presents:

Creative REACTIONS

Cambridge UK
25th & 26th June 2022

The Pint of Science Cambridge coordinators:

Annabel Curle

I am a final year PhD student in Clinical Neurosciences, in Joanne Jones' lab. I am working on the immunogenicity of cell therapies for Parkinson's Disease (PD) and the role of the immune system generally in PD.

Sophie Jones

I'm a physicist working in materials development for image sensors. I'm back at Pint of Science, formerly on the Leeds team and now leading the Cambridge team. Outside of the lab I enjoy climbing and video games!

Creative Reactions team:

Tejasvini Chalikonda

After finishing my PhD in Behavioural Ecology, I now work at an environmental consultancy focussing on business and biodiversity. I am happiest when I'm outdoors, reading a book, spending time with friends, or crocheting! Having organized two virtual Creative Reactions in the past, it's incredibly exciting to be organizing an in-person exhibition again!

Karen Jinks

I'm a mixed media artist and graphic designer from Cambridge, and have been helping to organise Creative Reactions from the beginning. It's such an amazing project and the creativity and inspiration that comes from the collaborations never ceases to amaze me!

Angeliki Kanouta

Hi, I'm Angeliki! I work as a research technician. This is my second year being a member of the creative reactions team! Found myself enjoying it more than I thought!!

Welcome to Creative Reactions 2022

Museum of Technology, Cambridge
25th and 26th June 2022

We are proud to present the **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.

THE ARTISTS

11 artists were paired with local scientists who were taking part in the Pint of Science Festival and covered the following themes:

www.pintofscience.com

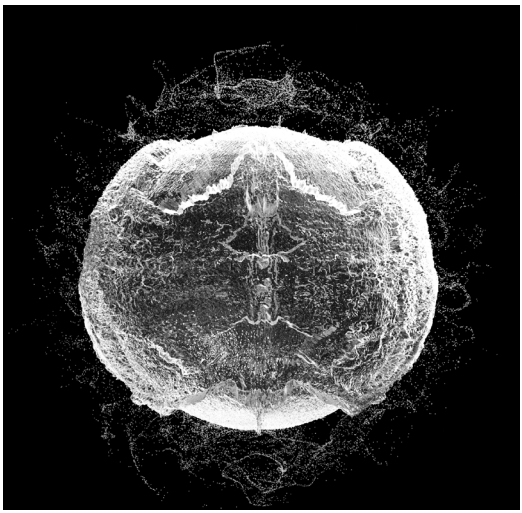
LOOKING FOR NEW PHYSICS WITH EMUS

Can symmetry be broken?

There are many different forms of symmetry in nature. From Dr Holly Pacey's research, I have found that particle physics is currently arranged into the standard model; with symmetries such as charge and flavour, amongst others. But there are parts missing, the model is not complete.

Physicists are trying to fill in the gaps, mapping out uncharted areas, smashing particles together at higher and higher energy levels, and sometimes finding new particles in the process. Could the theory of supersymmetry fill in the gaps?

I experimented with symmetry to create my own strange new particles, fragile and ephemeral. I made inkblots as a starting point, to research through physical making. These link the human connection to the unseen and our search for knowledge at the edge of our understanding of the universe.



I have mapped these inkblots onto my new particles, transforming them into worlds of the unknown. Certain particles could be crystal balls to help peer into the future of particle physics. Will analysis of particle collision data find that symmetry can be broken?

Research inspiration:

Dr Holly Pacey

At the Large Hadron Collider, scientists try to understand the fundamental ingredients of the universe by smashing together protons at a high enough energy to create particles, hoping for some that haven't been discovered before.

Within our incomplete Standard Model of the universe, the charge-flavour conspiracy makes it more likely that within 'emu' collisions, electrons and anti-muons are more likely to be produced in collisions than anti-electrons and muons. If this is not observed in our data, it must be new physics.

