



[macro]biologies & [micro]biologies

Art and the Biological Sublime in the 21st Century

Edited by Regine Rapp & Christian de Lutz | Art Laboratory Berlin

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Foreword and Acknowledgements

This book provides a sustainable supplement to the *[macro]biologies & [micro]biologies* series which took place at Art Laboratory Berlin between 2013 and 2015. The whole programme consisted of four group exhibitions, several seminars and talks on contemporary art and the life sciences. Four exhibitions – *the biosphere, organisms, the bacterial sublime*, and *proteo* – featured renowned international artists working across the borders between the arts and different fields of biology. Our essay presents a thorough theoretical reflection of the individual positions of all nine artists and their exhibited works. With our thoughts and conceptual approaches we want to manifest *the biological sublime* in artistic positions of the 21st century.

The publication then presents artist statements, included either in the exhibitions or in workshops and seminars of the *[macro]biologies & [micro]biologies* series, including visual documentation. We consider their individual approaches to the specific topics expressed in their own words equally of high importance.

Finally this book documents in text and image a number of highly remarkable events from the *[macro]biologies & [micro]biologies* series – workshops and seminars with artists, biologists, and scholars, discussing synthetic biology, speculative design, DIY Bio, computing with slime moulds, open source research on antibiotics, and practical exercises in citizen science.

Throughout this publication theoretical parts are accompanied by visual documentation of the exhibitions and events – thanks to the outstanding photographs of Tim Deussen. Our goal throughout has been to present transdisciplinary artistic positions that are highly relevant not only to art in the emerging 21st century, but to society as a whole. Current developments in the life sciences promise to alter our lives as radically as information technology has over the last few decades. The position of artist as researcher, citizen scientist and bio-ethicist offers a vital set of bridges between science, technology and democratic structures in an era of great change.

We want to thank all artists included in the exhibition series of *[macro]biologies & [micro]biologies*. It has been a great pleasure to work with you. We treasure the remarkable insights we obtained while cooperating with all of you.

Then we want to express our gratitude to our colleague Olga Shmakova for having constantly broadcast and promoted the exhibitions and events to a wide public. With such great press outreach and echo we could hit our target of reaching a wide range of recipients. Many thanks as well to our Art Laboratory Berlin staff – Eirini Kokkinidou, Katarina Hergouth, Chiara Donelli, Elizabeth Sawyer and Aleid de Jong – for so excellently taking care of the preparations and looking after both the exhibitions and events. Finally our gratitude goes to Eva Jera Hanžek, for having put together all the content and images into this wonderful book format.

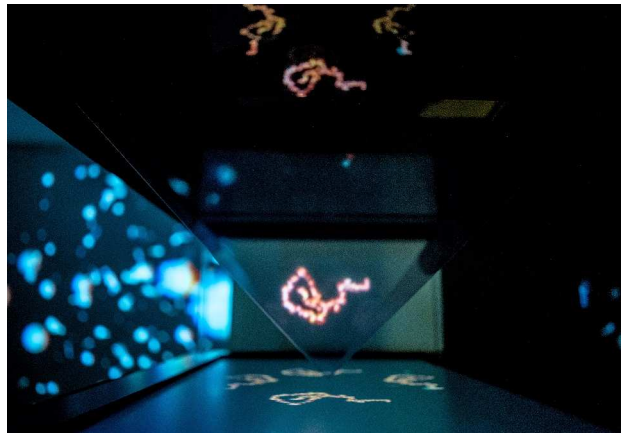
Thank you for your great support: Aurore Ballengée, Prateep Beed, Daniel Belasco Rogers, Jason Benedict, Jessica Bernds, Eva-Maria Bolz, Rudolf Brandeis, Ashley Chang, Sarah Chareza, Jeff Degan, Tim Deussen, André Dietrich, Annette und Wolfgang Großskinsky, Sabine Flach, Desiree Förster, Herbert Fuß, Carola Hartlieb, Janez Jansa, Mason Juday, Denisa Kera, Marcella Okretic, Svantje Meier, Heike-Catherina Mertens, Ashling Ni Gabhainn, Brigitte Rapp, Klaus Schmitz, Gerhard Scholtz, Daniela Silvestrin, Andrej Strehovec, Rüdiger Trojok, Raul Valverde, Assibi Wartenberg, Marko Zavbi – and last but not least Lord Byron. Our special thanks goes to Michael Schröder for his generosity and support.

Finally we want to thank the following institutions and foundations who have financially supported our exhibitions, seminars, and workshops: Schering Stiftung, British Council, Arts Council England, Ministry of Culture of the

Republic of Slovenia, Municipality of Ljubljana - Department of Culture, Berlin
Senate Department for Urban Development and Environment, European
Regional Development Fund (ERDF).

Also we want to thank all our cooperation partners: Aksioma, The Waag Society,
Kindle Project, Creative Capital, School of Visual Arts, New York, Department of
Chemistry/ Technical University of Berlin, Comparative Zoology of the Institute
of Biology/ Humboldt-University of Berlin, Art Nodes Berlin, UAP Poznan,
biomimicry Germany, fotoscout, and degewo.

Regine Rapp & Christian de Lutz
Berlin, May 2015



Art and the Biological Sublime in the 21st Century

By Regine Rapp and Christian de Lutz

Introduction

“Art and science, the twin engines of creativity in any dynamic culture, are commonly thought of being as different as day and night. This is a critical error. The partitioning of curiosity, inquiry and knowledge into specialized compartments is a recipe for cultural stagnation.”

Stephen Wilson, 2010 [1]

Above:
[macro]biologies and
[micro]biologies publications
Temporary Library at
Art Laboratory Berlin
January-March 2015

Instead of a unified conception of existence, such as “world” or “nature”, today, in the post-anthropocentric era, we find ourselves confronted rather with a multiplicity of structures and a blurring of boundaries. This has led us to question, by means of interdisciplinary artistic positions, certain areas of one of the fastest changing fields of current research – the life sciences.

Middle left:
Mathias Kessler
*Jarrells Cemetary, N37°
53.96' W81° 34.71'. Eunice
Mountain, West Virginia, 2012*

In this essay we want to discuss more theoretically the art works shown in our exhibition series *[macro]biologies* and *[micro]biologies*, which took place between January 2014 and March 2015. These works and projects were dedicated to artistic reflection on the current drastic changes to how we connect, relate and interrelate to the worlds around us.

Middle right:
Suzanne Anker
*Petri's Panoply, 2014, wooden
table, 186 glass Petri Dishes
Various items collected in
Berlin*

Our interest lies in showing examples of artists working in the life sciences, in collaboration with the natural sciences and natural scientists. The life sciences are marked by a plurality of disciplines (e.g. ecology, botany, comparative zoology, biotechnology, biochemistry, microbiology, etc.), therefore we favour use of the neologism “biologies” for our further discussion. While the artists we have chosen usually have concentrated on one or two specialised areas, we are most interested in their dedication to understanding and partaking in scientific professionalism. We are also interested in developing a hybrid field that results from the collaboration between artists and the sciences.

Bottom left:
Synthetic Biology workshop
with C-LAB, September 2014

Bottom right:
Joanna Hoffmann
*πρωτεο/proteo, 2013, video
animation (Pepper's ghost)*

Recently we have observed a growing range of collaborations between the fields of art and science (visual culture, art and sciences), creatively experimenting with the intersections and blurring the boundaries between theory and art. In the 21st century the scepticism of interrelating art and science (e.g. Leo Steinberg's sceptical attitude towards the connection of art and science), has finally been overcome, as today there are numerous theorists, artists and collaborative projects expressed through exhibitions and symposia, which reflect this fruitful, overlapping phenomenon. [2] In this series of exhibitions, talks and workshops, Art Laboratory Berlin presented some outstanding artistic positions, which comment on current phenomena within the *biologies*.

[macro] and [micro] – from the Vast to the Minute

Our curatorial approach was to move from the vast to the minute. The *[macro]biologies & [micro]biologies* series proposed exhibitions, performances, and talks at Art Laboratory Berlin over the course of more than a year. The series moved from biosphere and landscape – systems, structures, creation and devastation (exhibition 1) to the level of nonhuman, multi-cellular beings (exhibition 2) and finally explored microorganisms (exhibition 3), as well as the minute particles or objects that form life or a basis for living (exhibition 4). Additionally a programme of talks, workshops, performances and other events with artists, scientists and scholars accompanied the exhibitions.

The core of the outstanding international artistic positions chosen shows a wide range of artistic strategies: Katya Gardea Browne carries out a cinematic archaeology of the biosphere; the Center for PostNatural History articulates the phenomenon of the postnatural; Mathias Kessler reflects landscape between utopia and dystopia; Alexandra Regan Toland develops an aesthetic of geographies while reflecting on urban nature through art and science; Suzanne Anker critically reconsiders art history and creates a strong aesthetic language of science; Maja Smrekar produces an aquatic art laboratory for the study of native and invasive species; Brandon Ballengée performs both artistic and biological research on amphibians that involve 'eco-actions' in wetlands; Anna Dumitriu displays communicating bacteria and develops a bacteriocentric view; and finally Joanna Hoffmann explores the origin of life by entering the world of molecules.

We consider curating not only as presenting art works and projects, but as combining the artists' manifold ideas and theses in space – as *spatialised theory*. Therefore this theoretical text and publication is an essential part – a theoretical postproduction so to say – of the *[macro]biologies & [micro]biologies* series.



[macro]biologies I: the biosphere

For the first exhibition project *[macro]biologies I: the biosphere* we have chosen four noteworthy international artistic positions who, in their artistic practice, deal with the structures and systems of our world: Katya Gardea Browne, The Center for PostNatural History, Mathias Kessler and Alexandra Regan Toland. The exhibition focuses on the ecosystem and the biosphere with billions of life forms that interrelate with other systems (e.g. geology and climate).

A Cinematic Archaeology of the Biosphere

The recent works of Mexico City based artist, photographer and filmmaker **Katya Gardea Browne** stress the cultural and environmental tensions between urban and rural in and around Mexico City, the world's largest metropolis. For the exhibition at Art Laboratory Berlin she produced three video works about different aspects of threatened ecosystems in Mexico: *Xochimilco* (2014, 7:45 min), *Panoramas* (2014, 8:03 min) and *Maíz* (2014, 16:14 min).

Katya Gardea Browne
Torre, Panorámica Solotepec
/ Paisaje, Maíz y Periferia
Mexico 2014, photograph
(detail)

The video ***Xochimilco*** is a meditative journey through the waterways of the district of the same name in the Mexican capital. The word is a combination of the Nahuatl words "xochitl" and "milli" and can be translated as "where the flowers grow." [3] The peaceful rhythm of the video enables one to reflect upon

the drastic changes in a megacity, which originally was made up of flourishing wetlands. Only occasional acoustic moments betray a human presence. However, the biosphere dominates, especially the so-called "chinampas" ("floating islands"), upon which Gardea Browne plays with colour filters, rapidly switching between colour and black and white. Continuous views of water and reflections as well as the waterfront, the boundary between water and land, point to the peripheral – a moment that can always be found both aesthetically and politically in Gardea Browne's work.

The video **Panoramas** can be seen as homage to the Mexican landscape, both urban and rural. The journey out of Mexico City through plains and over mountains is compressed by a staccato stop-motion effect, which arises from the juxtaposition of Gardea Browne's countless photographs. There was an interesting dynamics in the presentation of the works, as both videos – the meditative *Xochimilco* and the quickly moving *Panoramas* – were presented in the same room, one interrelating with the other.

The video **Maíz** deals with the cultivation and use of maize in Mexico. Gardea Browne filmed in various locations, including Quetzalan (Puebla), Solotepec (Estado de Mexico) and Huamantla (Tlaxcala). The video provides an insight into the unique cultivation of maize in so-called "milpas" (corn fields with mixed cultivation, often of beans and squash) and refers to the fundamental importance of maize in Mexican culture. Scenes of the making of tortillas, the traditional Mexican corn bread, are coupled with encounters and interviews with farmers. Right next to the video *Maíz*, the artist arranged a display case with various objects, playing on themes from the video work. As if through a critical post-archaeological gaze Katya Gardea Browne had gathered several older and newer objects in the case, referring to the subject matter of corn: books and postcards of corn fields, as well as traditional varieties of Mexican maize in different colours, and artefacts associated with the fertility of the soil. In a quite unique way, Gardea Browne shows the omnipresence of maize in current Mexican culture, arranging a telephone card with a god of soil fertility printed on it next to an ancient sculpture of a corncob.

In her artist talk at Art Laboratory Berlin in Spring 2014, Katya Gardea Browne stressed her own interest in the topic of the biosphere as well as the process of her artistic production and research. "The challenge of the environment and its transformation is something we are well aware of these days", she explained. "Yet we seldom look at the historical and social systems of the past, with the purpose



Above:
Katya Gardea Browne
Xochimilco, 2014, 7:45
Video still

Right:
Katya Gardea Browne,
Xochimilco, 2014, 7:45 min (left);
Panoramas, 2014, 8:03 min
(right), exhibition view
Art Laboratory Berlin



of learning from them; only from the context of historical revisionism, from an occidental point of view and the cultural advances of our known society. The idea of a Pre-Hispanic agriculture (e.g. man-made floating gardens) intrigues me.” [4] The thought provoking artistic method of Katya Gardea Browne lies in the self-referential moment, in the correspondence of artistic tools and subject matter. In questioning her own relationship to nature and the environment she uses the camera as a tool of perception to focus and re-focus the lens. “I am interested in the transformation of a city landscape, places in between, ruptures and borders i.e. the fixed and unfixed points” she remarks. [5]



Katya Gardea Browne
Display case with
objects, exhibition view
Art Laboratory Berlin



As if breaking a narrative pattern and working against the chronological order, Katya Gardea Browne makes use of her photographic records of the chosen landscapes to create what she calls a “panoramic image of environmental destruction.” The juxtaposition of historic documentation, old films and photography together with new photo and video footage is a vital part of this dynamic artistic method.

The Phenomenon of the Postnatural

The **Center for PostNatural History (CPNH)**, based in Pittsburgh in the U.S., is an art and research project dealing with the history of mankind’s manipulation of life forms, from early agriculture to genetic modification. After the idea arose in 2008, the artist Richard Pell together with his colleagues finally opened the CPNH in 2012 (Director and Curator of PostNatural Organisms: Richard Pell, Director of Science and Learning: Lauren Allen, Mobile Exhibit Design and Production: Mason Juday). The *PostNatural* refers to life forms that have been intentionally altered by humans through domestication, selective breeding and genetic engineering. Towards this end, the CPNH produces thematic multimedia exhibitions, printed works and maintains a collection of living, preserved and documented specimens of postnatural origin.

The CPNH also questions the institution of the “Natural History Museum” as such. As an institution of modern knowledge production, especially since the 19th century, and far after the time of cabinets of curiosities, when art and science had not yet separated, the natural history museum has been a place where the division of subject and object, the dichotomy of humans and nonhumans was consciously implemented. To open up a “Center for PostNatural History” today is therefore a noteworthy step outside this oppositional dilemma, as it goes beyond and refers to the artificially altered specimen – which has, of course, been altered by humans. It puts into focus an important part of the current debate on the ‘anthropocene’ and has discovered in its own structure a remarkably fresh note. “I am concentrated on where natural history museums finish”, states Richard Pell on the CPNH. [6]

At Art Laboratory Berlin in Spring 2014 the CPNH presented their work ***PostNatural Organisms of the European Union***, a form of museum representing biofacts of living, preserved and documented organisms. What Richard Pell and Lauren B. Allen call a “regionally specific travelling exhibition“ turns out to be an

amazing collection of European specimens altered by human intervention. [7] A large circular wooden structure contains a film screen and eleven dioramas where the visitors can study a preserved red canary, have a look at a transgenic mosquito developed to fight malaria, or learn about the Svalbard seed vault in Northern Norway. With the help of telephones, the visitors receive short factual information on each of the specimens presented.

“The museum is essentially anthropocentric – it looks at the organisms that we alter, but also at how they alter us”, says Richard Pell. “The history within an engineered organism is vast, and represents the continuum of human manipulation of plants and animals. For example, the rats we breed to develop human-like tumours will shape the progress of medical research, which in turn will have an effect on which of us survive.” [8]

Reflecting on aesthetic and artistic parameters in the work *PostNatural Organisms of the European Union*, it is an installation that puts the recipient automatically into the position of “museum-visitor” and playfully simulates well-known ‘modes of the museum’: looking at dioramas, listening to explanatory texts, deciphering labels with Latin names and dates, and last but not least, the habitus of knowledge acquisition. By doing so the viewer adopts the museum visitor’s gestures – an intriguing mimicry effect, which by consequence lets the visitors question the conventional forms of a museum as such.

