

SMQB Artists-in-Residence 2021-2022



Overview:

The Centre for Systems Modelling & Quantitative Biomedicine (SMQB) is a new interdisciplinary research centre based at the University of Birmingham. We are delighted to announce an exciting opportunity for artists and creative practitioners to create novel pieces of work responding to collaborative SMQB research. We are keen to encourage emerging, as well as more established artists to apply. We also strongly encourage lived experience artists i.e. those with a personal connection to the research subject matter, perhaps because they are a former patient or they live with a particular health condition themselves or because they care for someone else who is affected by the topics under research by our teams.

About Us:

SMQB comprises a group of research innovators with backgrounds in mathematics, computer science, physics and biomedicine. We are passionate about delivering transformative research that impacts upon lives, through contributing measurable advances to healthcare and medicine. We believe placing the research challenge at the core and bringing together expertise from complementary disciplines will be increasingly essential for driving fundamental research discoveries in the biomedical domain and enabling their translation into societal benefit. Find out more at www.birmingham.ac.uk/smqb.

Research Incubator:

Our flagship 'research incubator' enables the co-design of research projects at the interface between quantitative disciplines and biomedical and clinical research. Projects involve a six-month focused period of research where investigators from complementary disciplines, as well as other stakeholders are paired with one or more of our Centre Fellows. Centre Fellows provide the critical expertise needed to take the project from concept to delivery and by the end of six months teams will have produced results suitable for both first publications and onward funding.

Artist in Residence:

Our aim with this artist residency is to involve artists/creative practitioners as part of the research process, helping bring on board new perspectives and insights as part of the team, whilst also leading on new creative outputs that will be showcased alongside more traditional research outputs later next year.

We are seeking applications from motivated artists/practitioners who are interested in responding creatively to one of the research projects being taken forward for our

research incubator in October 2021. These four projects are summarized on pages 5-6 of this document. Creative outputs could include (but are not limited to): musical composition, performance and other multidisciplinary visual arts such as painting, drawing, printmaking, sculpture, textile craft or photography - we are open to proposals of all kinds. We encourage applicants to carefully consider how their work will engage others with the research itself as well as the art form(s) e.g. through delivery of participatory art workshops or other public engagement activities.

Each artist/practitioner selected on to the programme will spend time collaborating with our researchers over the next six months. Their level of involvement over this time period should be self-managed and proportionate to the fee on offer, bearing in mind the requirements mentioned in this form (blogs, team meetings, public engagement activities etc.) and the creative work they will deliver as per their application. We obviously do not expect artists to work full time for six months. Most of the artists we have collaborated with previously have undertaken the residency part-time on top of day-to-day working or studying.

Fee:

The successful applicants will each receive a **fee of £2500 (including VAT)**, to include travel, materials and production of the commission detailed in their proposal.

Each research incubator kicks off with a two-day meeting that brings all stakeholders together to map ways of working and project milestones. **This two-day meeting will take place near Birmingham (location tbc) over the 6-7th October, 2021. Successful applicants will be required to attend**, with their travel arrangements and overnight accommodation for the research incubator paid for separately by us. If childcare cover presents an issue in attending this two-day meeting, please let us know as we would like to facilitate your involvement. The meeting provides an opportunity to refine project proposals, as we anticipate artists/practitioners may wish to make some changes to their initial ideas following discussions over these two days. The meeting will also allow an opportunity to agree suitable working patterns for all collaborators. Successful applicants will also be asked to document their collaboration through short blog posts and brief presentations roughly every 6-8 weeks. They will also be asked to take part in some team meetings and public engagement activities alongside our researchers, including an end-of-project showcase event next year involving all collaborating teams and artists.

Applying:

Applications are to be made by email to the Community & Public Engagement Manager, Caroline Gillett at: c.d.t.gillett@bham.ac.uk with the subject '**AIR 2021**'.

Deadline: Sunday 12th September, 2021. Email attachments must not be larger than 5MB and should include a single PDF containing the following:

1. Your name, contact details and website address (if you have one)
2. An outline proposal which describes what kind of creative work you would like to organise, how this responds to the research & how it will engage others (500 words)
3. An artist's statement / biography (200 words)
4. An up-to-date CV
5. Evidence of your current recent practice in the form of up to 10 images or a direct link to a showreel of film and video work (maximum duration of 5 mins) uploaded to YouTube/Vimeo

We will be offering the opportunity for shortlisted candidates to meet the Centre's Director and conducting informal interviews on the afternoon of **Thursday 23 September, from between 1 – 5 pm**. Please let us know when you apply if it will not be possible for you to attend on this day. If you are interested in applying, but have further questions, please contact Caroline Gillett who manages the programme: c.d.t.gillett@bham.ac.uk

Testimonials from SMQB Artists in Residence 2020-21

You can find out more about the work of last year's artists through reading their blogs [here](#), viewing the virtual exhibition [here](#) and watching their individual video presentations linked below and a panel discussion involving all artists [here](#).