Created by:

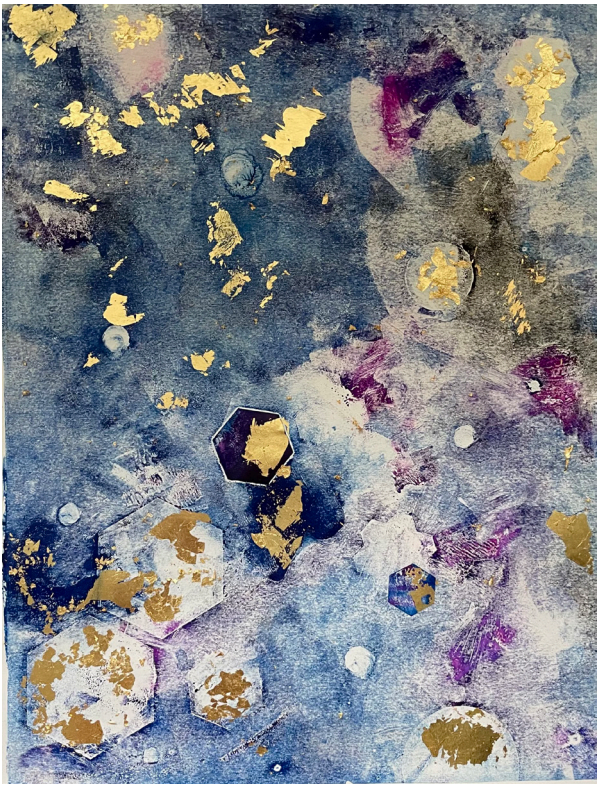
Tiina Burton

Cambridge, UK based artist and lecturer Tiina Burton delves into unknowns. She works with scientists to create artistic responses to their cutting-edge research, alongside collecting sensory experiences to help her understand the nature of reality. Her current focus is an exploration of attention over time, space and matter through repetitive actions such as walking. Tiina's work has been collected and exhibited internationally, and she has published two books of fine art photography.

https://tiinaburton.co.uk

Atoms to Galaxies

DARK ENERGY AND THE EDGE OF PHYSICS



Dark Energy

Monoprint - Ink and gold leaf

Ink is applied to a printing plate and using rollers, brushes and other tools, texture is added to the plate. Stencils, masks and individually printed pieces are applied before making the final print. Gold leaf has then been applied.

The gold and hexagons are in reference to the James Webb Deep Space telescope. Dr Matthew Bothwell's fascinating talk on Dark Energy - relating to the expansion of the universe, was my inspiration.

Research inspiration:

Dr Matthew Bothwell

Around a century ago, Edwin Hubble made one of the most important discoveries in astronomical history: the Universe is expanding. Ever since Hubble, understanding exactly how fast the Universe is growing has been one of the most important tasks in cosmology. Today, astronomers are faced with a puzzle: why is the expansion of the Universe speeding up? Attempting to answer this question will force scientists to question the most fundamental assumptions in all of physics, and might take us beyond the edge of the Universe itself.

Created by:

Allison Henderson

I am a graduate of Camberwell, UAL and can usually be found working at my easel - I paint for the fluid nature and versatility of the paint, hinting at narratives using the natural world as my stage and players. Mono-printing is a 'painterly' form of printing where the one-off image is directly created on the printing plate.

Drawing and painting are fundamental to my artistic practice as is encouraging and teaching others to draw and be creative.

http://allisonhendersonart.com

Black Holes

My headline summary is that the paradox arises from black holes destroying information (should be conserved) and the proposed solution to the paradox is that the information lost is actually 'encoded' into the quantum state of the graviton field of the black hole.

The way I have been attempting to represent this visually is with the classic black hole model you've seen, then I've been experimenting with ways to grow crystals onto the brass to represent the quantum information.

Research inspiration:

Jordan Cohen

Hawking's famous Black Hole Information Paradox has stumped physicists for over half a century, but it relied on the idea that black holes are 'bald'. In other words, a black hole does not carry any details about the material that made it beyond its mass, charge, and spin. Recent research by Hawking and others, however, has found that black holes actually sport infinitely dense heads of hair. In fact, whenever an object falls into a black hole, a faint imprint of the object ends up irrevocably laced into the fabric of space and time surrounding the black hole.

