

Pint of Science presents...



# *Creative* REACTIONS



**18th-19th May 2018**  
**Cambridge UK**

Where art and science meet



**Welcome to Creative Reactions 2018**  
**St Barnabas Church, Mill Road, Cambridge**  
**18th and 19th May 2018**

We are proud to present the fourth Creative Reaction science-art exhibition with works made in a plethora of media, where local creatives have responded to the speakers from the Pint of Science talks.

Pint of Science is a global phenomenon, founded by two scientists, Michael Motskin and Praveen Paul, who wanted to create a platform where the general public could learn about groundbreaking science in a more informal and accessible way, in the pub! Talks happen over three nights in May, all over the UK and internationally.

Creative Reactions was formed when a group of scientists and artists got together and thought it would be amazing if creatives could meet with the scientists from the Pint of Science festival, and make some work in response to their specialism. In the last few years, the brainchild of Armando Carlone, Stan Strawbridge, Karen Jinks and Mandy Knapp has produced some truly innovative work that communicates the beauty of scientific research through the lens of the creatives's visionary mind.

Like Pint of Science, Creative Reactions is only possible thanks to lots of volunteers working tirelessly behind the scenes, recruiting artists and scientists, making the matches come together, fundraising and shaping every edition of the festival with their own creativity. We cannot thank them and the artists & scientists enough for committing their time and effort to this unique collaborative effort between sciences and arts.

Each of the artworks you can enjoy has been made after the scientists have given their time to their appointed creative, who have a steep curve in grasping the content in a short amount of time, and making their own interpretation on it. You will find information next to the artworks, describing each artist's take on the science, in a wonderful range of media.

We hope you enjoy the immediacy and vibrancy of the Creative Reactions.

With thanks to our sponsor:



## The Pint of Science Cambridge Coordinators...



### **Federico Rossi**

Neuroscientist at UCL. I map the intricate connections within the brain and investigate how they determine the functional properties of neurons. I am committed to disseminate the beauty of science, and curious to turn it into art!



### **Ryan Hamnett**

A postdoc investigating the neurobiology of our body clocks. I'm passionate about demonstrating the value of science and making it engaging for everyone!

## The Creative Reactions Team...



### **Colleen Rollins**

I'm a PhD student in Psychiatry exploring the neural basis of hallucinations in patients with schizophrenia. Academics aside, I practice figure drawing, acroyoga, & rock climbing. I'm excited to help foster communication by integrating art & science!



### **Karen Jinks**

I am a Mixed Media Artist and Graphic Designer, founder of the Cambridge Creative Network and helped create the first Creative Reactions. It is such a wonderful collaborative project, bringing together artists and scientists to produce extraordinary works.



### **Mandy Knapp**

I'm a Cambridge based artist, specialising in printmaking and networking with other artists. I co-founded Cambridge Creative Network, and helped with the very first Creative Reactions pilot. I love seeing how artists respond to the speakers specialisms in such exciting and innovative ways.



**Letizia Mariotti**

I am a postdoc in Neuroscience studying how the brain creates a representation of space to control motor function. Science communication has a lot to learn from the arts to inspire the public: I am excited to contribute to the Creative Reactions team!



**Michal Szpak**

I got my PhD in human genetics and been working on population genetics, local adaptation and human population diversification. Outside academia, I pursue my acting training and interest in theatre and drama. Very keen on cross between art and science!



**Bao Xiu Tan**

I am a PhD student in stem cell biology exploring how physical factors of the extracellular environment affect stem cell behaviour. When I'm not in the lab, I like to sketch, dance, and spend time outdoors.



**Jessica Santivanez**

I recently completed a PhD in neuroscience and I am now working in early drug discovery at GSK. Outside the lab, I am an avid yogi and dancer. I am also very passionate about bridging art and science – I have previously organised neuroscience-inspired art exhibitions, so I am excited to contribute to Creative Reactions!



**Gautier Nicolo**

I am a Postdoctoral Research Scientist in Earth Sciences at the University of Cambridge. I explore old terrains and volcanoes to understand how the continents formed and evolved. I travelled all around the world from the dry lands of South Africa to the ice sheet of Greenland to collect rocks and data. Along the way, I document my travels with a series of photos, drawings and videos. My wish is to reach people beyond the field of academia and advertise scientific discoveries to children.

# The Artists

Over 50 artists were paired with local scientists who were taking part in the Pint of Science Festival and covered the follow themes:

**Atoms to Galaxies - p7**

**Beautiful Minds - p14**

**Our Body 1 - p22**

**Our Body 2 - p29**

**Our Society - p36**

**Planet Earth - p41**

**Tech Me Out - p46**

**Immunology - p52**



[www.pintofscience.com](http://www.pintofscience.com)



### **'Come Climb With Me'** (left)

The main inspiration for this piece came from a phylogenetic diagram representing the diversity of taxa examined by Dr Labonte in his allometric study of animal's adhesive pads. As phylogenies are a bit like windows looking back through evolutionary time, I choose the idea of a wall clock to represent how, while insects and animal figures can enjoy the ability to stick effortlessly to vertical surfaces, us humans are left dangling on a rope, seemingly unable, for the foreseeable future, to be climbing these walls using adhesive pads like they do. All the quirky components in this piece were sawn out of copper and brass sheets by hand using a fine jeweller's saw blade, then assembled and soldered. I've used etching techniques to add textures and details while the colour effects were obtained via "flame painting".

### **'Stratum' Collection** (right)

Taking inspiration from the striking lamellar structure of Gecko's toes, I constructed a range of sculptural silver pieces characterised by a succession of curved sterling silver wires and 9ct gold highlights.



### **Created by:**

## **Aurora Lombardo**

Aurora is an Italian artist with a background in science and biology and a member of the Society of Designer Craftsmen. Working with silver, glass and ceramic she creates a range of one-off pieces and limited edition collections. In order to fabricate, form, texture and polish each individual piece of jewellery, she combines a variety of traditional fabrication methods, with glass fusing and ceramic bead making techniques. Bold dichroic glass accents, textile & ceramic elements, etched patterns and raised surface textures are often used by Aurora to add contrast and interest.

[www.auroralombardo.com](http://www.auroralombardo.com)



### **Research inspiration:**

## **David Labonte**

Geckos can comfortably hang from one toe, and ants easily carry items multiple times their own body weight up plant stems – the natural world is full of climbing experts. But how do these animals manage to stick to even the most challenging surfaces, while simultaneously being capable of seemingly effortless locomotion? In this talk, I will reveal some of the tricks employed by climbing animals.

[www.clare.cam.ac.uk/Fellows-and-Staff-Directory/dl416/](http://www.clare.cam.ac.uk/Fellows-and-Staff-Directory/dl416/)

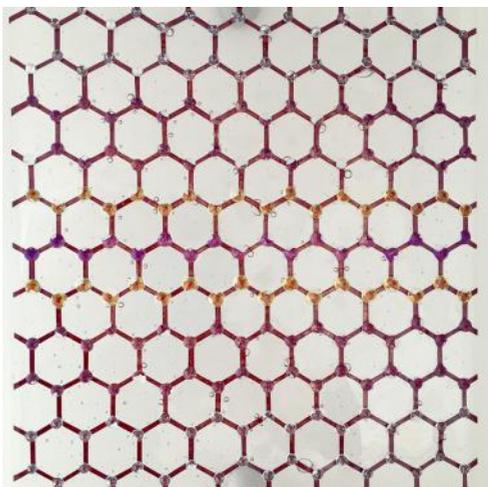




### 'The Trouble With Nanotechnology Is, It's Really Small'

The final piece is my creative reaction to the use of colloidal gold nanoparticles, which are used in many applications including targeted cancer drugs. At the nano-scale these particles do not appear gold in colour. Depending on their size, they range from reds to purples to blues, when viewed collectively in a suspension. I symbolised this by using dichroic glass to form tiny dots which are fused onto a hexagonal pattern representing the structure found in carbon nanotubes. These tiny wonders are used today in a myriad of applications from building bicycles to human tissue growth.

One of the first examples of the use of nanoparticles is in the beautiful glass made by the Romans. This iridescent glass was made by including tiny proportions of nanoparticles of gold and silver dispersed in colloidal form throughout the glass material. The Lycurgus cup in the British Museum is a fine example of the two-tone effect typical of dichroic glass.



Initially, we wanted to recreate this iridescent effect. This was attempted by building up layers of colloidal gold and silver nanoparticles within layers of glass. Alas, we did not create a spectacular result, so the final piece makes use of dichroic glass, made by applying multiple ultra-thin layers of metals onto glass, by a vacuum-deposition process.

#### Created by:

### Bex Burston

I make fun and optimistic pieces in either kiln fused glass or textiles. I love bright positive colours and imagery from nature, often with influences from retro fabrics, wallpaper and ceramics. I gained my BTEc Art Foundation at the Kent Institute of Art and Design, my BA (Hons) Applied Arts Practice at University of Hertfordshire and my PGDip Arts Management at Anglia Ruskin University. I work full time on my art from my garden studio, ably assisted by my cockapoo, Monty.

[www.bluedesignshed.co.uk](http://www.bluedesignshed.co.uk)



#### Research inspiration:

### Sir Mark Welland

Professor Sir Mark Welland was Chief Scientific Adviser to the UK Government Ministry of Defence. He is currently Master of St Catharine's College, and Head of Electrical Engineering and Director of the Nanoscience Centre at the University of Cambridge. Nanoscience can be used to adapt everything in our daily lives; from superhydrophobic structures to new therapeutics using gold nanoparticles for brain cancer. This talk will give a broad overview about the potentials and the challenges of technologies on the nanoscale.





### '400g'

'400g' is a laser cut etching on hand polished steel, taken from a photograph of a collision in the Large Hadron Collider photography chamber. The LHC provided evidence of the existence of Higgs Bosons, which provide mass to any particle they are part of. Steel was chosen as appropriately weighty to give the impression of mass when the piece is held in the hand. The obvious beauty of collision photographs had to be simplified, but the one selected was a good candidate for examination for evidence of Higgs Bosons.



### Created by:

#### Diana Probst

Diana Probst is a fine artist whose usual work is in oil paints and watercolour. However, she also does contract work for engineering clients, and Creative Reactions lets her reach outside anything she has previously done, working outside her own knowledge both in subject matter and materials.

[www.dianaprobst.com](http://www.dianaprobst.com)



### Research inspiration:

#### Sam Gregson

Sam's scientific journey really took off as a particle physicist, science communicator and all round resident anarchist at the University of Cambridge and the Large Hadron Collider Beauty (LHCb) experiment at CERN, Switzerland (thesis analysis). Now he looks to bring the joys of science to everyone: young and old, rich and poor, scientific veteran or beginner...

[www.clare.cam.ac.uk/Fellows-and-Staff-Directory/dl416/](http://www.clare.cam.ac.uk/Fellows-and-Staff-Directory/dl416/)





## Atoms to Galaxies

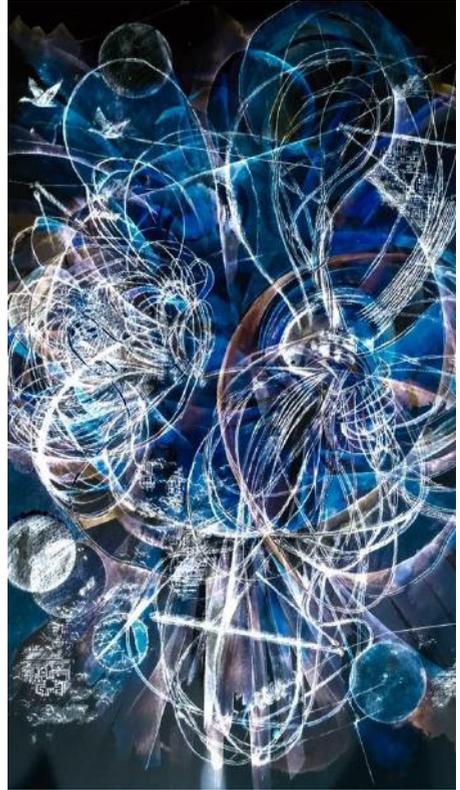
# THE SUN, OUR STAR

### ‘The Sun, Our Star’

In collaboration with Dr. Helen Mason OBE and her research on Solar physics, I have produced a series of experimental and dynamic artworks focusing on the Sun’s active regions. I have found particular interest in the imaging of magnetic energy and the way it becomes distorted and twisted by movement below the Sun’s surface.

Work exhibited and available in my browser has explored the theme with a variety of media including; intaglio, relief, transfer and screen-print printing methods and these have been combined with watercolour washes and drawing. Experimental, digital manipulation has commenced allowing vivid colours of the spectrum, evocative of the x-ray imaging used to view the Sun’s surface.

The main intention of all these artworks is to communicate and explore the Sun’s magnetic flux, both gentle and violent through the use of expressive mark-making. Additional symbols are integrated, including sunspot discs and fragments of electrical circuits, pondering the ultimate effect of expelled magnetic energy when it reaches the Earth.



#### Created by:

### Maria Merridan

Born in St Albans, Herts in 1970, Maria studied Illustration at Kent Institute of Art and Design (1989-1992) and more recently completed the Certificate in Printmaking at Curwen Study Press, Cambridge. She now lives and works as an artist near the Cambridgeshire/Bedfordshire border and is a part-time Lecturer in Art and Design at a local college. Her fine art works are often inspired by the themes of science, natural history, navigation, weather and journeys. Maria also produces contemporary, hand-made cards and other original printed paper-based goods under the name ‘Coded Storm’. [www.mariamerridan.info](http://www.mariamerridan.info)



#### Research inspiration:

### Helen Mason

The Sun, our star, gives us everything we need for life here on Earth. Observed from space it is spectacular and very dynamic. Sometimes it is peaceful and quiet, sometimes it rages and has huge explosions which can impact the Earth’s environment, causing the beautiful Northern Lights, and other less pleasant effects. [www.damtp.cam.ac.uk/people/h.e.mason](http://www.damtp.cam.ac.uk/people/h.e.mason)





**‘Monsters in the dark - the quest to find the most massive and extreme galaxies hidden from sight in the distant Universe’**

This collection of paintings came into existence though early beginnings as freestyle sketches with the exhibition theme ‘Monsters in the dark’ in mind. The theme relates to super galaxies at extreme distances that aren’t easy to see. Linked to the theoretical possibility of parallel universes established the idea to use art as a medium to express otherworldly ways to see and imagine.

