



Welcome to the February 2017 Issue of the
Department of Radiology Newsletter!

Researcher Feature: Dr Jamie MacKay



Osteoarthritis (OA) is the most common joint disease in the adult population. Advanced disease can be treated with joint replacement, but there is a lack of good treatment options for people with milder disease and nothing is available to prevent disease onset or progression.

Part of the reason for this is that it is very difficult to assess the effect of potential new treatments on joint structure over a feasible time period for early phase clinical trials, creating difficulties in the drug development pathway. Conventional imaging with x-rays is insensitive to change, and by the time x-ray changes are established the optimal time to intervene has probably been missed.

My research focusses on the development of novel acquisition and analysis techniques for magnetic resonance (MR) imaging of knee OA (the knee is the commonest joint affected by OA). These have the potential to allow much earlier assessment of response to treatment. They should also improve characterisation of patients with OA – important as OA is a very heterogeneous condition with a number of different disease ‘phenotypes’ described.

During my PhD (under the co-supervision of Prof Gilbert (Radiology) and Prof McCaskie (Orthopaedics)) I have been working on improving the analysis of subchondral bone (bone adjacent to the joint surface) and articular cartilage on MR.

First, I have been characterising the texture of subchondral bone in subjects within the Osteoarthritis Initiative (OAI) cohort (in collaboration with OAI investigators at Tufts University), and evaluating whether or not differences in subchondral bone texture are able to predict OA progression.

Preliminary results suggest that they can, although the absolute differences between subjects who progress and subjects who do not are small.

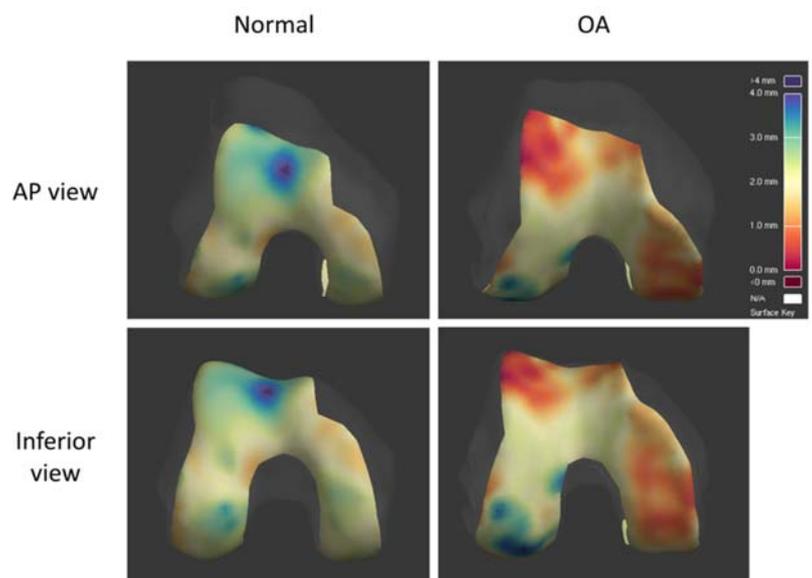


Figure 1. Comparison of cartilage thickness values in a cadaveric knee with no features of OA (left) vs a knee with severe medial and patello-femoral compartment OA (right) performed using Stradwin software (developed by Dept of Engineering, University of Cambridge). Note lower thickness values in the affected compartments of the OA knee.

Second, I have conducted a systematic review and meta-analysis of the discriminative validity of MR techniques which aim to quantify the composition of articular cartilage (i.e. proteoglycan and collagen content) which has shown that the ability of these techniques to discriminate between OA subjects and controls is relatively weak using existing approaches. As a result, we have been working on ways to improve the discriminative power of these techniques.

These include developing and validating a novel surface-based method of measurement of articular cartilage. This work has been done in collaboration with Graham Treece (Dept of Engineering), Tom Turmezei (Dept of Radiology) and the Dept of Anatomy who have provided cadaveric knees to enable the validation work. The method under-development should improve speed and accuracy when compared to alternative methods, and will permit statistically powerful surface based intra- and inter-subject comparisons.

