UNIVERSITY OF CAMBRIDGE
Department of Radiology

Newsletter

March 2021

Message from Professor Gilbert

Lockdown3 has been the hardest of them all with even higher deaths compared to last April, extended homeschooling, and increasing social isolation and deteriorating health. However, as we begin to see the early shoots of Spring, we are also beginning to see the end of this current phase. The vaccination programme has been amazing, and in Cambridge we should be very proud of the enormous concerted effort there has been to include as many of the patient facing clinical school staff as possible in the initial vaccine roll-out. Please can I encourage you, friends and family to take up the vaccine when you are offered this. The vaccine really does reduce severity of the illness and keep patients out of hospital and allows us to get the NHS services back up and running.

The Covid research endeavor continues with large numbers enrolled in the vaccine trials as well as the various treatment trials, the Bioresource and the follow up studies. Apparently 38% of the 900 Covid patients discharged in the current wave have been enrolled into trials which is a fantastic effort. DRAGON AI is progressing well having built a huge CXR and CT database and the various Covid imaging studies are going well.

We are being encouraged to continue with our research and the Regius is very keen to get trials back up and running. The Radiology department and WBIC are both receptive to getting imaging research started again. If there any problems please let me know. We await guidance from the University as to when we are allowed back to the department but at present we should continue working from home where possible. As soon as we are allowed I think the hope is that research will accelerate back to normal levels. Our PhD students and post docs have been brilliant and continue to find ways to work around the lockdown (in a safe responsible way!).

The challenge of limited normal human interactions remains at the moment with the increasing stress this places on us all. And we all miss the stimulation from being in the department with the friendship, ad hoc conversations, advice and opportunities that this brings. I am in awe of those of you who have developed new skills of engaging educationally with your offspring while maintaining happy home lives. This, while working, is an almost impossible feat so be very proud of your achievements. The ingenuity of our staff is wonderful to see and I particularly loved the online advent calendar. You are all wonderful in looking out for each other and being kind and understanding. There are many well being activities so please take advantage of them.

And so what happens now? The Covid numbers are dropping rapidly and with increasing numbers of the population vaccinated we can hope for a more liberal time ahead. However, the prediction is for a further wave in the Autumn (like seasonal flu) and so we should do what we can to enjoy late Spring and Summer, and plan accordingly. Hybrid working is likely to become the norm but it is important to remember that we will be back in the department at some point – hopefully in the coming months – I look forward to welcoming all of you back!

FEATURES

BRAID and OpenClinica

by Nick Payne

The BRAID study, investigating supplemental imaging for screening women with dense breast tissue, has now recruited 1,150 participants across its four sites (Cambridge, Cheltenham, Manchester, and Leeds) and over 570 scans have been performed so far. With consent forms, registration forms, imaging CRFs, and additional questionnaires needed for each of these participants, there have been clear benefits from the trial choosing to use an electronic database – OpenClinica.

The OpenClinica system allows studies to be broken down into 'events' each of which have electronic forms associated with them. For example, the BRAID "Baseline/Screening" event has three forms: a consent form, a consent counter signature form, and a registration form. A link to the consent form, which contains the participant information sheet, is emailed to the participant and designated staff can be notified once it has been completed. Similarly, the CanRisk questionnaire (a reasonably lengthy form covering the participant's lifestyle and medical history) can be sent to the participant for them to complete at their own pace. Although conversations still need to be had between participants and research nurses, the use of OpenClinica streamlines the process by allowing forms to be completed prior to visits on site, data to be captured directly into the database, and quick monitoring of each participant's status through colour-coded icons on the web platform.

The benefit of quick and easy monitoring extends to a trial basis when it comes to study management and keeping track of remote sites. With all the data online, it is possible to write queries either using a graphical interface or directly in SQL to interrogate the data and put together 'dashboards' for quick reference – the figure below shows an example of a dashboard monitoring live BRAID recruitment and imaging in each arm of the trial.

However, these benefits are not without their costs and caveats. The main hurdle faced is in the design of the events and forms which requires some forethought into how they will be used and what data is required as this has implications on data

quality and extraction. Form design is especially important for any items to be completed by the participant; clear wording and a simple structure will allow most participants to fill in the forms without needing support from research staff. Conversely, in our attempt to make the CanRisk questionnaire as clear as possible for participants by using more advanced form features to only display relevant questions based on previous answers, we had some participants needing *more* support because they ran into technical issues loading the form!

Finally, the data available to be queried and monitored is only as accurate as those responsible for inputting the data make it. While the use of a digital system should save multiple instances of data input, we have found that sometimes there can exist two versions of 'current' data – that on OpenClinica and that on paper waiting for input into the database. There are many reasons why this is (working practice, the design constraints of the forms, the need to separate identifiable information) but it does mean additional checks are needed if precise data is required.

As the BRAID trial has progressed so has our use of OpenClinica as we discover problems and develop better ways of working. While it can be difficult to get a digital system to perform in the exact way you require it to, the ability to access and monitor live data is very valuable to a large trial. I've just had a quick check; Cheltenham and Leeds have added another 3 recruits, so we're up to 1,153 participants!

NIHR | Cambridge Biomedical Research Centre

BRC/NIHR Audit

The BRC have just audited our output to check we are acknowledging their support. Sadly we have not fared very well!

The BRC support many members of staff in our departments and it is likely that whatever you are doing the BRC will have had some kind of impact. Miles Parkes, the new director of the BRC would like us to put the **strapline below** on every published output from our department. This includes all papers including reviews, letters, commentaries, abstracts, news pieces, in fact material of any kind because as he says "to do so costs us nothing but failure to do so costs us heavily!" The NIHR measure the frequency with which they are mentioned and organisations and departments who fail to do so will not receive further funding.

'This research was supported by the NIHR Cambridge Biomedical Research Centre (BRC-1215-20014). The views expressed are those of the author(s) and not necessarily those of the NIHR or the Department of Health and Social Care'

So I now need you to remember two things before you press the **"submit"** key **OPEN ACCESS and BRC!!**

NIHR Publications

All research with NIHR Cambridge BRC/CRF funding and/or support that is due for publication must be reported to the NIHR via the NIHR Cambridge BRC communications team. You can do this via an online form on the NIHR Cambridge BRC website. **https://cambridgebrc.nihr.ac.uk/your-research/**

The NIHR via your local comms team must also be notified of press releases 14 days in advance. Failure to do so may result in financial penalties.

