



Mellissa Fisher, *Microbial Me* (2013).

The Invisible World and the Visible Self

Melissa Fisher

The human body is a landscape on which hosts of microorganisms co-exist, grow, interact, and compete. This microbial body is largely invisible – a hidden part of our unique fingerprint. In this interview, Melissa Fischer asks what happens when that body is liberated for all to see; a form of self-emancipation, for sure, but also a new beginning for her microbial self.

A key moment in your development as an artist has been the discovery that rich forms of life normally invisible to us can be made visible through scientific methods. Could you describe something of this process of discovery?

It really began during an Art and Science Interdisciplinary module I was taking back in 2010 called Broad Vision, run at the University of Westminster by artist Heather Barnett. At that time, I was an illustration student who was struggling to find inspiration in my subject, and, in short, when I looked down the microscope during that course, I found it: The shapes and colours I saw simply blew me away, and the thought of this beauty being invisible to the naked human eye convinced me it was this *invisible* world that I wanted to bring to the public through my project work as an artist. Throughout the Broad Vision course, I experimented with different ways of making the invisible world visible and found that the most fascinating approach was to render the invisible *physical*. Dr. Mark Clements, who I met during Broad

Vision, became my collaborator, and I remember asking him whether I could make sculptures out of agar. He responded: 'I have no idea', but he was interested in trying. So we tested the idea out with various moulds and realised that it worked; the structure of the agar held perfectly and retained a high level of detail. I then began to explore casting parts of my body and produced a face for my first exhibited 'Microbial Me' work (originally titled 'Face of Truth') at GV Art (London) in 2013.

'Microbial Me' is a project about the use of scientific materials in an artistic context as well as about the exploration of the microbial life found on the surface of the skin. By re-presenting skin-sourced microbes on an agar sculpture taking the form of my facial profile, I am recasting the self-portrait as a living microbial portrait – one that evolves over time. In the work, I am assigning agar, as a medium, a wider purpose that extends beyond the 2D petri dish into a 3D landscaped form. 'Microfloral Femunculus' was an extension of 'Microbial Me' – a miniature of the human body cast in agar that would bring this work closer to my original artistic intentions. This was an experimental piece in visualising the body; we wanted to test how microbes swabbed from each area of the human body might behave on a smaller, corresponding agar structure of the human form. In order to explore these behaviours further, we tested three different types of agar support medium separately, generating results that would inform later work with the medium. Our plan with this work was to start small with the body figure and work towards a method for casting a full-scale human figure.

Our everyday lives take place in near-ignorance of our own microbiomes. What do we gain from making this invisible part of our lives visible in this way? How should it alter our sense of what constitutes *self*? Indeed, has it altered your sense of self?

Mark and I drew inspiration from the initial reaction of the public when seeing 'Microbial Me'. We heard many people saying: 'I didn't know that

we had bacteria on our faces' ; we were shocked by how little the public knew about these bacteria that accompany us through life and play an important role in our everyday health. Brought to our attention, this marked the start of a longer journey for us – one exploring how to render the invisible world visible for more people through bringing artistic and scientific practices into partnership. Working to alter people's *sense of self* in this way has been a phenomenal and fascinating experience for me. My interest is in a form of science communication that can educate the wider public about the human microbiome: How many bacteria, and which types, live on our skin? What is the extent of their growth over our bodies and in the environment? Just how much do we need them in order to stay alive?

In general, I think people are scared of the unknown, and so I wanted to bring the unknown to the surface to start a discussion on what it means to be human, i.e., to ask whether the self we present to others (and perceive ourselves) is really the *whole* self we are. Since I have begun working with my own bacteria, my sense of self has changed greatly. The mere understanding that bacteria are growing all over my body has shifted my self-perception towards that of a living composition made up of millions of tiny organisms; it has forced me to question what being a human really means and what kind of organism my body actually is. I even behave differently towards myself now because of this understanding. For example, I no longer obsessively clean my hands or body as much as I used to; my knowledge of bacteria has made me much more conscious of their vital role in my continued health and existence. In short, my new understanding about bacteria has made me think differently about my own mortality and my relationship with nature: I am nature, and we are nature.

