Open call... We invite postgraduate students from across CSM to join an exciting experimental project designed to interrogate and reimagine contemporary scientific research centred on heart disease, energy harvesting and cellular sensing.

QUESTIONS TO EXPLORE:

• How are scientists tackling the problems of heart conditions?
• How do heart cells sense and understand environmental conditions?
• How are engineers developing technological interventions to interface with the body?
• How is scientific research conducted and how can this research be ‘hacked’ by the practices of art and design?

Dates
4-8 November 2019

Times:
Monday - Thursday: 2-6pm
Friday: 10-1pm + evening public seminar (optional)

Location:
The Grow Lab, Central Saint Martins, Kings Cross
**Project:**

In November 2019 visiting scientists from Tokyo Institute of Technology and Queen Mary University in London will present their research to be ‘hacked’ by a group of artists and designers in a week-long collaborative hackathon.

The project, open to all postgraduate and doctoral students across Central Saint Martins, will open up cutting edge scientific research for consideration from cultural, political and social perspectives through art and design practices.

Through a week of presentation, demonstration, experimentation and ideation participants will collaborate with students from across diverse disciplines at CSM and with professional researchers in fields of art, design, science and social science.

**Structure:**

Day 1: Introduction and scientific presentations / demonstrations

Day 2: Practical activities / discussions to unpack the science and start ‘hacking’

Day 3 & 4: Students work in small groups to develop ideas in critical / creative response to the scientific research.

Day 5: Presentation of outcomes to the visiting researchers + public symposium in the evening.
Background and Intention:

As part of the launch of the new Grow Lab* facility at Central Saint Martins we are hosting a Scientist in Residence project, which aims to bring cutting edge scientific research into art and design teaching and research. Through experimentation and investigation students will be encouraged to consider the implications for scientific and technological developments in society. We invite students to engage with the practical, ethical and philosophical dimensions that arise from this research in a form of ‘hacking’ - in practical and conceptual terms. And in turn, the project offers the Scientists in Residence alternative perspectives on their own research specialisms, by offering it up to be interpreted through different disciplinary lenses.

Hacking Hearts invites students to respond to a body of scientific research from a range of perspectives within fields of art and design, considerations may include: speculative design, material manipulation, ethical dimensions, or philosophical questions. The intention is for open-ended exploration: students may develop ideas for design solutions, run an experiment or propose an artwork, or they might interrogate the central research question and present provocations, thoughts and actions. The emphasis is on the process of enquiry rather than achieving resolved outcomes. The creative responses produced through the project may take any form, such as models, maquettes or material experiments; designs, proposals or manifestos; and questions, performances or actions.

By creating the conditions for mutual exchange, dialogue and collaboration we hope that novel insights and hybrid methods may emerge from a process of co-enquiry between disciplines, knowledges and practices.

* In Autumn 2019 Central Saint Martins opens a new workshop facility in recognition that biology and science are increasingly integral to much art and design thinking in the 21st Century. The Grow Lab is a basic biology laboratory focused on working with living systems (plants and microorganisms) and imaging technologies.
Since pacemakers were first introduced in 1958 to regulate heart rate, hundreds of thousands of people worldwide have enjoyed an extended life expectancy through technological intervention. Advances in the technology have progressed greatly in this time, but the problem of how to power the device persists, with patients having to undergo surgery every 5-7 years just to replace the battery.

Wataru Hijikata’s research on energy harvesting and flow seeks to remedy this problem to develop self-powered pacemakers, which can harness the natural reflexes of the body to generate power. He will share his latest research and prototypes for an implantable power generation system driven by muscle contractions for supplying power to activate implantable medical devices (AIMDs). The proposed system creates a feedback loop between the body and the device through electromagnetic induction.

Much heart disease stems from biochemical behaviours at a cellular level. Recent discoveries have shown that cellular behaviour is influenced by the stiffness of the environment. The stiffness of the heart changes during development, during ageing and especially also in heart disease, thereby affecting how well the cells in the heart can beat. However, it is still unclear how the cells in the heart measure the stiffness, or if cells from healthy and diseased hearts can sense it in the same way.

