

Implantable MicroSystems

IMPACT for Personalised Anti-Cancer Therapy

In this issue:

- [IMPACT at the Edinburgh International Science Festival](#)
- [Prof Tait at the UK Diagnostics Forum](#)
- [Springer book chapter submitted](#)
- [Latest on experiments](#)
- [Regulatory meeting](#)

IMPACT Project at the Science Festival

IMPACT took part in the University of Edinburgh's Family Events Programme, part of the Science Festival activities held at the National Museum of Scotland from 1-16 April. Based at the Learning

Centre, our 'Micro-Engineers' event invited children and their carers to discover real life plans to implant a miniature monitoring station inside a cancer tumour to help doctors destroy it. In the movie *Fantastic Voyage*, a submarine with a crew is shrunk to microscopic size and injected into a patient's blood stream. At our event, there was no science fiction involved, but some 2000 people enjoyed a variety of activities. They learned about sensors and used some common ones found at home and in

***UK Diagnostics Forum
Oxford, 16-17 May 2017***

Diagnostics are often classed as disruptive technologies, requiring a change in care pathways and roles and responsibilities. Prof Joyce Tait has been invited to present at this forum her understanding of the behavioural side of the adoption of new technologies, as well as the social science around the challenges of change.



The IMPACT project team showing how the IMPACT chip will work

hospitals. They were also able to light up an LED attached to a chip by dipping a rod into a 'body' tank, showing how the IMPACT device will be powered when inside the body. Visitors to the exhibit also enjoyed a 'spot the difference' poster activity to teach the difference between healthy and cancerous cells, before looking down microscopes and testing their knowledge on both types of cells.



Spotting the difference between cell types



Further pictures from the Science Festival can be found on our project website: <http://edin.ac/2ppZmQK>

Latest developments on the experiments

The engineering team have recently been working closely with the Vet School to trial prototype IMPACT oxygen sensors in cadavers. These tests represent an exciting and important first step towards their eventual use in living tissue. Preliminary analysis of the results has been encouraging, showing that most sensors survived the rigors of mock surgical insertion and gave readings consistent with their environment. The team is now further developing the oxygen sensors to increase accuracy and allow autonomous operation. We also plan to test sensors for pH (another indicator of hypoxia) in the near future.

Liyu showing how the IMPACT device will be powered when inside the body



The IMPACT team has just completed a chapter for a Springer publication titled 'Biological and Chemical sensing on CMOS'. The chapter has sections on Cancer Biology; Oxygen Sensing; Biomarkers; and Electrochemical Sensing and Wireless Operation – Challenges and Options.

Regulatory Workshop with John Purves

John gave the IMPACT team an overview of medical device regulation in the UK and Europe. Each of the IMPACT research teams was then invited to present their projects, addressing the designs, materials and protocols likely to be affected by regulation. An excellent discussion ensued on the steps necessary for the preparation of an end of project dossier to take to regulators or to an industrial partner.

A further meeting is scheduled for next week to look at how best to implement some of the recommendations. Further meetings with John are planned to ensure that we are compliant with best practice as the project enters its final 2 years.