In this vein, the recognisable component of the artist – the agar form moulded directly from your own face – becomes less visible (even distorted) as new microbial colonies grow. Is this the emancipation of your own microbial self, or does the eventual decline of this new ecosystem reveal a deeper set of dependencies that sustain our integrated relationship with nature?

The sculptures of my face only bear a passing likeness. Over time, I see them turning into something completely different again. As soon as they become covered with bacteria, it is no longer my face that I recognise at all. One piece (developed with Mark and Dr. Richard Harvey) has been exhibited at The Eden Project in Cornwall for almost three years; it still looks as beautiful and interesting as it did after three days. It is, technically speaking, my face, but it is a different version of my face created by my own bacteria in their own time. To the public, it is a generic face, but one similar to their own, and, therefore, one they can relate to. It could be seen as powerful in this way: The face is what people first turn to in an encounter – the first thing people look at in each other – for reassurance, for approval, and to detect emotional states. Of course, the work also resembles a death mask, introducing a tension between the suspension of my own life (as the artist) and the beginning of a new microbial world.

So, yes, the work is an emancipation of myself, but also a new beginning for my microbial self. ‘Microbial Me’ generates an ecosystem all of its own based on the microbes from my skin, continuing to change and morph over time in unexpected ways. It is no less subject to processes of living and dying. In their natural environment, bacteria on our skin are in constant competition with each other (a process also replicated on the agar sculptures). The colonies can compete with each other for nutrients, with those bacteria able to grow at low nutrient concentrations becoming more dominant as the sculpture matures. Bacteria also compete with each other in more aggressive ways, such as producing antibiotics which can kill

other types of bacteria or alter the environment, for example, by producing high concentrations of acid which can prevent other bacteria from growing . On our bodies, the bacteria are finely balanced; each body part will have slightly different micro-environments which favour one species more than another. This competition between bacterial colonies on the sculpture is similar to the complex interaction of human societies: Different societies compete with each other for resources (such as food and water) in the same way as bacteria do. There is also symbolism in the bacterial production of antibiotics – the equivalent to human warfare. What was a sample of bacteria living in a balanced ecosystem on my skin becomes a new ecosystem outside of my body with its own, unpredictable fate.

From another angle, the vibrant forms of microbial growth that emerge in your work are fascinating and repellent in equal measure – kept at a distance from us by a protective casing. How have audiences reacted to this tension between insight into our natural histories and the perceived risk of contamination in your work?

When the public views the work, I have noticed that there is a strong response of disgust. That seems to be the general feeling people have towards bacteria: An indifference to whether their impact on us is good, bad, or unknown. Usually, I display the sculptures in glass or Perspex casing, which allows the viewer to see the sculpture whilst sheltering them from the horrendous odour that the bacteria generate, and shielding the external environment from the risk of possible contamination. Since it is not known exactly which types of bacteria have been harvested from my skin for growth in the sculpture, all bacterial sources are treated as potentially ‘dangerous’. Our future plans include sequencing the bacteria so that we can determine any contamination risk from the outset. We have faced many challenges in exhibiting the pieces: They need to be safely displayed within

airtight casings and with minimal risk of being disturbed or knocked over. Although we explain to curators the best way to display the work, many have been reluctant to include them in exhibitions (seeming not to have properly understood the risk assessments that we have already undertaken).

These pieces are always seen as ‘grotesque’ to begin with by audiences because they are something unfamiliar, and we have all been raised to believe in the value of cleanliness – a sterile world without bacteria. What I am trying to do is help audiences see that bacteria are, naturally, everywhere and that their role in sustaining life is much more complex. Recently, I was able to work with the BBC presenter Michael Mosley on a new bacterial sculpture cast from his own body (a project I will discuss later), spending time with him over the course of its development. The sculpture made him uncomfortable; it was simultaneously exciting and disgusting, especially as it was ‘himself’ he was seeing down there covered in bacteria. But, over the duration of filming, he became more amazed by his own microbiome and how his bacteria were evolving to resist the broad spectrum antibiotic we applied to part of the sculpture. This initial sense of disgust is not something I worry about; I am still exploring new ways of exhibiting parts of the microbiome that can help draw-in and educate audiences.