I have also been working with Josh Kaggie on the development of functional cartilage imaging, evaluating changes in cartilage composition with MR in response to joint loading and exercise. This may enable a more refined and sensitive measurement of adverse changes in cartilage occurring very early in OA.

Lastly, I am in the final stages of planning a prospective longitudinal study to perform knee MR imaging in subjects with early OA and controls at three time-points over a 1 year period. This will feature a suite of novel MR techniques for the assessment of synovitis, subchondral bone, osteochondral junction and articular cartilage. The aim will be to evaluate which techniques are the most reliable and responsive, and therefore most suitable for use in the setting of early phase clinical trials.

Department News

We are excited to welcome two student visitors who have been working in our department!



Omar Ali and **Petros Fessas** are 4th year medical students who have joined the Gallagher lab for a 12 week SSC project. They are working together on a project which investigates the sensitivity of T1rho to changes in pH and glycosaminoglycan concentration involving scanning a series of phantoms with varying compositions.

Linked with this, **Omar** and **Petros** have also been working with T1rho head scans of healthy volunteers, examining the ability of T1rho to discriminate spatial heterogeneity and activation patterns in the brain. This latter clinical work will be tied in with the work of Fulvio Zaccagna, comparing T1rho imaging of GBM and healthy brains.





Paulo Mei is a visiting researcher who will be arriving on the 1st of March and working with Dr Tomasz Matys for 3 months, on a project entitled:
“MR Imaging of Invasive Phenotypes in Glioma and Pram.”

OPEN ACCESS UPDATE

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 want to make sure that as a department we are 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

New Rooms

In the next few weeks we will have access to our new rooms on level 5. This is excellent news for the department, which has grown considerably in the past few years and was in dire need of further desk space. There will be some staff relocation to the vacant rooms and those affected will be informed in advance, so that they can prepare in advance for the move.

EARS 2017

We have invited excellent speakers for EARS meeting 2017 and would like all department members to support this important meeting. If you haven’t registered yet, please do so by clicking on the following link:

<http://radiology.medschl.cam.ac.uk/ears-registration-2017/>

ECR 2017

Many of our department members and our NHS colleagues are presenting at the European Congress of Radiology. Please check out the next page for the schedule of ECR Presentations and Posters from our department.