Richard Pell, also well known as an artist and founder of the Institute of Applied Autonomy (IAA), seems to be well aware of this performative, mirroring effect of the *muscion*. It is exactly this format, the museum, which he chose for his collection of postnatural specimens. “The rhetoric around altered organisms has become narrow, both for those who are afraid of ‘ Frankenfoods’ and those who believe that genetic engineering will cure cancer”, remarks Pell on the museum visitors’ biased views of the CPNH. “[They] often want to have their own belief system mirrored in your own rhetoric, or at least they want to have someone else’s bias so they can recognise and argue with it. Otherwise they must argue with themselves, which is uncomfortable but is exactly the experience we want them to have.” [9]

The work *PostNatural Organisms of the European Union* was shown in the WAAG Society in Amsterdam in 2012, and in a different format at the Museum für Naturkunde in Berlin (the Natural History Museum in Berlin) in Spring 2013. Art Laboratory Berlin recommended Richard Pell and the extraordinary collection of



The Center for PostNatural History
PostNatural Organisms of the European Union, 2012 - ongoing

Above:
Installation at Art Laboratory Berlin

Below:
The Laboratory Mouse, The Canary, samples of specimens of the CPNH and part of the installation above

the CPNH to Uwe Moldrzyk, director of exhibitions at the Museum für Naturkunde in Berlin. In the context of the exhibition *Developments – 60 Years Discovery of the Structure of DNA*, Richard Pell installed part of *PostNatural Organisms of the European Union* and was able to also exhibit specimens from the Museum für Naturkunde in Berlin itself. The role of Richard Pell was not only the 'double agent' position of artist as curator. By inserting the installation in a remarkably smooth and camouflaged manner within the Museum für Naturkunde in Berlin and the DNA exhibition, he was literally able to hack the museum. This intervention was not obviously perceivable for all museum visitors, as the integration of CPNH and Berlin museum specimens continued within the flow of the larger exhibition. Therefore this new approach of a collection of postnatural specimens within the traditional collection of the Museum für Naturkunde in Berlin turned Pell and the CPNH – subconsciously – into a hidden agent provocateur. [10]

Thinking Landscape – between Utopia and Dystopia

New York based artist **Mathias Kessler** deals with the phenomenon of changing landscapes caused by human intervention. For nearly ten years he has explored the concept and history of “nature” within the Eurocentric context of capitalism, humanism, and representation. In his work he not only exposes the many interventions of human culture that have threatened, remade, and shaped what nature is, he also plays with our longing for an apparently pristine environment. His photographs, computer-generated landscapes and installations work within the historical interface between private space and the adjoining public space of the natural order – between memory and its image, authenticity and alienation.

For this exhibition, he presented contradictory phenomena and images in both exterior and interior spaces. In the public space, beginning on Prinzenallee next to the main exhibition space of Art Laboratory Berlin, then in front of Prinzenallee 58 and in its courtyard (a former factory and squat), he applied computer-processed photographs taken in the Florida Everglades from his series ***Sunset in Simulacrum_3.2014.3D Rendering*** from 2014. The images depict romanticised sunsets and refer to an idealised image of nature that is a human construction. With these motifs – wheat pasted posters in public spaces – Kessler plays with the ephemeral and literally fast fading quality of such artificial constructions.



Mathias Kessler
Sunset in Simulacrum_3, 2014, 3D Rendering
2014, Prinzenallee, Berlin Wedding

Below:
Mathias Kessler
Jarrells Cemetary, N37° 53.96' W81° 34.71'
Eunice Mountain, West Virginia, 2012
Exhibition view, Art Laboratory Berlin



In the interior space, however, Kessler deals with radical views of “nature” – in this case the destruction of whole landscapes by industry. His wall piece *Jarrells Cemetary, N37° 53.96' W81° 34.71'. Eunice Mountain, West Virginia* from 2012 was more than 7 meters long and covered a wall of the cultural hall at Prinzenallee 58 from floor to ceiling. His aerial photography and documentation of mountain top removal coal mining in the Appalachian Mountains focuses attention on the human ability to shape the very Earth around us. It also refers to the disastrous consequences of modern hubris. Kessler states: “I use aerial images of surface coal mines in West Virginia that show and bring us the unprecedented destruction of landscape as wallpaper into the white cube and by its extension the living room.” [11]

Undoubtedly the specific aerial view from above emphasises the shock-effect, while deciphering the natural catastrophe implemented by the method of mountaintop coal mining. The mountains are “methodically blast[ed] apart layer by layer and [then they] truck off the coal to generate electricity and forge steel.” [12] Kessler originally wanted to visualise the industrial territory from a neighbouring hilltop, but this was complicated and finally indirectly prohibited by the company itself (which made it nearly impossible to reach a small Civil War cemetery which is still in the middle of the vast mountain top removal area). Kessler finally got full measure of the whole devastation, after he rented an airplane to gain access to an aerial perspective and take areal photographs of the territory. [13]



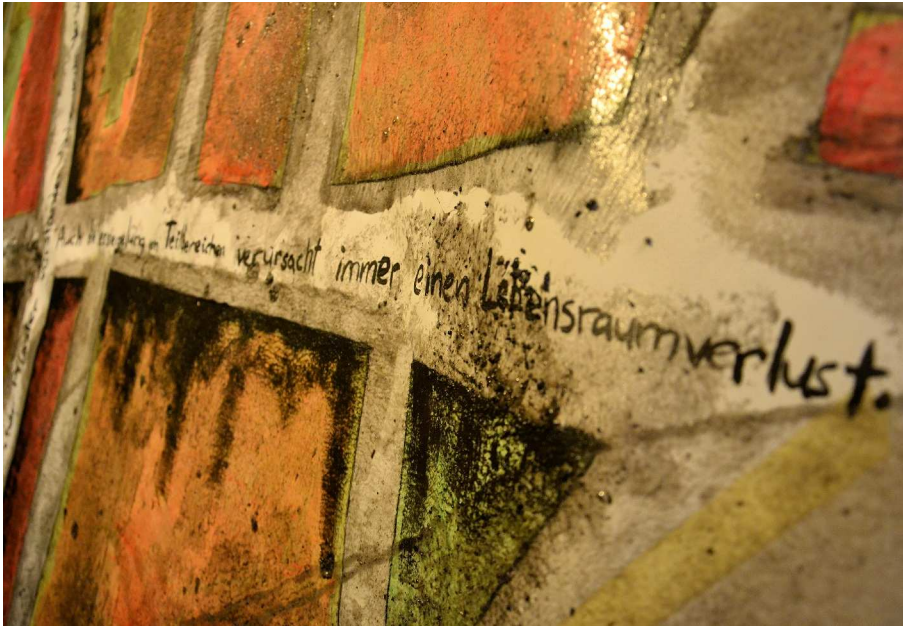
Mathias Kessler
*Sunset in
Simulacrum_3.2014.3D
Rendering, 2014, Prinzenallee
58 Courtyard, Berlin Wedding*

Kessler's monumental wall photography plays successfully on the illusion of the spectator's gaze: from afar one might easily fall for the trompe-l'œil effect that one is standing in front of a large 19th century panoramic landscape painting, especially looking at the colourful autumn forests, which appear to almost be painted in a postimpressionist manner. Only by observing more thoroughly and approaching the image, does one quickly become aware of the roughly pixelated photo-print aesthetic, wallpapered over an entire wall. Finally one recognises roads, vans and digging machines – absurdly small in the large image – and realises the vastness of the coal mine's real size.

The centre of the monumental wall piece consists of the removed mountain top, which looks like a blank space and literally falls out of the reddish brown pattern of the forest, which itself appears pushed to the periphery of the image. It is amazing how the light, colourless part of the picture, the centre of the image, depicts catastrophe. The awareness of the devastation goes along with the observing of a truly monumental image – Kessler therefore plays with monumentalism and the genre of photography, depicting “nature” in the postnatural era.

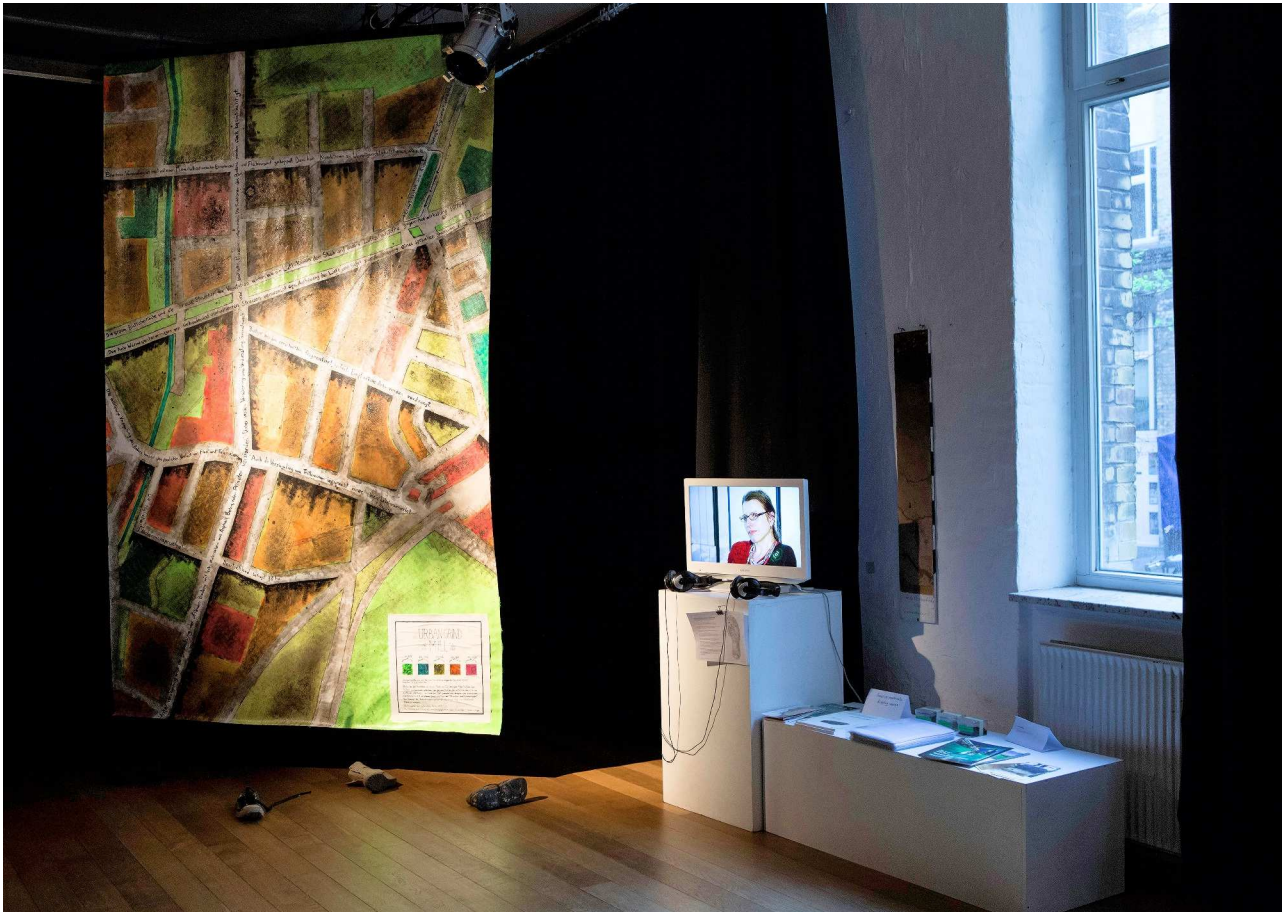
Aesthetic Geographies – Reflecting Urban Nature through Art and Science

The Berlin based artist and ecologist **Alexandra Regan Toland** works on multiple levels to create social awareness about urban ecological systems. As a soil studies scientist she examines the resilience of urban flora. In her artistic work she involves combining social awareness of urban nature with community activism. Toland has already worked several times with Art Laboratory Berlin: in 2009 she presented her performance and interactive urban exploration *Personal Dispersal Mechanisms* at Art Laboratory Berlin. The artist realised a collaborative walk and installation project, leading a group of Berlin residents through part of the green corridor along the Panke River and made personal introductions between individual people and plants. [14] In Summer 2010, together with the artist Myriel Milicevic, she conceived the exhibition project *Wish Garden – Wild Urban Offshoots*, part of the series *Artists in Dialog*. They chose the immediate area around Art Laboratory Berlin (the ‘Soldiner Kiez’) as a place to investigate interactions between the local human population and urban flora and fauna. The exhibition space functioned as a laboratory for mapping, sketching, modelling and prototyping. [15] Toland calls her artistic research practice of the last eight years “aesthetic geographies”. She explains it as “participatory, transdisciplinary



Alexandra Regan Toland
Mapping the Urban Grind Mill (detail)

Below:
Alexandra Regan Toland
Mapping the Urban Grind Mill, 2014
Exhibition view, Art Laboratory Berlin



cartography and artistic research on human-environment relationships.” [16]

For the exhibition *[macro]biologies I: the biosphere* Toland realised a new project **Mapping the Urban Grind Mill**: She used cartographic documents, urban dust, and a collection of shoe profiles to examine the pressures of soil sealing (i.e. the widespread pavement of porous surfaces) on human and non-human communities in Berlin. Toland produced a large map of the local area around the exhibition space of Art Laboratory Berlin (“Soldiner Kiez”), made of soil and dust, in which she also used text excerpts from the Berlin Geographic City Atlas. The map's character was linguistically extended, the excerpts had a strong impact on the visitors, as they were removed from their specific context and therefore confronted the recipients with a special dynamic. Along the streets on the large map, Toland wrote chosen sentences, e.g. “Die große Blattoberfläche und die raue Struktur der Vegetation wirken wie ein Luftkamm, der Staub und andere Luftschadstoffe gegen Aufwirbelung bindet.” (“The large leaf surface and the rough structure of the vegetation act as an air filter, which binds dust and other air pollutants and prevents swirling.”) or “Die tägliche Flächeninanspruchnahme in Deutschland beträgt 78ha.” (“The daily land consumption in Germany amounts to 78 hectares”). This, in turn, made the reader curious to read the content of articles, books and maps. Visitors were also invited to participate in Toland's project by taking part in an interview and by donating sole profiles of old pairs of shoes.

The presentation of her project was manifold: Next to the spatial installation she also provided the public with the results of her research. Toland, who just earned her PhD on soil art in the 20th century at the Institute of Soil Studies (Technical University, Berlin), works as an artist, as well as a researcher in soil studies, and as a soil scientist. She is a noteworthy scholar in the interdisciplinary field of art and science. Her interest is to overcome the gap between environmental art and environmental science. In one of the publications, exhibited to the public, we could explicitly read about this important exchange of knowledge offered by Toland: “By communicating examples of soil art to a mostly scientific audience, this presentation functions as one step in such a knowledge transfer process. Conversely, we are interested in the creative aspects of scientific research, and how these might inform and enrich artistic practice.” [17]

[macro]biologies II: organisms

This exhibition highlights the works of artists dealing with multi-celled organisms. Noteworthy is both the relationship of these organisms to us, as well as their roles as independent actors. The exhibition focuses on the works of three remarkable, internationally recognised artists whose art deals with multicellular organisms: Suzanne Anker, Brandon Ballengée and Maja Smrekar.

Reading the Aesthetics of Science

The American artist and theoretician **Suzanne Anker** has been one of the key figures working at the border between art and biology for several decades. Her work combines inquiry into science and the newest technologies with a keen aesthetic sense. Connecting neuroscience, space technology and biosciences with the field of visual aesthetics, she has developed an impressive body of work. In her art practice she not only reconsiders the history of art through the perspective of science history, but also comments to the newest technological developments. As the chair of the Fine Arts Department of the School of Visual Arts (SVA), New York, she has contributed numerous theoretical impulses to the field of bioart. By installing the Bio Art Lab at SVA in 2011 she has also invested in a priceless base for the younger generation of artists and scholars. [18]

Suzanne Anker
Astroculture (Shelf Life) II
2014, installation (detail)
Exhibition view
Art Laboratory Berlin



At Art Laboratory Berlin Anker showed several series of works, which express Anker's fascination for various forms of intersection of visual art and biological sciences due to technology. The installation ***Astroculture (ShelfLife)*** from 2009 consists of three plant chambers with installed LED panels. Seedpods are planted inside. By means of the red-blue UV lights the plants – peas, and beans, oregano and mint – all appear fuchsia. The concept of this process-oriented work foresees regular watering, and a mainly dark space. Over several weeks the growing process indeed develops visibly faster than under 'normal' conditions. The work manifests the possibility of growing herbs in any light deprived space. Anker's luscious, intensely magenta shining wall installation has added a political undertone, as soon as we become aware of the origin of the term "astroculture": it derives from NASA's Space Development Program with the apt trademark label "Advanced Astroculture" (ADVASC), experimenting with different forms of gravity and extreme condition for plants' growth, in space since 2001. In this sense Anker's work reads itself like a critical commentary on the NASA rhetoric, especially NASA's targets for the future: "How can industry take advantage of growing plants in the unique microgravity environment created as the International Space Station orbits Earth? The Wisconsin Center for Space Automation and Robotics at the University of Wisconsin-Madison – a NASA Commercial Space Center with partners in industry and academia – is dedicated to help industry explore the possibilities." [19]

In the series ***Vanitas (in a Petri dish)*** from 2013 Suzanne Anker reflects the historical concept of *vanitas* from an extraordinary perspective – the Petri dish. Eggs, flowers, pearls, dead frogs, feathers, cloth, honeycomb, cherries, and many more items are differently combined in Petri dishes. The superimposed size of each image provides a forensic gaze onto this post-baroque syntax. The square format of the photographs stresses the circle form of the Petri dish even more and automatically recalls the centuries long discourse of square and circle. Anker reconsiders the art historical notion of *vanitas* and therefore employs the Petri dish "as the site of laboratory life in which the Petri dish changes from an object of science to an object saturated as art." [20] The metaphors for mortality, fugacity, fortune or prosperity in traditional *vanitas* painting in Dutch art of the 16th and 17th century can be read here as a subversive subtext regarding new promises in current scientific research.

Anker extends the *Vanitas* series with a phenomenal switch into current technological developments: her series ***Remote Sensing*** from 2013 is a series of work produced through rapid prototyping technology. The three dimensional



Left:
Suzanne Anker
Vanitas (in a Petri Dish) (15)
2013, inkjet print on archival
paper

Right:
Suzanne Anker
Remote Sensing, 2013
Exhibition view
Art Laboratory Berlin

working software program converts the two-dimensional image into an object. The images to which the 3D-prints refer are from the *Vanitas (in a Petri Dish)* series. The original eggs, flowers, feathers or pearls have now mutated into rough light coloured landscapes out of plaster, resin and pigment, set in Petri dishes. Anker plays with the result of the translation process of 2D photograph into 3D printed object – the aesthetic power lies here in the uncontrollable result of the image transformation. “Turning data into images is an information age phenomenon”, remarks Anker. “Whether mapping the double helix through haptic methods, or scanning hostile environments such as Antarctica or the ruins of Chernobyl – zeros and ones create images, which are not always decipherable.” [21] The title “remote sensing” refers to current image production technologies, “extracting information about an object without coming into physical contact with it.” [22] The resultant sculpture shares resonance with pictorial maps and landscapes employed by remote sensing, whose connotation is directly connected to satellite technology.

