



Sonja Bäuml, Crocheted Membrane (2008/2009).

Reimagining the Self

Sonja Bäumel

The human microbiome includes all microorganisms that live on and within the human body. For Sonja Bäumel, it constitutes a membrane between people – one full of life that serves as a route for exchange. In this interview, Sonja asks how this unravels our notions of the single human body, of social interactions amongst bodies, and of the legibility of human identities.

One of the startling facts positioning your work is that a large number of cells constituting our bodies are not human but bacterial, viral, and fungal. How does this force us to reimagine the human self in terms of non-human life and our wider environment?

Where does the environment begin and end? My interest lies in the microbial layer – a second skin that can be found on top of our own. It is an in-between layer, full of life, which serves as landscapes of multi-beings exchange.. The human body does not end with the skin but is continually and invisibly expanding into this fluid in-between. The in-between is full of entanglements, and our human body is just a tiny part of these microbial interactions. For more than, I have been collaborating with anthropologists, artists, cultural historians, designers, philosophers, scientists, and filmmakers to find out more about this in-between space. Moreover, I am investigating the influences scientific knowledge has had on the way we have perceived and interpreted the human body historically. My objective is transferring such an understanding within contemporary

time and projecting it further into the future, striving to unravel the ways in which our comprehension of the biological body affects our current society and the cultural contexts in which we operate. I am particularly interested in how our understanding of what it means to be human is fundamentally changing in the 21st century. The democratisation of scientific knowledge and the critique of human exceptionalism are at the core of my work and its investigations into the curious relationship between humans and microbes.

Drawing on microbiologists' claims that 50% of cells that constitute our body are not human but bacterial (1), we can begin to envisage the human body as a complex ecosystem. Current research suggests that microbes might play an important role in affecting our biological and even behavioural states (such as in relation to depression (2)). In this way, the microbiome brings into focus our entangled, social, multispecies bodies. But there are also ways in which the microbiome can be used to reify old categories of distinction, and it is important to address these issues. Based on current scientific theories and discoveries revealing the influence microbes have on the human body and mind, my work seeks to stimulate our cultural imagination regarding the impact of this microbial paradigm shift: It raises critical questions about the impact this scientific research has on societal issues such as concepts of privacy, individuality, and future desires and fears; and it stages encounters with these organisms living inside and on us to explore possible futures for further co-existence. This may allow us to better take care of both the microcosm and macrocosm around us and, thus, ultimately to better take care of ourselves.

Using an example of your own work, how do these ideas play out in practice?

'Expanded Self II' is a bacterial imprint from my skin grown onto a three-dimensional agar form (the medium used in microbiology to grow bacteria)

in the shape of my body. This is a work that should be understood as an expanding body in its own right rather than a singular, isolated entity. It could be seen as a metaphor offering new points of view about who and what we really are. The work was commissioned as part of the project *Gare du Nord*, which took place at the Anatomical Theatre of the Waag Society in Amsterdam (initiated and curated by Chiara Ianeselli and Lucas Evers). A quote from the humanist Caspar Barlaeus: ‘Auditor, te disce; et dum per singular vadis, crede vel in minima parte latere Deum’ (3: p.537) (‘Listener, learn yourself, and while you proceed through the individual [organs], believe that God lies hidden in even the smallest part’), written along the walls of the theatre was the project’s starting point, informing the curatorial framework and interpreted by the commissioned artists, each investigating the subject of *the smallest part* from their own perspective.

I would like to emphasise the process behind this work, as it is just as important as the outcome. Visiting the anatomical theatre prompted a new development of one of my previous works – ‘Expanded Self’, a bacterial body imprint on two-dimensional agar. When starting a new project, I rarely have a fixed plan as I always work in a process-based fashion. I wanted to use agar, as often before in my work, so making living materials such as skin bacteria (normally invisible to the naked eye) perceivable. My aim, however, was to transform this usually two-dimensional material into a three-dimensional form, helping to better visualise the human body as a haptic and entangled landscape. This new piece challenged me, both physically and mentally, because I envisioned achieving this through producing a cast of my own body. To do this, I needed to lie for five hours in a silicone and plaster mould. The silicone mould allowed me to get all the details of the skin’s surface, and the plaster mould around it helped to keep it in shape. The process revealed to me that I needed to feel my body’s own borders before being able to feel its change into an expanded form.