Professor Evis Sala wins prestigious award

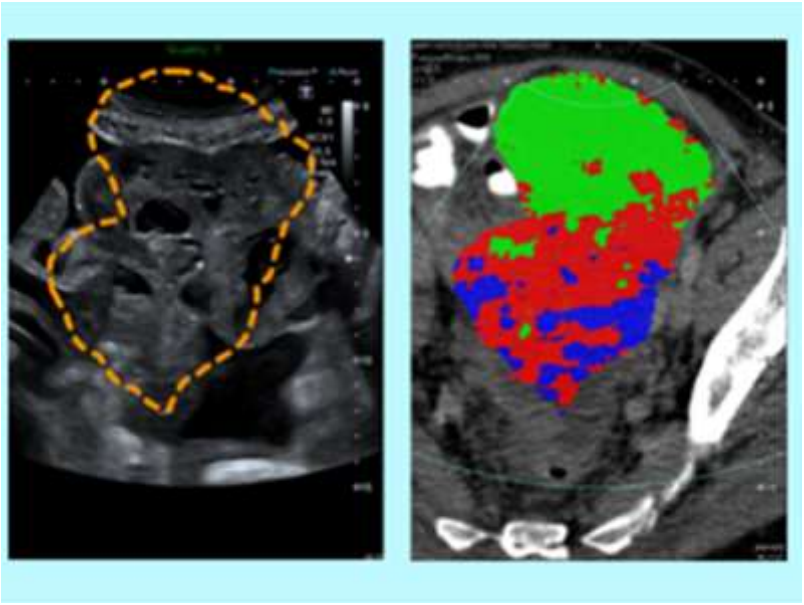
Evis Sala (Professor of Oncological Imaging, Co-Lead ICM, and Advanced Cancer Imaging Programmes at the CRUK Cambridge Centre) has been awarded the British Institute of Radiology/ Canon Mayneord Memorial Award. The prestigious annual award is made to an individual or a group of collaborators in recognition of recent or current contributions in the wide and expanding field of radiology.

On receiving her award, Professor Sala delivered the online BIR/Canon Memorial Lecture on *Integrated radiogenomics for virtual biopsy and treatment monitoring in ovarian cancer* to an audience of over 350 radiologists, radiographers, oncologists and physicists.

https://tinyurl.com/6kh2wpaf

Highlights from the Radiogenomics and Quantitative Imaging

Virtual Biopsy



Ultrasound-guided targeted biopsies of CT-based radiomic tumour habitats: technical development and initial experience in metastatic ovarian cancer, recently published in European Radiology, 14 Dec 2020, highlights a new advanced computing technique using routine medical scans (CT and US) to enable us to take fewer, more accurate tumour biopsies.

The research led by Professor Evis Sala and funded through the MFICM and CRUK shows that combining CT with US images creates a visual guide for radiologists to ensure they sample the full complexity of a tumour with fewer targeted biopsies.

This is an important step towards precision tissue sampling for cancer patients to help select the best treatment. In future, the technique could even replace clinical biopsies with 'virtual biopsies', sparing patients invasive procedures.

The publication, with Co-first author Dr Lucian Beer and Paula Martin-Gonzalez from Radiogenomics and Quantitative Imaging group attracted national media attention resulting from a press release sent out by the University of Cambridge press office on 6 January 2021, the MFICM news page and other pages on the MFICM website, in the CRUK Cambridge Centre website.

Media coverage for this article:

Daily Mail

Science Times

Imaging Wire

iNews

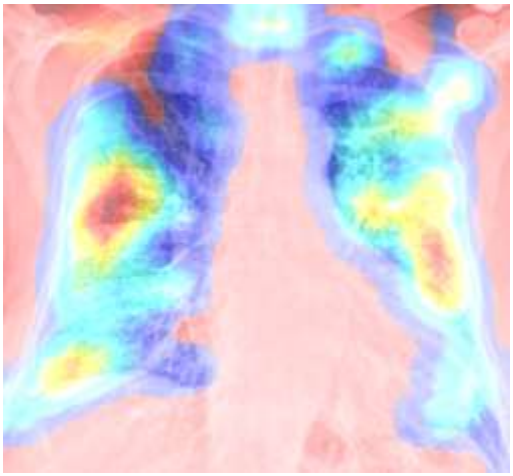
Cancer World

Diagnostic World News

Health Europa

COVID-19: AIX-COVNET and DRAGON

The **AIX-COVNET collaboration**, led by the University of Cambridge, is progressing with development of algorithms to support clinicians in the current pandemic and beyond. By utilising multi-source data, including chest X-rays, CTs, automated calcium scoring and EPR, they expect to increase accuracy of diagnosis and prognostication to allow for more accurate triage and personalised treatment regimes. Many of the team have been working on the project in addition to their usual duties and everyone involved is quick to stress the importance of the unique working relationship between partners. The tools will first be deployed at Addenbrooke's and later released open source. Media coverage: **Addenbrooke's Press Release**, **gov.uk**, **NHSx**, **inews**, **IT Pro**, **Cambridge Independent**.



*A saliency map from an early preliminary AIX-COVNET model for COVID-19 diagnosis using chest X-rays from the **National COVID-19 Chest Imaging Database (NCCID)**.*

To inform development, the collaboration undertook a systematic review of the literature. None of the currently published models are of potential clinical use due to a number of systemic issues, including methodological flaws and/or underlying biases. The review has been accepted by *Nature: Machine Intelligence* and is currently awaiting publication. An earlier version of the review has been released on arxiv and an opinion piece reflecting on the outcomes is currently under consideration by *Radiology: Artificial Intelligence*.

In addition, the collaboration is a member of the **DRAGON** consortium, which officially began in October 2020. The project is funded by the IMI and consists of high-tech small and medium sized enterprises (SMEs), academic research institutes, biotechnology and pharmacological partners from across Europe. DRAGON have already developed a prototype app to inform health professionals about existing predictive models for COVID-19 related risk assessment, whilst work is also progressing on development of a diagnostic tool for thoracic CT. Press release: **ERS**.