Although an interaction with these microorganisms in your work is prevented, you raise the point that we exchange microbial life through our everyday interactions all the time. Your work makes something of this process visible, but are there other ways in which this everyday exchange outside of the laboratory (or gallery) might be made shown, and to what effect?

I explore some of these interactions through the workshops I run. In ‘Design Your Own Microbiome’, I ask participants to draw a self-portrait and use a marbling technique over it to create microbial patterns of the kind you would find under a microscope. Another way Mark and I plan to reveal

something of our everyday microbial exchange outside of the laboratory is to sequence the microbiomes of participants, revealing their microbial fingerprints for comparison. Activities such as these continue to be important to me because they allow an engagement with the public through my practice that is safe and avoids any of the risks associated with exposure to living bacteria. None the less, I am currently developing a 'Design My Microbiome' workshop with a collective called 'BIO.CHROME' – one where participants are given casts of parts of my body onto which they apply their own bacteria, so raising questions about bacterial ownership and origins: Do all the bacteria on our skin belong to us? Do we share bacterial species, in which case which ones? How much variation can be found within our microbiomes?

Turning to questions of practice, you have engaged with research scientists and arts organisations in the creation of your work. If working with living materials offers new opportunities to explore questions around living processes, do you understand your work as exploring a topic that necessarily defeats disciplinary boundaries?

I first experimented with agar at home, although without nutrients, to work out what sculptural qualities it might have to offer. Working with agar containing nutrients essential for supporting growth, however, can only be undertaken in a lab setting; this is due to the potential risk of growing pathogenic bacteria. When I began working with agar, I was concerned principally with questions of appearance. As each type of agar used in scientific research contains indicators to reveal certain types of bacteria, I was inspired to mix two or three different agar types together to see if this would affect bacterial growth and variation – this was certainly evident in 'Microbial Me'. Mixing agars to get the desired colours, textures, and growth, I was little concerned with the application of scientific method.

My own practice of blending together different agars for artistic reasons has led me to really interesting outcomes and deeper insight into how different organisms in the microbiome respond to their environment and interact with each other. Mark and I coined the term 'bastardising agar' when experimenting in the lab with this technique (because we are not using the agar as intended but, rather, to create a new purpose for it). Some might criticise this approach, but I do not believe that cross-disciplinary working means that, when an artist and scientist collaborate, they have to focus on questions of a scientific nature. Many artists have this focus; I am more interested in experimenting with concepts and materials and newlines of artistic questioning.

Recently, I was able to expand 'Microfloral Femunculus' for the BBC Four documentary 'Michael Mosley vs. The Superbugs'. Mark and I were commissioned to create a life-size bacteria sculpture of the presenter ('Microbial Michael') to be part of this documentary on antimicrobial resistance. To make this possible, we created a new method of body-casting, one where an immovable cast of the sculpture is placed in its final orientation and then filled up on the inside with agar (from the bottom to the top) to form the sculpture. The challenges we faced with this project mainly concerned building a casing for the sculpture which could meet strict health and safety requirements whilst being aesthetically pleasing. This was a very experimental piece, and, unfortunately, the seal within the casing failed after four days, dramatically shortening the length of the time-lapse film we could create to document the work. In this process, Professor Sheena Cruickshank (my collaborator) observed how fascinated she had become with the piece: Its rich visual appearance has now inspired her to ask more questions about the types of bacteria the sculpture supports and their extended life course. In contrast, some scientists I have worked around in the lab have criticised my playful approach for not being scientifically rigorous. But I argue that I am not trying to conduct scientific research: I am trying to make the invisible world visible by experimenting with materials and pushing the boundaries of casting and sculptural form.

Let us think about the relationship between our complex real-world and laboratory practice for a moment: In these sculptures, different species of bacteria or fungi will become dominant overtime and will continue to grow until they run out of a specific nutrient or produce toxic by-products that eventually prevent them from growing (or even kill them). This prompts a new wave of growth from another bacterial species favoured by these conditions. This process will repeat itself over and over again until all the nutrients are completely used up (which will take a very long time). Scientists are unable to predict exactly how this will occur or when the end will finally come. This is simply because they would not normally leave an experiment for this length of time, and normally they work with pure cultures of bacteria (rather than complex communities such as bacteria from the skin). This is something where, perhaps, only working with artists such as myself will help us uncover answers to these questions – although the challenges of running a 20 year artistic experiment would be considerable!