As soon as the moulds were ready, I moved my atelier to a room next to the anatomical theatre, one I had transformed into a semi-sterile working

space. Here, I worked with do-it-yourself biology (DIYbio) techniques in order to execute the work, including tools from the Open Wetlab at the Waag Society and a big pressure cooker from Mediamatic (a cultural institution in Amsterdam) to generate the large quantity of sterile agar needed. After properly setting up the space, I poured the molten agar into the mould, recruiting helpers in the middle of the night to remove the moulded body parts and place them in a giant petri dish. Once these preparations were finished, I applied the invisible bacterial collection that I had previously isolated (consisting of skin bacteria and microbes collected during a single day in a Viennese environment) onto the agar surface. The finished work was then placed in the exhibition space. Here, I started a research process – a controlled experiment – taking place within a cultural frame (i.e., an art exhibition), one where the outcome resulted from the constant transformation of this living work, a process that could not be known in advance. This gave rise to the realisation that the form we witness is not cast as a unique single piece but is the result of an accumulation of its smallest parts – microorganisms that cohabit us. Through this work, I intended to create a space where the potential of bacteria as cooperative partners can be re-imagined and where we can explore the implications for processes of larger cultural significance – art as a territory of cultural experimentation and the artist as researcher.

By placing microbial species from a shared body into a new environment (the moulded replica of your own body), you create the conditions for a further expansion of *self*. As such, how do you understand yourself to be actually embodied – but also changed – through your work?

‘Oversized Petri-Dish’, a work realised in 2009, was an astounding experience as it allowed me to witness a part of my own body growing independently of myself on external media. Something, which used to be

part of my body, becomes autonomous and visible because the external conditions of the petri dish better favour growth (making it visible). It was a mind-blowing moment when I saw what I would usually understand as *me* suddenly flourishing as *we*. This was an important step in my practice, a kind of proof that bacteria are there and that my body is constantly expanding into space and connecting with others and the environment. The development of my body of work over the last few years has actually made this clearer to me. We are surrounded by diverse beings that are in constant exchange with their surroundings, but we cannot see or touch them. Observing the body separated from the context of its primary living organism – with most unaware of this beautiful invisibility – drives me to question our sense of body awareness. I make use of, explore, and experiment with my own body, considering it a tool to gather information about our physical and biological matter. This information is to be transformed into a comprehension of who I am and, in particular, of who we are together; this is a way of trying to better understand what bodies are really composed of. There are ethical and practical reasons for using my own body, but it also reflects my main interest in revealing the body's *bigger picture* by extending what I personally experience *through my own body* towards what happens with all bodies.

In Expand Self II, we can clearly see how you become part of the medium of your own work. In 'Becoming Media', is there a risk to yourself and, perhaps, others?

Yes, I think that 'Becoming Media' in my works allows me to dive into the living material with all my senses. It is almost a proof or a necessity which allows me to tangibly feel and touch what I am thinking and talking about – a means to reflect upon ways of documenting my ongoing thoughts and to express artistic intent. I would wish to see others in our everyday lives to gain a new awareness of their bodies by focusing on their senses.

As mentioned earlier, there are very practical and ethical reasons for me using my own body in my work: First of all my body is always with me; second, there are risks involved in producing my works that only I can take. In creating 'Expanded Self', for example, I removed my natural skin flora and replaced them with a more populous, foreign bacterial layer. I had conducted a lot of experiments before producing the work in order to make sure that my natural skin flora would recover after such an intervention, though an incalculable risk still remains (as we do not know everything about microbial behaviour). I think, to be capable of fully understanding our integration with natural life-forms, we first need to gain awareness and respect for microbial life as equal partners. Our microbial populations adapt individually, their growth influenced by factors like weather, light, personal hygiene, and the use of cosmetic products. I am interested in outlining this *bigger picture* and, particularly, in understanding the ways in which we humans are connected to our surroundings and enveloped within an unknown network of other life.

