

## **Genomic Art: Seeing Controversy**

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For many of us artists who make work to challenge our audiences, the story of Steve Kurtz resonates personally. On the morning of May 11, 2004, Steve Kurtz, an art professor in Buffalo and a member of the artist collective called the Critical Art Ensemble, woke up to find that his wife had died in her sleep. He called 911 to alert the police. When the police arrived, they discovered “unusual art materials” at his home, and called the FBI. With the help of the USA patriot Act, which increases the powers of law enforcement agencies to search, seize, and detain with the suspicion of bioterrorist activity, Prof. Kurtz was arrested on charges of bioterrorism. The FBI confiscated his car, computer, all of his equipment and his wife’s body.

It has since been determined that the suspected bioterrorist materials were in fact a form of harmless bacterium commonly used in high school classrooms. He purchased the bacteria from a science professor at the University of Pittsburgh for \$256. The government dropped the bioterrorism charges, and instead, Kurtz was arraigned on July 8<sup>th</sup> on four charges of mail and wire fraud. Each violation carries a maximum penalty of 20 years in prison. These laws are usually used to prosecute people involved in defrauding others of money or property, as in telemarketing schemes. Or, as the CAE defense fund suggests, these laws have also been used in cases where the government could not prove any other charges.

The arrest of Kurtz has engaged the shock and outrage of fellow artists. But looking at the artistic experiments of artists who work with genetics suggests that attracting the attention of law enforcement might have been an inevitable result. This isn’t to say that any laws have been broken—only that a challenge is being made by artists—it was only a matter of time before the establishment took notice.

Art as a means of protest, or even a call to action, is not a new idea. Politically motivated art has probably been around about as long as the idea of human expression. Prominent 20<sup>th</sup> century examples include Picasso's *Guernica*, the Guerilla Girls "new feminism," and the Yes Men's infiltration of the World Trade Organization. But art about genetics is a relatively new arena, since genetics is a relatively new area of science. The gene as a means of heredity was only discovered in 1866 by Gregor Mendel, and it wasn't even called a gene until about 1900. Watson and Crick introduced their famous model of DNA in 1953. A scientific race ensued for the first transgenic organism—an organism that contains genes from more than one species—and culminated in the first transgenic rat in 1981.

Genetics captures the human imagination on multiple levels. On the one hand, there is a beauty in the idea that the essence of a being's inheritance is captured in as elegant a structure as a double helix. On the other hand, there is money to be made in mastering and controlling a powerful new technology, and large corporations such as Dow AgroSciences and Monsanto quickly began to take advantage of new genetic technologies.

There is plenty of material here for artists with activist tendencies. The large corporations that control the technology are suspect, and ripe for criticism. When you are a large company subject to intense market forces with the competition biting at your heels, are the choices you make for the greater good, or to satisfy the bottom line? So when Monsanto's colorful ad campaign promises better crops for 3<sup>rd</sup> world countries, a solution to overseas fuel dependence, and safer crops at home, are we to believe this utopian vision of the future? This particular ad campaign is also fascinating in its use of the photograph. It is asking you to believe the little story that it is photographically "documenting"—say, that of a pest-ridden ear of corn juxtaposed with a Polaroid sized photograph of a juicy, healthy ear of corn. But the photograph of the juicy corn is the "imagine" part of the slogan—they are admitting that it the photograph is a fiction—which serves to draw attention to the fictional nature of the original document. In any case, the power structure controlling these new genetic technologies is something that artists have targeted.

Then there are also unanswered questions about the technology itself. What happens when we eat modified organisms, and what happens when we release these organisms into ecosystems? Genetically modified corn was already widely available to US farmers, with broad safety assurances from seed companies, when a Cornell University

scientist published results on how the pesticide engineered into the genetic structure of the GM corn was adversely affecting Monarch butterfly caterpillars.

And then there is the issue of how, and if, we will apply genome modification technologies to the human genome. We've cloned other organisms, and we've modified their genomes. This is a picture of Dolly, the first cloned mammal, born in Edinburgh in 1996. She died in 2003, at the age of six, but she's had plenty of successors, with a pair of cloned Bengal cats making headlines at a cat show in New York City last week. The knowledge to alter or clone the human genome is here, or almost here—so what will we do with that knowledge?

Gary Schneider's *Genetic Self Portrait* addresses questions surround the human genome. With images of his own chromosomes and reproductive cells, Schneider encourages the viewer to consider the composition of self at the molecular level. As richly beautiful silver and platinum prints made with new imaging techniques, Schneider's work serves to celebrate the essence of humanity. The work makes no attempt to teach or preach, but when surrounded by his huge, magnificently crafted photographs, it is hard not to feel protective of the human genome. And by implication, a viewer might be led to feel opposition to using new-found scientific tricks on something as inherently beautiful as the genetic composition of an individual.

