Welcome to the summer issue of the Hutchison/MRC Research Centre newsletter. This edition takes a look at our work promoting science in schools to help encourage and inspire the next generation of cancer researchers. We’re very grateful for the continued commitment and enthusiasm of our staff which makes these sorts of outreach activities possible.

Professor Ashok Venkitaraman
Professor Bruce Ponder
Joint Directors, Hutchison/MRC Research Centre
The Research Centre is a regular participant in the Cambridge Science Festival, and this year saw us support the Olympic theme of ‘Breaking Boundaries’ with a range of new and innovative activities in the Biology Zone. Visitors had the chance to see if they could escape our cellular matrix maze, splat the cancer cell rat or fix some chromosomal rearrangements.

Cancer research is a wide and varied field, but we hope that our exhibit gave visitors an idea of how increasing our understanding of relevant biological processes can then lead to improvements in treatments for patients. We outlined how cancers can be initiated by damage to DNA, with our instability jenga game demonstrating how the build up of mutations can eventually lead to the ‘collapse’ of a cell. Chromosomal rearrangements can also play an important role in the development of cancer, and our visitors had an opportunity to see how many variations they could come up with, using our multi-coloured chromosomes.

The splat the cancer cell rat game also proved popular, and demonstrated that targeting cancer accurately is quite a challenge. Our work aims to improve how hard we can hit cancer, and find ways to identify it as early as possible.

One of the most dangerous features of many cancers is their ability to spread to other parts of our body. The tissue that surrounds a tumour is like a mesh, and an escaping tumour cell must change its shape and deform to squeeze through small spaces within this mesh. The cells can “pull” on the strands like a rope to help. We had many volunteers wanting to try our matrix maze to experience how a tumour cell moves through its environment (as seen on the front page)!

We hope that everyone that visited us during the Cambridge Science Festival came away with a better understanding of the type of problems that cancer researchers try and solve, and had a look at the fun side of science too!

We would like to say a huge thank you to all the staff and students from the Research Centre who contributed time and effort towards making our science festival activities so successful, and to the MRC workshop who constructed many of our exhibits.

More images from the Cambridge Science Festival, including the Biology Zone, can be found on the University of Cambridge’s Flickr stream: www.flickr.com/photos/cambridgeuniversity/sets/72157629284541442/ and as video on the University’s YouTube channel: www.youtube.com/watch?v=O-8TPWxQ1dU&feature=youtu.be
Taking our science into schools

Outreach activities at the Research Centre aren’t confined to the Cambridge Science Festival, and many of our researchers also visit local schools to talk about the work they do.

This year, as part of National Science and Engineering Week, scientists from the Edwards’ group, who study chromosomal rearrangements in breast cancer, spent a morning with children at the Meridian Primary School in Comberton. The school tries to ensure that each class has at least one science lesson from a real scientist, and this year post-doctoral researcher, Dr Karen Howarth, and graduate students Katy Bird and Jamie Weaver, gave a lesson on genetics to year 6 pupils. This included a short presentation to introduce them to the idea of cells, DNA, and copying information. And then moving on to what can go wrong when information is copied incorrectly, in order to present the basics of cancer research. Pupils could then take part in activities involving creating origami DNA, writing their own DNA code, and dressing up in lab coats to look at some real chromosomes under the microscope.

Commenting on the day, Karen said, “It was very well received, with lots of questions and even a few football fans missing the start of practice at lunchtime so that they could ‘finish their science’. Their teacher couldn’t believe it!”.

And it wasn’t just the graduate students in the Edwards group who’ve been involved in science outreach activities. Undergraduate, Bethany Jones, who was completing a Part II project in the lab, also visited the Meridian Primary School as part of the Seek Science group for a lesson on light and colour for six and seven year olds, from Years 1 and 2.

