Of Festivals and kindling young minds…

looking back on a successful year of engaging with the next generation - thanks to our students and staff.

On a perfect March day filled with glorious spring sunshine, what a fantastic celebration it was for the MRC CU to mark the last day of the Cambridge Science Festival, 2017! The event was hosted again this year at the CRUK CI's foyer, as a joint effort between members of the cancer research community at the Biomedical Campus. The CU had a great team of students, post-docs and staff, who were joined by members of the Cambridge University society - CATS, to promote the Unit’s mission through all the 8 activity stands that went on display. In addition, there were two very well attended talks (150 + visitors) from members of the Unit, dwelling on the role of computational biology in cancer and the link between metabolism and cancer.
With around 300 visitors, ranging from retired pensioners to primary school children, it was a day filled with the buzz of creativity. All the activities at the stands had been carefully designed in-house with months of thought and effort having gone into it. Be it the hands-on experience of a key-hole surgery model, anatomical models of disease, using raspberry pies fruits and ducks to illustrate cancer mutations in the genetic code, a bespoke cancer invasion maze or chromosomes models to understand the impact of genomic instability, there was something to meet everyone’s taste and curiosity. It was also a great opportunity to show-case the breadth of MRC funded science in Cambridge through the well-received MRC Colouring Book – a joint venture between various MRC Units in Cambridge. Overall, a fun filled day of creativity and science coming together!

Following on from the University Science Festival, our next big public engagement endeavour was at the Unit Open Day and the inaugural Schools Roadshow visit to Comberton Village College, as part of the MRC Festival of Medical Research, that was being celebrated across the country in June.

About fifty sixth-form students from four different local schools (Hills Road, Long Road, Parkside Federation and The Perse) visited the Unit on the 20th of June. Small groups of students along with their teachers were taken on a tour of our research labs where they had a chance to interact with our students and staff members and the opportunity to try out some of the hands-on experiments that had been carefully designed for them. To finish off there was a careers session over cakes and juice with a chance to meet staff from across the spectrum (research group leaders to science support), students and post-docs and a bag full of MRC memorabilia to take home. In spite of the hectic and hot afternoon, all the enthusiastic young visitors and our Unit members alike, had a great time.

The same was true of our inaugural visit to Comberton Village College on the 23rd of June where our researchers and fellow volunteers from CATS, presented an interesting mix of research and career stories. So well received was this trial visit, that the MRC CU have been requested to come back in the autumn and talk to the whole school!

For more images from the Cambridge Science Festival, the MRC CU Open Day and the Comberton school visit, please see: https://www.facebook.com/MRC.Cancer.Unit/
MRC Cancer Unit Special Lecture, 2017

The MRC Cancer Unit’s Special Lecture, 2017, was delivered by Professor Inder Verma, of the Salk Institute, USA, on the 26th of June. Professor Verma, renowned for his contributions to the development of retroviral vectors and gene therapy, spoke of recent work in his laboratory investigating the consequences of aberrant expression of heterochromatic repetitive satellite RNAs in BRCA1-mutant breast cancer settings and the mechanisms involved therein, which lead to genomic instability and eventually tumour formation in-vivo. The scientifically thought provoking, yet well-humoured, talk was most enjoyable and led to a lively discussion afterwards. His visit to the Unit also included a lunchtime session with students and post-docs, discussions with MRC CU group leaders and a dinner reception at Pembroke College attended by distinguished past and present faculty members from across the University.

The end of an era and a new beginning at the Hutch

May, witnessed the end of a wonderful chapter of service at the Hutch. After 8 busy years of being Health and Safety Manager at the Hutch, Lorraine Smith had decided to put away her lab coat and swap those safety glasses for time with the grandchildren. Stepping into the shoes of Mark Elsdon, also hugely popular during his time in post, Lorraine brought in a refreshingly pragmatic and fit for purpose approach to H&S in lab management. Risk Assessments were about being safe and sensible not just occupational-hazard-boring paper work! Through all the inevitable travails, late night emergencies, ad-hoc situations and the more mundane stuff that the job sometimes entailed, Lorraine - with a smile and a spring in her step - went about making the Hutch a safer, risk aware and regulation compliant place to work in, for all of us. A big thank you and our very best wishes for all her new adventures!

The show continues with the baton now with Oana Sadiq who has replaced Lorraine as the H&S Manager. Having worked in similar roles in other University departments (CIMR, Biochemistry) prior to the Hutch, Oana has hit the ground running – thanks to the joys of chiller breakdowns at the Unit, impeccably timed to a June heatwave. May these have been the last of her troubles! We wish her well in her new role.
MRC Cancer Unit: Research successes

