Welcome to the first issue of our newsletter for 2017. In this edition we get a glimpse of what’s new at the Unit, celebrate the successes of our colleagues and reminisce about the Hutch Annual Retreat, 2016.

Here’s wishing everyone the very best for a scientifically exhilarating 2017!

To keep up to date with our news, till the next edition, please visit our Website, Facebook and Twitter pages.

Professor Ashok Venkitaraman,
Director, MRC Cancer Unit

As the new academic year at the MRC CU started off to the buzz of new students, new post-docs and new core staff, the warm smiles and the friendly faces at the Unit were all there - just like every other year- to help all the newcomers settle in.

The Centre is proud to announce the arrival of two new Systec autoclaves.
These went into service recently replacing the previous ones that had been in service for the past 15 years and were becoming increasingly problematic to rely on. The new arrivals are a culmination of a lengthy process that included a combination of bids to secure funding from the MRC, the Clinical School and the University Energy and Carbon Reduction Project (ECRP), detailed market research and an in-depth tender process. Apart from reliably enabling the highest standard in Media production and Glasswash processing, the Systec models have been optimised for a reduced carbon footprint and provide significant energy and water savings - in line with the Centre’s priorities.

<table>
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<th>Estimated Annual Savings</th>
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<tr>
<td>Electricity</td>
<td>£17,000 ≡ 130,752 kW or 24 Tonne CO₂e!</td>
</tr>
<tr>
<td>Water</td>
<td>£938 ≡ 422,400 litres/annum!</td>
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<tr>
<td>Service contracts/repairs</td>
<td>£28,357</td>
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<tr>
<td>Total</td>
<td>£46,295</td>
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The support team (featured below) are now looking forward to putting the autoclaves to the test against the Centre’s everyday demands as well as providing backup options to other departments.

The new Grad-soc. bunch are here!

Sarah, Edo, Naz, Erika, Alex and Stephanie take over as the New Graduate Society at the Hutch. This lively team will continue to organise scientific talks and the annual grad soc lecture, galvanise volunteers for various outreach activities from the Unit and of course keep the social calendar ticking with Happy Hour, the Hutch quiz, pub crawls, board game and pizza nights and the Hutch Summer BBQ.

MRC CU Post-docs to provide new leadership at the Clinical School Postdoc Committee:

Last November, at the Clinical School Postdoc Committee (CSPDoc), two members of the Hutchison/MRC Cancer Unit were elected to the committee. David Shorthouse (Hall Group), was elected Co-President, and Kalina Haas (Venkitaraman Group) was elected to the general committee. The CSPDoc Committee represents all postdocs around the clinical school, with a mission to raise awareness of postdoc issues, have a say in the development of the clinical school as a community for postdocs, and runs numerous networking, socialising, and skill/careers development events across the clinical school campus.

Top Right: The new Hutch Graduate Society committee  
Bottom Right: The new Clinical School Post-doc committee
MRC/Hutchison Annual Retreat

The 2016 Hutchison/MRC Annual Retreat took place at the Møller Centre in Churchill College, in early December. On the eve of the actual day, a dedicated poster session was organised at the Research Centre itself, allowing more time for exhibition and discussions relating to the posters. The session was very well attended and enjoyed by all. The poster competition was won by Sarah Davidson for her poster entitled: ‘Employing single cell RNA sequencing technology to investigate fibroblast heterogeneity in the tumour microenvironment’. The runner-up prize was awarded to Dr. David Shorthouse for his poster entitled: ‘Dysregulation of Osmotic Machinery Predicts and Controls Cellular Transformation in Cancer and Disease’.

The main scientific sessions of the Retreat took place the following day and included presentations from group leaders as well as postdoctoral researchers and PhD students on a diverse range of ongoing research themes from around the building. Scientific sessions were chaired by students and post-doctoral members of the Unit. The award for best oral presentation was won by Jennifer Harris for her talk entitled: ‘Tumour-associated lymphatics as regulators of dendritic cell trafficking’. Shawn Lu Wen Tan took the runner-up prize for his talk entitled: ‘Aldehydes unmask the carcinogenic potential of germline BRCA2 mutations’.

The highlight of the evening was the famous Hutch quiz organised, as always, by the inimitable Brian Richardson!

Overall, the two-day event was an enjoyable and informative experience for all who attended and provided a great snapshot of all the latest ongoing research and development at the Hutchison/MRC Research Centre.