Anker also has produced an installation especially for the exhibition at Art Laboratory Berlin: *Petri's Panoply* (2015). Over 180 Petri dishes combine both

organic and synthetic materials: candle, wax and garlic; noodles and beetles; tomatoes and red chillies; glass and light bulbs; leaves and herbs; black beans and seashells; mushrooms and earth; jelly baby cherries and red chillies; and many more strikingly colourful objects. [23] The density of objects and colours produce a post-baroque table with a mesmerising effect on the viewer. The haptic and textural qualities of the objects, meticulously arranged in a clear colour scheme emphasise the wish to observe. In this work, as in so many other works by Suzanne Anker, one comes upon the combination of living and dead materials, the dichotomy of synthetic and organic, of artificial and “natural” – as much as it is still possible at all to use the term in the age of biotechnology. "I consider the Petri dish as a signifier", notes Anker, who is currently researching the history of the Petri dish. [24] Similar to the modernist "objets trouvés", Anker transforms the Petri dish into an object of the biological sublime in the 21st century.



Suzanne Anker
Petri's Panoply, 2014
Wooden table, 186 glass
Petri dishes, various items
collected in Berlin
Exhibition view
Art Laboratory Berlin

Aquatic Art Laboratories – On Native and Invasive Species

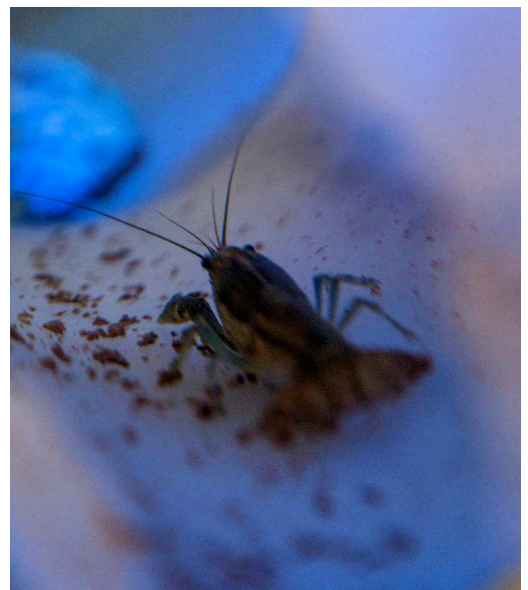
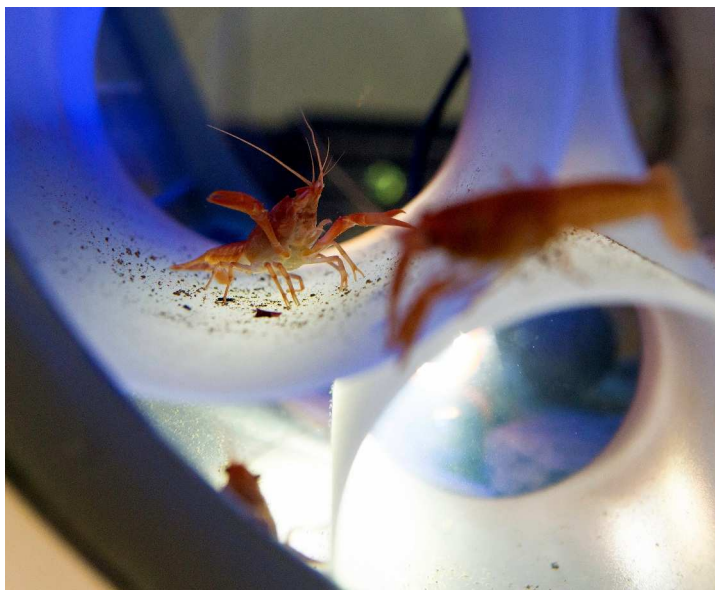
Maja Smrekar is an emerging young artist from Ljubljana, Slovenia, whose work connects the intersections of humanities and natural sciences, with her main interest being the concept of life. Her work focuses on both the collaborative process between artist and scientist and the possibility of hybrid outcomes. For her project *Hu.M.C.C.* she was awarded first prize at the Cynetart festival, European Centre for Arts, Hellerau, Germany, and an honourable Mention at the 2013 Ars Electronica, Linz.

Her work in the exhibition, **BioBASE: risky ZOOgraphies**, is a further iteration of an ongoing project, *BioBase*, which proposes a prototype of a future mobile laboratory for the study of invasive aquatic arthropods. The first version was developed in 2012, working together with biologists in Ljubljana, Slovenia, where Smrekar built the installation **Crustacea deletur**. [25] This inter-disciplinary project explored the problem of invasive species, in this case the interaction between European (indigenous) and non-European (tropical, invasive) crayfish. An architectural housing, resembling a tent, contained a two part aquarium, one part containing the local Slovene crayfish (*Astacus astacus*), the other – the Australian red claw crayfish (*Cherax quadricarinatus*) which had recently settled in the thermal oxbow lake Topla in Slovenia and multiplied in great numbers. The two parts were connected by a ladder, allowing the crustaceans the possibility of crossing over and confronting each other.

Maja Smrekar
BioBASE: risky ZOOgraphies
2014, installation

Left:
Detail: The male Louisiana
crayfish (*Procambarus*
clarkii)

Right:
Detail: The female marbled
crayfish (*Procambarus fallax*
forma *virginalis*)



For the exhibition at Art Laboratory Berlin Smrekar has continued to develop this project and presents the physical installation of *Crustacea deleatur* in a different form as **BioBASE: risky ZOOgraphies** focusing on two totally different invasive species, who are both present in Germany. In preparation for this new work, Smrekar was in contact with Dr. Gerhard Scholtz of the Comparative Zoology Department, Humboldt University of Berlin, a specialist on crustaceans, whose recent research has specialised on a particular invasive species of crayfish: the female marbled crayfish (*Procambarus fallax forma virginalis*). [26]



Maja Smrekar
*BioBASE: risky
ZOOgraphies*, 2014
Exhibition view
Art Laboratory Berlin

Thought to have originated in Florida, the marbled crayfish has become a popular addition to aquariums worldwide. But outside of its original habitat, only females of the species can be found. These reproduce asexually, by a process known as parthenogenesis. A single female can produce dozens of daughter-clones. The results are of particular interest for scientists studying epigenetics, the interaction of genes and the environment. But this uncontrolled reproduction is also the most probable cause of illicit introduction of the crayfish into waterways in many countries around the world. [27]

Smrekar has placed six of the marbled crayfish in the left aquarium. In the right aquarium males of a related species of the same genus, the Louisiana crayfish (*Procambarus clarkii*) have been placed. A ladder between the tanks allows access and possible interaction of the different species. Equipment for monitoring environmental conditions, as well as an online connection for assistants to note progress in the experiment, are included in the installation's housing. This tent-like housing also allows visitors space to physically approach the tanks and become acquainted with their crustacean inhabitants.

A number of interesting collaborative decisions were made during the development of the Berlin project. Initially, Smrekar proposed to confronting invasive and native species, as in Slovenia. But the available invasive species in Germany were all from North America, and often carry a disease that can be fatal to European crayfish. For ethical reasons this proposal was discarded and, in consultation with Gerhard Scholtz, Smrekar developed the current pairing. Beyond the topic of interaction between invasive (usually introduced by humans) and native species, which is highly relevant to the current discourse of the 'Anthropocene', the parthenogenetic character of female marbled crayfish calls to mind current debate about biotechnology and human reproduction. It has been noted that biotechnologically aided parthenogenesis may one day become a human norm. [28] Smrekar's work provides a multifaceted laboratory for both exploring the natural world around us and our own cultural and biopolitical developments in an age of precarious ecosystems.

Encountering Amphibians – Between Art, Science and Eco Action

The American artist **Brandon Ballengée** pursues a sustainable form of artistic research in his metier as a visual artist in the field of bioart, and as a biologist in the field of herpetology. He is one the most remarkable current figures

combining art and science in one persona. As an educated artist and biologist, he holds a transdisciplinary Ph.D. in art and science. Since 2011 he has taught bio art and urban ecology at the School of Visual Arts (SVA), New York. Next to numerous publications on the topic of amphibian malformations, he has worked for more than ten years as a field researcher on this theme.

Art Laboratory Berlin showed the video documentation of his ongoing remarkable project **Malamp UK**, on which Ballengée has worked in various forms since 2001. The project's aim is to investigate the potentially unnaturally high occurrence of morphological deformities among wild amphibian populations. As an artist and biologist, he has studied amphibians internationally involving collaborations with numerous other researchers and hundreds of participating members of the public. An important part of the *Malamp* project is the so-called *Eco Action*. "Through experiential field trips, workshops and research, I attempt to bridge communities to particular ecosystems", states Ballengée. "These activities are designed to increase understanding and appreciation of nature and are open to the public or groups of students. Likewise, participants collect important ecological data making them, citizen scientists. I believe that through hands-on research and getting our feet wet we can learn a lot about our backyard and the life-forms we share this planet with." [29]

Brandon Ballengée
The Cry of Silent Forms
2009-2013, 8 video works
Installation

Left:
Exhibition view
Art Laboratory Berlin

Upper right:
Wrath, 2013, video still

Lower right:
Sisyphus, 2009/13, video still



The exhibition also presents other works which Ballengée has developed in the course of his artistic and scientific research of the last years: The video installation ***The Cry of Silent Forms*** from 2009 (ongoing), is made up of eight monitors arranged on the floor, and offers the viewer a unique microscopic view of life in water. All works were made in laboratory or research situations created to replicate natural stresses on amphibians (predators, parasites, etc.). Videos include *Consume* in which toad tadpoles unexpectedly start to cannibalise one another; *Origine du Monde* where a leech fans oxygen to its young; *Prana* in which we see the last breaths of a metamorphic common frog fatally injured by a sickleback fish; *Sisyphus*, a late stage midge pupa dying while attempting to hatch into adulthood, and other video footage. “To study deformed amphibians it is necessary to raise tadpoles in laboratory settings to monitor their development”, says Ballengée. “For this research my colleagues and I have created experiments to better understand what is happening to amphibians in today’s environments.” [30] The works, coming from biological research, capture surprisingly charged moments that offer the viewer a set of unique and intimate views of life.

Left:
Brandon Ballengée
Eco Action, Yorkshire
sculpture park, Wakefield
England

Right:
Brandon Ballengée
European common frog *Rana
temporaria* being examined
for deformities in summer
2008, Malamp studies in
Yorkshire, England

Danse Macabre from 2014 is a limited edition print produced by Ballengée to raise funds for saving the Dutch Fire Salamander, which is currently under serious threat of extinction. The print is an example of Ballengée’s own



development of the process of *clearing and staining* which beyond its aesthetic merits also shows the development of bone and cartilage in amphibians. Ballengée had developed a special chemical method, based on traditional processes, staining bones and cartilage with different colours. Now this technique has become popular amongst scientists. [31]

The video projection ***Un Requiem pour Flocons de Neige Blessés (A Requiem for Injured Snowflakes)*** from 2009/12 shows images of deformed frogs and tadpoles from Ballengée's research that were collected in southern Quebec. Each image is of an animal, which died due to its deformities. These 21 portraits of short-lived beings carry the environmental marks of their birthplace. In this requiem, with a musical score composed by Ariel Benjamin and Andrew Diluvian, life's fragility is manifest. The relatively large depiction of the toads is related to Ballengée's conscious decision of scale before the human gaze: „Any bigger and the frogs appear monstrous, inspiring fear; any smaller and they become dismissible. The size of a young child”, Ballengée hopes, “will inspire compassion in viewers.” [32]

Brandon Ballengée
Un Requiem pour Flocons de Neige Blessés (A Requiem for Injured Snowflakes)
2009-2012, video stills





[micro]biologies I: the bacterial sublime

The third exhibition of our series, *[micro]biologies I: the bacterial sublime*, was a retrospective of the artist Anna Dumitriu, whose work is based on active collaboration with microbiologists through her participation in the consortium *Modernising Medical Microbiology*, a project centred at Oxford University and involving microbiologists and medical experts in conjunction with Public Health England. The institution Public Health England, sponsored by the Department of Health, follows the mission “to protect and improve the nation’s health and well-being, and reduce health inequalities.” [33]

Communicating Bacteria – Developing a Bacteriocentric View

In her diverse artistic practice **Anna Dumitriu** combines microbiology and textiles, robotics and digital media. In her objects, installations, performances and workshops she uses live bacteria and ‘social robots’. Her work using bacteria as a medium binds the fields of art and microbiology, combining historical narratives and cutting edge research, with a key goal of making modern microbiology accessible to the public through exhibitions, performances and workshops. She is a perfect example of the 21st century artist in a new role as ‘a heuristic and diagnostic ethicist’ of new scientific, technological (and artistic) innovation.

Anna Dumitriu
Pneumothorax Machine,
2014, antique medical
equipment, altered through
carving and engraving
Exhibition view
Art Laboratory Berlin

A core body of her work, **Normal flora**, is an ongoing art project investigating the ubiquitous bacteria, moulds and yeasts that form a key part of the complex ecosystems around us: our bodies, our homes, and the wider planet. An example of this, the installation **Bed and Chair Flora** is made up of a chair carved with images of the bacteria found on it, which are also sewn by needlepoint into the chair's upholstered seat. Draped over the chair is a large collaborative work of crochet whose patterning is based on electron microscope images of bacteria found in the artist's bed.

If one of Dumitriu's strategies is the stitching, carving and crocheting of microscopic images, another is the actual propagation or growing of bacterial colonies on textiles. This tricky strategy belongs both to the mundane world (familiar to anyone who has discovered an old cloth covered with 'mildew') and to the laboratory (as Dumitriu must sterilise her work before exhibition to render it safe for public interaction).

The Communicating Bacteria Dress for example combines bioart, historical textile techniques and 3D mapped video projection. The work was created by staining textiles by means of pigmented bacteria, which change colour when they send and receive communication signals. Bacteria have intricate communication capabilities, which are now being investigated as a form of social intelligence. The work consists of an Edwardian whitework dress. Dumitriu grew bacteria along the stitching. At certain points during the production she 'activated' the bacteria, which then changed colour as part of a process of social communication within microbial communities. The effects were then filmed. The finished work shows not only a 'final result', but using video mapping she projects the different stages of this production (one might also say 'performative') process directly onto the dress. [34]

Another work in the exhibition, the **MRSA Quilt**, also employs textile as a medium for the growth of bacteria. [35] Here Dumitriu has grown MRSA bacteria (Methicillin-resistant *Staphylococcus aureus*) on the smaller fabric squares, which have been embedded in chromogenic (colour changing) agar. Patterns are created by a range of diverse treatments and diagnoses for the disease. [36] Significantly, Dumitriu calls this work "a storytelling quilt", as the whole medical procedure of discovering which antibiotics work best on the MRSA has been transformed into the pattern of the quilt. The textile (and how it has been microbially altered) therefore, becomes both medium and message.



Anna Dumitriu
Bed and Chair Flora
2006 – ongoing, carved
chair, needlepoint and
crochet, exhibition view
Art Laboratory Berlin

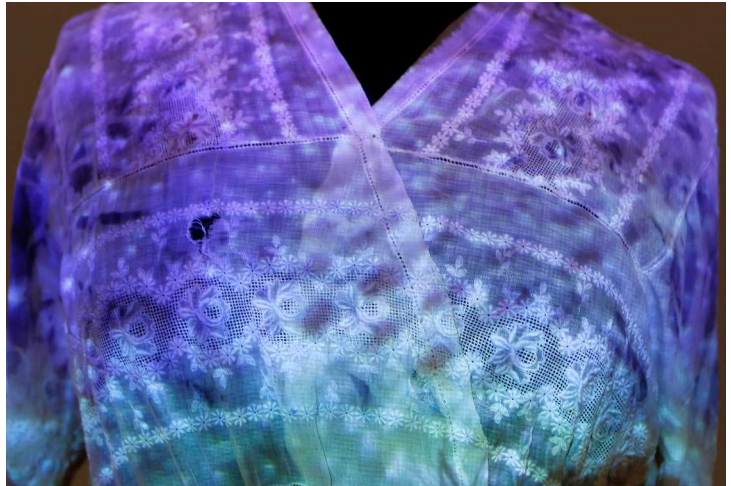
In Dumitriu's artistic oeuvre we come upon the unique and fascinating combination of analogue handcrafted objects and cutting edge scientific research issues. The interesting relationship between her use of handcrafts reflects a specific gender aspect: the great tradition of whitework embroidery by women in the home on the one hand; the era of enlightenment, dominated by male 'natural philosophers' and the differentiation between art and science on the other. The combination of embroidery with scientific practice expresses – in Dumitriu's own words – the “paradigmatic changes in the process of research and current moves towards transdisciplinarity, alongside a consideration of what a 'feminine' approaches to science might mean.” [37]

A new series of related works ***Magic Bullet*** and ***The Consultation*** were specially created for the exhibition. They document the contribution of scientists in Germany to the development of Sulphate drugs, which were in effect the first commercially available antibiotics, and were originally derived from dyes. Both make use of the Sulpha drug Prontosil, developed in the 1930s by Gerhard Domagk, following upon the work of Paul Ehrlich. In ***The Consultation***, models of a table and three chairs bring forth a narrative of a possible medical consultation. The models are yellow, literally painted with Prontosil.