Pietro Bardini, composer – view video [here](#)

"This residency helped me develop my practice by inviting me to participate directly in the research processes and allowing me to freely expand my initial ideas. Collaborating with SMQB's researchers and teams pushed me to investigate new approaches to sound composition and how collaboration between different practices can generate novel and unexpected outcomes. This residency has helped me find a balance between my composition background and my interest in computation, which I have been further researching into since.

This collaboration has since brought more opportunities to develop work with researchers working at the boundaries between health and data. I am currently working to develop an audio-visual piece using genetic health data and machine learning."

Carol Breen, artist – view video [here](#)

"Working with SMQB has been a fantastic experience. I learned a lot about the different ways in which images are created and produced in various scientific contexts. I was provided with a tour of the labs at Birmingham University which gave me insight into calcium imaging, and other microscopy techniques. Collaborating with the team of researchers was such a valuable experience for me. I am fascinated by images, and the economies within which images circulate. I re-make and re-appropriate images of all kinds including my own to think more about public and private space therefore it was so exciting for me to be working with medical images. I re-purposed and re-appropriated elements from images created using calcium imaging, 3D macromolecular structure data from the protein data bank, as well as plots from Isabella Marinelli's PhD thesis which was used in the teams research into Beta Cell heterogeneity. At the initial incubator event at Bristol I started to understand how oscillations play such a huge part in the cellular processes that the research team are examining, which led to one of the researchers translating cell activity into sound which I then incorporated into my work. I was given helpful feedback about my project, learned more about art in relation to public engagement as well as valuable insights into my work from the producer Caroline. Going forward I am developing a new method – screen printing. Over the coming weeks I will be learning this process at the Printheus in Cardiff and creating a series of prints from the work I created during this collaboration. I am also keen to experiment more and develop future work based on the experiments I created during this residency. I have started to collate research which relates to conversations that arose from the final online public sharing event, as well as reflecting on the valuable conversations I have had with the research team on the slack channel we shared over the course of the project. The interactions I had during the research incubator and meetings during the residency with the other artists were also beneficial. I would highly recommend other creatives apply to this residency."

Melissa Fisher, artist – view video [here](#)

"From this experience, I met amazing new collaborators & scientists doing impactful research and I also got a step towards the direction I wanted my artistic practice to go.

Possibly the easiest and nicest people I've ever worked with, really inspired by learning about artists as well as expressing what science they want to communicate. Brilliant team, I'm sad to be at the end of my residency with them, I wish I could do it again.

This has informed my practice substantially and taken me to realms of my practice I didn't know existed, I managed to get an Arts Council England grant from the development of this collaboration as it is a theme I will be continuing"

Vicky Roden, artist – view video [here](#)

"The SMQB residency was a fantastic experience – it gave me the opportunity to meaningfully engage with a subject that I had a great passion for, significantly push myself creatively and has enabled me to forge relationships with organisations that previously wouldn't have been possible.

As a previous hyper-thyroid patient who was treated at the QE hospital the process enabled me to both give something back to the facility which ultimately resolved my condition and taught me a lot of things about the condition that I was previously unaware of. This has given me a lot of closure about issues I experienced at the time, enabling me to move past previous problems.

Throughout the project I have very much been treated as part of the team, with valuable contributions to make, rather than a public engagement afterthought tacked on after the bulk of the work had been done. It was fantastic to really feel like I was helping shape the research, and providing new avenues to explore in respect of the data that could be useful in treating overactive thyroid conditions. This very much gave me the passion for the project to overdeliver, and to put as much as I could into the work. While I had used materials such as resin before I was far more ambitious in the ways that I used them for this project, and allowed myself the freedom to really experiment.

The outcomes of the project have been incredibly positive – I've been contacted by the Thyroid Trust and am working with them to create awareness raising workshops and work for International Thyroid Awareness Day, something which will bring my work to a wider audience and also continue my aim of helping to prevent others experiencing what I did.

I've also been in touch with other artists who are currently experiencing thyroid problems, sharing stories and informing each other's work. Finally, I'm still very much in touch with the original team, and am looking at creating work relating to their other projects – I'm currently planning an accurate model of a sperm cell using resin, silk and crystal beads (which is not a sentence I ever expected to say!). In short, the residency has been an incredible, supportive, fulfilling and steep learning curve, and I would absolutely recommend anybody apply for future opportunities with SMQB."

Research Incubator 2021: Research Project Summaries

When applying please make clear which project your proposal relates to.