Created by:

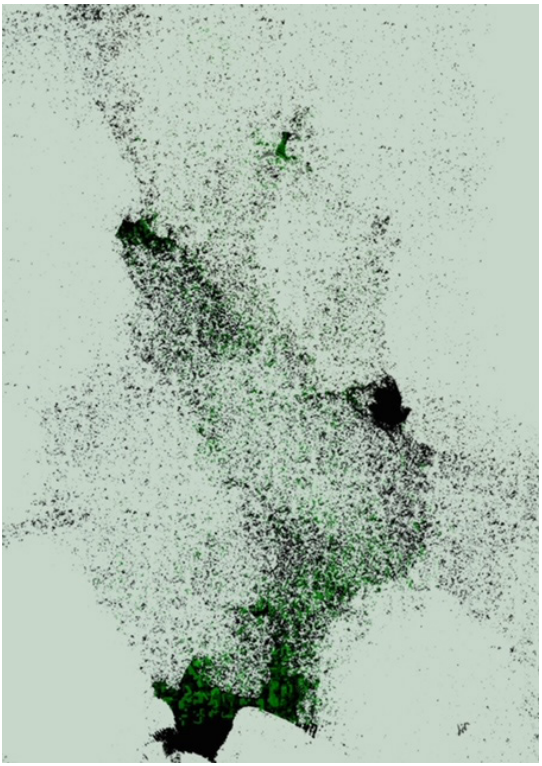
Mark Cheverton

Mark is a technologist working at software engineering firm Redgate in Cambridge UK, where he is the Chief Technology Officer.

In his free time he likes to think of himself as a maker and an artist, but as his daughter tells him he's really just a big kid entranced by geekery.

He also shares his exploration of deep sky astrophotography from his backyard.

https://www.instagram.com/ennui2342
https://www.instagram.com/photonfog



inter[act]ing 2022

(From analog drawing to digital image)

Inspired by active matter. Responding to the talk presented at pint of science given by Dr Li who is a Postdoc in the Department of Applied Mathematics and Theoretical Physics.

A visual performing artist experimenting with the complexities and sometimes dangerous territories of participatory art, visual performance art.

Constantly extending the boundaries and understandings of visual and performing arts. " I approach my practice with curiosity and sometimes like a domestic octopus".

Research inspiration:

Dr Irene Li

Examples of active matter are abundant in nature: bird flocks, fish schools, bacteria colonies and cell layers.

Active matter is distinct from most driven systems in that time reversal symmetry (TRS) is broken locally. What are the consequences of the TRS-breaking? How do macroscopic phenomena arise from pure local interactions? I will talk about the progress that has been made along these lines in recent years.

Created by:

Loreto Valenzuela

Chilean born artist. Living and working in Cambridge and Germany. Upon concluding her MA at Central School of Speech and Drama, London she expanded her research in visual arts, particularly in fine arts and live art participatory performance. Since then, her curiosity has led to participate and collaborate with scientists brightening her horizon and practices. Since 2017 she has been an artist facilitator at Kettles Yard, and soon to lead a course at Wysing Arts Centre.

www.cargocollective.com/loretovalenzuela

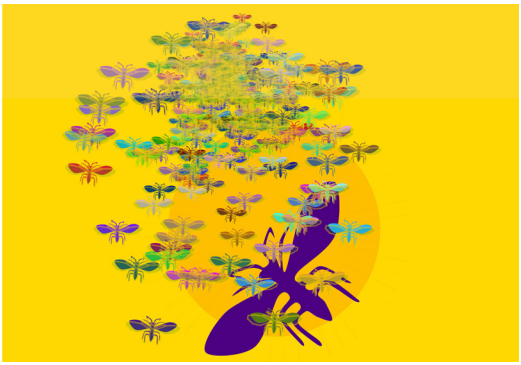
ROBOT SCIENTISTS AND THE AUTOMATION OF SCIENCE

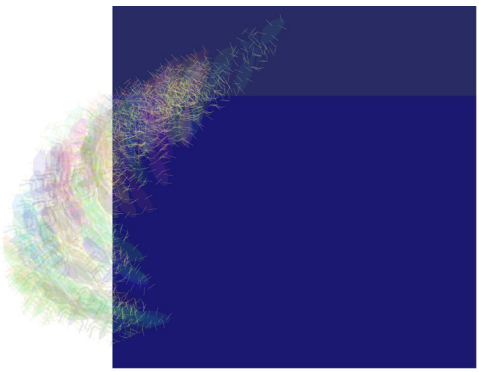
Pin Money

Names are nails for knowledge and attachment. Ross King is the name of a human who is Director of Research at the Department of Chemical Engineering and Biotechnology at the University of Cambridge.