"There is a serious potential to save lives, save time, save money"

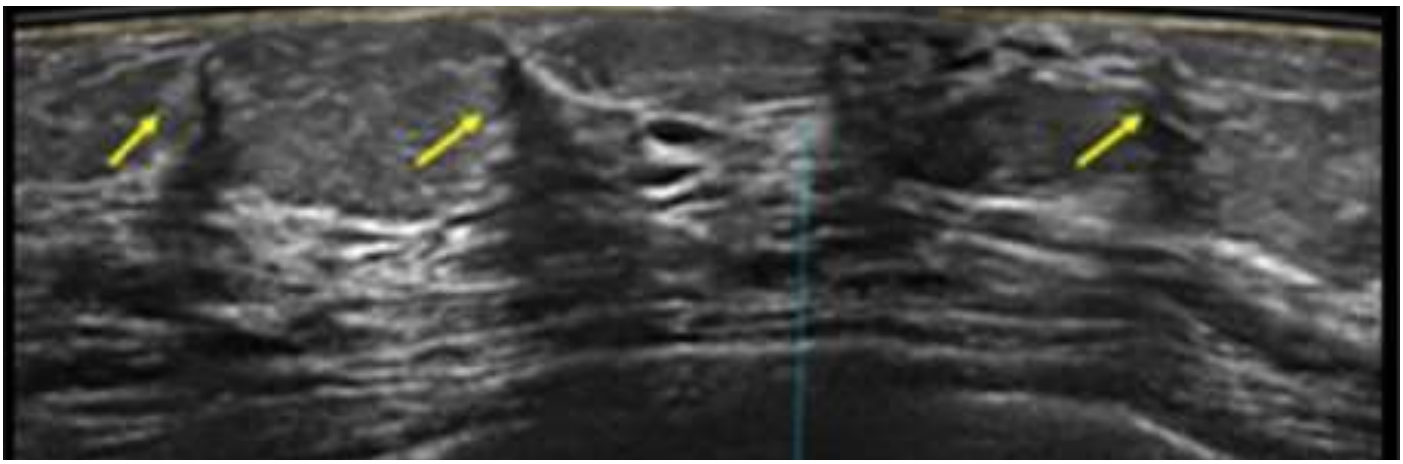
Ever wanted to know what Dr Josh Kaggie is working on? Learn about his typical day down in Room 253? His achievements and challenges? These and much more are some of the things you'll find out in a brilliant interview on the BRC/NIHR website. **https://cambridgebrc.nihr.ac.uk/spotlight-joshua-kaggie/**

Dr Joshua Kaggie is a Senior Research Associate and MRI physicist funded in part by the NIHR Biomedical Research Council and in part by a European Union Horizon 2020 grant (StarSTEM). Originally from Utah, Dr Kaggie moved to Cambridge under a Fellowship from GlaxoSmithKline, where he supported preclinical and clinical developments. Dr Kaggie is currently assessing or developing methods at MRI centres in Cambridge as part of the MRIS unit in Addenbrooke's Hospital, the WBIC, the Anne McLaren, and at the Veterinary School.

Feedback

We are currently working hard to improve communication and development within the department, and a big part of that work requires feedback from you. We are open to hearing any feedback or suggestions you have. If you'd like to provide feedback on anything department related, in addition to coming to see us, you can now provide it through a feedback form located on the Internal website via **http://radiology.medschl.cam.ac.uk/internal/feedback/**

We want to hear from all of you in relation to all achievements, updates, news and any information you would like to share with the Department.



Wandering Shadows; linear repetitive shadows in axial plane

Automated breast ultrasound (ABUS): Technical challenges, impact on breast screening and future perspectives.

by Iris Allajbeu, Sarah E Hickman, Nick Payne, Penny Moyle, Kathryn Taylor, Nisha Sharma, Fiona J Gilbert

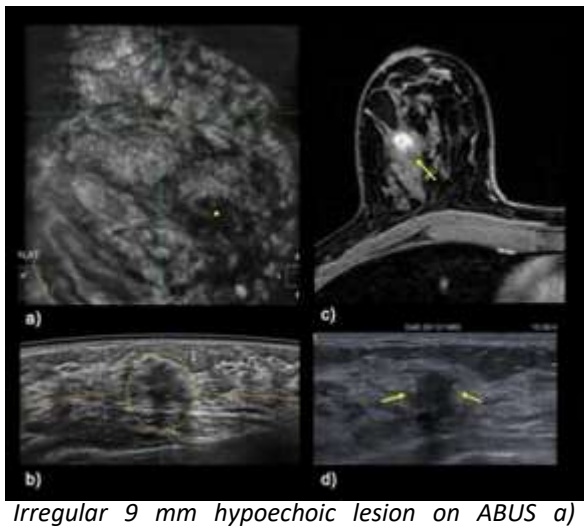
ABUS has been approved in the United States and Europe as a screening tool for asymptomatic women with dense breasts in addition to mammography. Supplemental US screening has high sensitivity for cancer detection, especially early-stage invasive cancers, and reduces the frequency of interval cancers. ABUS has similar diagnostic performance to Handheld Ultrasound (HHUS) and is designed to overcome the drawbacks of operator dependence and poor reproducibility. Concerns with ABUS, like HHUS, include relatively high recall rates and lengthy reading time when compared to mammography. ABUS is a new technique, therefore adequate training is required to improve detection and reduce false positives.

A standard ABUS protocol consists of scanning each breast separately in three planes: anterior-posterior (AP), lateral (LAT), and medial (MED) positions, resulting in six images for both breasts. Additional views may be required in women with larger breasts to cover the whole area with four images (two per each breast) sufficient in smaller breasts. Adequate patient positioning, transducer placement, proper depth selection, and compression are crucial in acquiring high quality images with the total examination, including patient preparation, lasting approximately 15-20 minutes.

Shadowing artifacts is one of the major challenges in ABUS interpretation. “Wandering shadows'' caused by the interference of ultrasound waves with curved surfaces of Cooper ligaments, presenting as repetitive linear shadows in the transverse plane, are common in ABUS examinations. They tend to be more prominent in heterogeneous dense breasts and the periphery, potentially leading to misinterpretation. (See Top image)

ABUS is a good supplemental screening tool for women with dense breasts and should be considered as an alternative to other modalities due to good patient tolerance, lack of ionizing radiation and IV contrast. Computer Aided Detection is a promising tool in reducing interpretation time and improving ABUS accuracy.

Other possible applications include use in symptomatic clinics in younger women and for surveillance of benign lesions, local staging, monitoring response to NAC, second look tool, correlation with molecular subtypes of breast cancer and breast density evaluation. Further developments are expected in the field of deep learning and integration of radiomics. Larger studies, robust training as well as software incorporation and standardization are required for better implementation of this imaging modality in screening and diagnostic setting.