It is also interesting to reflect on the issue of exhibiting living materials in the context of public spaces and traditional public institutions (e.g., museums and galleries). There is the need for a separated space (e.g., a petri dish) in order to help your living microbial material grow in the right conditions (controlling humidity, temperature, etc.) and to be safely exhibited. There is, however, still a perceived risk from audiences. My 'Expanded Self II' piece was removed from its exhibition space after a number of weeks – and prior to the exhibition end date – as it was considered by some individuals to be 'too much alive' ... what a pity! Worldwide, there are very few places where you can show living artworks as they require a high level of care (these are, after all, works that are constantly growing, adapting, and changing); our conventional curation and exhibition practices are not yet ready (or elastic enough) to be able to deal with such a challenge. When you can exhibit living artefacts, it is often only within a very limited time frame, often forcing you to show only a representation of the work instead of

the work itself. At the same time, when you are able to exhibit a piece, you have to begin the process of creation from scratch and reproduce the living artefact anew (which is a lot of work). This is not necessarily to your disadvantage, though, as each time you learn something more about the process, such as how new constraints or demands might influence the way the work can be exhibited.

What I have come to understand over the last years is that unless you are completely immersed in an understanding of living artworks (with its many abstract, complex, and challenging concepts), it is hard to enter into such an artwork as those I make. As these pieces have a niche focus, ask for knowledge of living systems, and largely concern media that is invisible to the naked eye, the end-result (micro-artworks) can be hard to grasp. When you want to speak to a wider audience, as I do, you need to help people directly experience the thing in question (e.g., through touch) in order to understand its own reality. Therefore, I sometimes use non-living materials in order to create imaginary landscapes that open up an understanding and conversation about life, enabling communication with a broader audience. Do not forget, we artists are still in a phase where we are trying to create an awareness and understanding for such a typology of work.

Whether in or out of a sealed environment, our everyday interactions will trigger forms of microbial exchange. Has your new understanding of the human microbiome changed the way you interact with others socially or forced you to reconsider how you see your own body in relation to others?

When I started working with microbes in 2008, I did not know about the existence of the human microbiome (such research started at around the same time). Through my work, I gained an understanding that the balance in a microbial community is very important and that the greater diversity of microbes present (of the right kind), the healthier the system is. I would

say that I have become much more aware of what happens when I interact with somebody, whether hugging someone or touching the skin of other bodies, whatever those bodies are. We are part of each other. When we die, our microbes will spread to other living environments. When we breathe, we share the air and microbial life with others. We can also have a strong impact on our microbial community that is closely related to our mental and physical well-being. The microbial world inspired me as a place where we can imagine the human body as a locus of messy entangled relations, “thinking against categories such as species, sex, ... , as a locus of social and biological categories in motion and in transition”¹.

So, how should we carry on our lives together? I think there needs to be a balance between maintaining the health of microbial communities and managing our day-to-day needs. For example, I would suggest trying to minimise antibiotic use where possible or reduce the use of chemical cleaning fluids which are harmful to the environment and destroy the balance of life in microbial communities. We are also what we eat, where we live, and how we care for ourselves, others, and our environment. From my point of view, the more sterile and homogenous (in terms of biodiversity) an environment becomes, the less resistance we can build. One interesting area of development that speaks to changing social behaviours is the emergence of person-to-person faecal microbiota transplant, which offers promise in restoring health to bacterial composition in the gut (4).

In how you describe your work, the idea of the *membrane* serves a very important role because of how it enables separation, transmission, and exchange. How would you describe the importance of the membrane concept in your own terms?

As you have seen, I create artefacts that blur and refashion the notion of skin. By continuing to question the way we traditionally recognise

¹ Helmreich, Stefan. 2015. *Sounding the Limits of Life. Essays in the Anthropology of Biology and Beyond*. Princeton: Princeton University Press. Page 62-72.

skin as a *border*, I am re-imagining skins (or membranes) as fictional layers of communication and as multi-being landscapes. After all, when we touch the surface of another organism, our skin picks up many new microbes whilst leaving others behind. In relation to the research I am conducting into individual perceptions of the human body, the fact we each have a constantly changing microbial layer surrounding our bodies could lead to the imagining of different types of communities that we share in common. In the long term, this could strongly impact not only the way humans interact but also the way societal systems and networks of other life forms are understood to operate. If only we were capable of seeing these relationships not as dividing and fixed but as more fluid, connected, and context-driven, I believe that this would enable us to better integrate with other life-forms. This may well engender more sensitive, or attentive, ways of interacting with each other and with our surrounding environment.