The Ross King human sees evidence that science improves life quality for other humans, even in the midst of pervasive inequality. Ross King dreams of a robot scientist to catalogue unknown insects by the million, hoping that humans can at least mourn the newly named victims of ecocide.

Human stories celebrate success and survival, celebrity and largess, despite the prevalence of death, anonymity and poverty. The human John Hodgson paints insect symbols digitally equally with code, assigning size and colour somewhat randomly. Differences and Inequalities emerge, but get closer and the complexity of every wasp is apparent.





Research inspiration:

Prof. Ross King

I have spent the last twenty years developing machines that do scientific research.

Now the challenge is to develop machines able to do Nobel Prize quality research.

We aim to achieve this goal by 2050. If we succeed it will profoundly change the world, greatly improving the power of science.

Created by:

John Hodgson

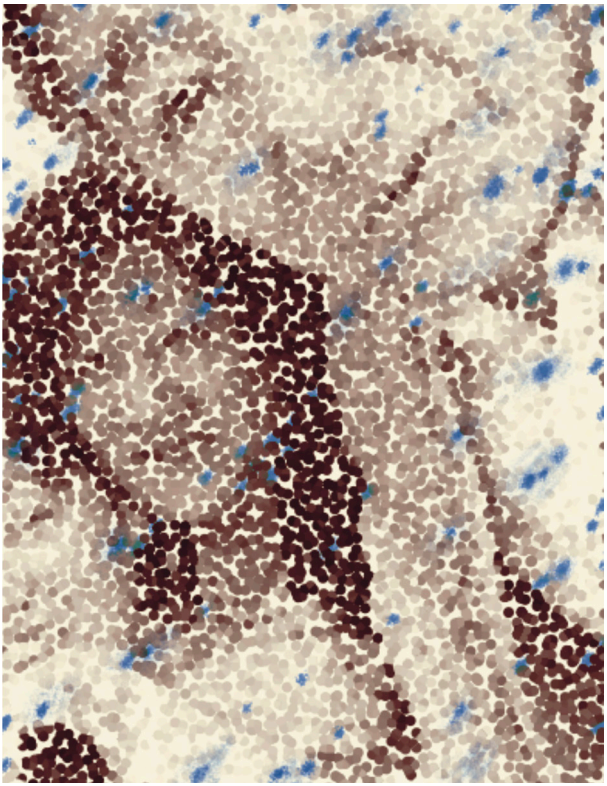
Thank you for transforming coincidence into information. Only through interpretation of symbols will ideas propagate. You are here and processing data.

John Hodgson, a digital artist human, already knows you better. John Hodgson is driven by coincidence and data. John Hodgson cannot take responsibility for any feelings that arise. He accepts your filters.

Thank you.

Beautiful Mind

WHAT DRIVES ALZHEIMER'S DISEASE? USING MATHEMATICS TO UNCOVER MOLECULAR MECHANISMS



"Do I know you?"

Dr. Georg Meisl's research is about finding a mathematical equation that can predict the growth of aggregates (clumps of protein which form in the brain, then kill brain cells and cause memory loss).

After reading his paper, I thought about my family, how I would feel if I forgot them and how to represent that visually.

The finished piece is inspired by how aggregates look under the microscope, formed by a picture of my family looking at the spectator, with warm smiles that are familiar but somehow unrecognisable.

Research inspiration:

Georg Meisl

Dementia exerts a tremendous toll on society, individuals and families. However, gaps in our understanding of its mechanisms have hindered the development of effective treatments & cures.