Adopting an approach with similarities to automatic drawing (André Masson) the first graphic apparitions on my canvas suggested pure gesture, rhythm, incantation. Shapes, forms emerged as defined, thematic whilst other ideas remained in the abstract wilderness. The space between imagination and reality inspired further concepts later to what originally emerged. Therefore my improvisational process remained throughout until I considered the balance just right and the work had taken on a life of its own.

**Created by:**

**Martin Stephen**

**ART:** Expressionist painting with oil, gouache, acrylic, creative photography, video art, digital composite, multi-media. Influences : Abstract expressionism (1943 - 70); Cobra group (1948 - 51); Expressionism (1905 - 20)  
**MUSIC:** Improvisation (Keyboards, drums, guitars, vocal) utilising digital effects, emulators, composite techniques together with live session performances. Influences : Free - jazz (1950’s / 1960’s); German experimental scene / early progressive rock (1967 - 80’s); Psychedelia (1967 - 69)  
[www.facebook.com/martinstephenarts](https://www.facebook.com/martinstephenarts)



**Research inspiration:**

**Matt Bothwell**

Galaxies come in all shapes and sizes. But the most massive and extreme galaxies of all aren’t easy to see — they lurk in the distant Universe, hidden from sight. I will discuss the quest to find the Universe’s most extreme galaxies — the monsters in the dark.  
[www.astro.phy.cam.ac.uk/directory/dr-matthew-bothwell](http://www.astro.phy.cam.ac.uk/directory/dr-matthew-bothwell)





**‘The Human Habitat’**

**Created by:**

**Nisha Gorania**

I’m currently studying Illustration BA (hons) at Cambridge School of Art. I have a bold and graphic style, with confident use of colour and line. I can often be found out and about (probably sitting barefoot on the floor) drawing on location, which is when I’m at my happiest.

**[www.nishagorania.com](http://www.nishagorania.com)**



**Research inspiration:**

**Ozgur Akan**

The internet of things is a fascinating, expanding field between the internet and devices. Even though the technology has been around for a long time, recent research is only now beginning to focus on the development of nanomaterial-based neuro-interfaces for next-generation computer-driven diagnosis and treatment for the nervous system.

**[www.neuroscience.cam.ac.uk/directory/profile.php?oba21](http://www.neuroscience.cam.ac.uk/directory/profile.php?oba21)**





## NEW TECHNOLOGIES FOR INTERFACING WITH THE BRAIN



### ‘Interface Collection’

Whilst my jewellery designs are usually handcrafted using traditional metal smith techniques, I’ve planned to learn the CAD Jewellery Modelling and Additive Manufacturing (aka 3D Printing) process for a while. My ‘creative reaction’ ideas

were more achievable using the computer aided modelling software and printing application, plus this type of prototype manufacturing is commonly used in the research labs in such scientific fields; so when I was paired with George Malliaras, Professor of Bioelectronics and Brain Interface Devices, it was the perfect reason for me to pursue this new avenue.

I’ve been on a steep learning curve teaching myself the basics of industry leading 3D modelling software and experimenting with various printing materials and applications. These new techniques enabled me to create a small collection, consisting of a choker necklace, cuff bracelet and brooch produced in SLA resin that is inspired by the brain and electronic circuitry interface. The pieces have then been hand finished with a spray paint and detailed with silver and brass metal features in the considered recessed shapes within the designs – interfacing traditional and technology productions.

### Created by: **Lorraine Hitt**



My former design career disciplines, including Graphic, 2D/3D Cad, Furniture and Architectural Interior are prevalent in my jewellery designs, which are all inspired by my love of simple visual forms, incorporating functionality and practicality. I currently handcraft my contemporary jewellery with highly polished brass and silver, sometimes combining the two - I’m also in the process of learning CAD Jewellery Design / 3D Printing and have experimented with this process for my ‘Creative Reaction’ – I’m excited to see how this new skill evolves my designs in the future.  
[www.elsiemjewellery.co.uk](http://www.elsiemjewellery.co.uk)

### Research inspiration: **George Malliaras**



One of the most important scientific and technological frontiers of our time lies in the interface between electronics and the human brain. I will show examples of novel devices for recording and stimulation of the brain that offer tremendous opportunities to improve our understanding of brain physiology and pathology and to deliver new therapies.  
[www.eng.cam.ac.uk/profiles/gm603](http://www.eng.cam.ac.uk/profiles/gm603)



## Beautiful Mind

# CASTLES IN THE AIR: MAKING AND INHABITING A DIFFERENT REALITY

### ‘Mind the Gap’

We make sense of the things around us through a combination of the world we have experienced and the world that is in front of us. Our brain fills in the gaps between the two as best it can, adjusting to the patterns it learns along the way. Hallucinations can be seen as a consequence of a disturbed negotiation between brain and world, as someone strives to make sense of the ambiguous.

In my painting I symbolise the patterns we’ve learnt from our experience (internal), layered with the input we receive from our senses (external), and consider the gap between these two that our brains try to fill to make sense of the world around us.



### Created by:

#### Kate Green

I’m an abstract artist and work from my garden studio, when not painting live at an event. I use paint to ‘sing with colour’. Visceral, visual utterances of shape, hue and mark are my vocabulary. I love colour, pattern, detail and mess. I’m excited by the extravagant dimensions and intimate details that I see in creation - a joyfulness in the very act of creating that I aim to reflect in my own work.

[www.flourishandfly.co.uk](http://www.flourishandfly.co.uk)



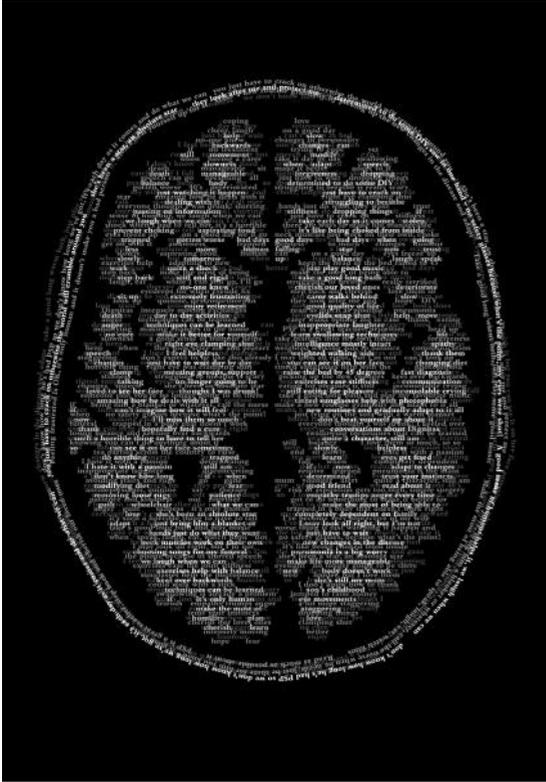
### Research inspiration:

#### Paul Fletcher

One of the most mysterious experiences that we come across in psychiatry is “psychosis”, which refers to a loss of contact with reality. It has many causes and manifestations and it poses major challenges to our understanding. I propose the view that it can actually be understood in terms of the normal functioning of the mind, which seeks to construct a working model of reality even though it has very little direct contact with that reality.

[www.fletchergroup.psychiatry.cam.ac.uk](http://www.fletchergroup.psychiatry.cam.ac.uk)





### ‘Adapting’

‘Adapting’ emerged from conversations with Dr. Timothy Rittman about Progressive Supranuclear Palsy (PSP), a rare form of dementia. The text in this piece is from interviews of people with PSP and their families talking about the challenges of the neurodegenerative disease and how they rise to them on a daily basis. The full interviews are available on the PSP Association’s YouTube channel.

The human brain is immensely resilient and complex, with neurons constantly re-routing around areas of damage to maintain function. We often think of our thoughts as a single stream of consciousness, or perhaps a cloud of feelings and ideas, but it is more like a palimpsest of conversations discussing problems and navigating obstacles.

### Created by:

**Emma Mayoux-Andrews**



Since graduating in Fine Art in 2014, I have been studying towards a health sciences degree while working as a graphic designer/illustrator with Oxford Designers & Illustrators. I see art, science and design as a means to communicate with the world, to listen more closely and reply to the wonderful and terrible things it presents us. As a scientist, I hope to contribute to preventing the premature loss of cognition and expression caused by neurodegenerative diseases to improve quality of life. As an artist, I hope to provide a platform for conversations to take place.  
[emayouxandrews@gmail.com](mailto:emayouxandrews@gmail.com)

### Research inspiration:

**Timothy Rittman**



The brain is a noisy and chaotic network, shuttling information from place to place. This talk will look at some of the principles that underlie brain networks, making use of mathematical models and network theory in health and disease. This will be a trip through an emerging story that is fundamental to our understanding of how our brains are beautifully, if a little chaotically, put together.

[www.neuroscience.cam.ac.uk/directory/profile.php?tr332](http://www.neuroscience.cam.ac.uk/directory/profile.php?tr332)



### ‘Beauty and the Beast’

This trilogy, that should be observed from the bottom to the top, depicts the evolution of ‘Satellite Communications’ from a contemporary perspective with focus on the past, present and future. The starting scene, at the bottom, represents Edmund Burke’s notion of nature as the most sublime object to mankind and the deployment of satellites into space reflects the manipulation of nature by mankind.

Of course, this manipulation of nature can be seen as a method of extracting knowledge from foreign atmospheres and provides us with the ‘beauty’ of knowledge. However, it simultaneously pollutes the atmosphere with various satellites that can be classed as ‘space junk’ and can be referred to as the ‘beast’ of this process. The exacerbation of satellites polluting space is depicted in the second frame to show the excess amount of metals that orbit the earth whilst we indulge into contemporary routines, such as phone calls, surfing the internet and watching television.



### Created by:

#### Louissa Bolah



I am currently a History undergraduate, specialising in early modern Europe as I go into my final year and hope to progress into the publishing sector, as a writer and artist. I have always pursued art alongside my studies as I luxuriate in having the time to fuse Fine Art and Illustration together and creating a psychedelic mood.

[www.louijart.wordpress.com](http://www.louijart.wordpress.com)

### Research inspiration:

#### Pablo F. Medina



The world is evolving at a pace never seen before: autonomous cars, drones, internet access on aeroplanes. Satellite communications are vital to realise this technology, starting from the electrons that form an electromagnetic wave all the way to the challenge of communicating with satellites. For the best and the worst, the future of worldwide wireless communications is looking at the stars.

[www.linkedin.com/in/pfmedina](http://www.linkedin.com/in/pfmedina)



## Beautiful Mind

# APPLICATION OF TECH FOR THE CARE OF PATIENTS WITH DEMENTIA

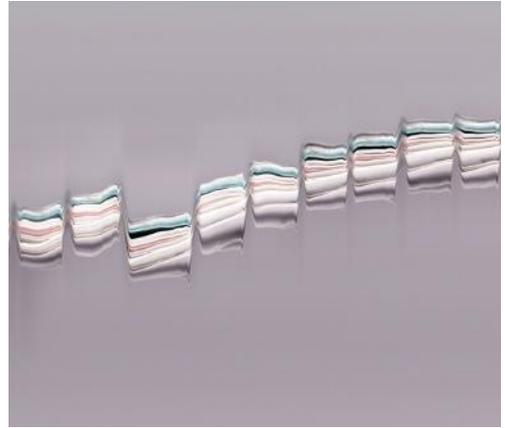
### ‘Silent Shift’

These photographic works are taken from a series made using an archived collection of personal letters written from Istanbul to England in the early 1990s. The letters, written on a range of paper have been stored and changed colour over a period of 25 years.

Using an intuitive methodology of moving and re-stacking the letters on the scanning bed, the letters interact with the set parameters of the digital screen. In this liminal and unseen space, tacit knowledge may allowed to emerge through form embodied and unanticipated. The photographs record these nuances of shift with the same set frameworks of:

- Materials (the stack of personal archival letters)
- Tools (the parameters, dimensions and route the scanner light takes)

It is the person who may intuit with iterated difference (J Derrida) each time the material is interacted with and where



new knowledge can occur embodied in emergent forms (H Bergson).

Creative Reactions conversations with Dennis Chan, Cambridge University clinical neuroscientist, have resonated in regard current smartphone tracking software, which may be able to map the silent, yet small shifts in everyday behaviour as a key to diagnosing not yet emergent symptoms of Alzheimer’s disease.

### Created by:

## Anna Fairchild

Anna is a practising artist and lecturer in Fine Art and Photography. Her current practice explores and investigates themes of fragmented place, time and memory through sculpture and photography.



Using an intuitive approach to fluidity of materials and processes contrasted with flat, hard surfaces and set parameters, the work takes the approach that we tacitly know more than we can tell (M Polanyi, 1966) and knowledge and memory can emerge through form (H Bergson, 1911).

[www.decodingdissonance.tumblr.com](http://www.decodingdissonance.tumblr.com)

### Research inspiration:

## Dr Dennis Chan

The current tech revolution will have the greatest societal impact since the Industrial Revolution. Smartphones are part of daily life. AI is used from internet searches to self-driving cars. Applied carefully, this revolution can transform the care of people with dementia, from apps to detect early Alzheimer’s disease through to virtual and augmented reality to support people at home. This talk will paint a vision of this future.