Congratulations to all the poster and oral prize-winners and a big thank you to all who were involved in the organisation of the event!
The Frezza laboratory has made important headways in the field of cancer metabolism over the last few months. A recent work authored by Marco Sciacovelli (also featured in the Clinical School newsletter), investigated the mechanisms through which the loss of the mitochondrial enzyme Fumarate Hydratase (FH) predisposes to cancer. Marco demonstrated that fumarate, a metabolite strikingly accumulated in FH-deficient cells, triggers a complex epigenetic reprogramming that induces the suppression of antimetastatic microRNA, leading to an epithelial to mesenchymal transition. This work, not only uncovers a new function of fumarate but also provides an explanation for the aggressiveness of FH-deficient tumours. In a parallel work, Edoardo Gaude performed a comprehensive bioinformatics analysis of 21 different types of solid tumours collected by the TCGA to identify underpinning metabolic changes in these tumours. Edoardo made the striking observation that mitochondrial gene expression was significantly suppressed across most of these tumours and that it correlates with poor patient outcome. Interestingly, tumours that express low levels of mitochondrial genes exhibit mesenchymal features, in line with their increased aggressiveness. Overall, both these findings provide substantial evidence that mitochondrial dysfunction plays a key role in cancer biology and understanding the underlying molecular mechanisms of this could shed some light on the process of tumorigenesis and cancer therapy.

Dr Jacqui Shields from the Unit has recently teamed up with Dr Sarah Teichmann, Head of Cellular Genetics of the Wellcome Trust Sanger Institute, to use their complementary skills in immunology and computational cancer research to answer a key question of recent times: why does the immune system sometimes fail to act against tumour development? The project, funded by a Cancer Immunology Project Award, and featured on the CRUK website, aims to chart out the body’s immune response against cancer using single cell genomics. Single-cell RNA sequencing data is being used to identify new pathways involved in tumour immunity. These will then be validated experimentally and pre-clinically. The research teams believe that a deeper understanding of the failure of the body’s main defence mechanism may prove to be pivotal in developing future immunosuppressive targets and to prevent such failure from occurring.
Conferences & Awards

Dr Christian Frezza was one of the eight recipients of the Cambridge Cancer Centre pump priming awards to study the role of fumarate as an epigenetic modifier in renal cancer. Christian was also an invited speaker at several meetings in 2016 including the ISCAM meeting in Brussels, the Royal Society meeting in Chicheley and a meeting at Aachen University.

Dr Carla Martins won the worldwide competition for the Lori Monroe Scholarship, awarded for promising Lung Cancer Research. Carla will use the funding to study the metabolic heterogeneity of mutant KRAS lung tumours.

Other News

Upcoming International Oesophageal Cancer Symposium led by Prof Rebecca Fitzgerald - April 2017

Big Biology Day 2016 at Hills Road

Dr David Shorthouse from the Hall Lab represented the MRC CU at the Big Biology Day, 2016, held at the Hills Road Sixth Form College for students from across Cambridgeshire and nearby counties. A very well received day indeed!

Recent arrivals & departures

We welcome Gabriel Piedrafta and Pahini Pandya (postdocs with the Hall and Martins groups), Juliane Perner (Bioinformatician, Fitzgerald group), new administrative support staff including Gene Walker (goods-in/lab porter), Jennifer Furman (Research Governance and Integrity coordinator) Elwira Fidziukiewicz (Research Study coordinator), Tim Young (Shared technician, Frezza group), Tessa Kasia (CCC programme – Venkitaraman group), Claire Jefferies (PA to Prof Fitzgerald) and Anasuya Chattopadhyay (Scientific Portfolio Manager).

We also welcome our new students to the Unit – Jake Cridge, Laure Talarmain, Pablo Orio Valls and Sandhya Sridhar (postgraduates); Constanza Linossi, Joelle Janssen, Lorea Valcarel (visiting students).

We would like to wish Yang Liu, Beth Muldrew, Aikaterini Jenkins and Mary-Clare Cathcart all the best in their future careers.
Our scientists in the limelight

Professor Rebecca Fitzgerald was an expert panellist in the first ever cancer-related event to form part of the Cambridge University Festival of Ideas: **Is earlier necessarily better?** The hugely successful event featuring other distinguished academics and organised by Professor Sir Bruce Ponder was widely featured, including in MRC-Life, several Twitter and FB blogs and the University website. Rebecca’s work on the Cytosponge was also featured in the [Cambridge Evening News](#) (16th Nov, 2016 edition).

Dr. Ben Hall was an invited speaker at the Microsoft ‘*Future Decoded 2016*’ – an event that also featured Professor Stephen Hawking as a keynote speaker. Ben spoke on his work using computer science techniques to understand cancer biology at the Exposition, held at the ExCel in London. In a programme of talks relating to how computing is transforming society in diverse areas including policing and health care, he showed how his laboratory at the MRC Cancer Unit are using concepts taken from the analysis of software and hardware to tackle the unique challenges and fathom the early stages of cancer development.

Dr Carla Martins was featured in the NCI blog in January, speaking of her longstanding interest in KRAs mutations and cancer.
Recent publications


Succinate Dehydrogenase Supports Metabolic Repurposing of Mitochondria to Drive Inflammatory Macrophages.


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