Catherine Chalmer's portraits of transgenic rats also use the photographic image to elevate her subjects. She borrows her visual structure from fashion and product photography where the subject is utterly perfect, surrounded on a field of pure white. But her subjects are genetically engineered to have fatal flaws—the rats she photographs are bred to express genes for cancer, obesity, and other diseases and genetic traits. These "designer mice" could lead to cures for devastating human ailments. But the strongest statement that Chalmer's images make is that they are a vivid visual testimony of the power of transgenic technologies to alter living beings.

Beautiful visual depictions of genetic feats, whether naturally occurring or the result of human manipulation, can only go so far in addressing the issues. Gail Wight takes a different tact in her piece *Kings Play Cards*. This multimedia work attempts to address the multitude of issues that have been created by the Human Genome project, which completed sequencing and mapping the human genome in 2003. The basis of the piece is a projection

of Petri dishes containing little human figurines that, strangely enough, bear a strong visual resemblance to chromosomes. The viewer can select individual Petri dishes, and in each dish is a piece of information. There are interviews with various scientists who talk about the way their labs have been affected by the way research is funded, lists of genetic traits associated with each chromosome, and historical images relating to heredity. Wight attempts to retain the complexity of the issue, and leaves the viewer to draw his own conclusions from his experience of the piece.

Some artists choose to get to the heart of the matter by actually using the new technologies. Eduardo Kac chose to approach the issue by proposing a transgenic pet. These days, anyone can have a transgenic pet, thanks to a company that has decided to market the GloFish. These zebra fish have a jellyfish gene that causes them to glow in certain kinds of light. I haven't gotten my hands on one yet, but the company website says your local fish store should have them on sale for \$5 apiece, and if it is a spoof it is a good one because the FDA.gov website has posted a disclaimer regarding the transgenic zebra fish.

But in 2000, the idea of a transgenic pet was pretty novel. Eduardo Kac's transgenic pet was a modified rabbit that contained the same jellyfish gene the glofish have. The bunny juxtaposes the not-so-innocent technology of gene transfer on a creature that is a symbol of innocent, furry cuteness. The glowing bunny was supposed to have been born in France in 2000, and Kac named it Alba and proposed to bring it back to be his family pet in Chicago. The proposal to export the transgenic bunny met with resistance, so he launched a poster campaign in France. In 2002, the scientist who created the glowing bunny said that it had died, that it was one of several transgenic rabbits conceived in 1998 for research purposes, and that although its eyes and ears glowed green, its fur could not possibly glow neon green since hair is composed of dead cells.

The French scientist's claims seem rather likely, and we all know how truthful photographs are as documents. But in the end it matters little whether Kac actually had the bunny made for him or he found it, or whether it glowed as neon green as the photographs seemed to show. Kac's playful use of transgenic technologies sparked outrage among some that it was irresponsible to alter nature for such frivolous purposes. But the other side of the argument is that Kac's bunny, in proposed isolation from other rabbits as his family pet, is a lot safer than planting thousands of acres of wind pollinated transgenic corn. Kac is

further inciting people's fears and fury by holding the bunny under the word "family," which just begs association with the idea of designer babies. The scenario of genetically engineering a pet bunny appears innocent, but it asks the big questions of where, and how, is the application of this technology acceptable?

Using technology to critique technology is also the basis of several projects by CAE, the Critical Art Ensemble that Steve Kurtz is a member of. One of their projects, Beatriz de Costa's *Genterra*, is a combination of a website and a participatory performance that uses genetic technologies to create a dialog. The website is filled with factual information about the technologies of gene transfer between species. The performance starts at the website, where participants are asked to educate themselves about the pros and cons of transgenic technologies. Participants then create their own transgenic bacteria with the help of "Genterra" scientists, using harmless bacteria and their own genetic material. Finally, participants are asked to make a choice—do they, or do they not want to release their transgenic bacteria into the environment.

Genterra's approach is interesting for a number of reasons. There is a tendency to label all large corporations that work with transgenic technologies as the bad guys. This is not entirely a bad thing— it is good that consumers are suspicious of the motives of large corporations driven by market forces. But genetic manipulation has definite prospects to benefit society. One of my favorite examples is the plight of the banana plant. Edible bananas are the result of an infertile cross between two varieties of wild bananas. The infertile offspring creates a pulpy pod instead of a seed filled pod, and the pulpy pod is the nutritious and tasty banana. These plants are then propagated by splitting the root, so every plant of a particular banana variety is genetically identical. A fungus or disease infection can easily wipe out an entire region's banana crop, which is an inconvenience to cereal bowls in western countries, but can be devastating to countries that rely on the banana as a staple food. Before genetic engineering, the only recourse to save a banana variety from extinction would have been to wait for the one in a million mutant banana plant that was disease resistant. With genetic engineering, scientists can splice in a gene for disease resistance from a wild banana plant.