[www.neuroscience.cam.ac.uk/directory/profile.php?dc598](http://www.neuroscience.cam.ac.uk/directory/profile.php?dc598)



## Beautiful Mind

# CHEMISTRY OF THE BRAIN - WHY WE FEEL HAPPY, WHY WE FEEL SAD (AND WHAT WE CAN DO ABOUT IT)

### ‘Neurochemical Fingerprints’

This artwork was inspired by the collaboration with Dr Andreas Berner, Lecturer in Molecular Informatics in the Centre for Molecular Sciences Informatics, University of Cambridge.

His work focus on neurochemical fingerprints of psychiatric drug. Mental states/diseases and chemistry of the brain (neurotransmitters) are linked; using lifestyle changes can be very efficient to influence mood (sports, meditation etc.), often as efficient as using medication.

My artwork depicts at the centre the most effective protective method for our brain: physical exercise and the latest tool used by scientists (microdissection) to measure different neurochemical fingerprints in the brain. Different neurotransmitters such as dopamine, noradrenaline and serotonin are depicted in more details.

SYPHAD (Systematic Pharmacological Database), the world’s largest database



of neurochemical fingerprints of neuropsychiatric drugs on rat brain, developed Dr Andreas Bender team is shown schematically.

Different methods such as mindfulness, mediation, yoga and the healing effect of nature are shown as a reminder that a lifestyle change can be very efficient on the mental states/diseases.

### Created by:

## Crina Samarghitean

Crina is a Romanian/Finnish artist, doctor and scientist, born in Bistrita, the gate of Transylvania, currently living in Cambridge, UK. She was selected to art school when she was a child and won many national art competitions in school. Since 2010, she participated and organised various art exhibitions in medical conventions/ bioinformatics meetings and different other venues. With her artworks she aims not only to communicate difficult concepts in science and medicine but also to improve wellbeing.

[www.facebook.com/IMMUNO\\_PIDart-397449166981071](https://www.facebook.com/IMMUNO_PIDart-397449166981071)



### Research inspiration:

## Andreas Bender

Brain chemistry influences our well-being, and our well-being influences brain chemistry – while this seems obvious today, it hasn’t always been this way (at least not in Western culture). In this presentation, we will show in which way our brain chemistry impacts us – and how to improve our well-being, using both ‘healthy habits’ (such as sports and meditation) and drug treatments (and everything in between) as examples.





## Beautiful Mind

# REPAIRING THE HUMAN BRAIN – TRUE OR FALSE?

### ‘Parkinson’s Triptych’

This work comprises a linked set of three artist books. Together they create an immersive and interactive whole exploring both the progression of Parkinson’s Disease and the stem cell therapy research of Professor Roger Barker:

Book 1 is a freestanding zig-zag formed book used to create an impression of the basal ganglia of the brain which contains the midbrain and substantia nigra.

Book 2 is a spiral bound book of the same pages unfolded on light brown paper representing the healthy substantia nigra.

Book 3 is a spiral bound book in the same form as 2 but on cream paper representing the dopamine depleted substantia nigra indicative of Parkinson’s Disease.

Books 2 & 3 are contained within the walls of book 1 along with the remnants of the dopaminergic cells lost through the pages. These fragments are arranged in the shape of the substantia nigra within the midbrain. Handset and letterpress



printed text in 18pt, 12pt and 6pt Baskerville italic portrays the common symptom of decreasing handwriting size in this disease, each text being a quote from a Parkinson’s celebrity. Handwritten additions to pages explain symptoms & research as notes in a clinical notebook. Typographic pattern explores and illustrates the progress of the disease in the brain.

### Created by:

## Elizabeth Fraser

As an artist printmaker Elizabeth Fraser currently works mainly with handset metal type and linocutting. With a BA(hons) in Graphic Design and an MA in Printmaking she has exhibited locally, nationally and internationally, and is an active member of the British Printing Society. She likes colour, pattern, letters and numbers. She enjoys playing with the material visualisation of language and exploring its role in the communication of place, memory and time. Elizabeth works from her garden studio in a village near Cambridge which will be open to the public as part of Cambridge Open Studios this July. [www.frauhaus.co.uk](http://www.frauhaus.co.uk)



### Research inspiration:

## Roger Barker

The ability to repair the human brain has always been something we would like to do, so that we can help patients with diseases of it. Over the last few years, we have started to discover that we can do just that. This has been done by harnessing the brain’s own capacity for repair as well as through delivering growth factors or transplants of cells. In this talk I will discuss all this with particular respect to Parkinson’s Disease.

[www.thebarkerlab.co.uk](http://www.thebarkerlab.co.uk)





## Beautiful Mind

# HALTING NERVE CELL DEATH AND IMPROVING QUALITY OF LIFE IN PROGRESSIVE SUPRANUCLEAR PALSY



### Created by:

#### Alan Rogerson

I like to draw a funny little world of strange and unusual things. An individual mixture of surrealist pop imagery based on the world I think I see. It all comes from the fun side of our darker lives, the fairy tales that Grandma used to tell us and our thoughts that wake us up in the middle of the night. I then mix things up with a little bit of day time television, over heard conversations and the arguments I have with myself.

[www.bagelboy.wordpress.com](http://www.bagelboy.wordpress.com)



### Research inspiration:

#### Luca Passamonti

Progressive supranuclear palsy (PSP) is an aggressive neurological disorder that is caused by the premature loss of nerve cells in certain parts of the brain. I present a recent international clinical trial that aims at halting the inevitable progression of the cell death in PSP. We hope to increase the life expectancy and quality of life of people suffering from this devastating illness.

[www.ftd.neurology.cam.ac.uk/directory/lucapassamonti](http://www.ftd.neurology.cam.ac.uk/directory/lucapassamonti)





The image shows several face expressions deformed as patients that lose cognitive abilities have trouble identifying them. In the foreground there is text from Life of Brian as they also lose ability to recognise jokes. Finally it all spins around the eye, as it is the part of the face that is more expressive in my opinion.

**Created by:**

**Xorge Castro**

Xorge studied industrial design and has been part of a life drawing group in Cambridge since 2012.

[www.x-castro.com](http://www.x-castro.com)



**Research inspiration:**

**Rohit Sinha**

Operating on the brain poses obvious risks to vital functions and the very 'being' of a patient. When treating brain diseases such as cancer and stroke with surgery, a core aim is to spare the healthy nearby brain tissue. In this talk Rohit will discuss the progress so far in our aim to save healthy brain during surgery and how current research may improve the safety of surgery in future.

[www.crukcambridgecentre.org.uk/content/clinical-research-fellow-profile-rohit-sinha-2017-cohort](http://www.crukcambridgecentre.org.uk/content/clinical-research-fellow-profile-rohit-sinha-2017-cohort)





## Our Body 1

# APPLICATION OF MAN-MADE SUPER STEM CELLS IN DISEASE RESEARCH AND DRUG TESTING

**‘From Dish to Body: the importance of induced pluripotent stem cells in our understanding of cell development, function, and disease.’**

In a petri dish, the earliest stages of heart cells already flash with a steady beat while growing – much like the fully developed organ will be beating in the body once the process of development is completed. As the cells in a dish multiply they synchronise and flash as one.

Meanwhile, neurons in a dish appear to explode like fireworks. They reach out and connect with their surrounding cells with fine ever developing strands – an indication of how the fully developed brain structure will reach out into the world, connecting and interacting with the surroundings. The cells behave as if they already know what they are about to become.

I visited Yichen Shi at Axol Bioscience Ltd which supplies scientists with an assortment of induced pluripotent stem cells for research purposes. While there,



I was shown different cell structures and observed their behaviour under a microscope. In combination with the visit I also browsed their website and found remarkably beautiful images of different cell types. This experience stimulated work in ceramics which explores the rich diversity and beauty of early cell structures.

### Created by:

## Charlotte Morrison

Charlotte undertakes projects and makes collections of work which explores different aspects of the human condition. She is interested in multiple perspectives of the person – and explores what happens when medical and scientific, personal and political aspects collide. She works in kiln formed glass and ceramics, with print, text and photography. For the past few years she has been involved in interdisciplinary collaborations while also undertaking several art-residencies. She exhibits regularly in different institutions in London and Cambridge.

[www.charlotteartworld.com](http://www.charlotteartworld.com)



### Research inspiration:

## Yichen Shi

Human stem cells extracted from adult tissues are commonly used for regenerative medicine research and tissue repair. In this talk, Dr. Shi will tell you about a different usage of stem cells – disease modelling and drug testing, using a special type of human stem cells created with the Nobel Prize-winning genetic reprogramming technology.

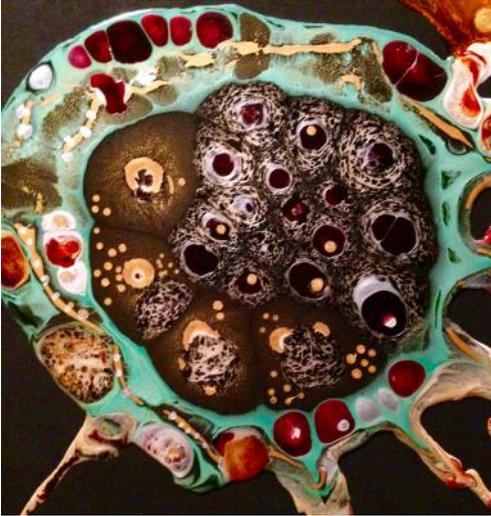
[www.linkedin.com/in/yichen-shi-346ab916/](https://www.linkedin.com/in/yichen-shi-346ab916/)





## Our Body 1

# BREAKING DOWN TUBERCULOSIS' DEFENSES AT THE MOLECULAR LEVEL



There is nothing more fun than a great pathological description, and Tuberculosis is no different. One of my favourites is a 'Ghon Complex'. Anton Ghon (1866-1936) was an Austrian pathologist who spent his life researching "Consumption" as it was known. When there is a combination of a TB

granuloma in the lung, and involved hilar lymph nodes on the same side, it's called the "Ghon Complex" This can be seen as spots on X-ray, or at Postmortem.

My artistic response to Dr Will Conrad's research reflects on both time and pathological process. Dr Conrad works with The Ramakrishnan Group at MRC Lab of Molecular Biology, Cambridge. Years of research have focused on understanding pathological and immunological responses to *Mycobacterium tuberculosis* in humans by studying *Mycobacterium marinum* in Zebrafish. The Ghon Complex, is something that develops over many years, usually as a result of childhood TB.

My art shows abstract representations of Ghon complexes, ribcages, granulomas, and the watery environment of zebrafish populations. In the same way that TB is difficult to control, the resin medium lends itself to an uncontrollable abstract, fluidity, that changes in front of your eyes, despite attempts to restrain and direct it.

### Created by: Kate Grant

Kate is a GP and has painted for over 20 years. She has provided art for multiple medical non-profits fundraisers in the USA and U.K. She has collaborated with The Cambridge Brain Unit, Wellcome Genome Campus, Stem Cell Institute Cambridge. Last year her art was installed on the Home page of Citigen.org, a genomic data research company, with the original at the University of Copenhagen. Later in 2018 her work will be part of a 6 month exhibition at the Sci-art Center New York. Kate currently works at a GP Practice in Norwich where there is a permanent art gallery in the waiting room. [www.paintscientific.com](http://www.paintscientific.com)



### Research inspiration: Will Conrad

The mycobacterium that causes tuberculosis infects one-third of world's population. Despite our efforts, it remains one of the top 10 causes of death worldwide and drug resistance is on the rise. Thus, there is a need for novel antibiotics that exploit new drug targets. My research focuses on the *Mycobacterium marinum* model of infection in zebrafish, which allows us to study the disease rapidly, safely, and at earlier stages of disease progression. We have discovered a mycobacterial gene we call TmID (pronounced 'timid'), which affects mycobacterial ability to survive in our bodies. [www.med.cam.ac.uk/ramakrishnan](http://www.med.cam.ac.uk/ramakrishnan)





## Our Body 1

# DESTROYING PROTEINS INSIDE HUMAN CELLS: HOW AND WHY?

### ‘Seeds of Life’

I have used the dandelion seed head as an analogy to show how scientists are developing new technologies to selectively destroy cellular proteins within Human cells. I have used the different parts of the plant to symbolize the scientific process involved with this technology. I have done this by making each individual seed into an antibody symbol. Some of these antibodies also have TRIM 21 symbols attached in the form of a cross. Those seeds with both symbols entwined are dispersed by the wind, with the wind acting as a proteasome. The protein is therefore dispersed and destroyed.

Scientists believe that the destruction of this protein and understanding cell biology will help cure diseases such as cancer and neurodegeneration. My print illustrates that just as seeds from a dandelion create new life, here, the seeds embody a scientific process that scientists’ hope will cure disease and ultimately give people new life.



The print is a five-colour linocut with the dandelion in the foreground and the Cambridge skyline in the background. Each colour block is hand cut using sharp bladed tools; inked using a roller and hand printed using a printing press. This is one of a limited edition of 20.

### Created by:

#### Kate Heiss

Kate is a contemporary Printmaker creating limited edition screen prints and linocuts. She graduated with an MA in Textile Design at the Royal College of Art in 1997, and worked as a Textile Designer across a wide range of fashion brands before setting up her own printmaking studio in 2011. Kate creates dynamic, illustrative prints inspired by her love of flowers and nature in her studio in Hertfordshire. Kate’s designs have been used for the stationery/homewares market and has featured in a variety of books. She has worked with Art Angels, Woodmansterne, Camden Graphics, Athena, and John Lewis. [www.kateheiss.com](http://www.kateheiss.com)



### Research inspiration:

#### Dean Clift

All the cells in our body contain thousands of molecular machines called proteins, which carry out almost all biological processes that are essential for life. Many diseases such as cancer and neurodegeneration are caused when these protein machines go wrong. Scientists are developing new technologies to selectively destroy cellular proteins with the hope of understanding cell biology and curing disease. [www2.mrc-lmb.cam.ac.uk/group-leaders/h-to-m/leo-james/](http://www2.mrc-lmb.cam.ac.uk/group-leaders/h-to-m/leo-james/)





## Our Body 1

# GROWING BRAINS IN A DISH - HOW AND WHY



### 'Something new, 2018'

Something new, 2018 is a video installation, a creative reaction to the work of Dr. Iva Kelava from MRC Laboratory of Molecular Biology Francis Crick Avenue. Iva's Lab work focus on understanding the evolution and development of the human brain through creating brain organoids or brain

on a dish. I have chosen natural objects and a household dish to create a video installation. I am a visual artist I use different mediums depending on the idea, subject of exploration. The main focus of my work is participatory art that respond to moments in movements. Mo[ve]ments.