I have a background in fashion design, and these ideas originally emerged out of a critique of the fashion system. I started with a simple question: Do we expect too little from our clothing? It felt very natural to me to express my ideas through the use of textile. In the project 'Crocheted Membrane', the clothing I developed (or, better, body forms) do not derive from shapes or historically patterned forms with an embedded social hierarchy and pre-established material richness but are instead determined by the needs and sensations of an individual human body, performing much in the same way as bacterial populations individually respond in their environments. Nowadays, I am more interested in working with these ideas in detachment from the fashion field, so exploring the in-between space that surrounds and connects all multi-beings bodies and my interest lies in non-verbal forms of communication.

In 2009, to come back to your question,, I talked about the second secretive layer of life on our skin, which is, in fact, very close to the function of textiles and clothing. 'Crocheted Membrane' has offered me a way to materialise an understanding of the abstract and invisible biological layer that surrounds

our bodies and to create an imaginary entry point for the general public to encounter such complex and challenging notions. Furthermore, through developing such work, I wanted to express a new visual language, one that could connect different audiences, such as fashion designers, scientists, and the public.

You have suggested that the ability to intervene in the microbiome might one day enable designers to tailor individual human skin bacteria populations into visible, flexibly adapting membranes. These membranes could change the function we assign to clothing, perhaps as indicators of status, health etc. How might such a membrane change the way we interact socially, and to what ends?

The '(in)visible' film project was artistically rooted in the world of fashion where critical and project-oriented approaches are rare. Although fashion is a social construct perceived in the form of clothing, the world of fashion and the world's actual needs seem strangely disconnected. Two problems I see are that, first, our clothing does not support the social and individual human body but rather celebrates conformity; second, whilst the use of forecasting does exist to generate new fashions, it is driven by prediction (i.e., based on past fashions) and commercial needs rather than the power of individuals' imaginations. I wanted to bridge this gap and redefine fashion's function as that of providing added value to the world as an accessible, fictional tool for critical reflection. In essence, my aim was to unsettle the *present* rather than predict the *future* and to critique consumer culture where profitability is its main goal. Here, design can act as a medium for the public to ask questions about the future rather than simply provide solutions to current problems.

In my first film, '(in)visible' (2008/2009), I envisioned how a novel second skin layer involving organisms such as skin bacteria, slime mould, and

plants might mutate when adapting to different environments and contexts. I was interested in how we could use this powerful non-verbal platform between humans in a more flexible and meaningful way, i.e., how a novel layer on our skin could help create new forms of communication between humans within their environments. Through such work, I asked questions such as: What might clothing or a second skin look like when developing out of someone's socio-physical needs and individual beliefs? How might interactions between humans change according to the adaptive behaviour of this novel layer on our skin? Could we become more sensitive or attentive to such interactions if they were to prompt changes in colour, shape, and structure of this flexible, visible membrane? Could social integration, for example, be supported by this kind of aesthetic and functional adaptation to the environment? In imagining what would happen if our second skin was considered as something other than the way it is today, we can ask how it could sharpen our sense of our surroundings, reminding us that we are just a tiny part of a wealth of microbial interactions. A(n) (in)visible membrane could tell a story about us as human beings, about our present state, our strength, our fragility, our fears, and our feelings. New societal landscapes could evolve related to the visualisation of these characteristics.

