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Re-designing Life: Current Debates in the Arts and Sciences on Enhancing Human Evolution

Artists have responded to what it means to be human in the age of biotechnology in multi-directional ways. In my contribution I want to analyse two artistic positions that refer to current developments in the sciences such as experimental genome editing (Crispr/Cas9), personal genomic data, identity/privacy, and genetic surveillance.

The first part of my talk will focus on the new art project *The Infinity Engine* by the San Francisco-based media artist Lynn Hershman Leeson that was part of the “Civic Radar” exhibition, a comprehensive retrospective of her work, mounted at the ZKM Museum of Contemporary Art in Karlsruhe, Germany (2014–2015). In *The Infinity Engine* Lynn Hershman Leeson explores the manipulation of DNA through genome editing, mass production of transgenic organisms, and the development of regenerative medical technologies, such as artificial organ fabrication using 3-D bioprinting. *The Infinity Engine* includes the project *Capture Room* which Lynn Hershman Leeson developed together with NASA scientist Josiah Zayner. *Capture Room* is an innovative and highly speculative project that attempts to identify a person’s genome through a non-invasive procedure; that is, without extracting and sequencing the DNA from a body cell, relying instead on information provided by an image or photograph of a person’s face.

The idea that *Capture Room* presents is not a bizarre vision of the near future of human genome analysis. It is a scientifically informed and probable scenario of what is likely to be standard practice and everyday technology in just a decade or two. The main obstacle to the realisation of this vision is not lack of machinery or algorithms, but our still very imperfect understanding of genotype–phenotype correlations embodied in complex gene expression pathways. Disentangling the complex gene interaction patterns that are involved in phenotype generation has proven to be far more difficult than was originally thought after the successful completion of the HUGO project some fifteen years ago.

In the second part of my talk I will present an art project that refers the relationship of DNA and identity/privacy from the reverse perspective which has become well known in recent years as “forensic molecular photofitting” that has now even entered the art world.

The Chicago-based artist Heather Dewey-Hagborg is collecting DNA samples from her neighbourhood, traces of DNA people accidentally leave behind on things like a carelessly

discarded chewing gum. In her art project *Stranger Visions* (2012–2014) Heather Dewey-Hagborg creates three-dimensional physical reconstructions of faces behind the anonymous DNA to show that leaving a hair behind in a place may soon be like leaving a photograph of one's face. One of the leading experts in the field of forensic molecular photofitting, Mark D. Shriver, a population geneticist at Pennsylvania State University, has used this method in forensics to generate a physical description of an individual (such as skin, eye, and hair colour) from the analysis of DNA found at a crime scene, effectively turning physical DNA traits into a genetic eyewitness.

In recent years the collection of our personal data by amazingly powerful corporations and various governments have garnered much of our attention. With his exposures the American whistle-blower Edward Snowden made it quite evident to what extent our personal data is collected and processed without our consent, and shown us that we lost control over our personal data some years ago. The question that follows from these insights is whether we will also lose control over our genetic make-up, due to potential misuse of DNA profiling and genetic surveillance; it is also clear that there is a close link between big data and genetic data.

Suggested Reading:

Ingeborg Reichle, *The Infinity Engine*. In: Peter Weibel (ed.): *Lynn Hershman Leeson. Civic Radar*, Hatje Cantz, Ostfildern 2016, pp. 334–339.

Robert Zwijnenberg, *Biotechnology, Human Dignity and the Importance of Art*. In: *Rethinking "Nature". Ripensare la "natura"*. Vol. 1 Burning Issues/Questioni aperte, ed. Flavia Monceri et al., Teoria (Pisa), Edizioni ETS 2014, pp. 131–148.

Jens Reich et al. *Human Genome Surgery. Towards a Responsible Evaluation of a New Technology*, Analysis by the Interdisciplinary Research Group [Gene](#) Technology Report, Berlin-Brandenburg Academy of Sciences and Humanities, Berlin 2015.

Tony N. Frudakis, *Molecular Photofitting: Predicting Ancestry and Phenotype Using DNA*, Amsterdam, Elsevier 2008.

https://en.wikipedia.org/wiki/Heather_Dewey-Hagborg