ANZMAG NEWS: SEPTEMBER-OCTOBER 2022

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Hi all, Welcome to the September – October 2022 edition of ANZMAG News.

ANZMAG CONFERENCE

The 13th Conference of the Australia & New Zealand Society for Magnetic Resonance will take place in Marysville, Victoria from 4 to 8 December 2022. That's just 31 days away. Registrations are now open at https://www.anzmagconference.org.au

Bruker will be running a user meeting which you can find out about at https://www.bruker.com/en/news-and-events/events/anzmag.html

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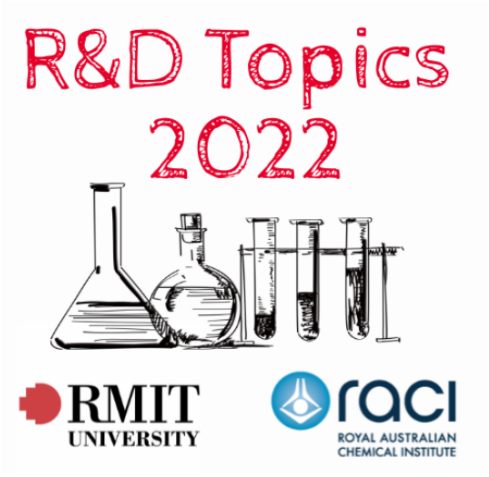
PAPER OF THE MONTH - SEPTEMBER

Paper of the month is a pre-print. The title is "Illuminating the Human Metabolome: Selective Detection of Multiple Metabolites in Unaltered Biofluids via Hyperpolarisation-Enhanced NMR Spectroscopy" by Kuhn et al. I was drawn to this one at it uses dynamic nuclear polarisation to increase sensitivity for metabolomic analysis. Something I have been interested in for a while. The authors actually introduce a new method called photo-chemically induced dynamic nuclear polarisation (photo-CIDNP) and test it on on unmodified biofluids, i.e. human urine and serum. They show that the use of photo-CIDNP on biofluids is feasible, can be performed straightforwardly manner in native aqueous medium at physiological concentrations, and acts as a spectral filter highlighting a clinically relevant metabolite subset. The method is compatible with standard metabolomics protocols and holds great promise for in-depth studies for use in metabolomics and other areas of analytical research. Check it out at https://chemrxiv.org/engage/chemrxiv/article-details/635fe071ecdad5194ef45d24 if interested.

PAPER OF THE MONTH – OCTOBER

As it is a double issue this time I thought we should have two papers of the month. The 2nd one is from Nature Communications and combines a bit of MRI and EPR. The title is "Electron paramagnetic resonance microscopy using spins in diamond under ambient conditions" by Simpson et al. The idea here is that Magnetic resonance spectroscopy is a very important tool in chemical and bio-medical research. However, sensitivity limitations typically restrict imaging resolution to ~ 10 μm. In this work the authors showcase an electron paramagnetic resonance microscope which selectively images electronic spin species by precisely tuning a magnetic field to bring the quantum probes into resonance with the external target spins. This provides diffraction limited spatial resolution of the target spin species over a field of view of 50 × 50 μm2 with a spin sensitivity of 104 spins per voxel or ~100 zmol. The ability to perform spectroscopy and dynamically monitor spin-dependent redox reactions at these scales enables the development of electron spin resonance in the physical and life sciences. You can have a read at https://www.nature.com/articles/s41467-017-00466-y if this sounds of interest.

R&D TOPICS



The RACI Research and Development Topics Analytical & Environmental Chemistry Student conference was founded in 1992 by Professor Neil W. Barnett of Deakin University. Based initially on the Analytical Research Forum run by the Royal Society of Chemistry in the UK, RACI R&D Topics was first held in 1993 at Deakin. It has since grown to include sixteen universities from across Australia, attracting in excess of 100 delegates annually. This year it will be at RMIT Univeristy in Melbourne from 4-7th December. Abstract and registration are open now. See http://www.rndtopics.com for full details. Please encourage Honours, MSc and PhD students, and young scientists from government/industry (up to 4 years post BSc. or equivalent degree), to submit oral presentations and/or poster presentations. Postdoctoral fellows (up to 3 years post PhD) are also invited to submit poster presentations.

The VESKI Inspiring Women Grants

These grants are designed to support women in STEM who face systemic barriers to success at a critical point in their career to enable them to continue their research in Victoria. They are calling for applications for women in STEM who just missed out on a ARC future fellowship or NHMRC Investigator grants and will provide up to 12months funding of up to $75,000 to support research outputs. If you are in Victoria see https://www.veski.org.au/bridging-the-funding-gap/ for details.