Also featured were works from *The Romantic Disease: An Artistic Investigation of Tuberculosis*, an ongoing art project by Anna Dumitriu. In the artist's words it is an "investigation into mankind's strange relationship with 'the Romantic Disease' Tuberculosis (TB) from early superstitions about the disease, through the development of antibiotics, to the latest research into whole genome sequencing of bacteria." [38] The project explores the medical and cultural histories of tuberculosis, a disease which has been part of the human condition for thousands of years, and which an estimated one-third of the world's population carries today. [39] Among the works are tiny felt sculptures of lungs that contain the extracted DNA from killed samples of *Mycobacterium tuberculosis* bacillus. But also included are a number of historical objects that remind us that, less than a century ago, TB was a major health scourge. The pneumothorax machine, a medical device from the early 20th century, was used to collapse lungs of TB patients, in order to 'rest' them. The *Romantic Disease* functions as both an altered museum of tuberculosis, and as a call to attention and action against the newer, antibiotic resistant forms of the disease, which threaten public health again today.

Going beyond her own work as a bioartist, Dumitriu has also examined the ethics of art and science collaborations. Along with Prof. Bobbie Farsides of Brighton and Sussex Medical School, she has created a series of international events under the title "Trust me, I'm an Artist. Towards an Ethics of Art and Science Collaboration", in collaboration with Waag Society and The University of Leiden. A panel of artists, scientists and ethicists discuss actual or proposed art/science collaborations, and their ethical concerns. This work appears against the backdrop of an ever-increasing artistic practice, which takes place in laboratories and explores everything from tissue culture to synthetic biology. With the rise of DIY biology practice and laboratories, an ethical exploration of new art/science collaborations has become highly relevant to the practice of both contemporary art and citizen science. [40]

The role of artist as communicator, de-mystifier and ethicist of new scientific and artistic developments is particularly apt at the beginning of the 21st century. Following on the work of such artists as Critical Art Ensemble and Beatriz da Costa, Dumitriu's oeuvre offers a bridge between the worlds of technology, the life sciences and a larger public.



Upper left and right: Anna Dumitriu
The Communicating Bacteria Dress 2010, antique
 whitework dress, *Chromobacterium violaceum* and
 the genetically modified strain *CV026*, video mapped
 projection

Left: Anna Dumitriu, *Becoming Resistant: from MRSA
 to MSSA*, 2012, Cotton calico, natural and clinical
 antibiotics and killed *Staphylococcus aureus* bacteria

Bottom right: Anna Dumitriu, *Blue Henry*, 2014
 Antique glass sputum cup altered through engraving

All photos: Exhibition view, Art Laboratory Berlin



Above: Exhibition view of *[micro]biologies I: the bacterial sublime* with works by Anna Dumitriu, front gallery at Art Laboratory Berlin

Left: Anna Dumitriu, *The Romantic Disease (Series)* exhibition view of rear gallery at Art Laboratory Berlin

Right: Anna Dumitriu, *Consultation*, 2014, installation



Workshop with Anna Dumitriu
at Art Laboratory Berlin
November 2014

[micro]biologies II: ΠΡΩΤΕΟ / proteo

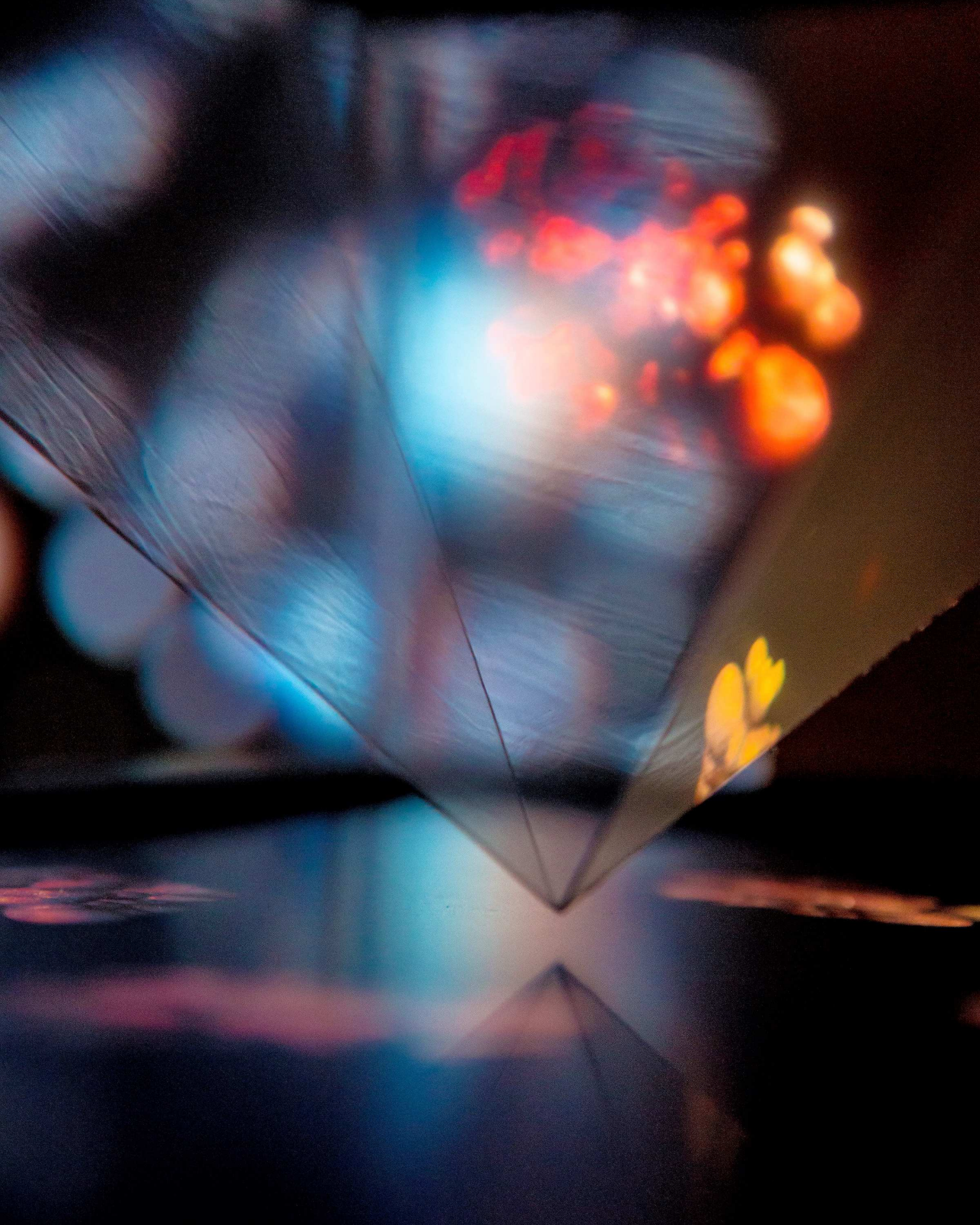
The exhibition *[micro]biologies II: ΠΡΩΤΕΟ / proteo* featured works by Joanna Hoffmann. In particular this fourth and final exhibition of the series *[macro]biologies & [micro]biologies* explored the minute biomolecules that form a basis for the phenomenon of life.

At the Origin of Life – Entering Molecular Space

The Berlin based Polish artist **Joanna Hoffmann**, who is also a professor at the University of Arts, Poznan, creates transdisciplinary works combining art, microbiology, physics and technology. Her use of multimedia installations, 3D stereoscopy, experimental video animation and other media explore the visualisation of sub-atomic and molecular as well as cosmic space. Her work relates to advanced scientific research on the phenomenon of life and to the interplay between scientific and cultural, sensual and illusive, digital and biological, natural and synthetic.

The exhibition space at Art Laboratory Berlin was transformed into a multimedia installation: Particularly noteworthy was the work **ΠΡΩΤΕΟ/ Proteo**, a ‘Pepper’s ghost,’ a forerunner of holography, projected onto a pyramid. The work’s title refers to the Greek root of the word protein (Gr. ΠΡΩΤΕΙΟΣ *the first, in the lead*) as

Joanna Hoffmann
ΠΡΩΤΕΟ/ Proteo, 2013
Video animation (Pepper’s
ghost), detail



well as to the philosophical tradition of searching for *arche* – the essence of the physical world (Anaximander) and the principle of knowledge (Aristotle). *Πρωτεο / Proteo* is an animation portraying a cloud of particles creating a mini-universe folded in the form of Calabi-Yau space, in which, according to superstring theory, successive dimensions of our world are “curled up” at the subatomic level. Giving birth to a convoluted protein molecule and its dynamic molecular ‘dance of life’, it brings to mind a question about the relations between the energy, matter and form.

The 3D projection and installation ***Molecule*** was created especially for this exhibition. It is based on scientific data of molecular structures and transcribed by the artist into a computer animation. The work, in tandem with Andre Bartetzki’s soundscape, relates specifically to the viewer’s body. As Joanna Hoffmann describes: “According to superstring theory our universe contains extra dimensions compacted to the subatomic level and hidden from our limited perception. If so, our own bodies carry dimensions inaccessible to our perception: we are spaces comprising manifold universes. But the evolution of our universe could follow the opposite direction. According to other theories, the multidimensional world collapses into a four dimensional one and even this one can be, like a hologram, a perceptual illusion.” [41]

Another 3D work is ***Anxiety of the 2nd dimension*** from 2012. The globular molecule of a protein, a linear narrative of amino acids with shapes of alpha helixes, presents itself as a philosophical study on space and existence. “We may wonder”, says Hoffmann, “whether our own trajectories of life wriggle on a rumply two-dimensional surface like on a crumpled sheet of paper, whose crinkles assure us of the variety of experiences and provide us with multidimensional illusions.” [42]

Joanna Hoffmann’s exhibition is intended as a laboratory of imagination. The works bring together a few threads of artistic research being developed within the frame of her long-term project ***Hidden Topologies of Being*** inspired by the atomic structure of protein molecules, the “basic bricks of life”. The works are based on scientific data describing protein structures. Joanna Hoffmann states: “Proteins are associated mostly with cellular robots. For me however, as an ‘assembly of proteins’ (using David Deamer’s term), a protein molecule became a key to explore relations between micro and macro scales of my existence.” [43] The video works incorporate excerpts of poems by Rabindranath Tagore and by the artist herself.

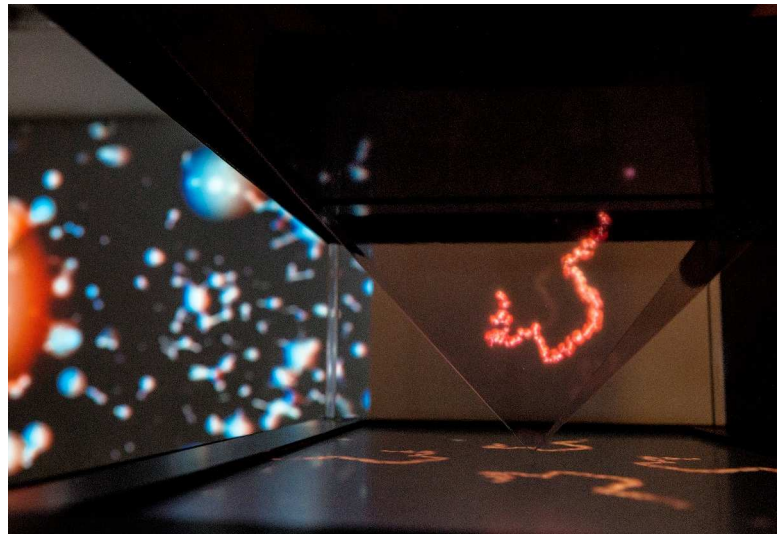
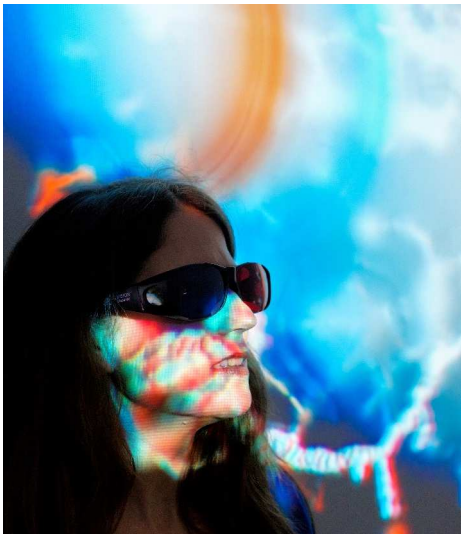
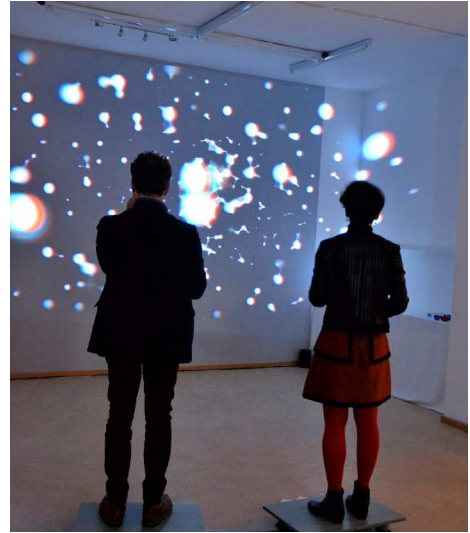
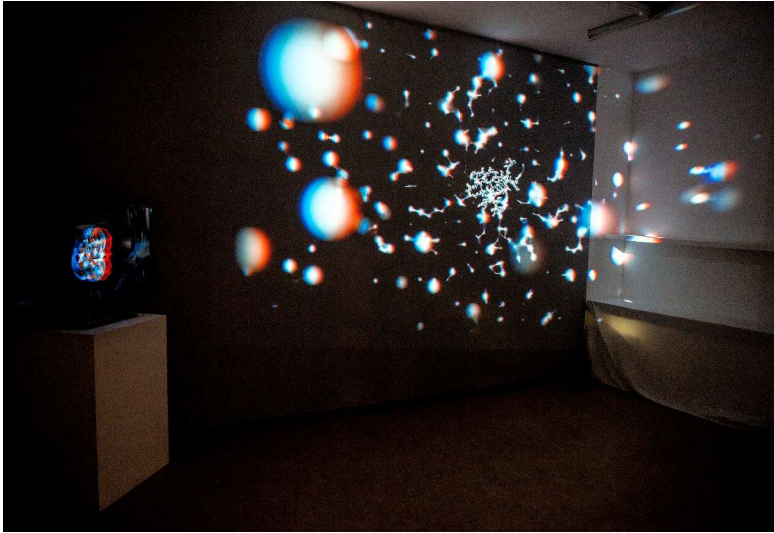
In these works Joanna Hoffmann seeks to visualise the implications of theoretical physics. As the artist notes: “If the scientific hypothesis about the multi-dimensional nature of the world is true, then these hidden spaces are everywhere, in each ‘point’ of the space outside as well as inside us. What does it mean for us to live in a multidimensional universe, or even multiverse? What kind of tools do we have to apprehend the invisible? [...] One day, maybe, our brain will be able to perceive how we exist in the multidimensional universe. For the time being, we have only our imagination in command and an enormous diversity of protein globules, each of them suggesting, in another scale, a blister of some world.” [44]

For this exhibition Joanna Hoffmann has worked in collaboration with sound artist and composer Andre Bartetzki. He had composed a multiple soundscape, mirroring aspects of Hoffmann’s video works: abstract forms and real environmental sounds, surface textures, subsonic noise and extreme treble.

By mining technologies as diverse as computer modelling and animation, Pepper’s ghost and 3D video, Hoffmann’s work presents the viewer with a set of structures for scientific, philosophical, and aesthetic wonder and analysis. Merging interpretations of scientific data, image, sound and poetry, *πρωτεο/Proteo* poses questions about the challenges and boundaries of our cognition, creating an emotional bridge between our daily experiences and the abstractness of contemporary science.

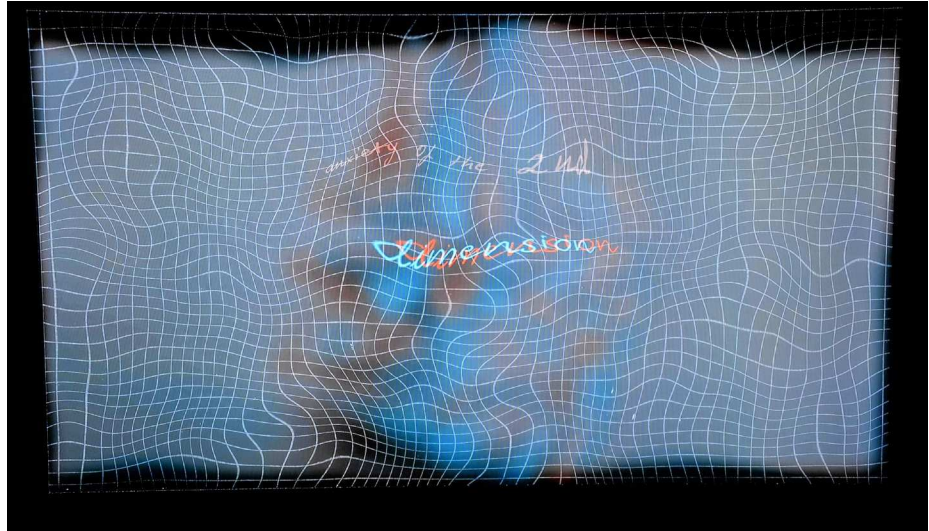
Exhibition view of *[micro]*
biologies II - πρωτεο/proteo
with works by Joanna
Hoffmann





Above and bottom left: Joanna Hoffmann, *Molecule*, 2015
3D video projection and installation (in collaboration with Andre Bartetzky), exhibition view, Art Laboratory Berlin

Bottom right: Joanna Hoffmann, *πρωτεο/Proteo*, 2013
Video animation (Pepper's ghost), exhibition view
Art Laboratory Berlin



Above: Joanna Hoffmann, *Anxiety of the 2nd dimension*, 2012
3D video

Below: Joanna Hoffmann, *Hidden Topologies of Being*
2011-2012, 3 channel video, exhibition view
Art Laboratory Berlin

The macro[biologies] & [micro] biologies Library

Parallel to the fourth and last show of the series, *[micro]biologies II: πρωτεο / proteo*, we arranged a study room for the public. In it we presented the “source books”, folders with information about all the artists, theoretical background material about their specific topics and information about of the exhibition series (January 2014 – March 2015). We also included a selection of books and texts that were fundamental to our conception and realisation of the *macro[biologies] & [micro] biologies* series.