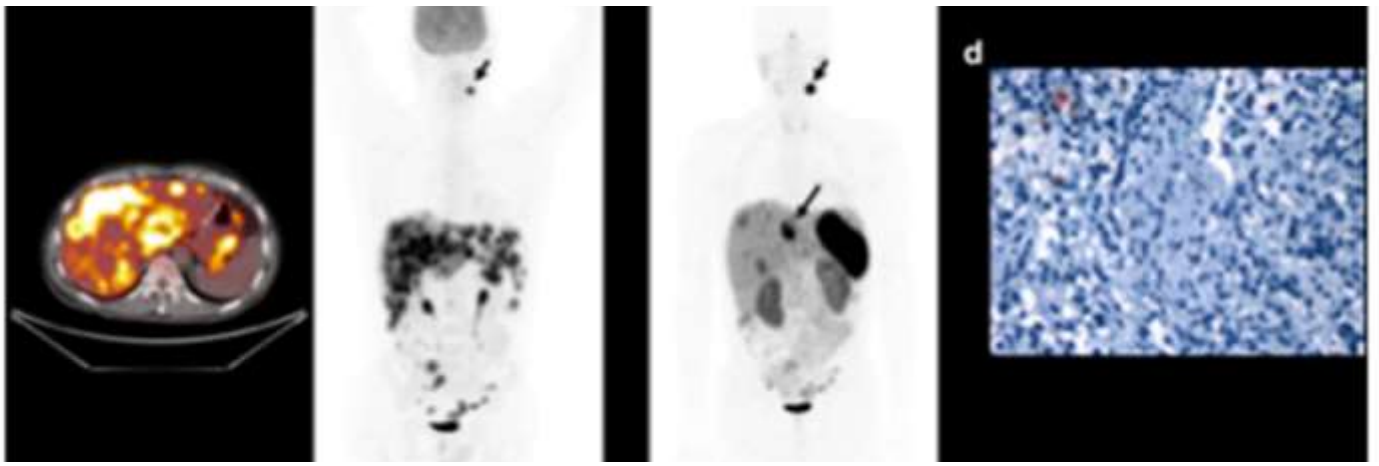
Irregular 9 mm hypoechoic lesion on ABUS a) coronal and b) axial planes (circle); corresponding lesion on d) postcontrast MRI and e) second look US (arrows). Unifocal invasive lobular Carcinoma, very good correlation of lesion size and location between e) MRI and ABUS images (b, c)

The Nuclear Corner: Exploring new possibilities for radionuclide therapy in rare cancers with unmet clinical need.

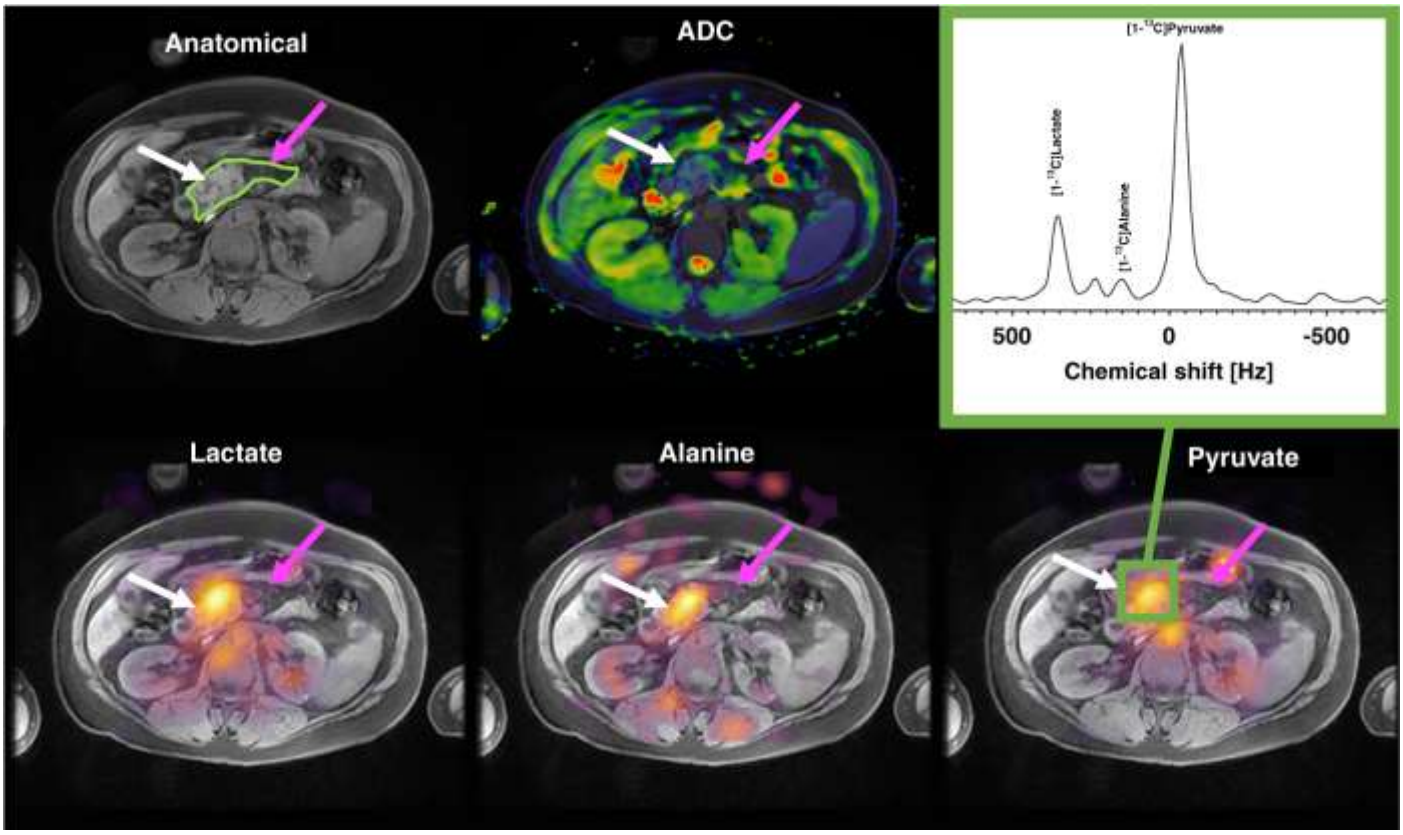
by Luigi Aloj, Olivier Giger, Iosif A. Mendichovszky et al