#### Created by:

### Loreto Valenzuela

I was born in Santiago, Chile where I initiated my performance practices with the inspirations of directors; David Musa, Vicente Ruiz, and Hector Noguera. I have lived in Cambridge since 1997. I set up the Wolfson Performing Art Society in 2008 where I devised live arts performances, happenings and art installa[c]tions and other collaborative participatory interventions. Recent works include: Cambridge Draw itself; Cambridge Sustainability Residency; #popmy.bubble Documenta; A table of resistance Gallery 9 Cambridge. I am an art facilitator for newly open Kettles Yard, Cambridge.  
[www.loretovalenzuela.com](http://www.loretovalenzuela.com)



#### Research inspiration:

### Iva Kevala

Growing brains in a dish, or minibrains, as we like to call them, is an amazing new method, which allows us to track the development of human and other species' brains as never before. How do we make these brains grow, and what are the questions we would like to answer using them? Can these brains feel and think? Is the method dangerous from an ethical point of view? Come and find out about our work on brain development and evolution and enjoy a pint of beer with it.  
[www2.mrc-lmb.cam.ac.uk/group-leaders/h-to-m/madeline-lancaster](http://www2.mrc-lmb.cam.ac.uk/group-leaders/h-to-m/madeline-lancaster)



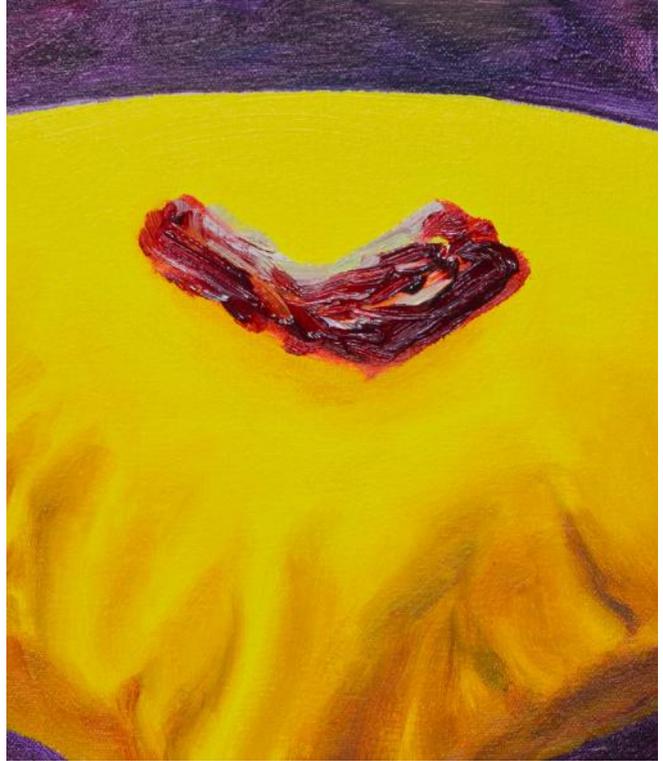


## Our Body 1

# GENE ACTIVITY IN HUMAN DEVELOPMENT

### 'Adam'

Athene was amazed to discover the prevalence of using skin stem cells from new-born foreskins to not only produce skin grafts but also for anti-ageing skin creams. One foreskin can be used for a surprisingly long time; Athene's interest was spiked when she heard a medical researcher talking about how his lab had used the same foreskin for 12 years, he jokingly invited everyone to it's bar mitzvah next year. 'Adam' takes it's title from Genesis and evokes thoughts of Eve being created from Adam's rib. Thick impasto describes glistening flesh, exploring ideas of the abject and confronting the notion of our bodies as pure matter.



### Created by:

#### Damaris Athene

Athene graduated from Camberwell College of Arts in 2015 and explores the corporeal and abstraction of the human form. The body becomes unrecognisable: images are re-appropriated from medicine, scale is vastly changed or body parts are digitally manipulated. The beauty in these seemingly abstract images seems at odds with their subject matter, creating a fascinating dichotomy. In 2017 Athene was selected for 'Platform for Emerging Arts #15' at the Leyden Gallery in London and held her first solo show.

[www.damarisathene.co.uk](http://www.damarisathene.co.uk)



### Research inspiration:

#### Peter Rugg-Gunn

During early development, the human embryo undergoes a transition where cells become specialised and are orientated to be the building blocks of the future body. Epigenetic processes that control gene activity have instructive roles in these events. My talk will discuss how epigenetic changes silence whole chromosomes in human embryos, choreograph DNA folding, and influence how cells specialise.

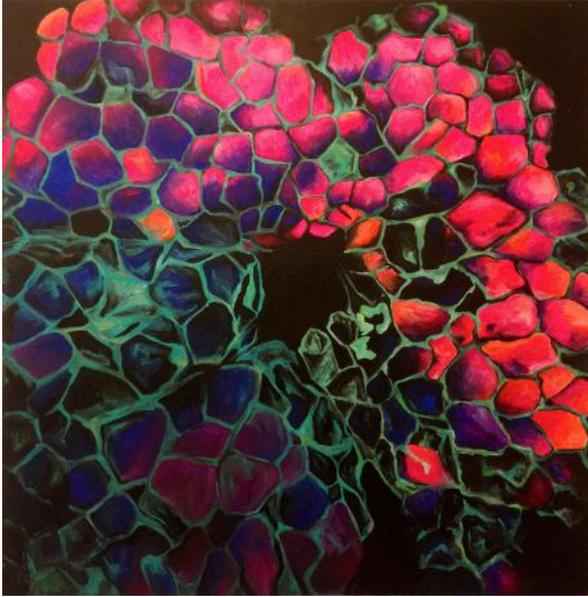
[www.babraham.ac.uk/our-research/epigenetics/peter-rugg-gunn](http://www.babraham.ac.uk/our-research/epigenetics/peter-rugg-gunn)





## Our Body 1

# ADULT LIVER AND PANCREAS ORGANOIDS



### ‘Regeneration’

This project centres around a theme of regeneration: the capacity for life to repair and renew itself. I was particularly struck by this immunofluorescence image from Huch’s lab which to me wonderfully

captures this concept. It illustrates the process of stem cells forming into mature liver cells. The vibrancy of the colours and cyclical nature of the image are a perfect metaphor for regeneration.

#### Created by:

### Rachel Scott

Rachel Scott is a final year medical student studying in Cambridge. Throughout her time as a student she has tried to set aside time for her art work: taking on projects such as set design for the Addenbrooke’s pantomime, or sometimes just relaxing on the weekend with some paints and a new idea. Acrylics are her favourite medium but recently she has been enjoying the subtlety of gouache and takes a travel set with her to all her hospital placements.



#### Research inspiration:

### Mikel McKie

The liver and pancreas are critical organs maintaining whole body metabolism. Historically, the expansion of adult-derived cells from these organs has proven challenging and this has hampered liver and pancreas stem cell biology. Recently, advances in culture conditions have allowed the culture of adult-derived liver and pancreatic material into mini “liver and pancreas organoids” - organs in a dish. [www.pdn.cam.ac.uk/directory/meritxell-huch](http://www.pdn.cam.ac.uk/directory/meritxell-huch)



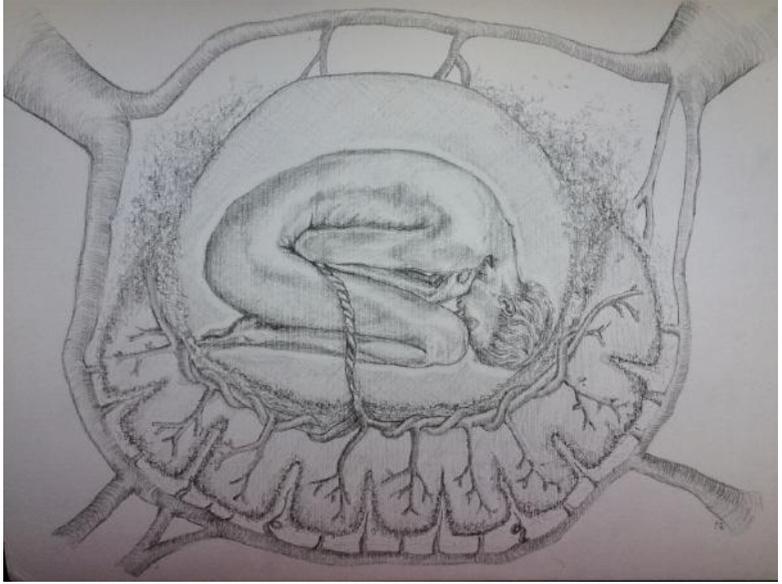


## Our Body 1

# EMBRYOLOGY 2.0: THE BEGINNINGS OF LIFE IN A DISH

### ‘Age Unknown’

Hearing about Marta’s research was fascinating – not just from a scientific perspective but also from an ethical standpoint. Marta’s research group have developed a new in vitro system, allowing researchers to culture human embryos beyond the point at which they would implant into the uterus. This will allow further research into embryonic development and potentially contribute towards finding out why some pregnancies fail. The legal and ethical limit for culturing embryos in the



laboratory is up to day 14. I decided to base my artwork on the potential result of this law not being in place – to what age could we culture human embryos?

### Created by:

#### Louisa White

Final year medical student,  
University of Cambridge



### Research inspiration:

#### Marta Shahbazi

The journey of human development is initiated with the fertilization of the egg. With the advent of assisted reproduction this journey may begin in a dish. The fertilized human egg develops in vitro until day 5-6, when it is transferred to the mother to allow implantation into the uterus and developmental progression. But what happens if instead of transferring the embryo we culture it longer? And if we dissociate the embryo into its building blocks -the stem cells- could we build the embryo back? Let’s explore the self-organizing properties of human embryos and embryonic stem cells.

[www.zernickagoetzlab.pdn.cam.ac.uk](http://www.zernickagoetzlab.pdn.cam.ac.uk)





## Our Body 2

# HARNESSING MICROBIAL MACHINERY IN THE HUNT FOR NEW ANTIBIOTICS



1. *Streptomyces* sp.
2. *Pseudonocardia* sp.
3. *Acromyrmex octospinosus*
4. *Leucoagaricus gongylophorus*

### ‘Symbiosis’

Since the discovery of penicillin in 1928, mankind has been locked in a constant arms-race, with every new antibiotic soon beckoning another wave of antimicrobial resistance. With the ever-rising threat of antibiotic resistance, the search for new antibiotics is more important than ever.

The leaf-cutter ants of the Attini tribe (genera *Atta* and *Acromyrmex*) appear to be

caught in an evolutionary arms-race similar to our own. The ants have been culturing and harvesting a fungal crop for over 50 million years, an ancient relationship that has reciprocally shaped both their existences. The fungal crop has evolved inflated hyphal tips (gongyliidia) that grow in bundles and contain a concentrate of amino acids, lipids and enzymes, specifically for feeding the ants. The ants, in turn have evolved a biological weapon to protect their precious crop from parasites – their own antibiotics. Filamentous bacteria colonise the ants, each containing the adaptive microbial machinery to synthesise an evolving spectrum of antibiotics in the face of developing resistance.

Fungus, ant and bacteria – all three are interdependent on each other, their lives intertwined a 50-million-year-old evolutionary dance, a partnership both beautiful and rewarding – not unlike the partnership of science and art.

### Created by:

#### Marcus Sim

I am in my final year student doctor at the University of Cambridge with a fondness for both scientific and creative exploration. I also run a small online shop at [www.redbubble.com/people/mearecus](http://www.redbubble.com/people/mearecus) where I donate 100% of the profits to leading effective charities such as the Against Malaria Foundation.

[www.redbubble.com/people/mearecus](http://www.redbubble.com/people/mearecus)



### Research inspiration:

#### Wayne Bowen

The availability of potent antibiotics is taken for granted in the modern era. Every year, however, the global antibiotic resistance problem gets a bit worse, and currently our best drug discovery efforts are only slowing down the onslaught. We need ingenious ways to discover new bug-defeating drugs, and fast. New approaches have emerged to explore the depths of microbe biochemistry for previously unexploited compounds.

[www.ttp.com](http://www.ttp.com)





## Our Body 2

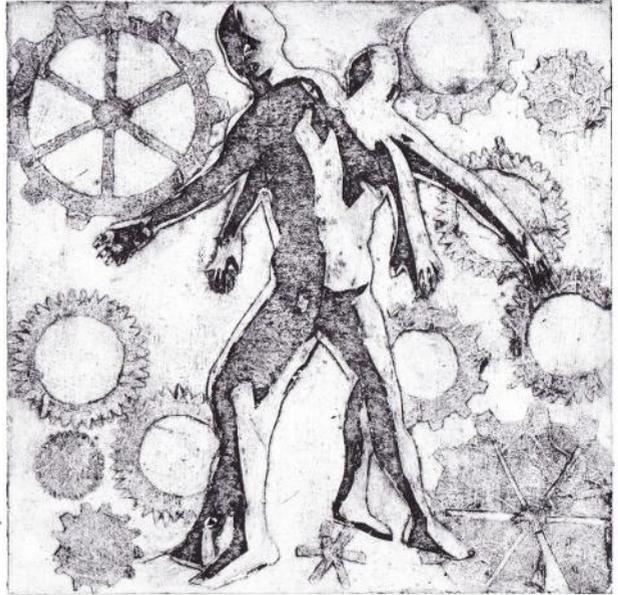
# DNA REPLICATION - SUSTAINABLE GROWTH IN BIOLOGY

### ‘Heads, Shoulders, Knees and Toes’

My partner and his team work on DNA replication: how the cellular machinery finds the replication points within the tightly folded genome, and what can go wrong.