Project 1: Precision medicine in acromegaly with metabolome analysis in blood samples

Acromegaly is a serious medical condition caused by a tumour in the pituitary gland, which sits at the base of the brain, and secretes too much growth hormone. It has major impact on the body's functions leading to high risk of diabetes, heart attack, premature death. Getting treatment right is very important. Treatment is by surgery or drugs and its success is measured by markers not really reflecting if the body has gone back to normal. Clearly, better biomarkers are needed. Acromegaly impacts on metabolism – the body chemical reactions important for release or use of energy. The products of these processes are 'metabolites', which can be measured and this has proven useful in several diseases. In previous research, we have identified some metabolites as potentially more accurate biomarkers for acromegaly. We plan to validate these in a larger study using scientific methods to analyse and compare metabolites in the blood of patients and of healthy, non-acromegaly controls. These metabolites will also help us understand how acromegaly causes damage in the body. This research is novel and exciting, with the potential to effect real change in the management of acromegaly and to positively impact upon the disease burden on the patients.

Project 2: Deciphering the 3D structure of the epigenome for improved cancer diagnostics.

The epigenome can be thought of as a series of switches in our cells. Each switch controls the amount of protein that can be produced in the cell. These proteins are important because they are the machines that manage a cell's health and its response to disease, environment, ageing and so on. The epigenome is the control panel of the cell. The problem for us as scientists is that the switches on the control panel are invisible.

We have developed a novel technology that will shine a light on these switches in our cells. We can see these epigenomic modifications for the first time and now we need to understand how they are connected and the role they play in the behaviour of a cell. For example, in a cancer cell, we expect different switches to be set to 'on' than in a healthy cell; those switches may lead to the production of proteins that make cancer deadly.

We will use this project to unravel some of the unseen wiring between the switch and the cell type by developing new methods for image analysis. This will allow us to rapidly identify healthy and cancerous cells from the array of switches we see and will have application in cancer diagnosis and the development of new cancer therapies in the future.

Project 3: Disentangling the impact of epilepsy and co-occurring neurodevelopmental disorders on brain networks

Epilepsy is a common brain disorder that causes frequent seizures. It can be very difficult to find out if a child has epilepsy, and when they have other conditions at the same time, this can be even harder. Two of the most common conditions that affect children with epilepsy are autism and ADHD. These conditions affect children's behaviour and brain function. When epilepsy, autism and ADHD are present, it can be very difficult to come to a clear diagnosis and to define which treatment should follow.

In this work, we will use recordings of brain electrical activity (electroencephalography) from children with and without these conditions to develop computer models of their brains. These models will allow us to understand how each of these disorders affect the brain. In the future, this information will help doctors when they are trying to assess if a child has one or more of these conditions and what is the best strategy to treat them.

Project 4: Automation and statistical refinement of an unsupervised analysis pipeline for measurable residual disease (MRD) testing in acute myeloid leukemia (AML)

Acute myeloid leukemia (AML) is a life-threatening blood cancer that affects around 3,200 people per year in the UK. Although treatments are improving, AML remains fatal in the majority of cases. Treatment for AML consists of chemotherapy, which kills the leukemia. However, although the initial response to treatment is good in 60-80% of patients, it is often found that some cancer cells survive in the bone marrow, and these grow in number to cause disease recurrence ('relapse') months to years after treatment. Highly sensitive laboratory tests can detect these few surviving cancer cells, termed 'measurable residual disease' (MRD). Patients with a positive MRD test are more likely to relapse. MRD testing can help clinicians decide which kind of treatment is likely to benefit patients most and to test new treatments in clinical trials. However, experienced specialist clinicians/clinical scientists are required to analyse and interpret the test results. Our research will create software that can analyse MRD results in a consistent manner. This will improve the test accuracy and make it easier for the test to be carried out, allowing more people to use MRD testing to improve outcomes for AML patients.

Quick FAQs:

I am interested in more than one research project, can I put in more than one outline proposal? Yes, but please limit this to a maximum of two different proposals (500 words each max). Please note that we are unlikely to fund two proposals from the same artist/practitioner in the same period.

Do I need to be Birmingham based? Research projects are all based at the University of Birmingham. We welcome applications from artists/practitioners anywhere in the UK, however you will need to coordinate your collaborative involvement and at times travel to meet with researchers, so please bear this in mind with regards to the fee on offer.

Can I submit a joint proposal with another collaborator/artist? Yes this is possible, but the fee on offer would remain unchanged and you would need to agree how best to split this amongst yourselves. Please contact Caroline to discuss this informally prior to applying.

What if my ideas change after meeting the researchers in person at the Incubator meeting? That's OK. We expect that initial project proposals may evolve a bit after meeting face to face with the researchers and other collaborators involved in the process. We see this flexibility as a good thing, as it should enable you to ensure that your idea is both practical to implement and meaningful to the overall project.

Who is on the selection committee? Shortlisting and informal interviews will be conducted by a panel including SMQB Director, Professor John Terry and Community & Public Engagement Manager, Dr Caroline Gillett, in partnership with a previous SMQB artist in residence where possible.