Thomas Iskratsch’s research seeks to answer this question, by placing heart cells on engineered surfaces, which are produced to have stiffnesses mimicking embryonic, healthy or diseased adult hearts and which can be used to measure the cellular forces. They can also print patterns onto these surfaces, on which cells will adhere and take up the specific shapes to allow the observation of single, or multiple cells together, in a highly reproducible way. This way they can analyze and manipulate cellular components and observe changes to shape, forces or other parameters in order to find how the cell feels the environment. In the future, they hope to identify drugs that will help the heart cells work better when the heart gets stiffer.
The scientists will be joined by social scientist **Professor Kayoko Nohara**, who leads a translation studies laboratory at Tokyo Institute of Technology. Her research centres around how message, meaning and understanding translate across disciplines, cultures and modes of communication. Humans have such flexible minds that they always find some kind of “meaning”, semantic or pragmatic, in whatever object they encounter, however new and obscure it might look in the first place. We can describe “it” one way or another using some language or media as far as the content is regarded as “something worth” communicating. Scientific findings originally described using academic language can easily be translated to a visual image, a TV documentary programme or a newspaper article. Knowledge can be hacked to stimulate new thinking and to produce something beyond science, such as a piece of art, literature, music or else? Her research investigates the process and result of such hacking and tries to figure out the mechanism of the creative shift, which takes place during the transformation from one expression to another.

**Hacking Hearts** is a research project in action exploring modes of translation between disciplines and cultures. Students who participate in the project will also be invited to contribute to the collection of data through simple questionnaires, documentation of ideation and (optional) interviews.

“Hacking” is part of the process of transdisciplinary knowledge sharing and mutual understanding beyond cultural border. Our research team is trying to develop methods to combine different skills and ways of thinking to acquire fresh perspectives and ideas through communication using various tools called Communication-Driven Hybrid Method. We would like to observe what will happen throughout the communications and interactions among all the participants during the workshop and how arguments in science and engineering are translated, reworded and then re-expressed.

**The Central Saint Martins team includes:**

**Heather Barnett**
Pathway Leader MA Art and Science
Co-director Art and Living Systems Lab

**Dr Ulrike Oberlack**
Course Co-ordinator, MA Design (Ceramics); MA Design (Furniture); MA Design (Jewellery)
Visiting Professor at Tokyo Institute of Technology

**Dr Betti Marenko**
Reader in Design and Techno-Digital Futures
Contextual Studies Leader BA Product Design
Visiting Professor at Tokyo Institute of Technology

**Dr Shem Johnson**
Specialist Technician of the Grow Lab
Who should apply?

We are looking for a diverse group of up to 12 students from across different subject areas at CSM. All postgraduate and doctoral students are eligible to apply to participate in this project. You do not need any prior experience in science, but should be excited by the possibilities of making work/generating speculative ideas in response to the scientific research presented.

You should apply if you are interested in:
- exploring different disciplinary approaches to research and enquiry
- the idea of creative and critical ‘hacking’ of contemporary scientific research
- working with scientific researchers from Tokyo and London and diverse faculty from CSM
- collaborating with students from across CSM subject areas
- exploring issues of translation: across disciplines, language and cultures.

Application Process

If you would like to participate in the Hacking Hearts experimental project please submit the following by 5pm on Monday 7 October by email to: Heather Barnett at <h.barnett@csma.ac.uk>

- A short statement of interest indicating why you are interested in participating in the project and any initial thoughts in response to the project description (150-300 words).
- Examples of previous work - a pdf with selected images and captions (max file size 5MB) and/or link to a website/online portfolio.
- Include your contact details: name, course, email and phone number

Numbers are limited to a maximum of 12 and we are keen to engage a wide range of students from across the college, representing different disciplinary approaches. Selection of participating students will be announced by Monday 14 October.

CSM x TiTech

This project is part of a transnational and transdisciplinary collaboration between Central Saint Martins and Tokyo Institute of Technology, exploring methods and mindsets of the disciplines across art and design and science and engineering. The project began in May 2018 with a public symposium exploring ‘The Experiment’ and has since developed three Research Residencies and two Visiting Professorships in Tokyo for CSM faculty, and many exchanges, seminars and public events. This is the first of what we hope will be many Scientist in Residence projects to be hosted at CSM.