Developing the capability to visualise the hidden interconnections between humans and microbes is the first fundamental step, acting to stimulate public awareness of these possibilities. But it is also essential for us to gain a deeper understanding of how such interactions might function in order to learn how to use them in the best way. Trying to interpret the soundless language spoken by millions of barely perceivable entities living on our skin is an essential step to building a new, living, and adaptable system on our bodies. To be capable of fully integrating with natural life systems, we first need to recognise the many ways in which microbes act as equal partners in living systems. Such a cultural shift could allow us to embrace their 'expertise' derived from billions of years of co-existence with us. Microorganisms, for example, have adapted incredibly successfully to

radical changes and transformations in their environments, reflecting their capacity to evolve in relation to changing needs and pressures. We could probably learn a lot from our tiny co-habitants. The overall intent of this project was to think of broader and long-term solutions in a sustainable society, which respects human resources and environments and takes responsibility for our actions. In my more recent work (such as 'Expanded Self II'), I am beginning to explore these issues through my interest in the relation between bodies in multi-being landscapes.

As a designer of objects that embody abstract and challenging concepts, your artistic practice throws a new light on concepts derived largely from scientific inquiry. What do you understand this relationship to be, and is there an influence you would seek on the scientific community?

I often work in scientific labs together with scientists when developing my projects. I feel that by working together, by asking different questions of each other, and by observing each other's working methods, we already mutually influence each other's ways of thinking. Hence, artistic practice makes a contribution through affecting the approach and focus of the scientific community too. An art project can offer the scientist freedom – a means to exchange knowledge and gain a different perspective on knowing, understanding, and questioning the world. Although I love to work with scientists, I have never been interested in becoming a scientist. If you can gain knowledge from both fields, you can see and appreciate the world around you even more. I have now worked for many years with scientists. At first, I was always the one to initiate projects and to reach out to the scientific community for collaboration. Now, after almost ten years, I have been asked for the first time to be part of a scientific research project, contributing to the work from an artistic standpoint. It has taken time for art to gain (once again) both trust and respect from science; and, despite incremental positive steps, we are still not fully there.

It is important to ask where work on the microbiome challenges conventional understanding of the body, and where it reinforces existing distinctions and forms of discrimination. In each project I develop, I have had the opportunity to ask questions along these lines and, perhaps, make a contribution to ways of thinking in the scientific community. For instance, in my project 'Fifty Percent Human', we sought to create greater awareness around the ethical issues of how to conduct experiments with microbes whilst still finding out more about them: How we relate to other living organisms – whether a cell, a plant, or an animal – is a question of care, which means both for them and ourselves. For me, microorganisms are not simply inert DNA; I am more interested in their personalities and their behaviour in context. This means that rather than looking at a single species in isolation, a new emphasis emerges on how microbes communicate in their social context. I think I have also had a more practical influence on the scientific community. In 'Expanded Self', I transformed everyday scientific materials into novel three-dimensional shapes and scaled them up considerably, broadening the view of what can be done with these methods and possibly inspiring or informing new working practices. I believe that artists and scientists share a lot in common (for instance, the joy and intuition of experimentation), though we must be aware of key system differences. For instance, scientific work is bound to a particular way of conducting research and publishing findings, whilst, as an independent artist, I am able to have a completely different view on things: With my work, I want to critically question a variety of subjects, to provoke discussion, and to express or celebrate a different, but equally important, kind of language – that of the magical and non-verbal language of material, colour, texture, and form.

Beyond the scientific community, your DIYbio workshops enable a participating public to encounter living works in public spaces. What is the role of these workshops, and how do you think it affects participants' understanding of bacteria as operating between artistic medium, dangerous contagion, and everyday fact of life (visible or otherwise)?

The aim of these workshops was to show that science is not necessarily as complex as it seems (depending on which level you operate at, of course), to spread DIYbio know-how, and to democratise scientific knowledge in action. A workshop allows you to bring important topics into the public sphere, to provoke questions, and to engage in discussion with a diverse professional community. Furthermore, workshops act as a platform to explore how we all need to take responsibility in dealing with topics which affect our shared future, whether we want to or not. I am, for instance, referring to the issues around antibiotic resistance or the field of synthetic biology. I think that we should all have access to basic knowledge in regard to such topics, to allow all of us, ideally, to collectively take part in discussing the role of such developments and what kind of future we would wish for: This needs to be a dialogue between artists, scientists, curators, health politicians, policy makers, people from the pharmaceutical industries, and different publics.

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Author Biography

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