The Australian Biochemistry Lunch seminar series brought to you by the Canberra Protein Group

The Canberra Protein Group has announced the Making Futures program, which will feature some of our outstanding young biochemists in a community supported, national seminar series. This is the first part of two Making Futures seminar series. A list of speakers is below, along with a Zoom link (https://anu.zoom.us/j/81449078807?pwd=enlYenp5OXdHWlJxRmpBSmRMWXJ0dz09) and QR code. I think these might be of interest to a lot of ANZMAGers.

24th October	**Conan Wang (University of Queensland)** Targeting undruggable targets in cardiovascular disease and cancer using constrained peptides
31st October	**Steffi Cheung Tung Shing (University of Melbourne)** Deciphering the assembly and signalling mechanisms of the unique BAFF 60-mer through the TACI cytokine receptor
7th November	**Michael Healy (University of Queensland)** Unravelling the molecular architecture of the Commander assembly
14th November	**Sarah Piper (Monash University)** Dynamic drug targets: Using Cryo-EM data and MD simulations to create realistic 3D animations of GPCR complexes
21st November	**Julia Grassl (University of Western Australia)** Detecting honey bee disease – a molecular approach to protect the beekeeping and pollination industry
28th November	**Jessica Holien (RMIT University)** Protein-protein interactions – untapped drug targets
5th December	**Elena Eremeeva (Queensland University of Technology)** Hybrid protein-nucleic acids biosensors for small molecule detection
12th December	**Dezerae Cox (University of Cambridge)** From whole proteomes to single molecules: Exploring protein homeostasis in health and disease using chemical probes

https://anu.zoom.us/j/81449078807?pwd=enlYenp5OXdHWlJxRmpBSmRMWXJ0dz09
12 noon (AEDT)
Meeting ID: 814 4907 8807
Password: 797403

The STA STEM Ambassadors program

A bit left field but a good opportunity. This program pairs science and technology experts with their local Federal MP or Senator. Ambassadors meet with their Parliamentarian several times each year to discuss STEM topics of interest and enhance Parliamentarians' access to STEM expertise. Applications for the next round are open at https://scienceandtechnologyaustralia.org.au/stem-ambassadors-2022-application-form/ Applications close 9am AEDT Monday 7 November 2022.

SEMINARS

There a few NMR seminars coming up around the world next virtual

The Konstantin Ivanov Intercontinental Magnetic Resonance Seminar Series aims to bring together NMR spectroscopists working on methods, DNP, low-field NMR, parahydrogen, singlet-state NMR, EPR, and related areas together for knowledge dissemination and interaction. They have Zoom seminars listed on the 4th and 11th November. I can't see any registration details on the website at https://sites.google.com/view/nmr-seminar-series/home?authuser=0 but if keen you could e-mail the organisers daniel.abergel@ens.psl.eu, gerd.buntkowsky@chemie.tu-darmstadt.de, madhu@tifr.res.in.

Oxford Instruments have an on-demand webinar on Enhancing development, scale-up and manufacturing of pharmaceuticals with benchtop NMR. See https://www.oxinst.com/webinars/enhancing-development,-scale-up-and-manufacturing-of-pharmaceuticals-with-benchtop-nmr

Bruker have a whole host of online seminars on a range of topics. See https://www.bruker.com/en/news-and-events/webinars.html for a list

Don't forget ANZMAG has a YouTube channel with free lectures. See https://www.youtube.com/user/ANZMAG/playlists for details.

STORIES FROM THE WEB

- https://phys.org/news/2022-10-molecular-multi-qubit-quantum.html

This story is on the use of EPR as part of an experiment on spectroscopically controlled quantum bits. Very clever work

- https://www.statnews.com/2022/10/13/faster-brain-imaging-seems-to-overcome-limitations-of-mri-scans/

An interesting proof of concept idea for faster MRI imaging called direct imaging of neuronal activity (DIANA). A bit of a way to go yet but a neat idea all the same.

- https://www.news-medical.net/news/20220927/The-potential-of-NMR-based-blood-profiling-as-a-single-domain-assay-to-simultaneously-predict-multidisease-onset.aspx

This article is about a recent study on the potential of NMR-based blood profiling as a single-domain assay to simultaneously predict multi-disease onset.

Thanks everyone. Have a good November. Please give me an e-mail on oliver.jones@rmit.edu.au with any suggestions and news items for the next newsletter, due out at the end of November.