As a printmaker, the process of image making also involves both duplication and mistakes. I made a collagraph plate and used the resulting prints to make the miniature book covers, as the source imagery for the book contents, and as prints in their own right.

The books in their frames represent the folded DNA, waiting to be unpacked and replicated. Inside, I have used the children’s rhyme ‘Heads, Shoulders, Knees and Toes’ as a tongue in cheek reference to the effects of errors in DNA replication, which can result in duplication of some parts of the genome.



I have also chosen to also display the inked plate itself, a photograph of my etching press – the machinery of printmaking – and some printing mistakes.

#### Created by:

### Jackie Duckworth

I am an illustrator, printmaker and textile artist, based near Cambridge. I studied Illustration at the Cambridge School of Art. I love the physicality of printmaking, particularly making linocuts. I also have an etching press which I use when I layer monoprints with linocuts, and to make collagraphs. When working on my own projects, I am inspired by history, myth and legend; birds and beasts. My illustration work usually integrates hand drawn or hand printed imagery with digital techniques; my textile artworks are large pieced and quilted wall hangings, made on commission.

[www.jackieduckworthart.wordpress.com](http://www.jackieduckworthart.wordpress.com)



#### Research inspiration:

### Torsten Krude

Each cell in our bodies has one full complement of the genetic information required for us to develop, grow and live. It contains 2 meters of DNA, with 3 billion letters of information. I will outline how this information is organized as chromosomal DNA, how it fits into the tiny sphere of a cell, and how it is replicated so that each daughter cell receives a full copy during cell division.

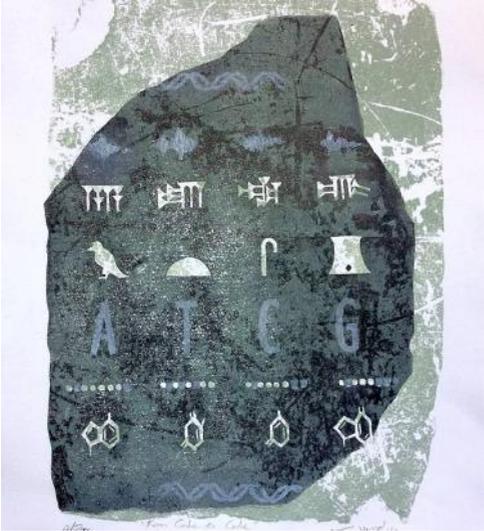
[www.zoo.cam.ac.uk/directory/dr-torsten-krude](http://www.zoo.cam.ac.uk/directory/dr-torsten-krude)





## Our Body 2

# ENGINEERING DNA FOR COMPUTATION AND DIGITAL INFORMATION STORAGE



### ‘From Code to Code. Sharing, Storing, Solving: Evolution’

DNA-based data systems have the potential to store and share information and solve problems. Such systems could constitute a major cultural evolutionary step. The artwork “From Code to Code”

depicts the development of information and knowledge sharing, from DNA code-based biological evolution of the sound waves of human language, through carved Sumerian cuneiform symbols, to Egyptian hieroglyphics. The Roman and other alphabets and printed type revolutionized sharing and storing of knowledge. Binary-based storage and computing further facilitated information storage and opened up powerful computing powers. DNA and its nucleotides comprise a potential next revolutionary step in providing a stable, compact and efficient matrix for sharing, and storing information and for problem solving.

The mixed print media art-work depicts the progression of the DNA code on a ‘Rosetta Stone’-like tablet, giving a translation of the DNA nucleobases (Adenine, Thymine, Cytosine, Guanine) in the various ‘languages’ from sound to binary to DNA. The background to the piece was printed from an old lithographic stone.

### Created by:

#### Tony White

Tony White is a painter and printmaker, and musician as well as a former research biologist.

Tony is past Chairman of the Society of East Anglian Watercolourists and holds a certificate in Fine Art Printmaking. Tony’s artwork has been featured on exhibition stands and on magazine covers. He has had work in the Royal Watercolour Contemporary exhibition at the Bankside Gallery in London and in The Fabriano Paper Museum in Italy. This will be Tony’s fourth year as a participant in Creative Reactions as part of Pint of Science.

[www.tonewhite.com](http://www.tonewhite.com)



### Research inspiration:

#### Pierre Murat

The growing demands for computational ability and high-density storage systems have prompted researchers to explore alternatives to silicon-based digital computers. The parallelism of hybridization properties of DNA together with its high shelf life and compactness, has allowed DNA-based systems to rapidly progress from proof-of-concept studies toward systems that can rival established devices.

[www.ch.cam.ac.uk/person/pm473](http://www.ch.cam.ac.uk/person/pm473)





## Our Body 2

# THE BIG EFFECTS OF SMALL CHANGES IN THE CHEMICAL STRUCTURE OF DNA



### 'Waiting for Disco'

In preparation for Pint of Science I joined Alexandre Hofer while he was working on his project. I enjoyed drawing in the calm of the lab, where it was surprisingly peaceful. It was interesting noticing all the little details that make up a chemist's workspace, such as the penned notes on the safety glass, equations written on one of the lab coats like a scientific tattoo sleeve, and seeing that scientists really do carry lots of pens in their front pocket!



### 'Looking for Accents'

#### Created by:

#### Roxana de Rond



As an illustrator, I find inspiration in everyday events. I love to sketch snippets from people's lives - things that most everyone enjoys, but are special in their own right - like having coffee with a friend, reading in a cosy chair, walking the dog or having a picnic. I live in Cambridge with my two daughters and our dogs, Milligan and Bandit. My inspiration often comes from them, and my other friends and family, who often make appearances in my work.

[www.roxanaillustrations.co.uk](http://www.roxanaillustrations.co.uk)

#### Research inspiration:

#### Alexandre Hofer



Although the core genetic information stored in DNA remains unchanged, its chemical structure often undergoes small modifications. These subtle changes help living systems to control the use of different parts of their genetic information in different cells or life stages, as well as to adapt to changing environments. As a chemist, I try to develop a way to detect and further understand one such type of modifications.



## Our Body 2

# HOW BACTERIA PLAY HIDE AND SEEK WITH ANTIBIOTICS, IMMUNITY AND VACCINES



### ‘The journey from the gut to the internal tissues’

Using dry brush sponge stamps and digital collage. Inspired by Piero Mastroeni’s research, the image portraying an abstract intestinal system.

I was interested the notion of how bacteria can play a hide and seek with antibiotics, and how bacteria can adapt to its surroundings.

#### Created by:

### Mark Farrell

Originally from an Animation background, currently focusing on some of my own personal projects and studying whilst working as a part time chef. Passionate for Illustration and Character design.

[www.markanimation.tumblr.com](http://www.markanimation.tumblr.com)



#### Research inspiration:

### Piero Mastroeni

To grow and spread in the body, bacteria need to engage in an arms race with the immune system, usually underpinned by multifaceted and intertwined events. The design and appropriate use of vaccines and antibiotics should be supported by fundamental knowledge of the biology of these interactions. How often does this happen?

[www.infectiousdisease.cam.ac.uk/directory/pm274@cam.ac.uk](http://www.infectiousdisease.cam.ac.uk/directory/pm274@cam.ac.uk)





## Our Body 2

# MIND THE GAP: USING TOUCHSCREEN COMPUTING TO FACILITATE TRANSLATIONAL NEUROSCIENCE RESEARCH

### 'iMouse'

It thrills me no end that in Dr Chris Heath's research, lab mice play with iPads in a dark space and drink milkshakes - just like my teenager. The black mice are placed in a chamber nicknamed the blue cupboard with an iPad. Whenever time they select the correct symbols, they are rewarded with milkshakes.

My creative reaction is this portrait of a teenager as a black mouse peering blearily at the iPad. We see him through the iPad trying to decide which symbol yields the reward. The edge of the canvas is blue, representing the blue cupboard where the tests are done.



### Created by:

#### Susan Abbs

My art is all about capturing light and colours. I was born in sunny Singapore but have been living in the UK for over 20 years  
[www.susanabbs.co.uk](http://www.susanabbs.co.uk)



### Research inspiration:

#### Chris Heath

Translating research from laboratory models to therapeutics for neurodegenerative or psychiatric illness is difficult. Touchscreen computing has harmonised cognitive assessment in models and patients to close the 'translational gap'. Here I describe how touchscreens can be used to evaluate motivation and emotional state and the benefits for patient wellbeing, model system welfare and study design.  
[www.open.ac.uk/science/life-health-chemical-sciences/people/ch25773](http://www.open.ac.uk/science/life-health-chemical-sciences/people/ch25773)





## Our Body 2

# DISCOVERING AND PREDICTING ANTIBIOTIC RESISTANCE USING GENOMICS



### ‘Cooling The Computers’

I am an amateur artist, recently picking up my brushes after a long absence. I met Julian who was kind enough to give me a tour of the Sanger Centre

which was extremely interesting and inspiring. My painting is an abstract painting done in acrylics, inspired by the stunning architecture, buildings and work undertaken at the centre.

#### Created by:

### Sue Wardley

I now live in Saffron Walden and have recently taken up painting again after a gap of many years. I was busy running my recruitment company for the previous 10 years supplying staff to many companies within the Cambridge area, so I had very little time. I had worked with medics previously and had 5 years at Amgen in the 1990's which gave me an interest in science.

I am now enjoying exploring new techniques and media and go to a local art class weekly. Other hobbies include travelling, golf, reading, dress design and dressmaking.



#### Research inspiration:

### Julian Parkhill

Antibiotic resistance in bacteria is of growing concern, with apocalyptic predictions of the consequences of resistance increasingly appearing in the media. Sequencing the genomes of bacteria can identify the emergence and transmission of resistant strains, and the genetic variants that confer resistance. These can be used to improve antibiotic use in the clinic, and counter the rise of resistant strains.

[www.sanger.ac.uk/people/directory/parkhill-julian](http://www.sanger.ac.uk/people/directory/parkhill-julian)





## Our Society

# DOES INEQUALITY MATTER?

### ‘Equality v Inequality’

The debate regarding Equality vs Inequality can be an incendiary subject. It is human nature to feel strongly about injustice toward another fellow mankind.

We can all agree to embrace complete equality of race and gender, but we hold varying opinions on monetary equality. In fact, just suggesting inequality in a conversation can be polarising. To mention the subject is to flick a switch, to light a fuse. Talking about equality vs inequality can be combustible.

Is it better to share our wealth via a balanced social support system or to tax the rich to feed the poor? And how does this make the middle class feel? Shouldn't this implied equity also support the middle classes?

Politically proposed solutions to economic equality don't seem to treat all people equally when it comes to the ability to put food on the table, buy a ticket to get



to work or put a down payment on a house. Do economic situations affect how people feel about equality?

The artwork is an assembled sculpture made of analogue meters housed in a wooden Control Room box. Under the Percent Combustibles you are invited to flick a switch to turn on the debate and see how talking about Equality vs Inequality in social and economic terms can cause Excess Deviation, pegging in a Primary Loop and effect the balance of English Metric.

### Created by:

## Liza Read

Liza Read is an artist and holographer (3D laser photography) living and working in Cambridge, England. Her most recent exhibition at Gallery 286, London titled To Hell & Back, is a contemporary series of holograms in mixed media inspired by Dante's circles of Hell. She makes sculptural assemblages on the themes of cutting edge scientific research contrasted with tactile antiquated surfaces and analogue technologies. Read recently founded the company Growing Art Partnerships to bridge the gap between art and science.

[www.lizaread.com](http://www.lizaread.com)



### Research inspiration:

## Mark Ramsden

In recent years, a general consensus has developed that inequality is not good for society. But, can you explain why inequality is bad? This session will begin with an introduction to some examples of inequality. Attention will then be focused on considering if inequality is bad for society. It is intended that the audience will actively participate in developing an argument to explain why inequality might be bad, or not.

[www.research.sociology.cam.ac.uk/profile/dr-mark-ramsden](http://www.research.sociology.cam.ac.uk/profile/dr-mark-ramsden)





## Our Society

# THE IMPORTANCE OF COMMUNICATING RESEARCH IN A 'POST-TRUTH' WORLD

### 'Truth Lies Here'

This 3D typographic collage was inspired by Giles Yeo's talk about truth and communication. In science truth relies on research, evidence and consensus but history has demonstrated that nothing is set in stone. Current truths might be future lies.

I grew up with advertising commercials about how good was the milk in the chocolate, the need to brush three times per day and that fat was evil.

Today, sugar might be the enemy to avoid, dairy not so good for our health and flossing might be better than mouth washing. What/who do we should believe?

For this piece I also thought in other typographic messages that could summarise my own opinion regarding this topic: 'trust no one', 'beware of fake news'



and 'keep critical thinking and carry on' because you might realise that the truth they told you it's actually a lie.

### Created by:

#### Lele Saa

Lele is an authorstrator, character designer and visual artist with almost 15 years of experience as advertising art director. Originally from northwest Spain she has worked for different international advertising agencies all over the world. Now based in Cambridge she is pursuing a career writing and illustrating her own stories, recently graduated from Children's Book Illustration MA at Cambridge School of Art. Her work, based mostly on her daily life experiences, is informed by graphic design, printmaking, sculpture and observational drawing.

[www.lelesaa.com](http://www.lelesaa.com)



### Research inspiration:

#### Giles Yeo

How does one tell an actual expert from a fake in this 'post-truth' era? If you are a 'doctor' claiming that vaccines cause autism, surely you know what you are talking about? The only way to combat this degradation of the value of truth, is to be, as academics, passionate about the truth. I will argue that communicating with the public should be part of a scientist's arsenal to tell the truth and call out untruths wherever possible.