Luigi Aloj, Olivier Giger, Iosif A. Mendichovszky et al. The role of [^{68}Ga]Ga-DOTATATE PET/CT in wild-type *KIT*/*PDGFRA* gastrointestinal stromal tumours (GIST). EJNMMI Res (2021) 11:5, **https://doi.org/10.1186/s13550-021-00747-0**

There are several projects under way exploring new applications for radionuclide techniques in endocrine and neuroendocrine cancer. These projects are focusing on the use of novel PET tracers with the aim of setting the groundwork for new radionuclide therapy applications in areas where effective treatments are lacking. A key driver of these projects is the close collaboration with Dr Ruth Casey (Department of Endocrinology & Medical Genetics). Somatostatin receptor (SSTR) targeted PET/CT with [^{68}Ga]Ga-DOTATATE is normally used to image and characterise well-differentiated neuroendocrine tumours and allows us to guide treatment with peptide receptor radionuclide therapy with [^{177}Lu]Lu-DOTATATE. SSTR expression is not unique to neuroendocrine tumours and DOTATATE PET/CT may have application in other types of tumours. This study focused on gastrointestinal stromal tumours that lack activating somatic mutations in *KIT* or *PDGFRA,* so-called 'wild-type' GIST (wtGIST). wtGIST have overlapping molecular and clinical features to neuroendocrine tumours and are lacking in effective treatments. These tumours are also often associated with gene mutations that cause deficiency of the succinate dehydrogenase (SDH) enzyme complex. There have been sporadic case reports of GIST showing high uptake of somatostatin receptor binding tracers but this has not been addressed in larger series and there is no general consensus. The role of DOTATATE PET/CT along with the potential of this imaging modality to guide treatment with [^{177}Lu]Lu-DOTATATE was studied in twelve patients with a diagnosis of metastatic wtGIST. Unfortunately, DOTATATE uptake was low or very low in most known GIST lesions, excluding [^{177}Lu]Lu-DOTATATE as a viable treatment option for these patients. On the other hand, very high uptake was found in 1 synchronous and 1 metachronous paraganglioma, a tumour also linked to SDH deficiency, in two patients in this series. DOTATATE PET/CT may be useful for the differential diagnosis of paraganglioma vs wtGIST in patients with genetic mutations that can predispose to these two tumour types.

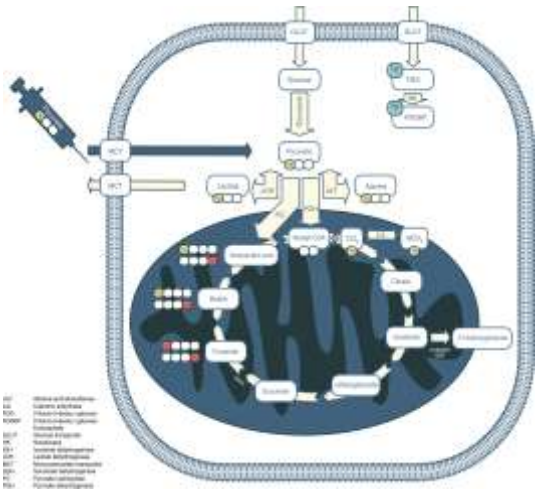


Transaxial fused [^{18}F]FDG PET/CT image of the liver (a) and MIP image (b) demonstrating FDG-avid liver, peritoneal and nodal metastases as well as a synchronous left sided carotid paraganglioma (small arrow) in a patient with SDHB mutation and known metastatic wtGIST. Panel c, DOTATATE PET/CT MIP image, demonstrating that few liver metastases show uptake higher than background liver (large arrow). As biopsies of all liver lesions could not be obtained, it remains unclear if liver lesions were all metastatic wtGIST or if the carotid paraganglioma was also metastatic to the liver. The left sided carotid paraganglioma shows very intense uptake of the somatostatin analogue (SUVmax 60, small arrow). Panel d, negative SSTR2 expression on immunohistochemistry of a biopsied dSDH wtGIST liver metastasis from this patient.



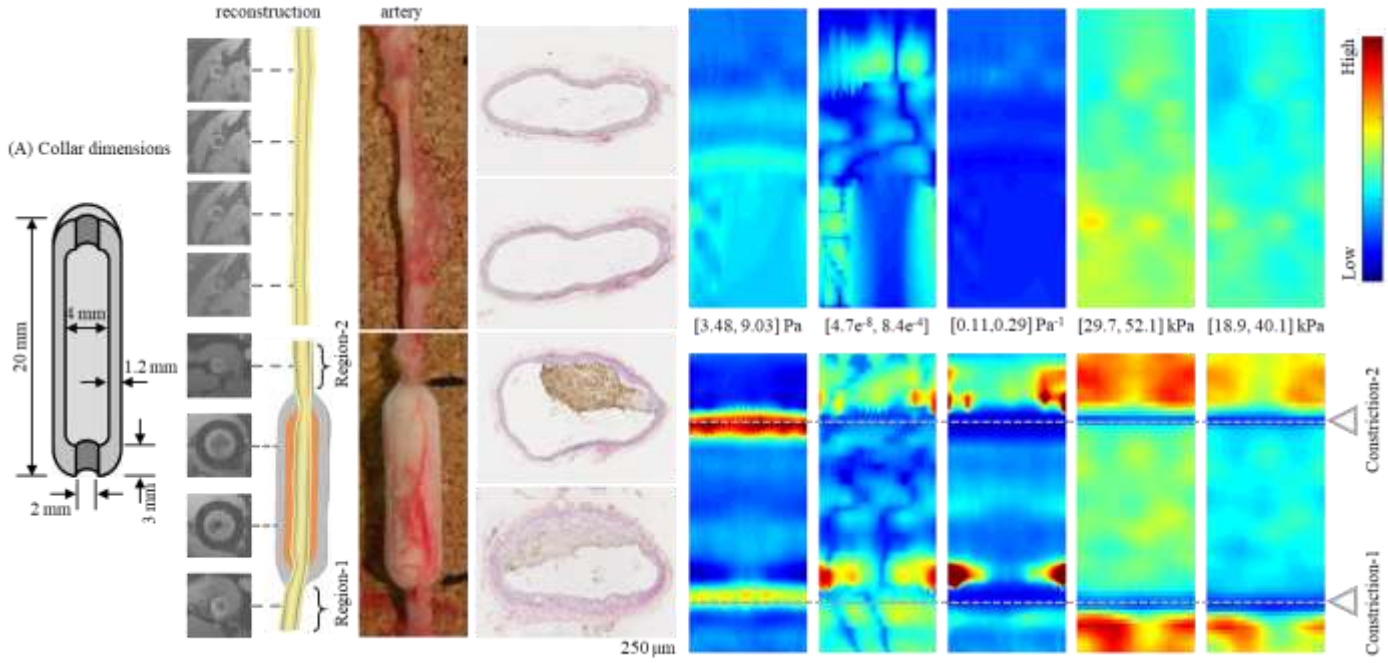
The use of hyperpolarised ^{13}C-MRI in clinical body imaging to probe cancer metabolism

