, genetically modified zebrafish called GloFish®, into the Gulf of Mexico – considering the right of the fish to live in freedom wilderness was more important than the unknown environmental impact of their release (Zaretsky 2010).

While Bateson emphasized the interconnectedness of the environment and living beings, including the human mind, Zaretsky invites us to re-wild, not only the organisms outside, but ourselves, and to assume the contradictions of our society: 'When it comes to sustainability, we cannot rely on utility, progress, optimization and austerity all at the same time' (2013a: 21:00–10).

REFERENCES

Bateson, Gregory (1987) *Steps to an Ecology of Mind*, Chicago, IL and London: Chicago University Press.

Flusser, Vilém (1988a) 'On science', *Artforum*, pp. 14–15, March.

Flusser, Vilém (1988b) 'On discovery', *Artforum*, pp. 17–18, summer.

Flusser, Vilém (1988c) 'On science', *Artforum*, p. 9, October.

Jacob, François (1977) 'Evolution and tinkering', *Science* 196(4,295): 1,161–6.

Jinek, Martin, Chylinski, Krzysztof, Fonfara, Ines, Hauer, Michael, Doudna, Jennifer A., Charpentier, Emmanuelle (2012) 'A programmable dual-RNA-guided DNA endonuclease in adaptive bacterial immunity', *Science* 337(6,096): 816–21.

Leví-Strauss, Claude (1994) *The Savage Mind*, Oxford: Oxford University Press.

Rifkin, Jeremy (1998) *Biotech Century. Harnessing the genes and remaking the world*, New York, NY: TarcherPerigee.

Tratnik, Polona (2017) *Conquest of Body. Biopower with biotechnology*, Cham, Switzerland: Springer, 2017.

Vacula, Matej (2017) 'Biocollider. Genes, collaborations, and permissions with Adam Zaretsky', https://bit.ly/2Bwb9pc, accessed 20 December 2019.

We Make Money Not Art (2009) 'Dangerous Liaisons and other stories of transgenic pheasant embryology', interview with Adam Zaretsky by Régine Debatty, https://bit.ly/2ZWDNJB, 7 January, accessed 28 March 2020.

Zaretsky, Adam (2004) 'Vivavivo! Living art is dead', *Leonardo* 37(1): 90–2. Also available: https://bit.ly/3jv7o4m, accessed 4 March 2019.

Zaretsky, Adam (2005) 'The mutagenic art', *CIAC's electronic magazine* 23, https://bit.ly/39tQHBJ, accessed 2 March 2020.

Zaretsky, Adam (2009a) 'Public EcoArt Lab', https://bit.ly/2WUynN0, accessed 14 March 2020.

Zaretsky, Adam (2009b) 'VASTAL lecture. Public EcoArt Lab', https://bit.ly/2E7cJP5, accessed 14 March 2020. 14:43.

Zaretsky, Adam (2009c) 'VASTAL performance. Public Radical Food Science Lab', https://bit.ly/39o2qBK, accessed 14 March 2020. 27:01.

Zaretsky, Adam (2010) 'GFRP: The GloFish® Freedom and Reconciliation Project', *TDR: The drama review* 54(4)(T208) (winter): 2–3.

Zaretsky, Adam (2011a) 'Dangerous Liaisons', part 1, https://bit.ly/32PxFof, accessed 28 March 2020.

Zaretsky, Adam (2011b) 'Dangerous Liaisons', part 2, https://bit.ly/3fXLqER, accessed 28 March 2020.

Zaretsky, Adam (2011c) 'Dangerous Liaisons', part 3, https://bit.ly/30E65Yi, accessed 28 March 2020.

Zaretsky, Adam (2012) 'Llowlab Lowlands', https://bit.ly/32PPAeo, accessed 14 March 2020. 38:01.

Zaretsky, Adam (2013a) 'Almost organic', a lecture for the conference 'Yes Naturally. Superplants: Towards a sustainable future' accompanying the exhibition *Yes Naturally. How art saves the world*, The Hague Municipal Museum, 23 March 2013, https://bit.ly/2OUWs1P, accessed 14 March 2020. 24:06.

Zaretsky, Adam (2013b) 'BioSolar cells: Making a field for interpretation. Two year report and proposal for future research', https://bit.ly/2OV9jkC, accessed 14 March 2020.

Zaretsky, Adam (2014a) 'Animal enrichment and the The VivoArts School for Transgenic Aesthetics Ltd.', *Inflexions* 7, 'Animating biophilosophy' (March 2014): 218–45, https://bit.ly/3jxngnb, accessed 28 March 2020.

Zaretsky, Adam (2014b) 'Errorarias: Concert for bipolar flowers', Sylvius Lab, Leiden Institute of Biology, https://bit.ly/2ZXL1N6, accessed 14 March 2020. 9:53.

Zaretsky, Adam (2017) 'Transgenic humans as bioart. Human genome editing as an experiment in art and science', held at DACER (DC Art Science Evening Rendezvous), Nacional Academy of Sciences on 3 October 2017, https://bit.ly/2BpXZd8, accessed 14 March 2020.

Zaretsky, Adam (2020) 'biPolar Bioart: USDA APHIS FDA BRS notification request', *Drain. Ecology of bad ideas* 16(1), https://bit.ly/39q9zl6, accessed 14 March 2020.