[www.mrl.ims.cam.ac.uk/research/principal-investigators/giles-yeo/](http://www.mrl.ims.cam.ac.uk/research/principal-investigators/giles-yeo/)





### ‘Possible pasts, probable presents, possible futures’

David Spiegelhalter's interests lie with us not knowing what is happening right now or even in the past. He spoke about the possible past and the uncertainty about the present; how things are reported as fact that are not. His vision is to have clarity of information, openness and honesty about what is known through the data that is collected and the mathematical models that analyse them. His belief is that this honesty of communication will lead to data literacy. Moreover, more accuracy of information about both the past as well the present leads to better informed choices.

I asked David to share with me how he envisioned this happening and to go more into detail. At the end of our conversation, I found myself inspired and enlightened yet the concepts spoken about still appeared abstract in my mind's eye. I did not know how I would communicate everything I had gathered from our conversation through art, so I allowed my creative interpretation



to remain abstract and dreamlike, to pay homage to the magic that I experienced when listening to David communicate his ideas. I'm highlighting the concept of having a possible past, an idea of where we may be in the present and the paths that may lead from there, placing a further emphasis on having full availability of data in the present and the opportunity to have this information accurately interpreted so that it could lead to a better grasp of the possible paths that can be taken in the future.

#### Created by:

### Esther Yasmin

Esther is a visual artist who's work often reflects a magical realist nature; diving into the depths of complex ideas and simplifying them into a unified piece. Esther currently holds a bachelor's degree in design from Goldsmiths, University of London and a foundation diploma in art and design from Cambridge School of Visual and Performing Arts. She has participated in and hosted a variety of art shows, fairs and exhibitions in various venues within Mexico City in Mexico, Paramaribo in Suriname and London and Cambridge in England.  
[www.estheryasminart.com](http://www.estheryasminart.com)



#### Research inspiration:

### David Spiegelhalter

None of us know what is going to happen, but sometimes we can put reasonable chances on what the future holds in store. Communicating these numerical risks is not straightforward, although research suggests the idea of 'expected frequencies' can be effective. People are willing to accept uncertainty about the future but, in this supposedly 'post-truth' world, will 'experts' be suspected if they admit uncertainty about what is happening now?  
[www.chu.cam.ac.uk/people/view/david-spiegelhalter/](http://www.chu.cam.ac.uk/people/view/david-spiegelhalter/)





## Our Society

# HOW SHOULD RISK BE COMMUNICATED?



### ‘Across from the Chapel’

Joseph’s work is a philosophical, almost abstract, study of the ethics surrounding the way in which risk is presented to the patient. We talked about whether it’s safe to allow doctors to choose themselves how to present information, and the very subtle but important distinction between coercing and guiding the patient. Might some doctors have a god complex? My sketch of Joseph at work, overlooking the grandeur of King’s



Chapel, reminds me of that question.

### ‘Risk assessment / Don’t worry, Mum’

Joseph and I had different views about whether knowing the average risk compared to your own should influence your decisions as a patient.

My view was that we have many potential risks and worries in our everyday lives, and knowing how you might

compare to the average, or ‘normal’, helps us filter all those risks, and decide which are the ones that are rationally worth worrying about.

So my painting is to represent all the other potential worries that might face the stressed patient whom the doctor faces, out of this context, in clinic. Joseph says his current work takes a step back from the “nitty gritty of lab work”. I’ve tried to add the nitty gritty of life back in!

### Created by:

## Naomi Davies

My ‘real’ job is running a detective agency. Well, family history detection, anyway. I run Helpful Genealogy from home, spending hours and hours solving tricky family history mysteries, and researching complex family trees. I started painting again as a way of winding down when I’m too involved with these baffling mysteries. A chance to use the left side of my brain for a change. I do quick bold sketches, usually in ink, and then often complete with watercolours. I especially love to draw when engaging in my other hobbies – drinking coffee, eating out, and watching cycle racing. [www.naomidaviesart.co.uk](http://www.naomidaviesart.co.uk)



### Research inspiration:

## Joseph Wu

Physicians and patients are confronted with difficult decisions every day. Many of these decisions are difficult because we simply cannot predict outcomes with certainty. Nevertheless, we can present statistical information that can estimate the likelihood of different events. For example, we might say that your risk of cancer relative to other people of the same age and sex is above or below average. The way this information is presented can dramatically affect our perception of risk. [www.people.hps.cam.ac.uk/index/graduate-students/wu](http://www.people.hps.cam.ac.uk/index/graduate-students/wu)





## Our Society

# INEQUALITY AND CRIME – WHERE AND HOW DIFFERENCES APPEAR AND WHY THEY MATTER



Alex Sutherland’s talk takes a walk through the many and varied ways that inequalities relate to crime and criminal justice. Starting from where people are born, where they grow up, to what happens at school, and how people are treated by the criminal justice process. The talk will cover ideas from different disciplines that converge on the topics of crime and criminal justice, and discuss policies relating to these topics. Along the way, we’ll ask ourselves what crime is and think about what an equitable criminal justice system might look like.

### ‘He made me do it’ (above)

After chatting to Alex, I was struck by how very young children can have their future shaped and influenced in a way that can predispose them to a life of crime. In my piece, ‘He made me do it’ the older self is blaming the circumstances of his childhood that caused him to come to the attention of the criminal justice system.

### ‘Chaos’ (right)

In this second piece, I am exploring the themes of role of the police and the chaotic nature of crime, in a collage on canvas using found images and original monoprint.



### Created by:

## Mandy Knapp

I found printmaking in 2001, when I went ‘back to school,’ to a daytime adult education print workshop in Richmond Upon Thames. I caught the printmaking bug, and invested in my own press and workshop. I moved to Cambridge in 2010, and without delay set up my little print workshop once more. My passion is interior design, and I love depicting furniture, interiors and make images that fit with a design vibe, sometimes flirting with abstraction. I enjoy exploring colour, form and texture through different print processes.

[www.etsy.com/uk/shop/MandyKnappWorkshop](http://www.etsy.com/uk/shop/MandyKnappWorkshop)



### Research inspiration:

## Alex Sutherland

This talk takes a walk through the many and varied ways that inequalities relate to crime and criminal justice. Starting from where people are born, where they grow up, to what happens at school, and how people are treated by the criminal justice process. The talk will cover ideas from different disciplines that converge on the topics of crime and criminal justice, and discuss policies relating to these topics. Along the way, we’ll ask ourselves what crime is and think about what an equitable criminal justice system might look like. [www.csap.cam.ac.uk/network/alex-sutherland/](http://www.csap.cam.ac.uk/network/alex-sutherland/)





## Planet Earth

# MONSTERS IN THE COLD: ADAPTATIONS OF ANTARCTIC MARINE ANIMALS



### ‘The Big Blue’

The big blue is a glimpse into the fascinating, dark, ice cold but also colourful and speciose world of the Antarctic Ocean. The subtle diver stands for the human investigator who is such a tiny alien element in this water world but tries to be part of it at least for a moment. Thousands of species, many of them endemic, have been living here from time immemorial; adapting perfectly to the extreme conditions. Amongst them the largest animal known to have ever existed can be found floating through the ice cold waters - the Blue whale.

In contrast some of the smallest creatures of Antarctica who live on the seabed - around 20.000 species of invertebrates and fish - own the most pretty colours, hidden in the depth of the ocean. But how do all these creatures adapt to their extreme living environment, how can they survive in temperatures down to -2.0C?

### Created by:

## Karoline Leopold

I'm Karo, I am a freelance graphic designer and illustrator with a passion for animals, people, travel, old buildings and urban sketching - simply creating! After working many years for different agencies in Germany, Spain and England I graduated from a master in children's book illustration at Cambridge School of Art in 2015 and started to work as a freelance artist.

My illustrations are created using mixed techniques like ink, colour pencil, water colour and digital colouring. I usually draw directly by hand, sometimes I edit digitally.

[www.karolineleopold.com](http://www.karolineleopold.com)



### Research inspiration:

## Lloyd Peck

Antarctic marine animals have lived in the coldest and most seasonal conditions in all of the oceans on Earth. They have evolved there for over 15 million years and this has produced unique adaptations and some of the world's most bizarre animals. There are giants and 10 legged spiders. The seabed biodiversity there is far more diverse than most people realise and the proportion of species that only live in Antarctica and nowhere else is far higher than for any other continent.

[www.bas.ac.uk/profile/lspe/](http://www.bas.ac.uk/profile/lspe/)





### ‘Without Frontiers’

This piece of work is the result of a creative collaboration between the work of Professor James Jackson and myself. “Earthquakes Without Frontiers” is a project run by Prof. Jackson that seeks to inform and support governments and policy makers for the need of increased resilience in populations exposed to the dangers of earthquakes and volcanic eruptions. The group’s work focuses on locations such as Central Asia, NorthEast China and Iran.

In my piece of work I have used imagery from the 2003 earthquake in Bam, Iran where 26,271 people died along with images from the 2011 earthquake in Christchurch, New Zealand where 185 people died.

Using images that have become instantly associated with the Christchurch earthquake, compared to the lesser known images of total destruction in



Bam, was important to me in creating a juxtaposition between the light ethereal structural elements of western buildings and the rubble of destroyed ancient Eastern structures; elevated to Western awareness through the application of gold. In designing this piece of work I primarily wanted to produce a considered composition albeit with elements of uncomfortable design reflective of the results of earthquake damage.

### Created by:

#### Tim Burkinshaw

I am an artist/illustrator/teacher based in Hertfordshire. My works are illustrative but often abstract in nature. Within my practice I seek to explore the potential of mark making and colour; through drawing, painting and printmaking.

[www.junctionblender.co.uk](http://www.junctionblender.co.uk)



### Research inspiration:

#### James Jackson

Earthquakes in developed countries today are largely stories about financial cost and infrastructure.

In developing countries, they are often about appalling losses of life. The reasons for this contrast are geological, as well as economic and social, requiring scientists, decision-makers and civic leaders to work together to enhance public safety.

[www.esc.cam.ac.uk/directory/james-jackson](http://www.esc.cam.ac.uk/directory/james-jackson)





### ‘Unstable state, explosive reactions.’

The idea of this artwork is to compare the volcanoes behaviours to mental health illnesses.

This drawing is representing stress. When we do not treat this mental illness and we try to cope with it for as long as possible, it tends to grow inside us until one day we cannot do it more and we explode, as a volcano does. Each person might then react in a different and unexpected way, from bursting out in tears in a quiet way to shouting to someone else in explosive and angry manners.

If we think about it, volcanoes have also different ways of reacting...

### ‘Unmasking deep worlds.’

Drones are being used to safely approach volcanoes, in order to study them and predict their potential future behaviours.

This artwork is trying to show that in an abstract way. The drones are opening the volcano pulling from the exterior layers out, exposing the inside and thus unmasking the hidden life behind the flanks of the volcano.



### Created by:

#### Elena Rubio Mota

I am a structural engineer working for the maintenance and construction of bridges in the Cambridgeshire area.

Before that, I worked at the North West Cambridge Development Project as a site engineer. However, since I was little I always had a passion for arts, joining different art courses and practicing at home whenever I had time to do so. I heard about the Pint of Science and Creative Reactions last year through a friend who was participating as an artist. It sparked my interest straight away and I joined the 2018 event as soon as I had the chance. I hope to be able to participate in more art related events in the future!



### Research inspiration:

#### Emma Liu

How are volcanologists using drones to study volcanoes? We can monitor volcanic activity in many different ways, but the dangers of working in these environments mean we still lack vital measurements at many hazardous volcanoes around the world. Drones are revolutionising our ability to observe eruptions up close, track lava flows, and measure volcanic gases... all from a safe distance.

[www.esc.cam.ac.uk/directory/dr-emma-liu](http://www.esc.cam.ac.uk/directory/dr-emma-liu)



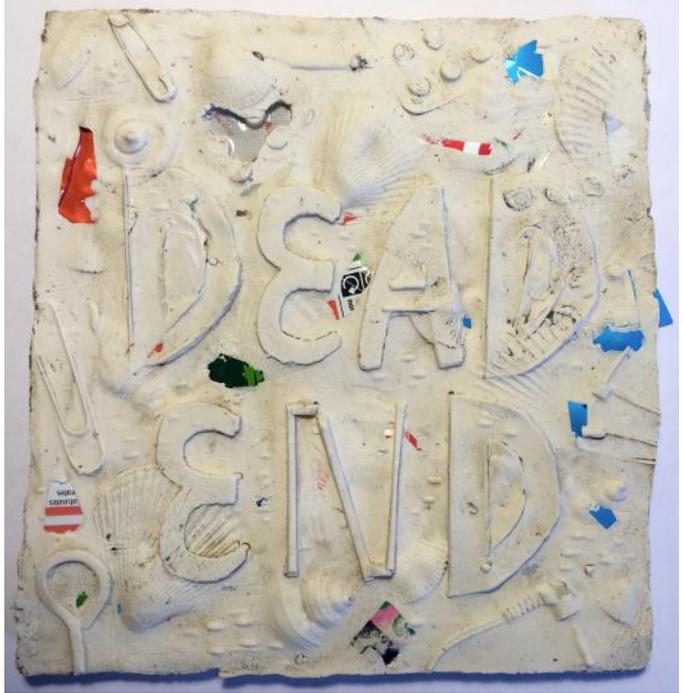


## Planet Earth

# ANTARCTIC OCEAN: THE “OTHER DEAD END” OF PLASTIC DEBRIS

### ‘Dead End’

My artworks deal with the feelings individuals experience in reaction to the building evidence about the plastic problem we are currently facing. These phrases range from complete hopelessness to a feeling of ownership over our consumption of plastic. During the process of making this artwork I was confronted with the plastic I use, which has been cast and captured in plaster.



### Created by:

#### Katie Allen

Croydon girl who has put down roots in Bedford, I'm a clunky, messy, grainy, scrappy illustrator who loves texture and typography. My tools of the trade are crayons, Indian ink and bios. I usually collate and refine my work digitally, a process which is heavily inspired by a love of printmaking found at university.