by Ramona Woitek & Ferdia A. Gallagher



Metabolic reprogramming is one of the hallmarks of cancer and includes the Warburg effect, which is exhibited by many tumours. This can be exploited by positron emission tomography (PET) as part of routine clinical cancer imaging. However, an emerging and alternative method to detect altered metabolism is carbon-13 magnetic resonance imaging (MRI) following injection of hyperpolarised [1-^{13}C]pyruvate. The technique increases the signal-to-noise ratio for the detection of hyperpolarised ^{13}C-labelled metabolites by several orders of magnitude and facilitates the dynamic, non-invasive imaging of the exchange of ^{13}C-pyruvate to ^{13}C-lactate over time. The method has produced promising preclinical results in the area of oncology and is currently being explored in human imaging studies. The first translational studies have demonstrated the safety and feasibility of the technique in patients with prostate, renal, breast and pancreatic cancer, as well as revealing a successful response to treatment in breast and prostate cancer patients at an earlier stage than multiparametric MRI. This review will focus on the strengths of the technique and its applications in the area of oncological body MRI including non-invasive characterisation of disease aggressiveness, mapping of tumour heterogeneity, and early response assessment. A comparison of hyperpolarised ^{13}C-MRI with state-of-the-art multiparametric MRI is likely to reveal the unique additional information and applications offered by the technique.

Woitek, R., Gallagher, F.A. The use of hyperpolarised ^{13}C-MRI in clinical body imaging to probe cancer metabolism. *Br J Cancer* (2021). **https://doi.org/10.1038/s41416-020-01224-6**



Novel mechanism for the development of atherosclerosis- the biggest killer in the world

Reported by Dr Zhongzhao Teng

Atherosclerosis is the first cause of death and disability in the world. It was traditionally believed that the main cause of atherosclerosis initialisation was the wall shear stress (WSS) induced by disturbed blood flow. Dr Zhongzhao Teng together with colleagues firstly in the world demonstrated that high vessel structural stress (VSS) can also damage arterial wall leading to the development of atherosclerosis. Atherosclerosis tends to develop at the location where artery branches or bends. Blood flow is disturbed by the local irregular geometry that can be quantified by using computational fluid dynamics (CFD). CFD can only calculate WSS as most of previously reported studies adopted. However, high VSS also occurs in the same location and it can only be calculated by approaches considering the deformation of arteries. Dr Teng and his colleagues developed an animal model to create distinct mechanical environment by introducing two constrictions along the carotid artery. They performed sophisticated fluid-structural interaction (FSI) analysis to quantified WSS and VSS simultaneously and found that low WSS, high OSI and long RRT were only associated with atherosclerosis in the constriction close to the head, and high VSS was associated with atherosclerosis in the constriction close to the heart. They concluded that VSS contributed to the initialisation and development of atherosclerosis solely or in combination with WSS.

Image shows Reconstructed 3D geometry based on baseline MR images, images of arteries removed from the animals and corresponding CD68 stain for the visualization of tissue inflammation and calculated flow parameters and mechanical loading within the structure (A: schematic drawing showing the collar geometry and dimension; B: MR-based 3D geometry reconstruction; C: artery with collar and the corresponding contralateral removed from an animal; D: CD68 stain showing macrophages in brown; E: calculated time averaged wall shear stress (WSS), oscillatory shear index (OSI) and relative particle residence time (RRT); F: Peak vessel structural stress (VSS) and Mean VSS along the artery wall thickness)

More details can be found in Teng Z. et al., Atherosclerosis 320: 38–46, 2021.
https://www.sciencedirect.com/science/article/abs/pii/S0021915021000307

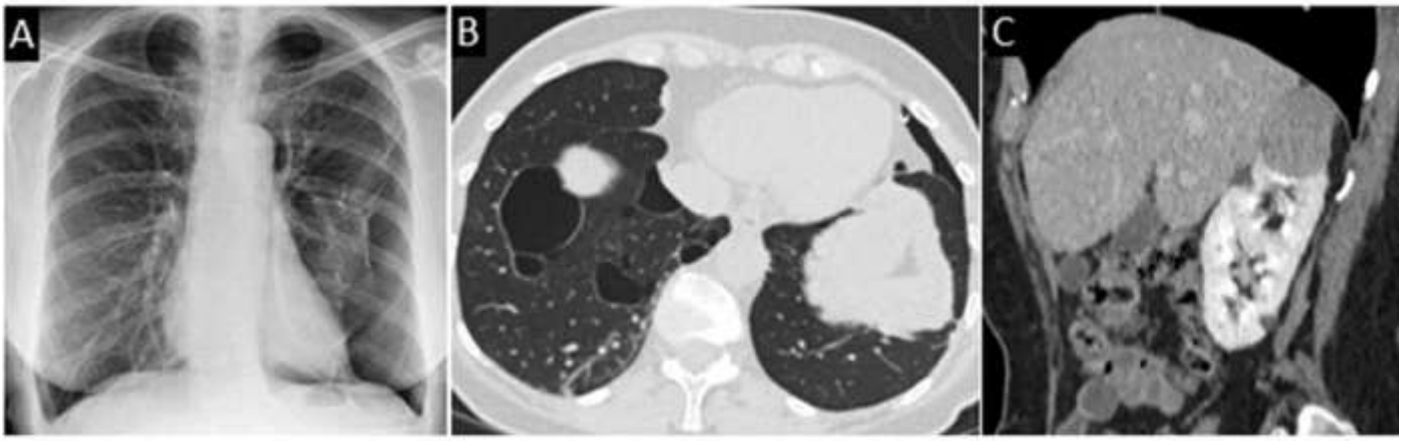


Figure: (A) CXR - Left sided pneumothorax; (B) Multiple lower zone lung cysts of irregular shape; (C) Right RCC

Pulmonary cysts as a diagnostic indicator of Birt–Hogg–Dubé syndrome in patients with renal cell carcinoma - Best Chest Research Presentation Abstract Award at European Congress of Radiology 2021

by AH Ashok, TJ Sadler, S Scullion, S Karia, J Babar, SJ Marciniak, G Stewart, E Maher, MTA Wetscherek.