Furthermore, we provided the visitors with photo documentation of each of the exhibitions and some of the related events. In this way it was possible to reflect on and to understand the series as a whole – *from the vast to the minute*. We also presented Art Laboratory Berlin’s publications to the public (e.g. the exhibition catalogue by Art Laboratory Berlin on Anna Dumitriu’ solo show, November 2014). It was a pleasure to see how intensely the public made use of this study room.

The positive feedback and frequent use of the research room convinced us to continue in this way – to combine the presentation of art works in an exhibition format with theoretical literature *sur place* – in the future. It will enable us to take one more step towards the idea of “citizen science” and further follow the practice of *sustainable curating*.



Endnotes

1. Stephen Wilson: *Art, Science + Technology*, London 2010, p. 6.
2. Suzanne Anker, Introduction, in: Anker, Suzanne/ Talasek, JD (eds.): *Biofictions and Biofacts: Staking a Claim in the Biocultural Bank*, Visual culture and bioscience: an online symposium, Volume 12 of *Issues in Cultural Theory*, Washington, D.C.: The Center for Art, Design and Visual Culture, University of Maryland and Cultural Programs of the National Academy of Sciences 2009, p. 12.
3. See also <http://www.britannica.com/EBchecked/topic/650882/Xochimilco> (5 April, 2015).
4. Katya Gardea Browne, artist talk, Art Laboratory Berlin, 30 March 2014.
5. Ibid.
6. Richard Pell in conversation with Regine Rapp and Christian de Lutz, April 2013.
7. Pell, Richard/ Allen, Lauren B.: *Bringing Postnatural History into View*, in: *American Scientist*, Arts Lab, <http://www.americanscientist.org/issues/pub/bringing-postnatural-history-into-view>.
8. Richard Pell – Transgene Curator. Interview by Jascha Hoffman. In: *NATURE*, February 16th, 2012, p. 307.
9. Ibid.
10. Regine Rapp, introducing Richard Pell at *SYNAPSE 2013. The International Curators' Network*, Workshop, 27 April 2013, Haus der Kulturen der Welt, Berlin.
11. Mathias Kessler in conversation with Regine Rapp and Christian de Lutz, October 2013.
12. John McQuaid: *Mingin the Mountains*, *Smithsonian Magazine*, January 2009,

- www.smithsonianmag.com/ecocenter-energy/mining-the-mountains-130454620/#v1ObYfwCc7yZuyuf.99.
13. Ibid.
 14. See also <http://artlaboratory-berlin.org/html/eng-event-5.htm> (5 April, 2015).
 15. See also <http://www.artlaboratory-berlin.org/html/eng-exh-19.htm> (5 April, 2015).
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 17. Toland, A./ Wessolek, G.: Soil Art – Bridging the Communication Gap. In: Makki & Frielinghaus (eds.): *Berliner Geographische Arbeiten 117; Boden des Jahres – Stadtböden*, Humboldt-Universität zu Berlin 2010, p. 127.
 18. To name only a few of Anker's numerous theoretical contributions:
Anker, Suzanne/ Nelkin, Dorothy: *The Molecular Gaze: Art in the Genetic Age*, Cold Spring Harbor Laboratory Press 2003; Anker, Suzanne / Talasek JD (eds.): *Biofictions and Biofacts: Staking a Claim in the Biocultural Bank*, Visual culture and bioscience: an online symposium. Volume 12 of *Issues in Cultural Theory*, Washington, D.C.: The Center for Art, Design and Visual Culture, University of Maryland and Cultural Programs of the National Academy of Sciences, 2009; Anker, Suzanne/ Flach, Sabine (eds.): *Embodied Fantasies: From Awe to Artifice*, Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien, 2013; Anker, Suzanne/ Flach, Sabine (eds.): *The Glass Veil: Seven Adventures in Wonderland*, Bern, Berlin, Bruxelles, Frankfurt am Main, New York, Oxford, Wien, 2015.
 19. NASA, Fact sheet number: FS-2001-03-47-MSFC on "Advanced Astroculture TM (ADVASC), Expedition Two, <http://www.nasa.gov/centers/marshall/news/background/facts/advasc.html> (5 April, 2015).
 20. Suzanne Anker in conversation with Regine Rapp and Christian de Lutz, April 2014.
 21. Ibid. – Suzanne Anker has been producing sculptures with 3d-printers for more than ten years. She also installed a 3D printing lab at SVA in 2008, see: *Making Art with Brainscans and 3-D Printers*, in: *Techonomy* 2014, p. 46.
 22. Schott, John R.: *Remote Sensing: The Image Chain Approach*, Edition 2, Oxford University Press 2007, p. 1.
 23. Suzanne Anker also used rests of foods and things she was using in the week of preparation of this installation in Berlin, as she explained in conversation with Regine Rapp and Christian de Lutz, May 2014.
 24. Ibid.
 25. The work was a production of the Ljubljana project space Aksioma, <http://aksioma.org/crustacea.deleatur/>. (5 April, 2015).
 26. Prof. Dr. Gerhard Scholtz, Humboldt-Universität zu Berlin, Institut für Biologie, AG Vergleichende Zoologie, <https://www2.hu-berlin.de/biologie/zoologie/gerhard.html> (5 April, 2015).
 27. Gerhard Scholtz in conversation with Regine Rapp and Christian de Lutz, June 2013 and also with Maja Smrekar, May 2014. Also see Martin, Peer/ Dorn, Nate/ Kawai, Tadashi/ C. van der Heiden/ Scholtz, Gerhard: "The enigmatic Marmorcrebs (marbled crayfish) is the parthenogenetic form of *Procambarus fallax* (Hagen, 1870)", in: *Contributions to Zoology* 79 (3), 2010, p. 107–118.

28. Sykes, Bryan: *Adam's Curse: A Future Without Men*, New York 2004 and Prasad, Aarathi: *Like a Virgin: How Science is Redesigning the Rules of Sex*, London 2012.
29. See <http://brandonballengee.com/eco-actions/> (5 April, 2015).
30. Brandon Ballengée, personal portfolio, April 2014.
31. Brandon Ballengée in conversation with Regine Rapp and Christian de Lutz, Chamarande, France, August 2013. Due to his mindful observation and analytical qualities he even became an official guide with the US Geological Service. Wilson, Stephen: *Art + Science Now*. London 2010, p. 39.
32. Leila Nadir: *Eco-Art and the Battle of Invisible Evidence*, in: *Hyperallergic*, June 6, 2012, see <http://hyperallergic.com/52538/eco-art-and-the-battle-of-invisible-evidence/> (5 April, 2015).
33. <https://www.gov.uk/government/organisations/public-health-england> (5 April, 2015).
34. Rapp, Regine/ de Lutz, Christian: *The bacterial sublime. Reflections on the art of Anna Dumitriu, a unique 'infective agent' in the culture of scientific investigation*, in: Rapp, Regine/ de Lutz, Christian (eds.): *Anna Dumitriu. The bacterial sublime, exhibition catalogue*, Art Laboratory Berlin, Berlin 2014, p. 26-32.
35. Anna Dumitriu has created this work in collaboration with Dr John Paul, Dr James Price and Kevin Cole.
36. See <http://www.normalflora.co.uk> (5 April, 2015).
37. See <http://modmedmicro.nsms.ox.ac.uk/art/> (5 April, 2015).
38. Ibid.
39. World Health Organization fact sheet on tuberculosis: <http://www.who.int/mediacentre/factsheets/fs104/en/> (5 April, 2015).
40. Ibid.
41. Joanna Hoffmann in conversation with Regine Rapp and Christian de Lutz, Berlin, January 2015.
42. Ibid.
43. Ibid.
44. Ibid.

Artists' and Curators' Talks



Left:
Artist Talk with Katya Gardea Browne
Art Laboratory Berlin, March 30, 2014

Bottom left:
Press Preview of the show *Imacrobiologies II: organisms*, here with Maja Smrekar, Suzanne Anker and Brandon Ballengée
Art Laboratory Berlin, May 30, 2014

Bottom right:
Press Preview of the show *Imacrobiologies II: organisms*, here with Suzanne Anker and Christian de Lutz, Art Laboratory Berlin, May 30, 2014





Upper left:
 Press Preview of the show *[macro]biologies II: organisms*; here with Brandon Ballengée
 Art Laboratory Berlin, May 30, 2014



Upper right:
 Artist Talk with Suzanne Anker, Maja Smrekar and Brandon Ballengée
 Art Laboratory Berlin, June 1, 2014



Middle:
 Curators' Talk with Regine Rapp and Christian de Lutz, Art Laboratory Berlin, May 4, 2014

Below:
 Curators' Talk with Regine Rapp and Christian de Lutz, Art Laboratory Berlin, May 4, 2014





Rhythms of a Living World

By Katya Gardea Browne

My *Xochimilco* video references an Eco-System in danger of being destroyed, perhaps within the next 15 years. The main concern of this project has been the documentation of different traditional methods of Agriculture, from the cultivation of maize to the pre-Hispanic use of natural resources such as the development of "Chinampas" (floating gardens) in the waterway systems of Mexico City.

Elaborate pre-Hispanic forms of agriculture such as the "Chinampa" were able to nourish and provide resources all year round to a mega city where population growth was as magnifying then as it is now. Even in the early 19th century, these systems still remained visible; seasonal crops, vegetables, maize and flowers were able to grow all the time by the use of artificial islands originally made for hydro-agriculture by the Mexicas. "Chinampas" have been seen by historians as "the most sustainable systems ever accomplished" (Jimenez-Osorino et al., 1990; Altieri, 2004).

Modern mega cities consume resources all around us. In Mexico, these reserves serve as the lung of a city and persist today as a reminder of its once flourishing botanical gardens. Their potential and past only remain as a memory of the original function, which is now neglected, ignored or purposefully destroyed by infrastructure, politics, over population and informal settlements. Urbanization is rapidly deteriorating the water systems, its natural reserve, flora, fauna and its potentials for use in the future.

The Ecological wear and tear of *Xochimilco*, its devastation and neglect can be seen as just another example of a fragile ecosystem. In a similar interest concerning biosphere and landscape; my "*Maíz*" video project documents local farmers and the traditional method and cultivation of Maize threatened by Genetic Engineering and pesticides. Indigenous autonomy and methods of cultivation are being challenged and pose as an alert to the future and survival of its environments and sustainability of its people.

Above:

Katya Gardea Browne, *Maíz*
2014, video, 16:14 min
Exhibition view
Art Laboratory Berlin

Below:

Katya Gardea Browne
Blue Corn, Mexico Tlacolula
market, photograph

The Center for PostNatural History

By Richard Pell

In *PostNatural Organisms of the European Union*, we bring together 12 different exemplary moments in postnatural history that took place in the EU. *Postnatural* refers to living organisms that have been intentionally and heritably altered by human-guided processes such as domestication, selective breeding, and genetic engineering. The exhibits are arranged chronologically based on the approximate date of appearance as an organism distinct from its wilder ancestor.

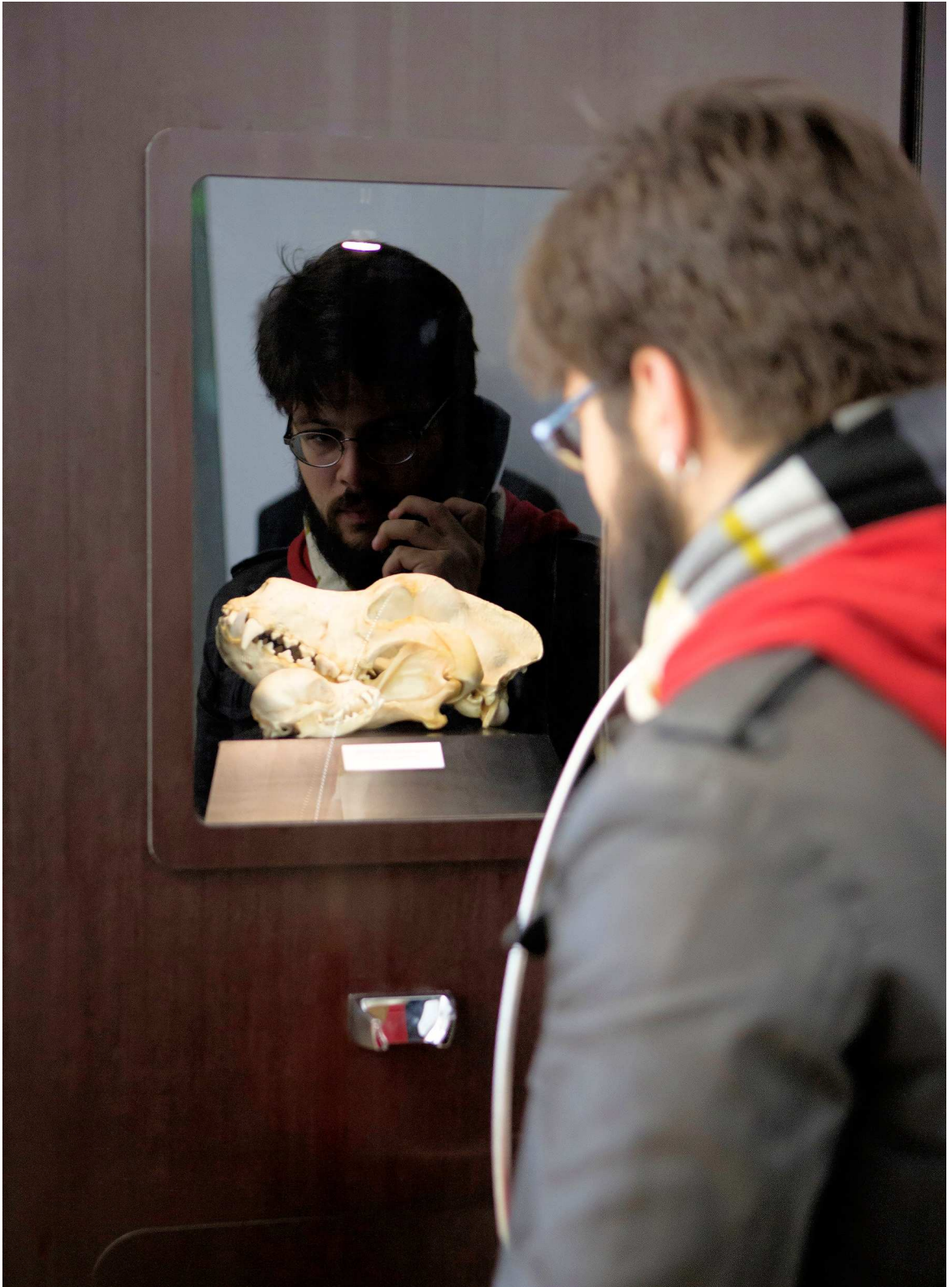
The ancient origins of postnatural history are represented by a pair of dog skulls, illustrating the tremendous variation in size between an adult Chihuahua and a Great Dane, both members of the species *Canis lupus familiaris*. Dogs began coevolving with their human hunting partners sometime prior to 11,000 years ago. The first evidence of agricultural seed saving dates to approximately 9,000 years ago. The wealth of the planet's agricultural seed heritage is represented by a diorama of the entrance to the Svalbard Global Seed Vault, Norway's still untested attempt at a frozen agricultural Noah's Ark, about 1,300 kilometres from the north pole.

Ancient postnatural history is followed with a series of 8 exhibits featuring specimens of postnatural organisms that were altered by humans for reasons of aesthetics, commerce, public health, and scientific understanding. These include laboratory mice, colourful canaries, and industrial corn, to name a few.

The most recent event in postnatural history represented is a diorama of a laboratory in Rotterdam where ferrets are being infected with a modified flu virus. This is an attempt to breed an airborne flu virus that infects the human respiratory system, so that treatments may be developed prior to outbreak.

As the exhibit travels and crosses international borders, new specimens are collected and added to reflect the postnatural flora and fauna indigenous to each nation. In this way, postnatural organisms not only reflect the cultural values that shape them, their habitat is often shaped by the political policies that specify whether or not they are permitted to live.

The Center for PostNatural History, *PostNatural Organisms of the European Union*, 2012 - ongoing
Installation, exhibition view
Art Laboratory Berlin



Nature and Us – Between Boundless Desires and Limited Compassion

By Mathias Kessler

My project took place in a formerly “occupied” housing complex PA 58, across from Art Laboratory Berlin, consisting of two parts: a tapestry of an aerial landscape of mountaintop removal in West Virginia and a poster of a tropical sunset from my series *Sunset in Simulacrum*, the latter in the courtyard. The images dealt with occupying spaces – spaces that we dream of, spaces which once promised a great future – much like the early utopia of PA 58.

The wallpaper consists of several photos that have been digitally merged together. While it shows the environmental impacts of coal mining and energy production, it turns a photographic reality into a partially constructed fantasy. The sunset images are constructed with 3D-rendering software. Like a billboard advertisement for a holiday in the sun, it is a false world built with a render engine, like a trompe l’oeil of desires. While we seek a spiritual experience in nature, like Gauguin’s mythic “wild, untouched exotic,” it is ultimately unattainable and thus substituted with the next best experience.

Advertising manipulates in similar ways, drawing us to buy *ersatz* products to briefly satisfy our inner desires. The cycle of economy, desires, and realities is represented through the juxtaposition of utopia (paradise) and dystopia (destruction). Surrounding the works are advertisements of commercial utopias and real estate developments promising soaring profits at the expense of those pushed out to less coveted neighbourhoods.