So Genterra allows for a positive assessment of genetic technology. It also forces participants to choose, which is a very powerful element, because it engages critical thought on the issues. The drawback of the project is that it has a limited reach—it is most effective

only for the few who are able to participate. And participation is self-selecting—the only people who would put forth the time and attention necessary are people who are probably already interested in the issues.

Parody is another means by which artists address technology. Virgil Wong's RYT Hospital-Dwayne Medical Center, (2001), is a fun and thorough satire of a high tech hospital. The "genochoice" section enables you to scan your genome and customize the genetic profile of your children. The hospital advertises its designer baby services with the slogan "It's the best of nature, before you nurture." Another section of the site chronicles the first male pregnancy, Mr. Lee Mingwei, who has posted his journal online so that you can follow him through his experience of being the first male to give birth. And on another section, you are invited to match wits with Clyven, the intelligent mouse. Of Clyven's creation, the site says "By implanting human brain cells (grown from a human embryo's stem cells) into a mouse engineered to have Alzheimer's, Dr. Keyes inadvertently made a remarkable and startling discovery: she not only cured the mouse's Alzheimer's disease, but the animal soon developed the relative intelligence of a human being."

In Wong's web parody, curiosity draws you in, and humor keeps you reading. The world she creates is an upbeat utopia where there is hope for any condition, and she exaggerates the sometimes absurd paths that real research takes, for love or money or just plain human curiosity.

But if you play along, real questions are raised. For example, as you navigate through the genochoice section to create the genetic profile of your virtual child, you are faced with a series of questions. You can clone yourself, use traditional "hetero" means with DNA from a male and a female, or use DNA from two women or two men. You are faced with a list of possible traits your child could have, and possible flaws you could correct. Every option you click has a price. What kind of world would we have if everyone was able to choose the hair color, eye color, and IQ of their unborn child? What if the next generation doesn't have genetic flaws, like Parkinson's disease or predisposition to diabetes? And who determines what is a genetic flaw—for example, if homosexuality has a gene, does it constitute a flaw? And what if only some people can make these choices—the people with enough money? These are big questions for the future of our society, and at the rate we are mastering the technology, questions that will be reality very soon, if they aren't already.

Humor and parody are some of the tools I use in my own art. My work address issues surrounding genetically modified foods. In my vegetable human hybrids, I make visible a technology that is usually invisible. Genetically modified crops usually look just like conventional crops, but my vegetables and fruits, which are modified with human genes, express traits from both species. We eat genetically modified foods on a daily basis, mostly in the form of processed corn and soy products, but in the US there is no labeling requirement. In the Genetically Modified Foods New Cook Book, I place these strange fruits and vegetables in the scenarios where we encounter food on a daily basis—the kitchen, and the dinner table. The recipe for Finger Rolls directs you to use a manicure brush to remove dirt from under the finger nails of finger carrots. The recipe for Updated Apple Pie counsels you not to taste raw Grinning Smith apple slices because they tend to induce garrulousness. And the Fibrous Plum Mould, which uses fair haired plums, boasts being one of the few desserts that give you a day's worth of fiber.

I use humor to draw people into my images, and my hope is that people will question the food choices they make on a daily basis. Judging by the number of people who see my images, and then bring up questions about genetically modified foods unprompted at a later date, at least some people are affected by the images. But my work also tends to point to another of the problems that the lack of labeling in the US has created—the perpetuation of myths and fictions about genetically modified foods. For example, most people tend to assume that those big, juicy tomatoes on supermarket shelves are genetically modified, because they heard something about genetically modified tomatoes. The truth to that myth is that the Flavor Savr tomato was one of the first patented genetically modified consumer foods, but the tomato is a hard food to grow and ship and Flavor Savrs turned out not to be a tasty tomato, so they never were widely available. According to the True Food Network, a website that tracks the development of genetically modified foods, there are five tomato varieties currently approved for sale, but none of them are likely to be found in your local supermarket.

With humor, parody, the tools of biotechnology, and visual language, artists working with genetics are questioning and critiquing a large and powerful establishment. The awareness that artists are creating by drawing attention to the structures behind genetic technologies will be essential to how these technologies affect the future of our society. Now is the time for artists to be involved—while these technologies are being developed and

before they become entrenched or legislated. Steve Kurtz is the unfortunate target of the current investigation, but on the other hand, it shows that genomic art has grown to a point where it is riding on the edge between controversy and legality, where its impact will be the strongest.