And the Fitzgerald group have also been out and about, visiting a number of schools in the region. Dr Rebecca Fitzgerald, along with Dr Pierre Lao-Sirieix, made appearances at primary schools in Cherry Hinton and Dry Drayton, with their ‘Gurgling Guts’ roadshow event. Around a hundred pupils got see how long our intestines are with willing ‘model’ Norman, and understand more about how we digest our food. Rebecca and Pierre also took part in a schools roadshow hub event at Sawston Village College, which saw around 200 hundred children from a variety of schools attend the three sessions they delivered. We hope that our outreach work in schools can help to inspire the next generation of scientists.
MRC Cancer Cell Unit Annual Lecture

The MRC Cancer Cell Unit annual lecture took place in May, when we were delighted to host a visit by Professor Sir Paul Nurse, President of the Royal Society and CEO of the new Francis Crick Institute.

A packed audience in the Sackler Lecture Theatre were able to hear about the latest research conducted by the Nurse group into cell division, and its control, in yeast. Using yeast as a model organism has provided many insights into the mechanisms and signals involved in controlling the cell cycle, and Sir Paul also touched on how to translate this work into mammalian systems. He also gave a brief overview of the development of the Francis Crick Institute, and how he hoped this would contribute to biomedical research in the UK in the future.

We are immensely grateful to Sir Paul for finding time to visit the Unit and be our annual lecturer for 2012. We hope to bring you details of next year’s annual lecture in the near future.

Image via Wikimedia Commons

Arrivals and departures

We would like to welcome MRC Career Development Fellows Dr Melanie Hofmann, Dr Emma Kerr and Dr Matt Lakins to the building. Melanie and Emma join the Martins group, and Matt, the Shields group. We would also like to welcome researchers Deepak Barnabus and Lerin Geo, who join the Fitzgerald group. And finally a warm welcome to Dr Christian Frezza, who joins the MRC CCU as a new research group leader. A feature on Christian and his work will be published in the next edition of the newsletter.

We wish Paul Russell every success with his career following his departure from the Venkitaraman group.
Hutch scientists in the media

Dr Rebecca Fitzgerald was interviewed in a video produced by CRUK, discussing her group’s role in the International Cancer Genome Consortium, and its research goals. The film is available to watch on CRUK’s YouTube channel.

Professor Ashok Venkitaraman, Dr Rebecca Fitzgerald, Dr Phil Jones, Dr Carla Martins, and Dr Jacqui Shields all appear in a feature on the MRC CCU in the Cambridge News.

A shorter version of the feature is also available from the Cambridge News website.
Recent publications

*Tumor initiating but differentiated luminal-like breast cancer cells are highly invasive in the absence of basal-like activity.*

Are breast cancers driven by fusion genes?

*Evidence for a functional role of epigenetically regulated midcluster HOXB genes in the development of Barrett’s esophagus.*

*Let’s Not Jump to Conclusions Regarding Low-Grade Dysplasia in Barrett’s Esophagus.*

*Where is the Truth When It Comes to Cancer Risk in Barrett’s Esophagus?*

*Screening for oesophageal cancer.*

*Do transcription factors hold the key to understanding the development of Barrett’s esophagus?*

*Polymyalgia rheumatica following robotic radical prostatectomy.*

*Chronic low dose UV exposure and p53 mutation: tilting the odds in early epidermal preneoplasia?*

*Interfollicular epidermal homeostasis: dicing with differentiation.*

*Co-ordination of cell cycle and differentiation in the developing nervous system.*

*Post-translational modification of Ngn2 differentially affects transcription of distinct targets to regulate the balance between progenitor maintenance and differentiation.*
**KRAB-Associated Co-repressor (KAP-1) Ser-473 phosphorylation regulates Heterochromatin Protein 1β (HP1-β) mobilization and DNA repair in heterochromatin.**

**Palladium-Catalysed Cross-Coupling of Vinyldisiloxanes with Benzylic and Allylic Halides and Sulfonates.**

**Beyond cancer genomics: after the end of the beginning.**

**Genome instability mechanisms and the structure of cancer genomes.**

**Synthesis and biological profiling of tellimagrandin I and analogues reveals that the medium ring can significantly modulate biological activity.**