My work reflects on urban structures and our postmodern consumer society, and the disproportionate relationship between our boundless desires and limited compassion. The economic relationship between those who profit and those who lose out mirrors our own disproportionate relationship to our environment, which is plagued by our denial and inability to truly connect with the natural world. I look at human temporality, and how advertising re-directs human desires to create phantoms that we chase but can never really obtain.

Above:

Mathias Kessler

Jarrells Cemetary, N37°

53.96° W81° 34.71'. Eunice

Mountain, West Virginia, 2012

Exhibition view

Art Laboratory Berlin

Below:

Mathias Kessler

Jarrells Cemetary, N37°

53.96° W81° 34.71'. Eunice

Mountain, West Virginia, 2012

Prinzenallee, Berlin Wedding



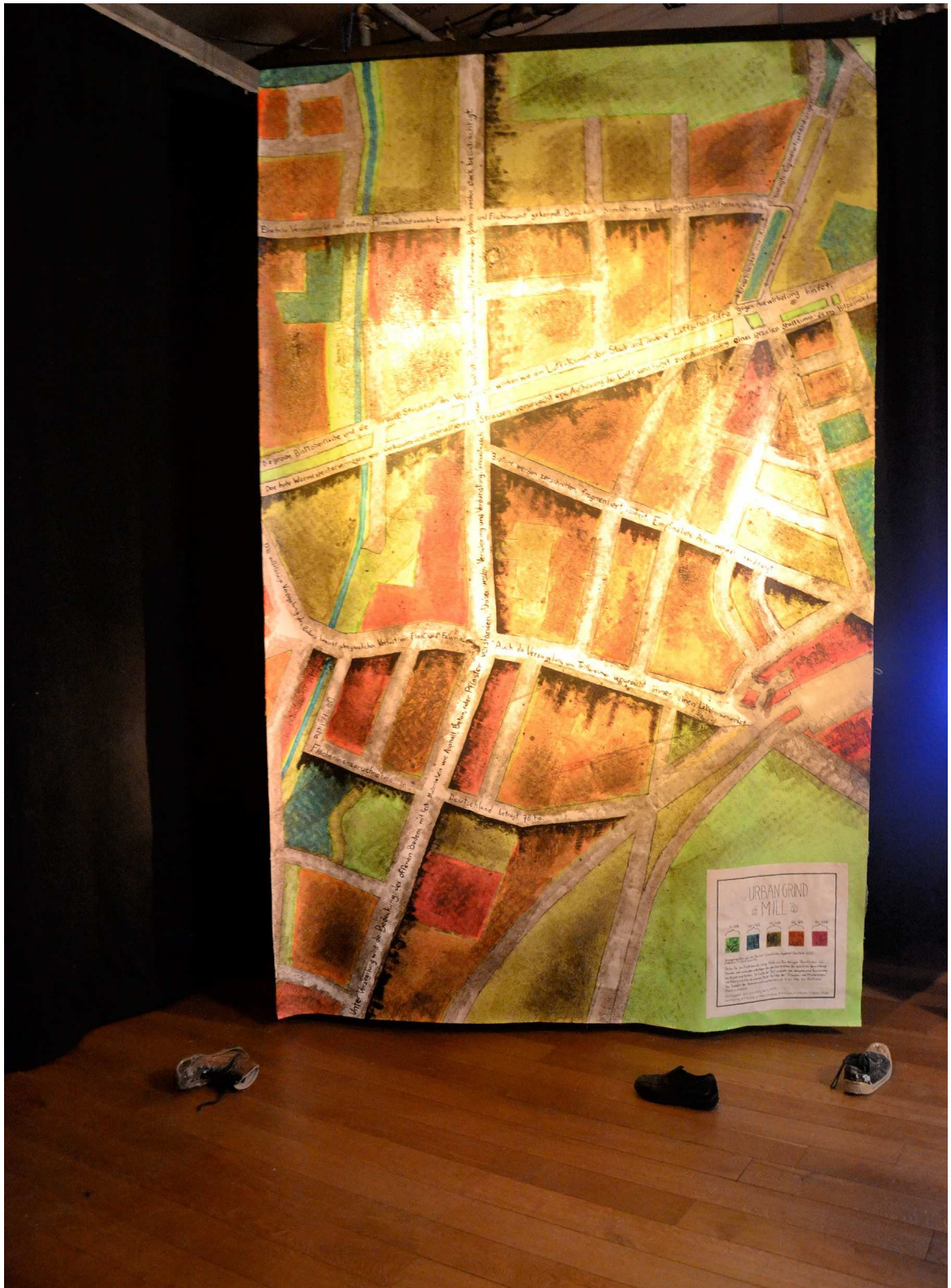
Mapping the Urban Grind Mill

By Alexandra Regan Toland

The map is an instrument of power and exploitation but also education and empowerment. With a background in visual arts and environmental planning, I am fascinated by the possibilities of cartography as a means of communication and visual inquiry. My methods draw on the works of a host of visual artists, field soil scientists, and radical cartographers who have previously pushed the boundaries of what can be mapped. My practice almost always involves some kind of interdisciplinary collaboration and public participation. In my translations of cartographic materials into public artworks, I like to experiment with scale, legend, perimeter, data layering, and print materials. I have used coffee and salt to map food streams, street dust to map soil sealing, river mud to map watershed risk areas, and WWII rubble to map WWII rubble distribution. My goal is to introduce little known aspects of the environment to the public via the cartographic interface.

For the *[macro]biologies & [micro]biologies* series at Art Laboratory Berlin, I explored the idea of an “urban grind mill” in a map made of street dust collected from sealed areas in Berlin and an installation of soil samples, shoes, and soil sealing data. Soil sealing may be seen as an indicator of the quality of macrobiologies. The stony surfaces of buildings, sidewalks and infrastructure are subject to the same forces of weathering as mountains and seashores. In time, atmospheric emissions and pulverized waste accumulate as urban dust – an unintentional consequence of so-called “pavement-milling”. Without vegetative cover to bind particulate materials, dust accumulates and mobilizes. Run-off storm water from paved surfaces can inundate streets and sidewalks like rivers cascading through mountain valleys. With no vegetation to filter dust, transpire water, or provide shade or habitat, negative biological effects result from soil sealing, including the climatic “heat island effect”, higher atmospheric and soil pollution, changes in water balance and groundwater recharge, loss of biodiversity, and health risks to those living in sealed areas.

Alexandra Regan Toland
Mapping the Urban Grind Mill, 2014, installation view
Art Laboratory Berlin





Petri's Panoply

By Suzanne Anker

The Petri dish, like a Rorschach inkblot or DNA's double helix, has become a popular cultural icon. While denotatively, the Petri dish is a covered glass plate used in scientific laboratories, connotatively, it alludes to something brewing under investigation. In this real or imagined container a concept, or a substance, if allowed to ferment will sprout its hidden dimensions. From seeds, to politics to toxic environments inside such a dish brings forth a host of arresting results.

Casting a wide net employing multiple overlaid metaphors, Petri dishes are a reminder both of life's enduring reconfigurations and death's restructuring of life. Remaking, repairing, and revamping is the new "call to the wild" as resources are exploited in scientific laboratories and in the culture at large.

Another set of work in the exhibition at Art Laboratory Berlin is a set 3-D rapid prototyped sculpture. The fabrication of *Remote Sensing* begins with the digital photographs from *Vanitas (in a Petri Dish)* series. These high-resolution images are reprocessed through computer programs that convert the photographs' brightness into 3D protrusions, a technique called displacement mapping. Each sculpture expresses differing topographies: from plateaus and valleys, to arcane rock formations and snow capped peaks.

Above:
Suzanne Anker
Astroculture (Shelf Life) II
2014, installation

Below:
Suzanne Anker
Remote Sensing (front), and
Vanitas (in a Petri Dish) series
(back), exhibition view
Art Laboratory Berlin

The concept of remote sensing deals with new technologies which can picture places that are either too toxic or difficult to visit. Using state-of-the-art satellite data, remote sensing apparatuses computationally picture such spaces. As an extension of digital photography, these images garner information electronically in order to eclipse onsite investigations.

And finally my work *Astroculture* is a living artwork in which vegetables sprout indoors using LED lights. In this work, darkness is not a deterrent to the production of life and its myriad forms. Such technology is currently being explored by NASA in the United States.



BioBASE – The Eco Utopian Agent

By Maja Smrekar

Nowadays, foreign species are considered one of the main causes of biodiversity crisis, whose consequence is an increased possibility of a 6th mass extinction of species on Earth. Within this paradigm in the BioBASE project, we analyse the relations between ecology as a natural science and Ecology as the ideology of contemporary zeitgeist. This distinction is paraphrased through the exploration of a possible dispersion of a foreign species, which is juxtaposed by a protected domestic species, within a specific local ecological niche. The infrastructure of the aquaria is designed like a laboratory for monitoring containing a border, through which each species can move into the territory of the other.

The content of BioBASE mobile research laboratory unit is aimed at, inter alia, a reflection on the human existential structure in the future in which this structure is mobile and in which each individual exists as a “civilian” as well as a “researcher”. At this point, we bring together a plethora of multidisciplinary topics, which establish the starting points for the realisation of many possible realities within the transhuman imperative of the near future; for the installation – designed as a mobile live-in research unit – paraphrases the human as the most invasive species of all. At the same time, such an artistic starting point offers a framework that reaches beyond the framework in which the mixing of species and the modifications of genetic material are accompanied by the fear of the unknown, for it explores the modes of coexistence with such live phenomena. The project, which, among other things, is devoted to the anthropology of fear, can thus also be seen as a warning that the aspirations for pure and “harmless” species can come very close to the concepts of pure race and the tendencies to exterminate the “invisible other”, for numerous political views of the world ecosystem and its increasingly rapid transformations support the eventual obliteration of both.

The Cry of Silent Forms

By Brandon Ballengée

To study deformed amphibians it is necessary to raise tadpoles in laboratory settings to monitor their development. For this research my colleagues and I have created experiments to better understand what is happening to amphibians in today's environments. This has involved growing tadpoles in the presence of predators, parasites, polluted water and sediments to monitor how these environmental factors may impact normal development and contribute to deformities. Often in experiments tadpoles are injured by predatory fish, insect larvae, parasites, even tadpoles attacking one another - these behaviors are natural yet in the lab we can record and analyse them to better understand what is happening in nature. Often these experiments are difficult to watch but imperative to understanding the cause or causes for amphibian deformations in the wild.

These films were all recorded within laboratories or during biological studies. Generally while performing experiments a researcher must focus on documentation, evidence collection and strict scientific methodologies. These recordings on the other hand are attempts to "preserve" finite moments outside of primary research: ephemeral instants in time we as humans would not normally notice. Likewise, while working in a laboratory as a scientist we must stay focused and objective, however, what we often see is incredible, beautiful, sometimes gruesome and tragic.

Even from a scientific distance research events have emotional resonance - these films attempt to bear witness to this complex psychological dichotomy and drama inherent to survival in hostile environments. For example, *Prāṇa* captures the throat of a metamorphic frog taking her last breaths before dying as a result of a predatory injury. For *Origine du Monde* a "mother/father" leech gracefully fans her underside bringing oxygen to cloned offspring that are parasitizing her. These and the other short films (8 minutes each) intentionally lack narratives as they are moments captured and repeated, in an effort to make them timeless. The sounds for each film are streams, waterfalls or other forms of running water.

Brandon Ballengée
Danse Macabre, 2014
Archival pigment print on
Hahnemühle photo paper





The Bacterial Sublime

By Anna Dumitriu

My work is focussed on my fascination for bacteria, those terrifying, ubiquitous, tiny and sublime organisms that colonise every niche on the planet and live both inside us and swarm over us. My solo exhibition at Art Laboratory Berlin aimed to provide a provocative introduction to the sculptural possibilities of research in this field and a cultural history of mankind's co-existence with microorganisms. In particular it focussed on clinical settings and the evolution of healthcare and research practices.

Many works that I consider important in my development as an artist were included, such as *The MRSA Quilt* and *The Communicating Bacteria Dress* which investigate the microbiological world through the lens of textiles and embroidery, in response to enlightenment philosopher Jean-Jacques Rousseau's writing on the abilities of women. I also developed a series works that told the dramatic story of the development of the dye-based drug Prontosil in Germany.

Several works from my series *The Romantic Disease* were exhibited. These pieces investigate tuberculosis (TB), from early superstitions about the disease, through the development of antibiotics, to new research into whole genome sequencing of bacteria. The fight against TB is intertwined with the development of antibiotics and vaccines. I made works using altered historical objects, such as an engraved *Blue Henry* pocket spittoon and a carved and engraved *Pneumothorax Machine*, which was originally used to collapse patients' lungs in order to rest them. I also worked with textiles, incorporating ancient treatments, such as dyes made from madder root, safflower and walnut, and various kinds of mycobacteria, including the TB vaccine Bacillus Calmette Guerin (BCG), made from weakened bovine TB, and the extracted DNA of killed TB. I am intrigued by the idea that an object can be invisibly tainted by disease and the emotional and intellectual impact this can have.

Anna Dumitriu
The Consultation, 2014
Exhibition view
Art Laboratory Berlin

ΠΡΩΤΕΟ / proteo

By Joanna Hoffmann

Today there are many (interconnected) definitions of life based on information processing, thermodynamics, cybernetics or patterns recognition. As an artist I explore a further perspective, seeing life as a way of existence of space and space as a way of the existence of life. This tautological definition not only implies the understanding of a “unit of life” (or an “individual existence”) as an integral fragment of much larger system but also locates its parameters at the heart of the rich history of human culture, based on the evolution of the spatial-temporal conception of our reality and our place in it.

Pythagoras, Copernicus, Bohr, Einstein, Braggs, Feynman – all quantum and post-quantum theories are part of this history. What will come next? How can we go beyond the limits of our minds? How can we apprehend micro and macro scales of our universe and ourselves as a nexus of Pascal's “infinite small and infinite big”? Through my artistic practice I look for answers to these questions.

The continuous advancement of technologies and the attendant scientific progress facilitate both the penetration and manipulation of matter at the molecular level, radically changing our perception of reality, the phenomenon of life and ourselves.

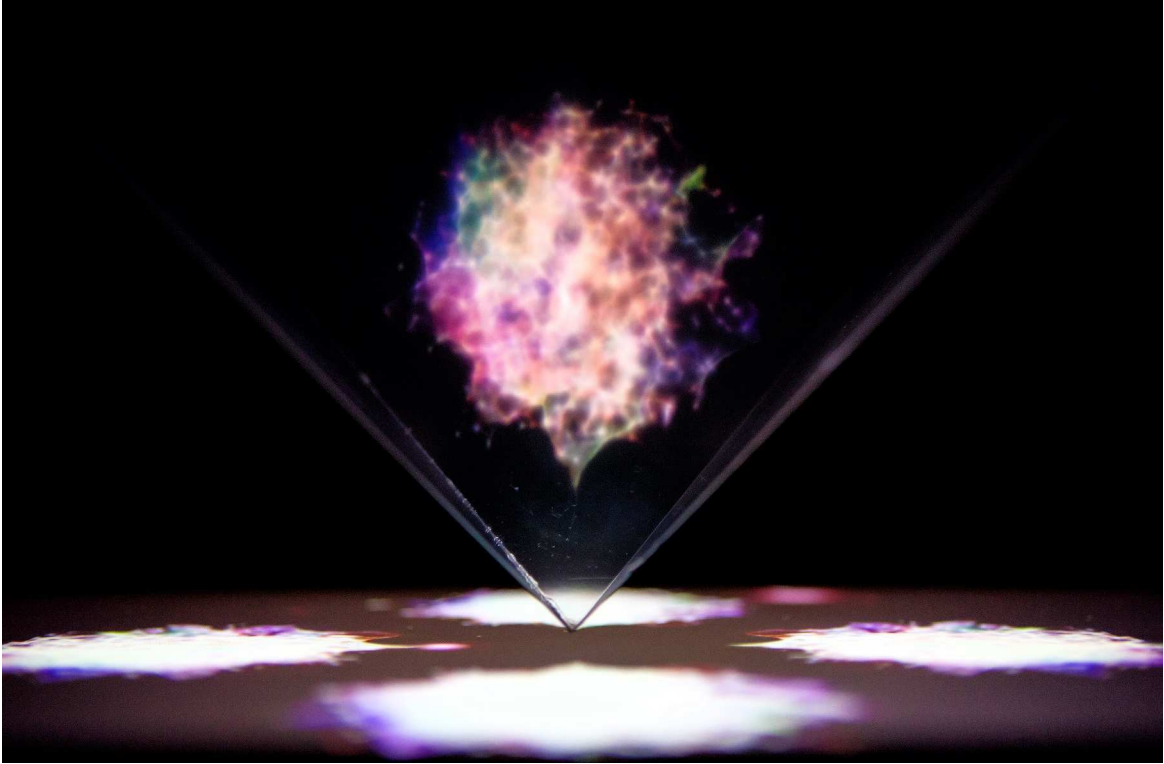
For some years I have been following scientific research on molecular structures, especially proteins and nucleic acids, which ensure our biological existence and reveal deep connections with our ever-changing environment. For me as an artist, this research activates old philosophical questions concerning chance and inevitability, determinism and indeterminism, entropy and order. I have been especially interested in how scientific and cultural imaginaries influence each other in shaping our understanding and knowledge.

Playing with our sense of scales and spatial perception, my artwork gives the viewer an impression of being absorbed in some immense experiment of unclear premises and meaning. Yet it enchants the viewer with the creative powers of nature and invites study and reflection over its secrets.

When you look at the map of atoms in a protein molecule (the basic brick of life) revealed by x-rays, you can easily mistake it for a fragment of a starry sky. Yet it conceals a hidden beauty of alpha helices, beta sheets and turns, and complex interactions. What conceals the macro space?

