



Cellular Propeller

Artist:

Howard Boland (C-Lab, London)

Ethics panel:

Bobbie Farsides (Brighton Sussex Medical School)

Sabine Roeser (Delft University of Technology)

Ursula Damm (Weimar University)

Stephen G. Gray (MIT, Boston, Imperial College, London)

Philipp Bayer (Heidelberg University)

Moderation:

Lucas Evers (Waag Society)

Fri, 05.02.2016

17:30 - 20:00

Workspace

Anxious to Make

transmediale, Haus der Kulturen der Welt

Trust Me, I'm an Artist

The series *Trust Me, I'm an Artist* investigates ethical issues arising from art and biological science collaboration, where artistic projects nudge up against the newly possible and often precede regulation. The series considers the roles and responsibilities of artists, scientists, and institutions involved. The protocol is as follows: an artist proposes an ethically complex artwork to a specially formed ethics committee (following rules and procedures typical for the host country), who then debates the proposal and comes to a decision about its implementation, which is publicly discussed.

transmediale hosts a Trust Me, I'm an Artist event where the project *Cellular Propeller* by Howard Boland (C-Lab) will be discussed following the protocol. Cellular Propeller explores the fourth domain of synthetic biology where bio-matter is mobilized to perform novel behaviors.

Cellular propeller description:

The proposed work *Cellular Propeller* makes use of synthetic biology that combines modern biology and engineering practices in a computational manner through modeling, prediction and implementation. Conceptualised as part of an awarded Art & Synthetic Biology residency at the German Cancer Research Center, it involves the fourth-domain of synthetic biology

that hybridises synthetic and biological matter to form novel biological or biologically inspired systems stretching into the realm of *pseudo-organisms*.

To realise this idea, it involves experiments with heart cells from newborn rats to make motile scaffolds. Due to limited availability of such material and ethical issues, it also takes the significant leap of using sperm cells to spin a coin-size wheel made from synthetic material. Availability of sperm cells and its potential for circumventing ethical ownership makes it appropriate for the project.

Cellular Propeller brings together art, science, technology, ethics and humour.

Still today, with all advances of molecular biology, motion remains a key attribute used to characterise something as living. *Cellular Propeller* partakes in rethinking *what is living* by producing a new hybrid living system or a bio-hybrid actuator. The project employs traditional quantitative engineering approaches to build a coin-size construct from living sperm cells and synthetic material that emulates a propeller motion. Morphologically, I am building a wheel or a functional propeller - genetically the propeller is human. Scientifically, the creation of *Cellular Propeller* is about understanding how sperm cells function in an artificial environment and the fundamental laws of forces and motion that govern this scale.

Obtaining biological material can be problematic due to legal restrictions and ethical frameworks especially critical in artistic scenarios. Using sperm cells opens debates about ownership of our body, its components and what we may harvest for art making. Beyond this, the cultural and biological condition of sperm cells involves a myriad of ideas including sex, pleasure, reproduction, IVF and health.

Howard Boland

Howard Boland is a multidisciplinary artist working with biological and digital media. His innovative research in synthetic biology has produced novel visual expressions in bacteria, culminating in UK's first art exhibition featuring living genetically modified microorganisms. He is co-director and co-founder of the art-science collective C-LAB and his interdisciplinary artworks have been exhibited and presented worldwide. With strong technical and creative skills, his experience spans from artistic to scientific contexts where he has led award-winning projects.

Ethics Committee:

Bobbie Farsides (Chair)

Bobbie Farsides is Professor of Clinical and Biomedical Ethics at Brighton and Sussex Medical School. Her research is focused on the experience of health care professionals operating in morally contested areas of biomedicine. She has conducted research and contributed to policy relating to organ donation ante-natal screening and testing, reproductive technologies, palliative care and issues around death and dying. Bobbie is Deputy Director of the Wellcome Trust funded LABTEC Centre (London and Brighton Translational Research Centre) and she was founding Co-Editor of the Royal Society of Medicine's journal Clinical Ethics. In collaboration with her colleague Sue Eckstein she is currently developing a series of events at BSMS under the heading Ethics in Performance to engage audiences with ethical issues through performance and art. <https://www.bsms.ac.uk/research/our-researchers/bobbie-farsides>

Sabine Roeser

Sabine Roeser is Professor of Ethics at TU Delft (distinguished Antoni van Leeuwenhoek Professor). She is also the head of the Ethics and Philosophy of Technology Section. She has been working at Delft University of Technology since September 2001. From September

2010 through August 2013 I also held a part-time professorship at Twente University (Socrates Chair). She obtained her PhD in 2002 at the Free University, Amsterdam, for her thesis *Ethical Intuitions and Emotions: A Philosophical Study*. She holds an M.A.-degree in Philosophy (cum laude, 1997) and an M.A.-degree in Political Science (1998), both from the University of Amsterdam. She did her B.A. in painting at the Academy of Fine Arts, Maastricht (1994). Her research covers theoretical, foundational topics concerning the nature of moral knowledge, intuitions, emotions and evaluative aspects of risk, but also urgent and hotly debated public issues on which my theoretical research can shed new light, such as nuclear energy, climate change and public health issues. www.tbm.tudelft.nl/sroeser

Ursula Damm

Ursula Damm has become known for her installations dealing with geometry and its social impact on public space. Since 1995 these installations became interactive, dealing with architectural aspects on the basis of tracking technology. Aside she developed numerous installations on the relationship of nature, science and civilization. Ursula Damm's works are shown worldwide in exhibitions and festivals.