ECR 2017 Schedule - Cambridge

| Date | Time | Title | Presenters/Authors from Cambridge | Location | ECR Programme |
|-----------|---------------|--|---|-------------|----------------|
| 01-Mar-17 | 10:00 - 11:00 | Voice of EPOS Stage 2 (Paediatric) EPOS Arena Paediatric scoliosis: beyond the curve. | Dr Emma Gerety | EPOS Lounge | VoE 32 |
| 01-Mar-17 | 12:30 - 13:30 | The MICRA trial: Minimally Invasive Complete Response Assessment of the breast after neoadjuvant systemic therapy | Professor Fiona Gilbert | Room M1 | CTiR1 |
| 01-Mar-17 | 14:00 - 15:30 | MR imaging | Dr Kathryn Taylor (moderator) | Room K | SS 314 |
| 02-Mar-17 | 08:30 - 10:00 | Hyperpolarised MRI in oncology | Dr Ferdia Gallagher | Studio 2017 | NH 5 |
| 02-Mar-17 | 08:30 - 10:00 | The high-risk lesions enigma | Dr Fleur Kilburn-Toppin (moderator) | Room E1 | RC 502 |
| 02-Mar-17 | 10:30 - 12:00 | L1 vertebra CT density measurements are too variable with different scanning protocols to be used as a simple screening test for osteoporosis. | Dr Emma Gerety, Dr M Hopper, Dr P Bearcroft | Room D | SS 610 |
| 02-Mar-17 | 10:30 - 12:00 | Effect of hyoscine butylbromide on prostate multiparametric MRI anatomical and functional image quality | Dr Iztok Caglic, Dr Tristan Barrett, Dr Andrew Patterson | Room N | SS 607 |
| 02-Mar-17 | 10:30 - 12:00 | Quantitative optoacoustic imaging detects increased haemoglobin in malignant lesions | Dr Oshaani Abeyakoon, Dr M Wallis, Dr P Moyle, Professor FJ Gilbert | Room F2 | SS 602b |
| 02-Mar-17 | 14:00 - 15:30 | Subdifferentiating equivocal PI-RADS 3 lesions in multiparametric MRI of the prostate to improve cancer detection. | Dr Brendan Koo, Dr Tristan Barrett | Room N | SS 707 |
| 02-Mar-17 | 14:00 - 15:30 | Imaging nervous system and musculoskeletal tumours | Dr Ferdia Gallagher (moderator) | Room F1 | SS 716 |
| 02-Mar-17 | 16:00 - 17:30 | Chairmen's introduction: Radio-Pathologic Correlation: more important than you thought | Professor Fiona Gilbert | Room E1 | RC 802 |
| 03-Mar-17 | 10:00 - 11:00 | Emergency | Dr Sara Upponi (moderator) | EPOS Lounge | VoE 76 |
| 03-Mar-17 | 10:30 - 12:00 | Clinical molecular imaging | Dr Iosif Mendichovszky (moderator) | Room F1 | SS 1006 |
| 03-Mar-17 | 12:15 - 13:00 | ESOR 10 Year Anniversary | Professor Fiona Gilbert | Room A | |
| 03-Mar-17 | 12:15 - 13:00 | ESOR 10 Year Anniversary: How did ESOR influence my professional development? | Dr Oshaani Abeyakoon | Room A | |
| 03-Mar-17 | 14:00 - 15:30 | Image Interpretation Quiz (IIQ) There's a patient behind every interesting case: Thorax | Dr Nicholas Screation | Room A | |
| 04-Mar-17 | 08:30 - 10:00 | Rethinking ductal carcinoma in situ (DCIS): Reducing overtreatment of DCIS | Dr Matthew Wallis | Room E1 | SS 1401a |
| 04-Mar-17 | 08:30 - 10:00 | Novel non-invasive imaging of tissue microstructure and pathology - high-resolution DKI and sodium MRI (23 Na-MRI) of normal brain | Ahmed Maiter | Room X | Student Sess 3 |
| 04-Mar-17 | 10:30 - 12:00 | Benefits and risks of preoperative axillary staging in a low-risk screening population | Dr Matthew Wallis, Dr F Kilburn-Toppin | Room E1 | SS 1402a |
| 04-Mar-17 | 10:30 - 12:00 | Portal interventions | Dr Miltos Krokidis (moderator) | Room Z | SS 1409 |
| 04-Mar-17 | 12:15 - 12:45 | Arthur de Schepper - Honorary Lecture: "From features to function - advances in breast imaging" | Professor Fiona Gilbert | Room A | |
| 04-Mar-17 | 13:00 - 14:00 | Radiographers | Dr Kathryn Taylor | EPOS Lounge | VoE 86 |
| 04-Mar-17 | 14:00 - 15:00 | Routine preoperative brain CT in non-small cell lung cancer - ten years experience from a tertiary UK thoracic centre | Dr Tomasz Matys | EPOS Lounge | VoE 57 |
| 04-Mar-17 | 14:00 - 15:30 | SFS: Screening with digital breast tomosynthesis in Europe: tumour characteristics and potential harms including overdiagnosis | Professor Fiona Gilbert | Room E1 | |
| 04-Mar-17 | 14:00 - 15:30 | A multicentre international study to develop and validate a reproducible assessment tool for evaluating the image quality of screening mammograms. | Dr Kathryn Taylor, Dr M Wallis | Room K | SS 714 |
| 04-Mar-17 | 16:00 - 17:30 | Image-guided minimally invasive treatment | Dr Miltos Krokidis | Room C | SA 16 |
| 04-Mar-17 | 16:00 - 17:30 | Fundamentals of mammography | Dr Susan Barter | Room F1 | E3 1623 |
| 05-Mar-17 | 10:30 - 12:00 | Breast cancer screening | Dr Fleur Kilburn-Toppin (moderator) | Room F2 | SS 1802b |
| 05-Mar-17 | 14:00 - 15:30 | Longitudinal diffusion tensor imaging in early stage Parkinson's disease | Dr Thais Minett | Room E2 | SS 1911a |