Above:
Joanna Hoffmann
πρωτεο / Protea, 2013, video
animation (Pepper's ghost)
(detail)

Below:
Exhibition view of
[micro]biologies II: πρωτεο / proteo



Artist Talk und Speculative Biology Workshop with Pinar Yoldas

Introduction

By Regine Rapp and Christian de Lutz

In the run up to the *[macro]biologies & [micro]biologies* series, Art Laboratory Berlin hosted a workshop (28 September, 2013) and artist talk (3 October, 2013) by the artist Pinar Yoldas. She is an outstanding cross-disciplinary artist and researcher. Her work investigates social and cultural systems in regards to biological and ecological systems. During 2013/14 she was resident at the Vilém Flusser Residency Programme for Artistic Research.

In her workshop the artist gave a quick overview into general biological systems such as the circulatory system, the nervous system, the reproductive system, etc., and how these systems (or more specifically organs) might evolve under the influence of global environmental transformations. Somewhere between biomimicry and critical design, the workshop gave participants, as Pinar Yoldas stated, "the time and assets to design future organs or think about that ultimate meat supplier with zero methane impact." Participants then discussed and designed speculative models for life forms for a post-human era. During the artist talk, Pinar Yoldas presented her projects *An Ecosystem of Excess*, as well as previous works.

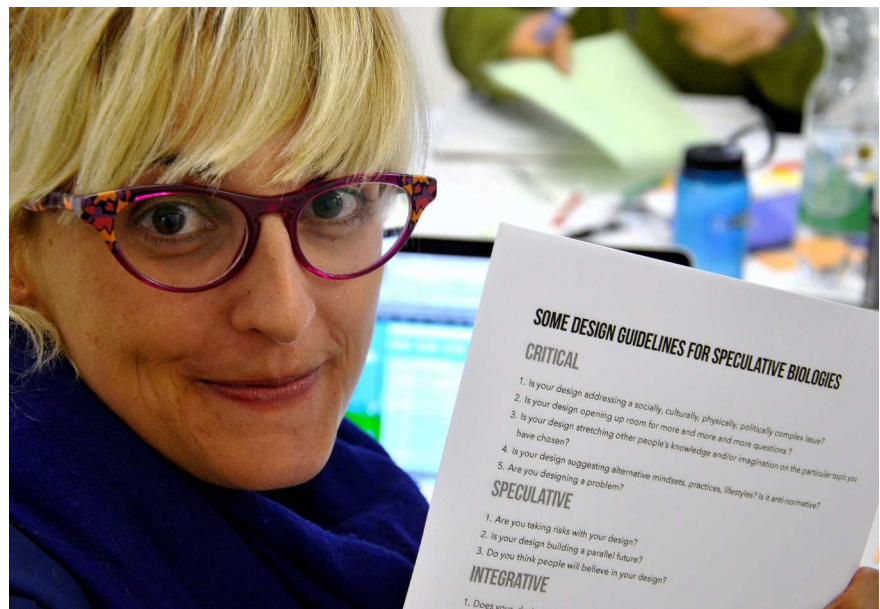
Reflecting my Artistic Practice and Collaborating with Art Laboratory Berlin

By Pinar Yoldas

Science and technology are two eminent forces that shape contemporary global culture. On the one hand, cultural movements such as transhumanism and posthumanism reposition human in a technoscientific world as the ultimate decision maker: nature can be controlled fully thanks to biotechnology, nature can be shaped and reshaped endlessly as we humans wish. On the other hand, our desire to control nature has been threatening life on our planet: excessive consumption and exploitation of natural resources have given rise to the most urgent and the most complex dilemma humanity has ever been confronted with.

These are the two faces of technoscience where my artistic practice emerges. I have a deep passion for art and science, and my work is heavily inspired by biology, ecology, anatomy and neuroscience. In the midst of political turmoil and violence, my work offers the lux of art & science, by introducing new organs, new life forms and new ecosystems. Yet this passion does not come from nowhere.

Speculative Biology
Workshop: *The Design of
Biological Systems and
Neo-organs* with Pinar
Yoldas, September 2013
Art Laboratory Berlin



According to biotech ethicist Gregory Stock, biology and biological sciences are the areas of research that are the most significant in shaping the future of our society. Again, according to visionary thinker Freeman Dyson the 21st century will be the century of biology. Designing genomes, Dyson claims, will be a personal thing, a new art form as creative as painting or sculpture. Both Stock and Dyson point to the increasing importance of biological sciences in our collective imagination.

Following up on this at Art Laboratory Berlin, arguably the number one beacon of art and science in Berlin, I delivered a workshop titled *Speculative Biology Workshop*. Following Stock and Dyson's arguments and naturally in Darwin's footsteps the participants were challenged with the design of biological systems and neo-organs. This one-day workshop, somewhere between biomimicry and critical design, gave the participants the time and assets to design their own lungs, grow that extra organ they always wished for or think about that ultimate meat supplier with zero methane impact. Needless to say in the workshop we were all enjoying the mixture of utopia, speculative design and our visions.

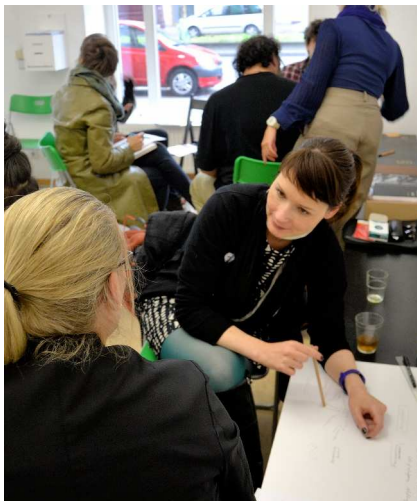
In my artist talk at Art Laboratory Berlin, which took place after the workshop, I presented and discussed several of my current works: *An Ecosystem of Excess* (new species that emerge in the Pacific Trash Vortex), *Foolfs Fowl* (chicken without brains) and more syn-bio oriented projects such as *Super Mammal* and *NeoLabium*, new genitalia and new skin designed to maximise pleasure. I have to stress that Art Laboratory Berlin, by reaching out for current issues and paradigms of the 21st century, was and is such an enriching institution for me. Also for my current work the dialogs and debates with Regine Rapp and Christian de Lutz were quite meaningful.



Above and right:
Artist talk with Pinar Yoldas, October 2013
Art Laboratory Berlin



Below:
Speculative Biology Workshop: *The Design of
Biological Systems and Neo-organs*, with Pinar
Yoldas, September 2013, Art Laboratory Berlin



DIY Bio Lounge

Introduction

By Regine Rapp and Christian de Lutz

The *[macro]biologies & [micro]biologies* series officially opened with a series of open workshops and talks from 24-26 January, 2014.

Conceived together with Rüdiger Trojok (www.openbioprojects.net), the *DIY Bio Lounge* included three days of biohacking sessions including biologists from Berlin and Graz, Austria. Jessica Bernds and Sarah Chareza created an installation containing bioluminescent bacteria, while members of Open bioLab Graz and Rüdiger Trojok involved visitors with ongoing experiments in an on site DIY laboratory.

During the three days there were talks by Prof. Andy Adamatzky, Theresa Schubert, Rüdiger Trojok, Julian Chollet and Dr. Denisa Kera on themes as diverse as biological computing with slime moulds (*Physarum*) and open source research to find new antibiotics (Biostrike).

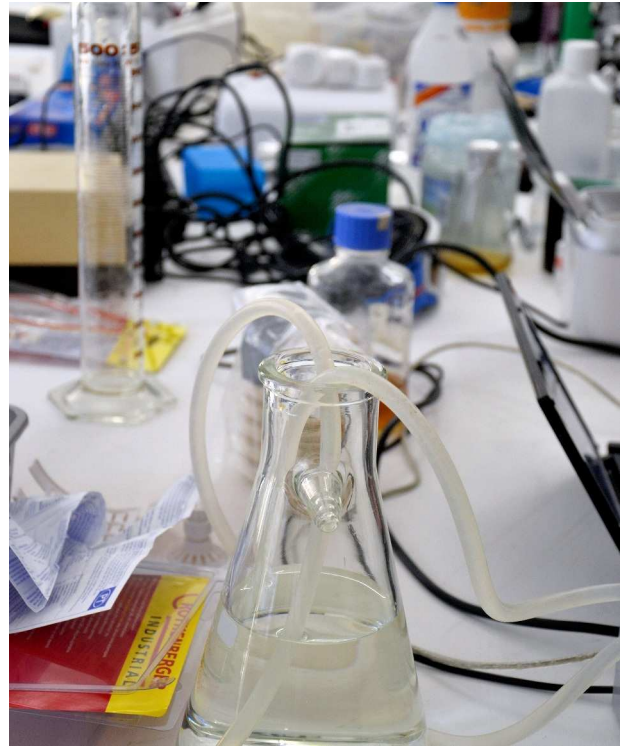
Biostrike as Soil Art: Biotech Guerrillas in the Post-Antibiotic Age

By Denisa Kera

According to the 2013 CDC report every year in the US alone "2 million people are infected with bacteria resistant to at least one antibiotic, and 23,000 people die from those infections" (<http://www.cdc.gov/drugresistance/threat-report-2013/index.html>). The calls for action by various scientists, government officials and big pharma executives over the last three decades have led to a peculiar transformation, from fears about "antibiotic overuse and resistance" to warnings about the "end of antibiotics" and recent "post (or pre)-antibiotic era" apocalypses. These "rhetorical" degrees of modification of the humble antibiotic have efficiently diminished the agency of citizens to a bare life, which will be preserved only when governments will generously donate large amounts of money directly to big pharma's efforts in saving humanity (in 2013 Glaxo received \$200 million by the U.S. Department of Health and Human Services, since 2012 almost 600 million Euros were spent in EU in various programmes). How is it possible that an actor responsible only to its shareholders becomes the only hope for humanity and what does this say about the state of global governance? Is this truly the only alternative in managing bacterial resistance to antibiotics?

While in other scientific and policy issues (GMOs, nanotechnologies) citizens are becoming active stakeholders and participants in the decision making from the research phase, antibiotics remain off limits to the public interest and involvement. More than any other scientific entity in the last century, it has managed to reduce us to mere biopolitical subjects in need of care by the big government and even bigger industry with little if any oversight or critical assessment. The transformation of people into farm animals in need of ever new and more efficient antibiotics has turned an acute infection into profitable chronic condition with promises of large profits similar to the ones big pharma already generates in regulating the sugar and cholesterol in our blood, and in the case of antidepressants, even various transmitters and mood enhancers.

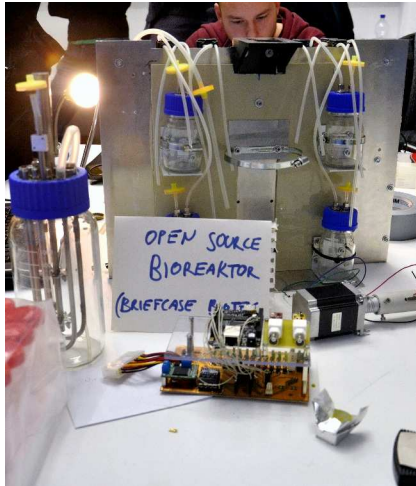
While big pharma is efficiently milking the government and the biotech firms are speculating on various future substances with mixed results, since late 2012 a global group of biohackers and open science advocates have decided to propose a



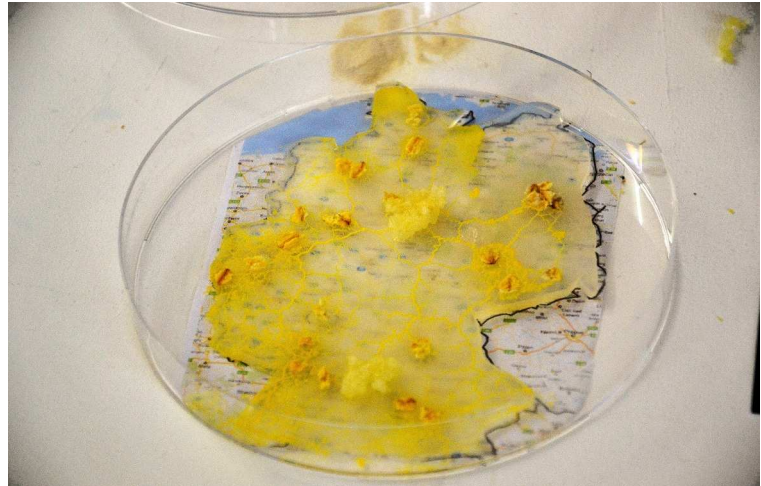
DIY Bio Lounge: *Bio Hackathon*, January 2014
Art Laboratory Berlin

different approach. They are trying to crowdsource (and crowdfund) the search for antibiotics globally, and set up a precedent in open drug discovery by simply reconnecting people with their soils, from where the majority of antibiotics (around 70%) have originated. The challenges are enormous and there are many dead ends, but the efforts continue. The most recent manifestation was the 2014 Biocommons white paper (<http://www.bio-commons.org/>) and meetings in 2014 around the EU searching for alternative IP regimes supporting open-source models for leveraging the cost for research and development in all life sciences.

Hunting for antibiotics in the soil is one of the basic microbiology protocols, which can also serve globally as an excellent introduction into microbiology at all educational levels, while contributing solutions to the current crisis. It involves taking a soil sample from the local neighbourhood, diluting it with water, inoculating an agar plate and incubating some strain of actinomycetes, a powerful source of most antibiotics. After the right bacteria are identified on the plate, they are then screened for antibiotic properties on an *E. coli* Petri dish (representing the dangerous gram negative bacteria). This basic protocol for cooperation was proposed during the first European DIY Bio meeting in Paris (Dec 2012) by Pieter van Boheemen (of the Waag Society's Open Wetlab) and



Upper left:
Open Source Bioreactor by Open BioLab Graz



Upper right:
Andy Adamatzky, *Physarum computer*

Right:
Workshop by Julian Chollet

All images from *DIY Bio Lounge*, January 2014
Art Laboratory Berlin



developed into a global project in October 2013 during a workshop in the Lorenz center in Leiden on art and science collaborations. Implementation started in October 2013 in a workshop called *Innoculab* session at the Waag Society Open Wetlab and at BiologiGaragen during the Re-new Festival in Copenhagen, and continues with many workshops around Europe but also globally in countries such as Israel, Indonesia and India.

This most basic microbiology protocol in the last few years has transformed into a form of collective and global soil art projects with elements of disobedience to the plans of big pharma. It mobilises global biotech guerrillas fighting in the post-antibiotic age against biopolitical control by invoking values of collective

bioprospecting, education, engagement, science communication, new soil rituals, bioart, citizen science experiments, and even calls to rethink the legal framework (bio legal and bio commons questions) and financing of research (proposal for biocoins). For most of the biohackers involved in the Biostrike scenario and prototype this has become a means to demystify the idea of antibiotics, and show that antibiotics are everywhere around us and we need to develop a better awareness of our microbial "commons" as well as love for our soils (e.g. at the Art Laboratory DIY Bio Lounge as well as other events such as the Hackteria lab in Yogyakarta, Indonesia, DIYbio workshops in Singapore, Tel Aviv Makerspace workshops). However, recently there has also been an important effort to introduce policy and participation back into the biosciences (in various Biocommons workshops in Helsinki and Berlin). As part of this effort, Biostrike can be located somewhere between soil art and soil design on one side (involving designers and artists gamifying Petri dishes and bacteria) and testing the possibility of soil politics and interaction between biohackers and policy actors on the other.

Open science, in the case of the Biostrike project, has acquired some of the artistic formats of happenings and performances, such as event-based collective tinkering, community hackathons in galleries or festivals, or global, group to group challenges and interactions between various formal (universities) and informal institutions (hackerspaces). These soil bacteria infested Petri dishes become tools of future-making, they produce stories, artefacts, sketches, simulations, models, prototypes to help us imagine, discuss, assess, prepare for, and even co-create futures while involving various actors and stakeholders in the process. The hope is that this can trigger our collective fantasy and help us negotiate our expectations and goals or even policy decisions based about the future.

The narrative, visual, performative, but also material practices around such Petri dish artefacts are means for experimental rather than purely deliberative future making. They are means for experimenting and testing futures by using tools and living with them. In this sense, the collective prototyping efforts are more than policy props. They open a possibility of experimental politics based on prototypes using a very strange, abundant and in some sense "abject material" - dirt. In this sense it is close to the story of manure as a material, which triggered not only the alchemist's fantasies of producing gold from the filthy and dark matter ignored by all, but also the speculative business opportunities behind the early phosphorus production in the 17th century. While Paracelsus was

advocating that "decay is the beginning of all birth", it was Robert Boyle who turned manure into a profitable business in one of his London laboratories. This was in Maiden Lane, where he was experimenting with phosphorus, because he needed a lot of excrement, and the name of the place refers to Middle-English word "midden", meaning a place where "beasts of burden" would relieve themselves.

BioStrike is an example of such present efforts to use "manure" today and create something valuable with all the past's ambiguities. It is a global prototyping game and citizen science project, which is trying to introduce a precedent in open drug discovery of antibiotics based on crowdsourcing soil samples from around the world and supporting open licences for drug discovery.

Slime mould
computing - the most
efficient path in a
labyrinth, Teresa
Schubert presentation
at *DIY Bio Lounge*
January 2014
Art Laboratory Berlin

But is this just a pathetic attempt by few to dream of a more just and abundant future while the pharmaceutical industry is happily speculating and taking all the money? The hope is that this design prototype can become a scenario for a post-antibiotics future, where the governments can also support citizen science organisations rather than big pharma in discovering new antibiotics. BioStrike,



in this dream, would eventually restore the broken stakeholders' relations and offer a new design, but also narrative on the relations between policy, industry and licences surrounding drug discovery. The whole idea of soil art (as more radical than land art in terms of scale) and bio-commons (as more radical than open source) explores this material abundant in nature (bacteria and evolution), which we have to protect from speculation. For now it still remains a type of science purification ritual performed at various workshops and festivals to celebrate the importance of open science. As was stated in one of the early descriptions of the project, where Biostrike was "Dedicated to Albert Schatz, who discovered streptomycin and saved millions from tuberculosis, our Nobel prize martyr-laureate (reference to so called "experiment eleven," a paradigm story of IP greed against open science). This project is trying to purify science through soil bacteria, which we hope will return research to people like him and find a cure against big pharma greed."