[www.cargocollective.com/katieallen](http://www.cargocollective.com/katieallen)



### Research inspiration:

#### Clara Manno

Around 80% of all the litter in our oceans is plastic. Observations of plastics debris in both Polar Oceans suggest that they have already spread across the world and thus recognized as one of the most important worldwide threats for oceans. Antarctic Ocean is thought to be a highly isolated, pristine wilderness but can become the last frontier of the plastic debris.

[www.bas.ac.uk/profile/clanno](http://www.bas.ac.uk/profile/clanno)





### ‘Illuminating the Ediacaran’

Meeting Dr Emily Mitchell and hearing about how the Ediacaran time period may represent the most important transition in the evolution of life on Earth has been amazing. It’s something truly significant –

a possible ‘missing link’ - that happened over half a billion years ago. Learning about the Ediacaran fed my passion for nature and led me to think about human development and our evolution of life, but through art.

My ‘creative reaction’ to Emily’s work is, therefore, seen through the eyes of seven imagined artists, each encountering the Ediacaran at different stages in art history. Each seeing their own meaning in these strange fossils, which tease us with their beauty and yet retain so much of their mystery. My works explore how art has always connected with meaning, and how that meaning has evolved through time.

The seven imagined artists that together form my creative reaction are: a Prehistoric man painting rocks; an Ancient Egyptian working on papyrus; a Medieval monk illuminating a manuscript; a Renaissance polymath making studies in ink; a Bohemian Art Nouveau poster maker; a psychedelic artist from the 1960s; and, then, my personal creative reaction, bringing together the latest in digital art and hi-tech manufacturing.

### Created by: Veronica Ellis

As a print and nature artist, I am interested in both art tradition and digital technology, which has led me to explore all forms of fine art, photography, art history and digital painting.

I have been painting and drawing all my life, often for pleasure, and more recently as a working artist. My favourite place is to be in nature, which led me to create my own affordable art business two years ago, Nature’s Grace. Often inspired by meaning and myth, my work aims to conjure the otherworldly beauty of nature and evoke some sense of the mystery of it all.

[www.naturesgrace.co.uk](http://www.naturesgrace.co.uk)



### Research inspiration: Emily Mitchell

For billions of years, life on Earth was only microbial. Then suddenly, around half a billion years ago in the Ediacaran time period, strange, large, complicated lifeforms started appearing. These Ediacaran organisms have body plans unlike anything alive today, so while some are likely to have been the first animals, others may have belonged to a now extinct group. I will talk about how I have employed a variety of scientific characterization tools to examine the lives of these strange creatures.

[www.esc.cam.ac.uk/directory/emily-mitchell](http://www.esc.cam.ac.uk/directory/emily-mitchell)





**‘Puntseq’**

The project that inspired this image looks at proving DNA profiles and microbial analyses of the river cam water prompted by the recognition that rowers can catch

water born illnesses. This images attempts to combine an actual set of DNA sequences from the river Cam along with showing the interaction a rower has with water.

**Created by:**

**Lucinda Price**

I’m a full time Cambridge based photographer. I’m usually found capturing people at weddings/events and having great fun filled, natural sessions with families; documenting many happy memories along the way. Living in Cambridge is a great base for meeting so many interesting people and I often come across scientists through my photography work. I love what I do and it’s a pure joy to living my passion as a livelihood.

[www.lucindaprice.com](http://www.lucindaprice.com)



**Research inspiration:**

**Lara Urban and Max Stammnitz**

Cambridge rowers, swimmers and punters regularly obtain serious infections from the river Cam’s water. An information and research framework that targets the involved microbial culprits is still lacking. PuntSeq will provide an in-depth resolution of the Cam’s microbial and pathogenic landscape by using the Oxford Nanopore MinION to sequence all DNA extracted from the river’s water.

[www.ebi.ac.uk/about/people/lara-urban](http://www.ebi.ac.uk/about/people/lara-urban)

[www.tcg.vet.cam.ac.uk/directory/max-stammnitz](http://www.tcg.vet.cam.ac.uk/directory/max-stammnitz)





Tech Me Out

## THE HUMAN CELL ATLAS - GOOGLE MAPS FOR HUMAN ANATOMY



### ‘Making the first Human Cell Map’

World-leading scientists discussed how to build a Human Cell Atlas—a collection of maps that will describe and define the cellular basis of health and disease. I chose to depict an explorer sent on a mission into the deepest parts of the body to record human cells.

#### Created by:

### Rich Gemmell

I am a Professional Illustrator and Graphic Designer based in the Cambridgeshire countryside. My work has appeared in The Guardian & The Sunday times and I have worked with Hodder & Stoughton on Booker Prize nominated books. I work mostly digital these days but I have a fine art background and strive for a hand drawn & painterly look to my work.

[www.richgimmell.net](http://www.richgimmell.net)



#### Research inspiration:

### Laura Clarke

Advances in technology mean that we can now analyse single cells in unprecedented detail. The Human Cell Atlas is an ambitious collaborative project that aims to map all cells in the human body. This talk will introduce the project itself, the technology it will use to analyse our cells and the software platform being built to support producing a ‘Google Maps’ for the human body.

[www.ebi.ac.uk/about/people/laura-clarke](http://www.ebi.ac.uk/about/people/laura-clarke)





### ‘The City Oasis’

Scott talked about how green spaces and parks within built up areas actually make the city breathe better, clean the air, cool the area and they can contribute to lowering the temperature globally. This seemed very powerful to me as we watch all ‘empty’ spaces being covered in concrete and built upon I can see the correlation between global warming and the loss of green spaces in our cities. He used NY and central park as an example and this is my response to that data. I know NY well and can feel how it really does do that in one of the hottest, most humid cities in the world.



### ‘Capturing Oceans’

Scott’s talk covers the subject of AI (Artificial Intelligence) and data. We are gathering huge amounts of data around climate change using satellites, drones and other advanced technologies but in order to predict more accurately global extreme events we need to analyse it all. Can we begin to utilise AI to help with this? I was struck by the enormity of this task and how the oceans, currents, huge weather systems and the cosmos are still so mysterious and beyond our knowledge, ever moving and changing. My image is a response to humankind trying to pin down and KNOW the ever changing and unknowable secrets of the oceans that link us all together across the globe.



#### Created by:

### Cheryl Warren

I originally trained as a sculptor before going on to Goldsmiths, London, where I took a post graduate mixed media course. This was what ignited my passion for working with varied materials and gave me a much more rounded, technical expertise. I was then lucky enough to attain an apprenticeship with a professional landscape painter which gave me a valuable insight in the day to day business of being an artist. In 2009 I graduated from the University of Hertfordshire with an MA in Art Therapy. This has helped greatly with my depth of connection and thinking that now goes in to my working process. [www.cherylwarren.com](http://www.cherylwarren.com)



#### Research inspiration:

### Scott Hosking

The increasing severity and frequency of high-impact weather events means more of us are living under the threat of flooding, heat waves, or drought. To increase our resilience to these events, there is an urgent need to make regional climate predictions more useful and actionable. In this talk I will discuss ways in which machine learning can help unlock the potential within the vast volumes of environmental data available. [www.bas.ac.uk/profile/jask](http://www.bas.ac.uk/profile/jask)





### ‘Triangles in the Sky’

Illustration of structure in the universe. The structure of matter in the universe is not quite randomly distributed, and by drawing triangles in the sky, we can obtain measures for how structured the universe is, and then

compare it to statistical models, and to the cosmic microwave background, which contains information about the evolution and structure of the early universe. Illustration created on a computer with Softimage, Modo and After Effects.

#### Created by:

### Dr Jon Heras

Jon studied natural sciences and chemical engineering at Cambridge, staying on for a PhD in MRI and image processing. He founded Equinox Graphics twelve years ago, born out of a hobby dabbling in computer graphics, and he produces accurate and engaging visuals for academia, industry and education. There aren't many jobs where you can be reading papers on synthetic biology, quantum mechanics and materials science, all in the same week!

[www.e-nox.net](http://www.e-nox.net)



#### Research inspiration:

### James Ferguson

Up until 2001, cosmology was an imprecise science, data sets were limited and most insights gained from them were qualitative; a successful theory needed only to fit within the right order of magnitude. This changed with the WMAP measurement of the cosmic microwave background radiation, shunting cosmology into a quantitative era where now predictions have to agree at the percent level. In this talk I will introduce the standard cosmological model, discuss how cosmology has evolved into a data driven science, and how it will have to change in the future for vast experiments.





‘**Human Beings (R u Xperienzd)**’ is a song by Daisy, a simulation of an AI song-writing consciousness created on the basis that everything really real is an actual occasion. Hofstadter proposed that to write an affecting song AI would need to experience travelling through the maze of life. Slime mold has been observed to solve mazes by augmenting it’s memory via the environment itself. Taking this observable model of entanglement where separation is a conceptual myth, Daisy hints at ways in which AI could inspire human cognition to reject the bifurcated machine model it currently employs for its idea of its own consciousness.

The idea developed after Marta and Mikey discussed A N Whitehead’s ideas of bifurcation in cognitive philosophy. Marta was later on her bicycle and imagined an AI tired of humans debating what AI is and instead simply wanted to create songs. Creation, coincidentally, is at the heart of Whitehead’s cosmology.



The name Daisy is derived from the tune (another cycling song) that HAL, the IBM inspired AI in 2001, plays as his power drains.

### Created by:

#### Mikey Georgeson

Mikey Georgeson is a musician and artist, known as the Vessel in David Devant and his Spirit Wife. He is studying for a doctorate in Fine Art at the University of East London where he also lectures. His film the non-bifurcatedman was recently selected for the Athens Digital Arts Festival, Singularity Now. As part of his practise he has recently written songs with artists for the festival of Georgian Culture in Gdansk and the Istanbul Biennial “Are we Human?”. He is a member of the panel exploring Felt Knowledges at this year’s Royal Geographic Society conference.  
[www.mikeygeorgeson.com](http://www.mikeygeorgeson.com)



### Research inspiration:

#### Marta Halina

In March 2016, Google DeepMind’s computer programme AlphaGo defeated the world-champion Go player. AlphaGo’s moves were surprising, original, “beautiful”, and extremely effective. Should we understand AlphaGo as exhibiting human-like insight? In this talk, I draw on research in cognitive psychology to evaluate contemporary progress in AI and examine how tests for identifying mental models in nonhuman organisms may help us interpret Deep Neural Networks.  
[www.people.hps.cam.ac.uk/index/teaching-officers/halina](http://www.people.hps.cam.ac.uk/index/teaching-officers/halina)





**‘Analogue generator - Personal discriminator’**

Generative adversarial networks (GANs) are two computer neural networks trained together to first create data (the generator) and then attempt to distinguish whether any given data is real or generated (the discriminator).

Generator/ If we can create data we can understand it better; so I generated my own fake synthetic data from analogue sources.

Using monoprint noise and medium format film portraits I have created a lenticular visualisation of ‘latent space’, or the possibilities in between images.

Discriminator/ Real and fake don’t necessarily have a binary relationship. What we believe to be real or fake, or somewhere between the two, is a reflection of who we are at that time - our beliefs, culture and training.

**Created by:**

**Tiina Burton**

For my practice as a visual artist and in my work as a fashion lecturer I examine what creativity might be and how it can be encouraged. My processes include analogue recording, making, gathering and curating with a DIY and collaborative ethos. My work has been collected and exhibited internationally, including in London and New York, and I have published two books of fine art photography.

[www.tiinateaspoon.co.uk](http://www.tiinateaspoon.co.uk)



**Research inspiration:**

**Petar Veličković**

Machine learning is, in essence, about understanding the world through data. And as Richard Feynman once said: “What I cannot create, I do not understand”. This leads us to generative modelling: being able to generate new, synthetic data that in some way captures the features of real data. I will present a high-level overview of generative adversarial networks (GANs), one of the most popular ideas to hit machine learning in the past decade and show, among other things, how they allow us to generate fake celebrities and turn horses into zebras (and vice-versa).

[www.cl.cam.ac.uk/~pv273/](http://www.cl.cam.ac.uk/~pv273/)





# CREATING TECHNOLOGY WITH SOCIO-EMOTIONAL INTELLIGENCE



## ‘Emotional Dissection’

It’s that age-old question, what makes us human? How does our brain work, how do we use our instincts, how did we become sentient, what is a soul? Why do we feel, how do we feel? We may not have all the

answers yet but already we are able to make ‘machines’ that monitor our behaviour and respond to what we do on a daily basis, in order to help us weave a path through the noise and provide us with tailored goods and services that we supposedly need or ‘desire’. Anyone who exists online will be subject to this analysis and it has now become commonplace, although still a little unsettling for some.

However the idea that somehow our behaviour could be also read in such a way so as to engage with us on an emotional level is still, to me, a little mind-blowing. How does artificial intelligence measure emotions? How does it know when someone is upset or bored and respond accordingly? As artists we are used to drawing emotions through instinctive use of lines and brush strokes to create an illusion of reality that we are familiar with, much like looking in a mirror. We respond emotionally to a painting because we know how that feels. How does a computer know?

### Created by:

**Karen Jinks**

I am a mixed media artist and graphic designer, who works with fellow artists and small businesses to help them grow and develop their potential. I also work with various groups and individuals around Cambridge to create exciting collaborations such as Creative Reactions.

As an artist I love to explore ideas around memories, emotions, environment and language, using various technique such as collage, digital media and painting.

[www.karenjinks.co.uk](http://www.karenjinks.co.uk)



### Research inspiration:

**Hatice Gunes**

Computing that is socio-emotionally intelligent aims to equip devices, interfaces and robots with the means to interpret, understand, and respond to human nonverbal behaviour, personality, affect, moods and intentions. Progress in industry and developments in academia provide us a positive outlook, however the socio-emotional capabilities of current technology are still limited. This talk will present an overview of some of the works we have conducted in the areas of affective VR, public art, and human-robot interaction.