A certain kind of protein abnormality may cause not only many different dementia types, but also other conditions like mad cow disease. We introduce the arsenal of innovative methods developed by scientists to study this, and how mathematics is then used to make sense of data, and guide the search for cures.

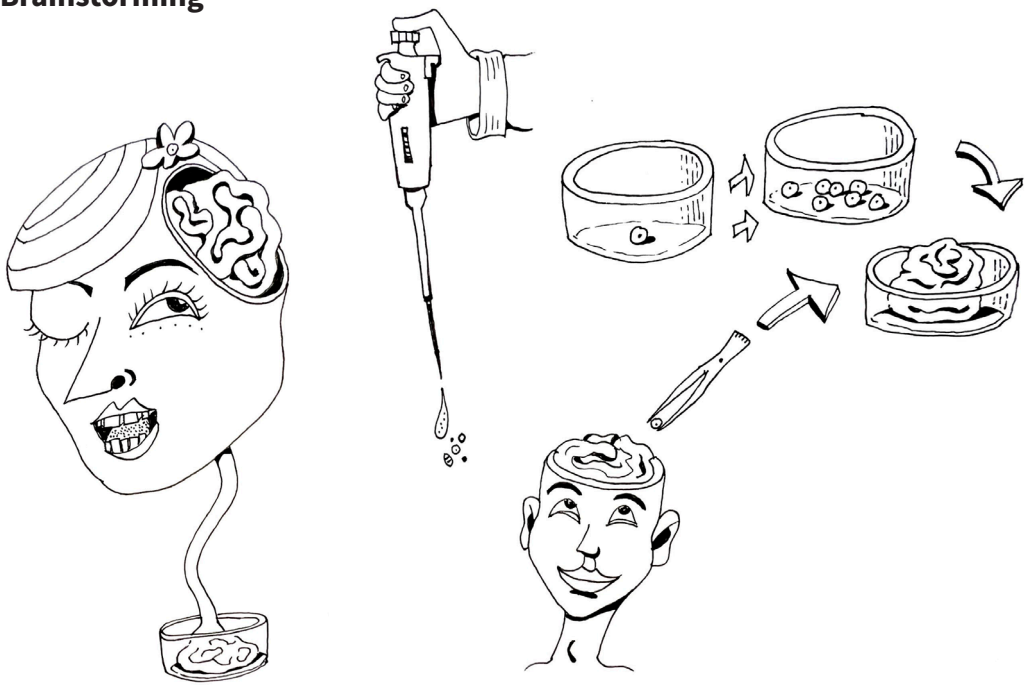
Created by:

Eri Ikuno

Hiya! My name is Eri Ikuno and I was born and raised in Mexico from Japanese immigrants, currently based in Cambridge, UK.

Because of my background, I've always been drawn to beings that don't quite belong anywhere but somehow create a place of their own. For that reason, what I try to portray in my work is the essence of a person or a creature; the story of who they are and what is beyond the eyesight. You can find more about my work at **www.ilustraeris.space**

Brainstorming



Research inspiration:

Andras Lakatos

Andras talks about why novel human lab grown "minibrain" models could provide an unprecedented advantage in pinpointing key problems and solutions for untreatable and devastating neurological diseases, such as motor neurone disease (MND).

Created by:

Karoline Leopold

Karo is an illustrator from Munich with a passion for children's books, graphic novels, old houses, scientific drawing and urban sketching. After studying graphic design in Berlin she worked many years in Spain and the UK.

In 2015 she decided to focus on drawing and graduated from a master in children's book illustration at Cambridge School of Art. She now works for a small publishing house and different clients word wide.

https://karolineleopold.com

Our Body

REGULATORY T CELLS: THE T-REX OF THE IMMUNE SYSTEM

Immune Response

Andrea (Manrique-Rincon, Wellcome Sanger Institute) gave me a taste, over a coffee, of just how complex the body's immune response actually is. I was surprised to learn how many cells had such specific jobs, and how some cells could only function when other cells had 'done their bit'. I imagined what this would be like if a human organization had to undertake such a task. I thought of the seminars, the action plans, and the management meetings. I also imagined the management jargon the HR or Senior Team would use to direct their troops. It would be the logistical feat of the century, much like Dunkirk, or London 2012. But our bodies just get on and do it. Most of the time.