Above:
DIY Bio Lounge: *Bio
Hackathon*, January 2014
Art Laboratory Berlin

Middle and below:
Presentation by Rüdiger
Trojek, January 2014
Art Laboratory Berlin

C-LAB Workshop

Introduction

By Regine Rapp and Christian de Lutz

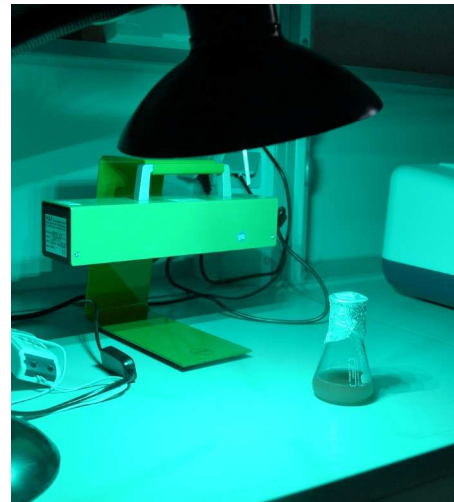
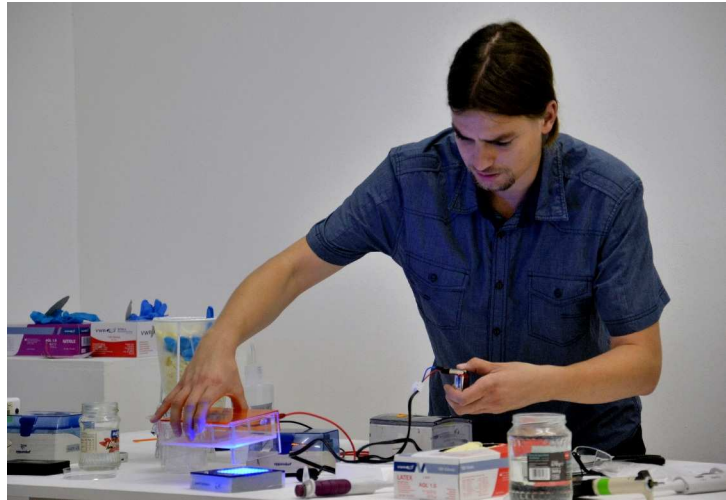
From 5-7 September, 2014 Art Laboratory Berlin presented a workshop on Synthetic Biology, led by the London based collective C-LAB (c-lab.co.uk/about.html) and curated by Desiree Förster and Daniela Silvestrin. During the workshop C-LAB showed how new forms of expression can be integrated into bacteria by genetic engineering and standardized synthetic biology.

The workshop took place partly in a makeshift (DIY) laboratory (on the premises of Art Laboratory Berlin) and partly in a professional laboratory for molecular biology at the Technical University of Berlin, under the auspices of the Berlin IGEM group. The results and experiences were then reflected on and discussed together with the artists, and both the artistic and the specific scientific practices will be discussed from different points of view.

Special thanks to C-LAB, the participants, The Berlin IGEM team, as well as Rüdiger Trojok. The workshop was funded in part by a grant from European Union and the Federal State of Berlin within the framework of the program "Soziale Stadt."

Preparing for the PCR
Synthetic Biology
workshop with C-LAB
September 2014
Art Laboratory Berlin





Upper left:
At the Technical University Berlin

Upper right:
Rüdiger Trojok explains Gel
Electrophoresis

Middle right: An example of *e. Coli*
with GFP

Left: PCR machine, from 1991
used in the makeshift (DIY)
laboratory at Art Laboratory
Berlin

Under the Surface, under the Skin. The Use of Synthetic Biology within the Artistic Practice of C-LAB

By Desiree Förster

The UK-based artists collective C-Lab, consisting of Laura Cinti and Howard Boland, experiments with ways to expand our perception regarding nonhuman life forms, such as plants and bacteria, with synthetic biotechnology. Their art practice reveals the limits of our perception and our representation-based access to life. For C-Lab, aesthetics, humanistic subjectivity, and narrative constructions alone are inadequate for gaining a 'deeper' understanding of the living medium. They propose that the living medium has an own subjectivity, that needs to be taken into account. Therefore, there is a need for the scientific aspects of the bioartwork to be more fully integrated into the artistic processes in order to generate an understanding beyond the 'superficial', while working towards developing epistemological insights on the living medium. Their art practice aims to connect the audience with the nonhuman other via technologies, while confronting them with their established assumptions about it and offering a new way of interaction.

In their workshops they engage a broader public such as artists, designers, DIY biologists, and lay people who wish to gain practical experience with the processes and methods in the creation of new life forms, bio-materials, and new forms of expression. C-Lab not only imparts expert knowledge, but also frames it by discussing the methods used, the results, and the impact of how the participants relate to the objects of their experimentation. In their artworks as well, C-Lab explores our dichotomist perception of nonhuman actors represented in the subjective and scientific image in order, perhaps, to deepen our understanding of the development of a more intimate connection with other life forms.

During their 3-day DIY Synthetic Biology workshop at Art Laboratory Berlin, C-LAB, together with 18 participants from various backgrounds, asked how new forms of expression can be integrated into bacteria by genetic engineering and standardised synthetic biology. The participants tested how parts can be interchanged easily by means of standardised genetic engineering and successfully produced genetic biosensors.

Biographies

Suzanne Anker is a visual artist and theorist working at the intersection of art and the biological sciences. She works in a variety of mediums ranging from digital sculpture and installation to large-scale photography to plants grown by LED lights. Her work has been shown both nationally and internationally including the Walker Art Center, the Smithsonian Institute, the Phillips Collection, P.S.1 Museum, the JP Getty Museum, the Medizinhistorisches Museum der Charité in Berlin, the Center for Cultural Inquiry in Berlin, the Pera Museum in Istanbul, the Museum of Modern Art in Japan, and the International Biennial of Contemporary Art of Cartagena de Indias, Colombia. Chairing SVA's Fine Arts Department in NYC since 2005, Ms. Anker continues to interweave traditional and experimental media in her department's new digital initiative and the SVA Bio Art Lab.

Artist, biologist and environmental activist **Brandon Ballengée** creates transdisciplinary artworks inspired from his ecological field and laboratory research. Ballengée's art has been exhibited internationally and in the summer of 2013 the first career survey of his work debuted at the Château de Chamarande in Essonne, France, and recently travelled to the Museum Het Domein in Sittard, the Netherlands, in 2014. Since 2009 he has been a Visiting Scientist at McGill University, Canada, and in 2011 he was awarded a conservation leadership fellowship from the National Audubon Society's TogetherGreen Program, USA. He holds a Ph.D. in Transdisciplinary Art and Biology from the University of Plymouth, UK, in collaboration with the Hochschule für Gestaltung Zürich, CH.

The **Center for PostNatural History** is a museum and outreach organisation dedicated to the advancement of knowledge relating to the complex interplay between culture, nature and biotechnology. The PostNatural refers to living organisms that have been intentionally altered through processes such as domestication, selective breeding or genetic engineering (Director and Curator of PostNatural Organisms: Richard Pell, Director of Science and Learning: Lauren

Allen, Mobile Exhibit Design and Production: Mason Juday). The mission of the Center for PostNatural History (CPNH) is to acquire, interpret and provide access to a collection of living, preserved and documented organisms of postnatural origin. The CPNH has been awarded a Rockefeller New Media fellowship, a Creative Capital fellowship, a Smithsonian research fellowship, support from Waag Society and the Kindle Project.

Anna Dumitriu's work is at the forefront of art and science practice, with a strong interest in the ethical issues raised by emerging technologies, focussing microbiology and healthcare. Her installations, interventions and performances use a range of biological, digital, and traditional media including live bacteria, robotics, and textiles. She has a strong international exhibition profile, having exhibited at major international galleries including The Picasso Museum in Barcelona, The Science Gallery in Dublin, The V & A Museum in London, and Art Laboratory Berlin. Her work is held in major collections, including the Science Museum in London and Eden Project in Cornwall, UK, and she holds the post of Artist in Residence on the Modernising Medical Microbiology Project at The University of Oxford and a visiting research fellowship at Brighton and Sussex Medical School.

Desiree Förster as a Berlin based curator collaborates within various disciplines such as (synthetic) biology, computer science, philosophy and humanities, and is interested in creating space for assemblies that cross assumed and naturalised relations. While organising workshops, talks and concerts, she is writing her Ph.D. and works at the Haus der Kulturen der Welt Berlin as a program assistant. She gave presentations about her research on interspecies relationships at conferences such as the Annual Meeting of the Society for Social Studies of Science, Copenhagen 2012.

Katya Gardea Browne is a Mexican Artist with a MFA from Yale University. She studied fine art at School of Visual Arts in New York and began her studies at the *La Esmeralda* National Institute of Fine Arts in Mexico. Her practice incorporates a vocabulary of video installation, sculpture and painting, raising questions of positioning and materiality as well as a constant concern with the body, architecture and cross-cultural contexts. She has shown at the Eco Museum in Mexico City, Architecture for Art in New York, Santa Fe Art Institute in New Mexico, Kunsthalle Berlin-Lichtenberg, Graphic Arts Institute in Oaxaca, Dumbo Arts Center in New York among others in the U.S. and Latin America. Her work is part of the JUMEX Foundation, currently showing in Vienna, Art Laboratory Berlin and the BAYER Foundation as part of her socially concerned research. She lives between Berlin and Mexico City.

Joanna Hoffmann, professor, Dr. hab., at the University of Arts in Poznan, Poland, leader of the Studio for Transdisciplinary Projects & Research and chair of the Art & Science Node in Berlin. She exhibited at the Center for Contemporary Arts in Warsaw, Science: Museum/DANA Centre in London; Transmediale Festival in Berlin; WRO Media Art Biennale in Wroclaw; MUSE Centre of Photography and the Moving Image in New York; European Patent Office Berlin, BioQuant Centre Heidelberg, Poznan Science Centre, Echoflux Prague. She spoke at international symposia, e.g. at *BeyondZKM* Karlsruhe; *ISEA* in Sydney/ Istanbul/ Singapore; *Mutamorphosis* CIANT in Prague, CZ; *Towards the Third Culture* in Gdansk, PL; She attended art residencies such as DKFZ/Heidelberg University, DE; Academy of Film and Television Potsdam-Babelsberg, DE; CEMA & NCBS, Bangalore, IN; KHOJ & ICGEB New Delhi, IN; J. Hoffmann was awarded several prizes, e.g. three times by the artistic stipend of the Polish Minister of Culture; 1st prize *2007 – very spatial year*, Europlanet/ Polish Academy of Sciences. She lives and works between Berlin and Poznan.

Denisa Kera is a philosopher and designer with a focus on open science and citizen science issues. She uses prototypes as critical probes and tools for deliberation, reflection and public participation in science. She has extensive experience as a curator of exhibitions and projects related to art, technology and science, and a previous career in Internet start-ups and journalism. Currently she works as Assistant Professor at the National University of Singapore, where she is also an Asia Research Institute research fellow.

Mathias Kessler is a New-York based artist who critiques and reimagines the concept of nature. Quoting from art history, philosophy and eco-political debates, Kessler re-stages representations of natural processes with humour and gravitas. He received his MFA in Art Practice from the School of Visual Arts, New York, in 2012. He had solo exhibitions at the Kunsthall Rotterdam; Rosphot National Museum for Photography, Russia; GL Holtegaard Museum, Copenhagen; and Kunstraum Dornbrin, Austria. Selected exhibitions include: Landscape in Motion, Kunsthau Graz; [UN]NATURAL LIMITS ACFNY, Hohe Dosis Fotohof, Salzburg; The Nature of Disappearance, Marianne Boesky, New York; Hoehenrausch, OK, Linz; GO NYC, Kunsthalle Krems; and The Invention of Landscape, Museo Palaxio de Bellas Artes, Mexico City. Residency: Cape Cod Modern House Trust, AIRE Everglades. His work has been featured in international publications, e.g. Bloomberg Press, Eikon, Kunstforum, Camera Austria, Die Zeit, Forbes, Prefix Magazin, and Art Bulletin.

Christian de Lutz is a visual artist and curator, originally from New York. His artworks deal with social, political and cultural themes, with an emphasis on technology, migration and cultural borderlines. He has collaborated with artists and institutions in Germany, Spain and Southeast Europe as well as exhibiting in Europe, the USA and Japan. As a co-founder and co-director of Art Laboratory Berlin he has curated over 30 exhibitions and developed a number of series, including *Time and Technology* and *Synaesthesia*, as well as *[macro]biologies & [micro]biologies*. His curatorial work concentrates on the interface of art, science and technology in the 21st century. Additionally he has published numerous articles in journals and books, and is active in a number of collaborative organisations including *transmediale/re-Source*, *Synapse* (Haus der Kulturen der Welt) and *The Berlin Network of Free Project Spaces and Initiatives*.

Regine Rapp is an art historian and curator. Her specific fields of research for 20th and 21st century art are installation art, image text theory, artist books, and art & science collaborations. Currently she is researching spatial aesthetics of contemporary installation art. She worked as Assistant Professor for Art History at the Burg Giebichenstein Art Academy Halle until Autumn 2013. She is co-director of Art Laboratory Berlin, which she co-founded in 2006. She curated over 30 exhibitions, e.g. the series *Time and Technology*, and *Synaesthesia*, and has published several books. Concurrent to the exhibition *So/LeWitt. Artist's Books* in 2011 she conceived and realised the international *So/LeWitt Symposium* at Art Laboratory Berlin. Together with Christian de Lutz she developed the international transdisciplinary conference *Synaesthesia. Discussing a phenomenon in the arts, humanities and (neuro-)science*, 2013 at Art Laboratory Berlin. Her latest curatorial series at Art Laboratory Berlin was *[macro]biologies & [micro]biologies* (2013 – 15), including the publication of the series.

In her artistic projects **Maja Smrekar** is connecting humanistic and natural sciences into transdisciplinary projects. She is fundamentally interested into the phenomenology of life. She was awarded 1st prize at the Cynetart festival 2012 by the European Centre for Arts Hellerau (Dresden/Germany), with an Honorary mention at the Ars Electronica festival 2013 (Linz/Austria), as well as the Golden Bird Award 2013 – the national award for special achievement in

the field of visual art by the Liberal Academy (Ljubljana/Slovenia). Maja Smrekar lives and works between Ljubljana, Slovenia, and Berlin, Germany.

Dr. Alexandra Regan Toland is a visual artist and landscape planner who grew up in Boston, USA, and has lived in Berlin since 2001. With a Master of Fine Arts from the Dutch Art Institute and engineering Diploma from the Technische Universität Berlin, her interests span a range of transdisciplinary activities, from ecological art and relational aesthetics, to urban sustainability, soil protection, and participatory processes. She recently finished a doctorate program as research fellow in the DFG Research Group *Perspectives in Urban Ecology* in Berlin. She was a recipient of an Andrea von Braun scholarship in 2013, has lectured at the TU Berlin, Leuphana University, and the University of Arts Berlin, and has co-chaired the German Soil Science Society's (DBG) Commission on Soils in Education and Society. She is also an enthusiastic beekeeper, vermicomposter, forester, and mother of two.

Pinar Yoldas is a cross-disciplinary artist and researcher who lives and works between Durham, NC, and Berlin. Pinar's research explores the collaborative potential between art and biological sciences. Her solo shows include *AlterEvolution* at Ekavart, Istanbul (2013) and *An Ecosystem of Excess*, at the Ernst Schering Project Space, Berlin (2014). Her group shows include *ThingWorld*, NAMOC National Art Museum of Beijing (2014); *Transmediale Festival*, Berlin (2014); *Tiere und Menschen*, Museum Ostwall, Dortmund (2014), 14th Istanbul Biennial (2015) and *ExoEvolution* at ZKM (2015.) She is pursuing her Ph.D. at Duke University at the Center for Cognitive Neuroscience and Media Arts and Sciences. She holds a Bachelors of Architecture degree from Middle East Technical University, a Master of Arts degree from Bilgi University, a Master of Science degree from Istanbul Technical University and a Master of Fine Arts degree from University of California, Los Angeles. Her book *An Ecosystem of Excess* was published by ArgoBooks in 2014. Pinar is listed as one of the Guggenheim Fellows for Fine Arts in 2015.

Imprint

Regine Rapp & Christian de Lutz (eds): *[macro]biologies & [micro]biologies. Art and the Biological Sublime in the 21st Century.*

Art Laboratory Berlin, Berlin 2015

Book Credits

Concept: Regine Rapp & Christian de Lutz

Layout: Eva Jera Hanžek

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www.artlaboratory-berlin.org

Media partner:
art-in-berlin, Berlin

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Front and back cover: Maja Smrekar: *BioBASE: risky ZOOgraphies*, 2014, installation view, Art Laboratory Berlin

This book provides a sustainable supplement to the *[macro]biologies & [micro]biologies* series which took place at Art Laboratory Berlin between 2013 and 2015. The whole programme consisted of four group shows, several seminars and talks on contemporary art and the life sciences. Four exhibitions – *the biosphere*, *organisms*, *the bacterial sublime*, and *proteo* – featured renowned international artists working across the borders between the arts and different fields of biology. Next to a theoretical reflection about the exhibited artists the publication also includes artist statements and documents a number of outstanding events from the series – workshops and seminars with artists, biologists, and scholars, discussing synthetic biology, speculative design, DIY Bio, and practical exercises in citizen science.