In addition to your work with living materials, you are an active illustrator, conduct microbiology research, and have an interest in stop-frame/time-lapse animation. Is there an interaction between your work with living forms from the microbial world and these other aspects of your work?

Since working with organisms through collaboration with scientists, my artistic work has changed substantially in all areas. My interest in the representation of the invisible and the patterns it creates is now present in my illustration work (as I recreate the microbial sculptures in my line drawings). Although the microbial world has come to influence all aspects of my current work, the theme of nature and the living has always been key to my practice in some way. When starting out as an illustrator, I always wanted to communicate movement through inanimate objects; this is present in my early work with fractal patterns which served as a kind of optical illusion of

the fractal equation. My engagement with the microbial world has pushed this interest in capturing *time* in my work much further. For example, my interest in seeing how bacteria grow (at different rates and in different patterns) has resulted in a number of time-lapse films. So, I think that my practice has not necessarily changed at heart, but it has evolved, like a cell dividing and reproducing – and it will continue to do that.

Another project of yours, 'Immortal Ground', sees your work expanding to encompass other notions of ecology and life. Could you tell us more about this piece and describe some of the challenges you face in taking your practice forward? How might your conception of living materials continue to change?

'Immortal Ground' was a project for my final degree show – 'Unfolding Realities' – in 2016 at Central Saint Martins in London. This project originated with a residency run by artist Alexis Williams in Ottawa Canada, under the title 'Art Ayatana – Biophilia'. This residency explored themes in biology and art through various activities like hiking in Gatineau park to forage for mushrooms or learning about caterpillar interactions and cell communication. The act of foraging and being connected to nature in a way that I had not engaged with before inspired me to create the project Immortal Ground. The mushroom that I became particularly interested in was the Reishi mushroom, which in Asian culture is known as the 'immortal mushroom' because of its role in increasing the macrophages in your white blood cells and boosting the immune system. The work gave me the opportunity to explore different ecosystems and engage with medicinal plants; it brought me to think about my sense-of-self with nature and the immortal values we ascribe to the natural world.

Thinking to the future, funding is one of the biggest challenges I have to overcome in creating microbial projects. They simply cost much more than traditional projects of a similar scale as the scientific equipment required

to produce the work and the protective housing needed to surround the sculptures are so costly. We now know, however, that this work is possible – we have made it happen. Finding the right environment to keep and exhibit such works is also something we are trying to resolve (itself a subject for future funding). As the body sculptures have an estimated lifespan of at least twenty years, we would like to recreate a project like ‘Microbial Michael’ and take the piece to ‘full-term’. Working at this scale has greatly altered my perception of working with living materials. It is ambitious to create living sculptures at such a scale, especially when gallerists are anxious about exhibiting such pieces and scientists fear being part of this kind of collaborative project. I have been very lucky with my current scientific collaborators as they understand what I am trying to do as an artist, so they want to be a part of my exploratory project work; after all, it helps them to think differently about their own research.

Artist Biography

Mellissa Fisher’s practice brings together interests in illustration, printmaking, sculpture, and living organisms to make the invisible world around us more visible. She holds a degree in Illustration and Visual Communication from The University of Westminster, UK. In 2016, she graduated from Central Saint Martins in London with an MA degree in Art and Science (a course that investigates the contemporary and historical contexts of artistic and scientific practice). Since 2016, Mellissa has undertaken major commissions for The Eden Project in Cornwall, UK (‘The Invisible You: The Human Microbiome’ 2015 –2020) and the BBC documentary ‘Michael Mosely versus the Superbugs’ (first shown on BBC4 in May 2017). Mellissa continues to collaborate closely with leading research scientists in her work, and she regularly delivers participatory workshops and public talks exploring the world of art and science. More on her work can be found at <https://www.mellissafisher.com/>