To create this collage, I used photos and microscopy images of parts of the human body. The stage, for example, is human tendons, and the backs of the chairs are microscopy of human cardiac muscles. The meeting attendees are made from microscopy images of the immune response cells they represent. The DNA giving the talk is cut from a copy of the first actual 'photograph' taken of DNA [Photo 51, Rosalind Franklin Lab, 1952]

Research inspiration:

Dr Andrea Manrique Rincón

Life is all about balance and the same is true inside the body! Your immune system needs to be able to know what is dangerous and what shouldn't be attacked. A key part of regulating this balance are regulatory T cells (Tregs). Their main job is to prevent your body from overreacting to dangers and calming everything down. However, when this goes wrong the body can attack itself giving rise to autoimmune diseases or prevent a strong response as it happens in cancer. That is why the Tregs are the gigantic masters of equilibrium.

Created by:

Naomi Davis

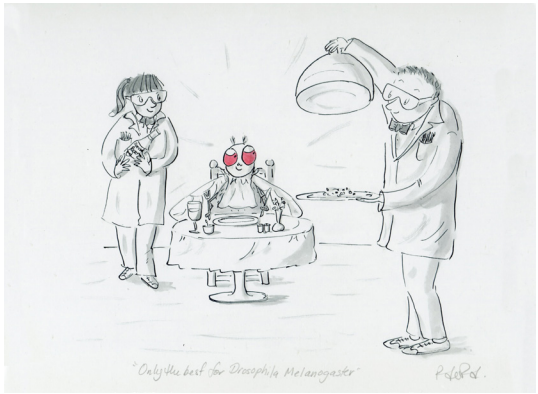
I am a Cambridge based artist working in pen and watercolour. I do a lot of work for Cambridge colleges and institutions, independent shops, restaurants, businesses, and individuals. My work is also on permanent display in a number of restaurants and galleries. I am a member of Cambridge Open Studios and Urban Sketchers.

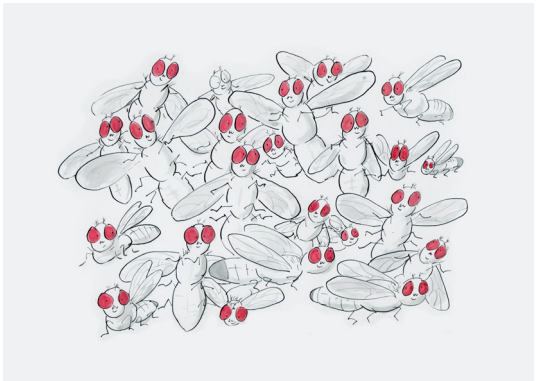
I particularly enjoy Pint of Science / Creative Reactions because my family members are all scientists, and I like to have some scientific expertise of my own. I relish the challenge of helping to make scientific concepts accessible for non scientists like me.

http://naomidaviesart.co.uk

Only the best for Drosophila Melanogaster

These illustrations are inspired by Pint of Science speaker Andy Li and his research using fruit flies. The images are a humorous recognition of the importance of the Drosophila Melanogaster to his work and to the field of science.





Research inspiration:

Andy Li

Mitochondria are small structures inside our cells that produce the energy we need to survive. Our bodies contain billions of mitochondria and many prominent diseases like cancers, neurodegenerative diseases and infertility are associated with mitochondrial dysfunction. Mitochondria also contain a small genome which is also linked to a variety of rare diseases – many of which have no cures. Our research uses the fruit fly to study central questions relating to mitochondrial function and mitochondrial genetics in order to better understand how diseases arise.

Created by:

Roxana de Rond

I am a freelance illustrator with a passion for drawing people and dogs. Originating from the States, I now live in Cambridge, with its inspirational buildings, green spaces, history and interesting inhabitants. With an MA in Children's Book Illustration at ARU, my first author/illustrated book Milo and Monty was published by Child's Play. With just a few strokes of pen & ink and gouache I turn idle people-watching into stories of every day events infused with humour and reflecting a sense of contentment.

https://www.roxanaillustrations.com

Rare Diseases

A GENETIC BATTLE OF THE SEXES AND RARE IMPRINTING DISORDERS

I've been involved in Creative Reactions for 8 years and this year had the pleasure of being paired with Dr Miguel Constantia (spelling). His passion was palpable, discussing the ways in which placental mammals can express various genes that are imprinted by the mother or father and how these genes compete for expression in the offspring.