[www.cl.cam.ac.uk/~hg410/index.html](http://www.cl.cam.ac.uk/~hg410/index.html)





## Immunology

# HOW THE IMMUNE SYSTEM DETECTS INFECTED AND CANCEROUS CELLS

### ‘Cheeky Selfies’

As a portrait photographer my job is to bring an individual’s personality to the surface and capture it. What constitutes a portrait? The image is clearly about the subject, and to make it effective it should spark curiosity.

Working with Dr Andrew Chan inspired me to explore on a cellular level what a person’s identity meant and how this could be represented. With his help I’ve created some very unique portraits which invites the viewer to delve deep into the person and learn something about them, in a world obsessed with individuals taking images of themselves.

I captured two different aspects of my volunteer’s identity; they had their cheek swabbed which resulted in their cells photographed and magnified to 100x to



show their inner unique distinctiveness on a cellular level, combined with a professional portrait which gives you the viewer a complete inside out view of the person. All my subjects work at the University of Cambridge’s Department of Pathology which gives the finished piece its own narrative.

### Created by:

#### Jemima Willcox

Jemima is the owner of Jemima Willcox Photography, she specialises in helping businesses create the right image. She concentrates on working with female business owners and entrepreneurs and provides professional portrait sessions in her Cambridge studio along with bespoke personal branding portrait sessions.

[www.jemimawillcox.co.uk](http://www.jemimawillcox.co.uk)



### Research inspiration:

#### Andrew Chan

Our immune system keeps us safe by fighting off infection and disease, much like the police on our streets. If we step on a rusty nail, it’s like an alien invasion on our cities and it would be difficult to miss. But what happens when our cells have been invaded and sinister things have already begun behind closed doors? How do we reveal the enemy from within?

[www.linkedin.com/in/dr-andrew-chan-867a0a129](https://www.linkedin.com/in/dr-andrew-chan-867a0a129)





## Immunology

# NEW GENE DISCOVERY IN PRIMARY IMMUNODEFICIENCIES DISORDERS



### ‘The Chink’

This sculpture is a cube made up of smaller cubes. In the centre is a clock with a reflective face directing small pointer lights that illuminate the individual small cubes. All of the cubes are identical except for one. The piece is an interpretation of the workings of a cell or an organism. The clock is the life force, perhaps the nucleus. This is contained and defended by the bricks but

one is faulty. It is the chink in the armour that leaves the organism vulnerable.

### ‘Chink Mapping’

This is a pen drawing of a square made up of smaller squares, also made up of smaller squares. Again one figure, representing one component is defective. This can be interpreted as a map or a scientific diagram of the gap in the defences. The scientific

endeavour to catalogue and characterise and represent invisible processes requires rigor, planning and perseverance. Some art also needs this degree of discipline. Luck can help too. A hunch or a coincidence can create a really helpful shortcut. There are for example, by chance, 424 cubes in The Chink. By coincidence 424 is the U.S. patent office code for a drug, bio-affecting or body treating composition.

### Created by:

## Susie Johnson

Susie’s artistic interests are diverse but always circle back to interlink as recognisably belonging to a set at some level. Her works often involve exploring simple elements to create new associations, complexity and dynamism. She revels in dissembling order, diverting paths and offering choices. Exploration of the elemental drawn line has under-pinned many of the works; how we manipulate this artificial device to relay information through readable forms is a key theme. A lover of games Susie invites the audience to find the relationships, between images and objects that on face value may seem unconnected. [www.susiejohnson.co.uk](http://www.susiejohnson.co.uk)



### Research inspiration:

## Crina Samarghitean

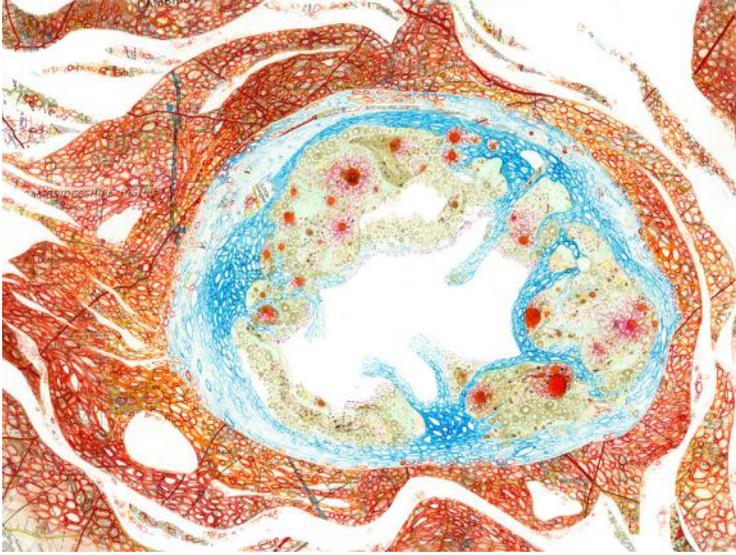
Primary immunodeficiency disorders (PIDs) impair the function of the immune system. Patients with these intrinsic defects have increased susceptibility to recurrent and persistent infections, and they may also have uncontrolled inflammation, autoimmune and cancer related symptoms. Most PIDs are rare and the diagnosed patients for a condition are often randomly spread out around the world. More than 350 PIDs affecting the immune system have been described so far.

[www.immunology.cam.ac.uk/Networkdirectory/CrinaSamarghitean](http://www.immunology.cam.ac.uk/Networkdirectory/CrinaSamarghitean)





## A GRUELLING EXPERIENCE WITH CARDIOVASCULAR DISEASE



### ‘Home...’

My piece was inspired by Dr Jane Goodall’s research into the macrophage cell and atherosclerotic plaque in the artery wall of the heart. Incredibly detailed slide images from Jane led me to consider the aspect

of scale using old maps of Cambridgeshire and tied in with Cambridge being a site of world wide medical research. The organic element of marbling onto vintage Japanese paper created unstable ‘gruel’ like areas in the heart.

### Created by:

**Caroline Henricksen**

I’ve drawn and painted from a very early age. I have a degree in graphic design, specialising in scientific illustration. I’m particularly keen on painting and sketching outdoors which contrasts nicely with very detailed botanical and zoological paintings in the studio. I mostly work in watercolour, pen and ink and gouache. Avid collector of woodland and beach finds.

[www.caroline-henricksen.uk](http://www.caroline-henricksen.uk)



### Research inspiration:

**Jane C Goodall**

If you are in your mid 30s, it is quite likely that you are developing atherosclerotic plaques in your artery walls.

As you age, these plaques develop gruel-like centres, resulting in unstable structures that can cause heart attack and strokes. This process is dependent on a cell called a macrophage, which is otherwise known for being a dustbin of the immune system, and providing protection against infection from bacteria and viruses. My research investigates how this process occurs and how we could reverse the development of atherosclerosis and its associated catastrophic events.

[www.med.cam.ac.uk/goodall](http://www.med.cam.ac.uk/goodall)

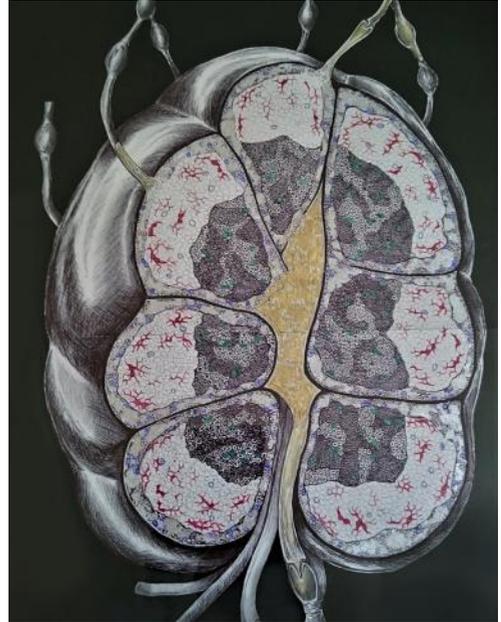




‘**Stromal networking**’ was inspired by the 2017 Immunology paper of the same name, co-authored by Dr Alice Denton and Dr Michelle Linterman.

The artwork seeks to give context to the intricate and complex relationships of mesenchymal stromal cells and immune cells involved in protective immunity, by viewing the process holistically at the lymph node level.

Chemokine gradients created by stromal cells are highlighted in silver and gold, demonstrating high expression of CCL19/21 and CXCL13 in the medulla T cell zone and B cell follicles respectively. Each immune cell population is highlighted in a distinct colour, Red: stromal cells [follicular dendritic cells (FDCs)], Blue: T cells, Green: Proliferating B cells. Note that these tend to be associated with specific areas of the germinal centre; the aptly named light zone, or dark zone. By taking a step back to view these individually detailed processes as a whole, it is possible to appreciate the daedalian beauty behind the mechanics



of launching an immune response. Whilst also providing an anchor point for the uninitiated to discover these intriguing cells responsible for honing the body’s response to infection.

### Created by:

#### Samantha Dale Fox

Samantha currently works as a scientist in the pharmaceutical industry, practicing art under her artistic alter ego Dale Vulpes Vulpes. ‘Vulpes Vulpes’ denotes the genus and species of the European red fox; a tribute to her namesake. Her art focuses on medical science as a multidisciplinary subject matter. Influenced by the biomorphic experiments of the Surrealists and early medical drawings her work emphasises the intellectual and emotional disconnect humans have with our understanding of ourselves.

[www.dalevulpesvulpes.co.uk](http://www.dalevulpesvulpes.co.uk)



### Research inspiration:

#### Alice Denton

Infection triggers two responses from the immune system: removing the invader and generating long term memory to shut down future infections before they take hold. A tool for both is antibodies, which are generated by a strenuous selection and reselection process, before ultimately swiping right. This talk will explain the set-up and rules of this ‘immunological Tinder’.

[www.babraham.ac.uk/our-research/lymphocyte/michelle-linterman/members/453/alice-denton](http://www.babraham.ac.uk/our-research/lymphocyte/michelle-linterman/members/453/alice-denton)





### ‘Shadow People’

People form the core of Dr Simon White’s research and behind every data point is a person. I have chosen to draw on this

aspect of the research for my piece. The data that he examines tells a story which includes the patient’s journey over time, their changing prognoses, as well as interactions with health practitioners and others the patient comes into contact with. Data is more than just information in a table, and most interestingly the absence of information can be very telling. The concept that a blank data point represents either the absence of someone from the study, or incomplete information about a person, forming ‘shadows’ is central to the work. Building up networks of interconnecting data and

‘shadow’ data begins to form impressions of populations, slowly coming into sharp focus. Only when they come together, can we gain best story the data tells us.

### Created by:

#### Jonelle Harvey

Jonelle’s own journey in science began in chemistry and she completed her PhD at a particle accelerator in Switzerland. During this time she began interpreting science research as art, her colourful work centering around creating visual interpretations of the data and abstract ideas that arise from science research. She is interested in visually revealing the hidden worlds within experiments and hopes to share some of this wonder with others. Jonelle is based in the Cambridgeshire area and has recently exhibited at ‘SciArt in the Cavendish Laboratory’ during this years’ science week.  
[www.facebook.com/jonelleharvey.art](http://www.facebook.com/jonelleharvey.art)



### Research inspiration:

#### Simon White

Counting seems such a simple thing to do, start from one and keep going, so why do you need a statistician? In this talk we’ll explore the need for statistical approaches to answer one of the basic questions: “how many people belong to a group or have a certain disease?”. An answer to this question is needed in policy and research (and we will also explore some of the ethical issues surrounding it).  
[www.mrc-bsu.cam.ac.uk/people/in-alphabetical-order/t-to-z/simon-white](http://www.mrc-bsu.cam.ac.uk/people/in-alphabetical-order/t-to-z/simon-white)





## Immunology

# INFLAMMATION IN DEPRESSION, A NEW TREATMENT TARGET

### ‘Confusion’

The biologist who I am collaborate with research area is - probing how immune system play a part in depression inflamed the brain and the body causes depression, in terms of treat depressive symptom by using anti-inflammatory drugs.

As the inflammatory cells in our body directly change the way our brains working, can have effects on how we think, feel and behave. The inflammatory proteins called ‘cytokines’ in the blood can get through the blood brain barrier, and they are part of the immune system to response to threat.

The human depression as a emotion have been seen as a normal react from psychology and neurology issue. Apart from it, gratitude that we now find the cells in our body could cause depression as well. As an artist I express my emotion through my artwork representing my feeling and statues directly. I do feel struggle and depress, through my artwork I am self-healing, and develop ideas thinking through



making. In my painting - I am embody the content of human depression emotion with inflamed brain, and the cells ‘cytokines’ and ‘marophage’ in the body. To perform the visible and invisible, microscope and microscope causes of human depressive emotion.

### Created by:

#### Reggy Liu

Reggy Liu is a fine artist and creative director who's practice incorporates drawing, painting, screen printing, photography, film, digital art, sculpture and installation. Liu works in harmony between art, fashion and science – social psychology, physics, facial cognition, special and colour cognition. She explores her work through thinking, making, and recreating to navigate her own experience with communication and the differences in oriental and western cultures towards human social psychology and culture identity of contemporary image content.

[www.reggyliu.com](http://www.reggyliu.com)



### Research inspiration:

#### Lorinda Turner

Around 1 in 13 people suffer from depression and anxiety in the UK, and whilst effective treatments do exist, around 30% of patients are non-responsive to antidepressants. There is compelling evidence that inflammation is often associated with and can precede the development of depression. Our latest research identifying biomarkers of inflamed depression and the potential to re-purpose current anti-inflammatory treatments for depression.

[www.newn.cam.ac.uk/person/dr-lorinda-turner](http://www.newn.cam.ac.uk/person/dr-lorinda-turner)







[www.pintofscience.com](http://www.pintofscience.com)