Since 2008 she holds the chair of Media Environments at the Bauhaus-University Weimar, where she established a Performance Platform at the Digital Bauhaus Lab as well as a DIY Biolab. In 2010, her students participated at the iGEM Competition at Boston with a speculative performance.

Stephen Gray

Stephen Gray, a Bioengineering PhD at Imperial College London which was funded by a studentship from the BHF Centre of Research Excellence. He is the cofounder of a 3D bioprinting company Ourobotics which has a novel and affordable multimaterial 3D bioprinter. His background is an M.Sc. in Regenerative medicine (stem cells and biomaterials) and a B.Sc. in Biochemistry and Synthetic Biology.

He is currently working part-time as a visiting lecturer on the innovation design engineering postgraduate course based between the dyson school of design engineering and the royal college art and design. He will be commencing a microfluidics postdoctoral associate position based between MIT in Boston and the SMART Centre in Singapore in early 2016. In his spare time he is working on helping to establish and organize social events for a group called biochanges. Biochanges is an interdisciplinary community of design engineers, academic and private biomakers, bioartists, biomedical researchers, fashion designers, entrepreneurs, architects, and bioengineers, interested in investigating emerging ideas, projects, collaborations, and opportunities within the fields of biomaker spaces, 3D Organ Printing, synthetic biology, and biodesign-engineering. <https://uk.linkedin.com/in/stephengra>

Philipp Bayer

A student in Biotchnology and Philosophy, Philipp Bayer intends to jump over the alleged gaps between Life-Sciences, Philosophy and Arts.

Following this path he became a team member of the joint Science&Arts iGEM team of Heidelberg and Weimar 2010, lead by Prof. Damm. In its unhopeful attempt to shatter the common synthetic biologist's view on arts as a unidirectional communication tool, the team performed the fictional release of an online shop, selling synthetic biology products - imagined by artists and reviewed by science students - at the MIT in Boston.

Motivated by the critical and somehow misunderstanding reactions of the audience, Philipp joined the Science&Arts project 'not invented by nature' in order to help the visions of four artists to be 'born to life'. Still, only one of the artists chose to handle life forms as subject and matter of his work in this meant-to-be Synthetic Biology project: Dr. Howard Boland.

Philipp has been working on providing cheap and easy-to-handle tools for molecular biology ever since and will bring the concept of his project 'Locust PCR – Molecular Biology for Everyone' to Bauhaus University end of February.

After joining the iGEM team Heidelberg for a third time in 2014 as an advisor, Philipp was finally able to make the iGEM'ers dream come true by winning the Grand Price of the competition.

Anna Dumitriu

Anna Dumitriu is a visual and performance artist based in Brighton, England specialising in bioart. Her installations, interventions and performances use digital, biological and traditional media including bacteria, digital projections and embroidery, working with diverse audiences. Dumitriu's work is at the forefront of art and science collaborative practice, particularly working with microbiology, robotics, artificial life technology, and art/science ethics. She is involved in public engagement in science, arts in healthcare and the teaching of art/science practice to both art students and medical/science students. She is Artist in Residence on Modernising Medical Microbiology at The University of Oxford, Visiting Research Fellow: Artist in Residence at The University Of Hertfordshire in the Department of Computer Science, and a Visiting Research Fellow: Lead Artist in the Wellcome Trust Brighton and Sussex Centre for Global Health Research at Brighton and Sussex Medical School. She was formerly a Visiting Research Fellow: Artist in Residence in the School of Informatics at Sussex University between 2005 and 2014. She participated in the e-MobiLArt project (EU funded European Mobile Lab for Interactive Artists) and is co-chair of the Arts and Culture Subcommittee of the Alan Turing Centenary. Dumitriu is founder and Director of the Institute of Unnecessary Research and lead artist on the "Trust me, I'm an artist: towards an ethics of art/science collaboration" project working with the Waag Society in Amsterdam and co-author of the book of the same name. She has written extensively on the notion of the "bacterial sublime".

Lucas Evers

Lucas Evers is initiator of the Open Wetlab of Waag Society. The Open Wetlab is a community laboratory for DIY biology, bio-arts, bio-design, and bio-engineering. It brings together creatives, scientists, and the public to make hands-on living probes and to investigate constructive biology and its effects on society and ecology. Lucas Evers initiates projects within the Open Wetlab on local, national, and international levels, ranging from neuroscience hackathons to projects such as *Trust me I'm an artist*, investigating the new ethical issues arising from art and science collaboration. Lucas Evers studied art and social sciences.

Trust me I'm an artist is a project by lead artist Anna Dumitriu, ethicist Bobbie Farsides, and Lucas Evers. Trust me I'm an artist is a collaboration between Arts Catalyst (London), Kapelica Gallery (Ljubljana), Ciant (Prague), Medical Museion (Copenhagen) and Leonardo Olats (Paris), coordinated by Waag Society (Amsterdam), co-funded by the Creative Europe programme of the European Commission, DOEN, the Netherlands Fund for Creative Industries.



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