It is a great privilege to accept this international scientific abstract award on behalf of the department. Birt–Hogg–Dubé syndrome (BHD) is an underdiagnosed autosomal dominant disorder, characterised by skin fibrofolliculomas, lung cysts, spontaneous pneumothorax and increased risk of renal cell carcinoma (RCC). The purpose of our project was to assess the presence of pulmonary cysts in patients diagnosed with RCC as a potential indicator of BHD syndrome.

We retrospectively reviewed chest CTs and hospital records from 2014-2020 of patients who underwent nephrectomy or biopsy for RCC. We reviewed more than 1500 patients with RCC. Six cases had genetically confirmed BHD, while 135 other patients had pulmonary cysts. Genetic evaluation in patients with suspicious imaging appearance of BHD is in progress.

This is the first study to investigate the incidence of BHD in a large cohort of RCC. Although BHD remains a rare condition, understanding the association of varying radiological and clinical features can provide an opportunity for improving its detection. We have developed a system for prioritizing referral to genetic testing of these patients and we are currently optimizing the pathway in collaboration with our genetics, respiratory and urology colleagues. The implications of a diagnosis of BHD are numerous, including genetic counselling for the patient and their family, regular imaging follow-up and potential lifestyle modifications due to the increased risk of pneumothorax.

Dr Wetscherek: “Our work highlights the importance of cross specialty collaborative working. A further personal highlight to me is the supervision of our radiology registrars and being able to inspire so many to get involved in research. We would also like to thank the Department of Radiology and Prof Gilbert in particular for being so supportive of NHS consultants to lead research projects.”

Once Upon… a tale of a Marmaduke Sheild 2020 award

by the male biochemists from Portugal, whose name starts with the letter J

It all started in the year of 2020. It was not a good year for most for multiple reasons. However, for the male biochemists from Portugal, whose name starts with the letter J and work in the Department of Radiology, it was even worse.

This worsening of conditions was not due to any personal reasons but due to a severe lack of drying machinery in the lab. “How can one live like this?” was a thought that frequently passed through the mind of the aforementioned subpopulation.

“How are we supposed to dry down our samples without warming them up and thus, risk the degradation of metabolites in the process?”. This question kept us up at night due to the induction of many terrifying nightmares, where small molecules of ATP and NADH reached out their tiny molecular hands, crying against the inevitable heat decay that was to follow.

“No more! This cannot go on, it’s inhumane and inmolecular!” cried our heroes. A new mission was born: to reverse this perverse curse against the molecular universe. But how to achieve such noble deed?

There is a device, created by the gallant members of Labconco sample concentration, which is capable of drying samples in a temperature controlled environment, allowing the process to happen at temperatures as low as -4C. Surely such a device would solve all of our problems! Our heroes set forth to purchase this apparatus but, as is wont with any fairytale story, soon where faced with adversity. Standing in the way of progress was a seemingly unsurmountable bill of over £15000. Could such funds be raised? How would champion the cause with more than mere words?

The quest for founds led our heroes to the Marmaduke Sheild Fund, a yearly grant put out by the School of Biological Sciences, and an application was put forth. For months our heroes waited with bated breath, hoping that the spirit or Arthur Marmaduke Sheild could somehow, from beyond the grave, move the hearts and spirit of the grant evaluators to this great cause.

And so it came to pass that our heroes did receive an email stating that, by the mercy of the evaluating committee, the grant was theirs, and there was much rejoicing and merriment in the department, for they knew their battle was won!

Soon, with the funds firmly fixed, followed by filling further ordering files, the contraption was ordered. Soon, pieces started arriving to what would be its final resting place: The lab in the CAB, where it stands now, in all its magnificent glory. And thus began a new age of science! One where molecules need not fear the heat and decay. One where biological samples need not be partially devoid of biological meaning by virtue of degradation. One where the expected signal to noise ratio of several assays can expect to be significantly increased by virtue of upconcentration of the samples. It is, in summary, a very glorious future indeed

Thank you for lending me your eyes and brain in the reading of this tale. I hope it was a pleasurable experience

Yours truly,

The male biochemists from Portugal, whose name starts with the letter J and which work in the Department of Radiology

Personnel

Congratulations to Dr Julia Carmona-Bozo

Congratulations to Dr Julia Carmona-Bozo for passing her VIVA, with minor corrections and "an excellent performance" according to both examiners, on the 8th February - "PET-MR imaging of hypoxia and vascularity in breast cancer"

Dr Julia Carmona-Bozo obtained her medical degree in 2011 at the University of Zulia in Venezuela obtaining her medical licensure in September 2013. Between 2013 and 2016, she was a Radiology registrar at Rafael Urdaneta University in Maracaibo, Venezuela. She obtained her Radiology degree in December 2016.

Julia's interest for research started while she was in Medical school when she joined a research society investigating endocrine and metabolic disorders. She became a student research assistant within that society participating in pre-clinical research projects. Later, she continued doing research and became a research assistant in a clinical study about Alzheimer's disease. Before coming to Cambridge, Julia was working with the widely recognised pharmaceutical company, NOVARTIS.

Her research at the University of Cambridge, as a PhD student, is focused on hybrid PET-MR imaging of breast cancer.

Together with Prof Fiona J. Gilbert, Dr. Roido Manavaki and the breast research group, she evaluates imaging biomarkers of hypoxia in breast cancer using ^{18}F-FMISO PET/MRI, DCE-MRI quantitative radiomics and morphological features of breast cancer vascularity and quantitative biomarkers of DWI-MRI in breast cancer.