| Poster Title | Authors |
|---|---|
| <i>The role of radiology in anatomy teaching in UK medical schools.</i> | Dr T.J. Sadler, Dr T.T. Zhang, Dr H.L. Taylor, Dr C. Brassett |
| <i>The CT fish mouth ampulla sign: A pathognomonic finding in main duct intraductal papillary mucinous neoplasms.</i> | Dr T.T. Zhang, Dr T. Sadler, Dr S. Whitley, Dr R. Brais, Dr A. Jah, Dr E.M. Godfrey |
| <i>Pearls and pitfalls for assessing the fat containing lesion in the female pelvis</i> | Dr A. Shakur, Dr H. C. Addley, Dr S. Freeman, Dr P. Moyle |
| <i>Gastrointestinal manifestations of gynaecological diseases</i> | Dr S.A. Khwaja, Dr F. Masood, Dr E.M. Godfrey, Dr S. Upponi, Dr S. Freeman, Dr P.L. Moyle, Dr H.C. Addley |



**UNIVERSITY OF
CAMBRIDGE**

**School of Clinical Medicine
Department of Radiology**

**Professor Fiona Gilbert would like to invite you to
an**

Afternoon Tea Party

to celebrate the retirement of

Professor David Lomas

Wednesday

15th March 2017

4.00pm

Berridge Room, Level 5

Followed by the Forum at 5pm where

Professor David Lomas

will be giving a research talk on

“Body MRI in Cambridge”

Please RSVP for the Tea Party to Catherine Munn (cm861@medschl.cam.ac.uk)

Upcoming Wednesday Forums

1st March

“Opportunities and challenges in PET/MR”

Dr Iosif Mendichovszky

Hot Seat: Dr Falak Masood

8th March

“Novel Thoracic Imaging and Data Analysis”

Professor Fergus Gleeson

15th March

“Body MRI in Cambridge”

Professor David Lomas

22nd March

EARS MEETING 2017 - Homerton College

Funding Opportunities Page

Over the next week we'll be adding a large number of funding opportunities to the web page here:

<http://radiology.medschl.cam.ac.uk/research/funding-opportunities/>

This is a great resource for finding potential grants and other forms of funding for your research.

Make sure you check out [Research Professional](#) as well, as it will allow you to search for potential funding.

Department Website

In every newsletter, we will be requesting that all department members – **including students** - do three things 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, this account must be up to date.

2 – 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.

It goes without saying that it is essential in the current academic market to promote your work, and we want to help you do that!

3 – We will be updated the website staff profiles to new versions soon. Let us know if there is anything you'd like to have included in the new format!

We are also still looking for basic outlines of people's projects, along with images if possible, to make our Research Themes section look fantastic, and show off that this is a world class department for prospective students and researchers.

IT Updates

By now you should all have had a chance to access the Internal Website at

<http://radiology.medschl.cam.ac.uk/internal/>

Please let us know if there's anything you'd like to see added there, either by emailing Ralph, or by filling in the department feedback form here:

<http://radiology.medschl.cam.ac.uk/internal/feedback/>

As always, if you have questions about anything IT related in the department, please come and see Ralph or Anna.

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 this link:

<http://radiology.medschl.cam.ac.uk/internal/feedback/>

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