New research from the Venkitaraman laboratory, published in the journal *Cell* last month and widely reported in several newspapers and internet forums, shows for the first time how exposure to aldehydes could promote cancer by breaking down the defence mechanisms that prevent mutations in our genes. Aldehydes, made in our own bodies in small quantities but increasingly found everywhere in our environment – from car exhausts, smoke, building materials and furniture to cosmetics and shampoos, have been linked with cancer, but the reasons for the link had so far remained unclear. In this paper Shawn Tan and co-authors demonstrate that aldehyde exposure effects even normal healthy cells, but people who already inherit a faulty copy of the breast cancer gene BRCA2 are particularly sensitive. Families who inherit faulty BRCA2 are at risk of developing breast, ovarian, prostate and pancreatic cancer: exposure to aldehydes could increase their chances of developing these cancers. It is also worth noting that given that our bodies convert the alcohol that we drink into aldehydes, over 500 million people from countries like Japan, China and Korea, who inherit a faulty gene that makes aldehydes accumulate excessively in their bodies after alcohol consumption, could be particularly sensitive to the cancer-causing effect. Overall, the new research shows how chemicals to which we are increasingly exposed in our day-to-day lives may increase the risk of diseases like cancer. It also helps to explain why “the faults in our stars” – namely the faulty genes we are born with – could make some people particularly sensitive to the cancer-causing effects of certain chemicals.

In research published in the journal *Nature Chemical Biology*, the team coordinated by Dr Christian Frezza and Dr Stefano Pluchino found that extracellular vesicles released from stem cells can deplete the extracellular environment of asparagine, a key metabolite for cancer cell growth. The enzyme responsible for this activity was found to be Asparaginase-like 1, a variant of the very same enzyme (L-Asparaginase) used in the treatment of acute lymphoblastic leukaemia, a blood cancer often diagnosed in younger people. Importantly, the researchers found that Asparaginase-like 1 acts by specifically breaking down asparagine, without affecting the levels of glutamine. This insight opens up avenues for new anti-cancer therapy with limited side effects (such as liver toxicity) that can occur when glutamine is depleted. The discovery of this ‘clean-acting’ Asparaginase-like 1 enzyme and the development of technologies around this research forms the basis of a patent owned by Cambridge Innovation Technologies Consulting Ltd, of which Dr Pluchino is a Co-founder and Director. This piece of research also richly demonstrates how a better understanding of fundamental cell biology can be scaled up to improving human health.
**Conferences & Awards**

Ellie Gregson, PhD student from the Fitzgerald group, won best oral presentation at the CRUK International Symposium on Oesophageal Cancer, held at the CRUK CI, 27th-28th April.

Gianmarco Contino, clinical lecturer in the Fitzgerald group, was awarded a certificate of recognition as early career scientists by the American Gastroenterological Association (AGA) for his presentation at the Digestive Disease Week (DDW) in Chicago, 6-9th May.

Jennifer Harris, PhD student from the Shields group, won a poster prize at the 29th UK Cell Adhesion Society (UKCAS) meeting held in Birmingham, in April. Jennifer has also been selected for an MRC sponsored internship, working with the UK, Department of Health.

**Other News**

Heatwaves, broken chillers and ice cream at the CU!

The gallant Brian Richardson and his wonderful lab-man team fought a remarkable battle (and won!) against an ageing central AC system and the weather gods who clearly conspired to offer us some of the hottest days of the year when the cooling broke down at the Unit. A few days of tropical weather, but also ice-creams for all, intervened our passage to restored air conditioning around the building and memories of the week when silver worms (read: portable AC ducting) and white-fans criss-crossed the labs!

**Recent arrivals & departures**

We welcome Hafsa Munir and Mona Shehata (postdoctoral fellows with the Shields and Venkitaraman groups), Miguel Leon Salvador (glass-wash), Sarah Leith Russell (BEST3 administrator, Fitzgerald group) and Oana Sadiq (Laboratory Manager, H&S).

We also welcome our visiting students to the Unit — Carlie Mendoza, Anna Sozanzka, Junzhe Zhao, Vivian Wong, Oisin Faust, Yu-Liang Yeh, Christina Niavi and Kushali Patel.

We would like to wish Evelina Gabasova, Siddharth De, Nuria Galeano Dalmau, Zarah Abdullahi, Agnieszka Mikolajewska Angela Riedel, Aikaterini Jenkins, Lorea Valcerel and Lorraine Smith all the best for their future careers.

**Congratulations to Dr Christian Frezza!** (on being promoted to MRC Program Leader).
Our scientists in the limelight

Dr Anita Balakrishnan from the Venkitaraman group was recently awarded the Hunterian Professorship by the Royal College of Surgeons of England, 2016-2017. Dr Balakrishnan delivered the Hunterian Lecture describing her thesis work in May 2017 at the annual conference of the Association of Surgeons of Great Britain and Ireland in Glasgow and following the lecture was awarded the Hunterian medal by Professor Derek Alderson, President Elect of the Royal College of Surgeons of England.

Professor Rebecca Fitzgerald was interviewed by BBC Radio 4’s flagship news programme, PM on Monday the 13th March. This interview, with Eddie Mair, highlighted research carried out in the Fitzgerald lab at the MRC CU over the past many years that has led to the fruition of the early detection device – the Cytosponge (‘Pill on a String’) - now in phase 3 clinical trials.

In recognition of her pioneering contributions to the field of early detection in oesophageal cancers, Professor Fitzgerald was also one of the recipients of the Royal Society Innovation awards this year, which was presented to her by the Duke of York at the Royal Society’s annual dinner, Labs to Riches, on the 30 March. This annual event seeks to bring together leading scientists, engineers, industrialists and policymakers to celebrate the achievements of the UK’s strength in research and innovation.
Recent publications