Julia is currently supervised by Prof Fiona J. Gilbert. The aim of her investigation is to explore and identify breast cancer biomarkers of tumour hypoxia and vascularity using in-vivo functional imaging in order to better understand the breast microenvironment and assess breast cancer pathophysiology. After finishing her PhD course, Julia wishes to further expand her research skills while going back to the clinical practise.

Introducing Dr Katie Peterson

Katie's research interests lie in the use of neuropsychological and neuroimaging methods for the diagnosis and evaluation of neurodegenerative and neurological conditions. Katie graduated with an MA (Hons) degree in Psychology from the University of Dundee in 2012. She then completed a PhD in Medical Sciences (Psychiatry) at the University of Cambridge under the supervision of Professor Barbara Sahakian and Professor John Pickard.

Her PhD research aimed to define cognitive processes affected by normal pressure hydrocephalus and the effect of shunt surgery on cognitive and neuropsychiatric symptoms. Since completing her PhD in 2017, Katie has been working as a postdoctoral researcher at the Cambridge Centre for Frontotemporal Dementia under the supervision of Professor James Rowe and Professor Karalyn Patterson on a project to develop a novel clinical test (the Mini Linguistic State Examination [MLSE]) for classifying primary progressive aphasia. As part of this research, Katie also used the MLSE to characterise language changes caused by movement disorders (e.g. progressive supranuclear palsy and corticobasal syndrome) and investigated neural correlates of language impairment in dementia.

Current Research

Katie is currently working between the Departments of Radiology and Clinical Neurosciences on projects employing neuropsychological and neuroimaging methods in neurodegenerative populations. She joins Dr Tomasz Matys' research group as a Research Associate for a study to investigate new MRI methods for dementia imaging.

Introducing Ali Khan

Ali Khan is a PhD student supervised by Professor Ferdia Gallagher and Dr Mary McLean. He graduated from the University of Nottingham with an MSci in Physics investigating the use of hyperpolarised gases in low field MRI. His current research investigates the use of hyperpolarized ^{13}C-pyruvate in the imaging of glioblastoma.

The PhD is funded by the Lundbeck foundation.

Introducing Rosa

Eva and Tim are proud parents of Rosa, born 2nd December 2020 and would like to introduce her to you all.

Upcoming Forums

Wednesday Forums 5 pm—6pm

Although not all our forums are available to view online, you can find those that are on our "Forum and Seminar Recordings" page at **https://tinyurl.com/ybv3qtp3**

Invites to forums will be sent out the previous week to the forum mailing list and will be published on the Radiology Teams Channel on the day. You can now find us on our new Twitter account **@Radiology_UOC** as well as **https://radiology.medschl.cam.ac.uk**, where we will be publishing our latest news and upcoming events and any last minute changes that might occur.

To receive your CPD certificate, please remember to sign the attendance register. If you are attending via Zoom, please remember to use your full name.

Next terms forums are currently being finalised and will be published on our website.

DATE	CHAIR	SPEAKER	HOT SEAT
10th March 2021		"Paediatric Interventional Radiology: Program development, scientific discovery and clinical translation" by Dr Avnesh S Thakor	NONE
17th March 2021		"Rectal cancer imaging: it's relevance and new perspectives" by Professor Beets-Tan	NONE

Upcoming Tutorials and Seminars

Radiology Physics Tutorials - Mondays 3 pm – 4 pm

Invites to Tutorials will be sent out the previous week to the Tutorial mailing list and will be published on the Radiology Teams Channel on the day

You can now find us on our new Twitter account **@Radiology_UOC** as well as **https://radiology.medschl.cam.ac.uk,** where we will be publishing our latest news and upcoming events and any last minute changes that might occur.

Please contact Andrew Gill (**abg28@cam.ac.uk**) for further information if required

DATE	CHAIR	SPEAKER
8th March 2021		"Introduction to machine learning" by Leonardo Rundo
15th March 2021		"Imaging Acceleration (Partial Fourier Sampling, Parallel imaging and Compressed sensing" by Hao Li
22nd March 2021		"$B_0(t)$" by Nick Payne

Update Your Information

In every newsletter, we will be requesting that all department members – **including students** - update three specific tasks for us:

1. Please ensure that your **Symplectic account** is up to date. We pull publication data for the website using this database, so to make sure your publications are up to date on the website.
2. The website pages on research teams and projects are out of date. Any material available for public consumption would be a great help!
3. Please send us any news or information about the projects you're working on! We want to publicise the department's achievements as much as possible, and get your names out there. The following are points of contact for research groups:

Ramona Woitek	rw585@cam.ac.uk	Breast imaging and oncologic imaging
Kelly Holmes	Kelly.Holmes@cruk.cam.ac.uk	Advanced Cancer Imaging Programme Manager CRUK
Tristan Barrett	tb507@medschl.cam.ac.uk	Multi-parametric MRI techniques for identifying and characterising prostate tumours
Joshua Kaggie	jk636@cam.ac.uk	Stem cell research for joint repair
Zhongzhao Teng	zt215@cam.ac.uk	The translational application of combination of in vivo medical imaging and mechanical analysis to assess the vulnerability of atherosclerotic lesions.
Tomasz Matys	tm418@cam.ac.uk	MRI and PET for characterization of the extent of primary and secondary brain tumours.
Yuan Huang	yh288@cam.ac.uk	Clinical-oriented risk assessment of CVD
TBC	TBC	Oncology and haematology trials

Open Access Reminder

As you all know, since HEFCE's policy change, in order for any publications to be eligible for the REF they must be made Open Access. We must make sure our department is 100% compliant.

The university has a team in place dedicated to making sure this process is as simple as possible and has now linked Open Access with Symplectic Elements so that publication data will be filled automatically from databases.

When a journal accepts your paper for publication, upload it through Symplectic before you sign any copyright or Open Access agreements.

See this page for more information on how to submit accepted publications:

http://osc.cam.ac.uk/open-research/symplectic-elements-deposit-pilot/depositing-articles-symplectic-elements.

You can also contact the open access team directly at: **info@openaccess.cam.ac.uk**

NIHR Reminder

All research with NIHR Cambridge BRC/CRF funding and/or support that is due for publication must be reported to the NIHR via the NIHR Cambridge BRC communications team. You can do this via an online form on the NIHR Cambridge BRC website. **https://cambridgebrc.nihr.ac.uk/your-research/**

The NIHR via your local comms team must also be notified of press releases 14 days in advance. Failure to do so may result in financial penalties.