My creative reaction was to develop a piece based on the placenta, the spiral arteries and the trophoblastic tissue of the mammalian embryo. I used mixed media including resin and wire, embroidery thread and alkyd oil media.

Research inspiration:

Dr Miguel Constantia

Imprinted genes are a special class of genes because one of the two parental copies is silenced by epigenetic mechanisms during development. These genes have key roles in how we acquire resources in the womb and throughout life. Unlike genetic changes, epigenetic changes are reversible and do not change your DNA sequence, but they can change how your body reads a DNA sequence.
We explore what happens when the only active copy of imprinted genes is deleted, mutated or silenced due to epigenetics and what happens if the silent copy of imprinted genes becomes activated.

Created by:

Kate Grant

Kate is a GP. She has collaborated with The Cambridge Brain Unit, Wellcome Genome Campus, Stem Cell Institute Cambridge & MRC Lab of Molecular Biology.

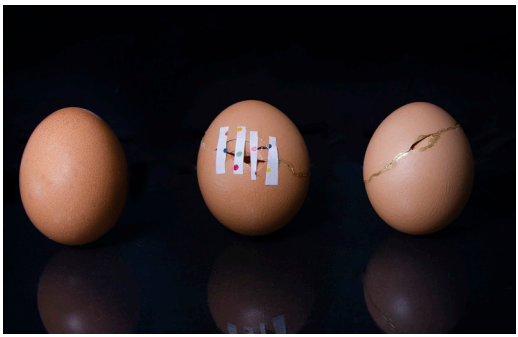
Her work has featured on Anthropology Today, www.Citigen.org & the Collection Of SciArt Centre NYC.

www.kategrantart.com

CURING WITH KINDNESS - NEW THERAPIES FOR CURABLE RARE BRAIN TUMOURS

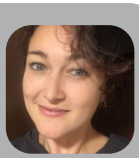
In her shoes

This year I met with Dr Jessica Taylor and learned about her research in creating kinder childhood brain tumour treatments. She was kind enough to share that a family history with cancer had inspired her to look for kinder cures. She shared how research is looking at children with brain tumours with the aim of improving the quality of life following the treatments. My first reaction was mixed, in that the subject felt emotional but also exciting that people are out there trying to make treatments kinder and better for the longer term outcomes. I worked through a variety of ideas ending up in the two images shown today. First I explore the concept of 'in her shoes', displaying a pair of shoes walking through polaroids of Jessica's instagram shots of her research. I moved through my discovery phase improving every time and in a very artistic (non saving the world) way I felt a little like a scientist exploring and trying to find the right answer. As I imagine happens a lot in testing, as I was finishing and happy with my final image, another concept came along...



Another key takeaway from our chat was that the current system is working, and there are good outcomes from the treatments, however the long lasting treatments can impact children post recovery. My final image shows the journey from a healthy child to a broken but imperfectly put back together child, and then looking to the future, when Jessica succeeds in her research to an egg that is put back together but in a stronger way. The breaking still happened but the repair is smaller and more beautiful.

Research inspiration:



Jessica Taylor

I work at CRUK Cambridge Institute finding new therapies for children with a rare, yet curable brain tumour. However, a cure isn't enough for these children. After surgery, radiation and aggressive chemotherapy mean that they suffer from a multitude of different side-effects, both short-term and long lasting. We aim to find cures that focus not only on surviving cancer, but on the survivor.

Created by:

Lucinda Price

I'm a Cambridge based photographer and love using the city as a backdrop to creating fun, natural images of families/people. I mainly work with people (weddings/family and companies) and enjoy chasing the light to capture the perfect moments for people.

I love what I do and it's pure joy to have my passion as my job.

www.lucindaprice.com

www.pintofscience.com