RSC INTEREST GROUP
ANALYTICAL BIOSCIENCES

RSC ABG Newsletter

3rd Issue - Spring 2025

Dear Readers, fellow RSC –ABG members,

With great pleasure, we are sharing the third issue of our group's newsletter.

Please send your feedback and any content for the next issue by emailing the group email (rsc.abg@gmail.com)

In this issue:

CHAIR'S REPORT

By Henry Day

Hello, and welcome to our first Newsletter of 2025!
At this time, I find myself reflecting on our achievements from last year, my first full year as Chair of the group. Our goal last year was to establish clear roles for all our committee and to bring on board some new members who can offer some fresh perspectives and ideas to the group.

Last year, we continued our annual Early Career Researcher Meeting (ECRM) and AGM events but also started this Newsletter as a new initiative.

Additionally, we celebrated several successes. Professor John Hunt and colleagues at Nottingham Trent's Medical Technology Innovation Facility, last year's ECRM hosts, won the prestigious Readers' Choice University Research Project of the Year at the Elektra Awards, one of the most recognised awards in the global electronics industry. The prize-winning research team included Dr Jessica Stanley, a past early career speaker at our 10th ECRM in 2023. New committee member Hamish Stewart was part of a team from Thermo Fisher Scientific who developed the Orbitrap Astral mass analyser which won at the Human Proteome Organization Awards and the R&D 100 Awards. You can read more about these successes later in the newsletter.

This year, we aim to build on that momentum, and we have an exciting schedule of activities planned. We again have our flagship ECRM event, its 12th edition, this year generously hosted by the University of Sheffield. The committee have put together a diverse selection of keynote talks to compliment the early career talks and posters, which are the stars of the show. This year we are delighted to have the RSC's President-Elect, Professor Robert Mokaya, OBE FRSC FRS, in attendance who will give an opening address. Organizationally, for this year's ECRM, we have been focusing on increasing the amount of industry sponsorship. I am pleased that we have two new sponsors Fidabio and JMP Statistical Discovery supporting us alongside Horiba who returns as a sponsor again this year. Their support is incredibly beneficial and helps us to keep registration costs as low as we can to widen participation.

If you or your company would also be interested in sponsoring our events, please do get in touch!

Cost of living challenges have been felt by all our members across the globe and University Chemistry Departments have a particular challenge in managing the gap between their costs and what they receive in government funding. We are acutely aware that when finances are squeezed, it is often funding for conference attendance that is among the first things to be cut back. This year, thanks to a special top-up grant from the RSC, we are pleased to offer a new bursary program for our ECRM event. The bursary will provide up to £400 to cover travel and accommodation for eligible RSC members presenting at ECRM who otherwise would not

be able to attend. Please go to our event page where you can download the Bursary application form, the deadline for applications is the 28th of March.

This year, we are also participating in Solutions in Science for the first time. This is a new event for us, and we are pleased to join forces with the other analytical special interest groups to put **on** this event. The ABG are supporting a session with Keynote speaker Professor Melissa Hanna-Brown from University College Cork, Chair of the Community for Analytical Measurement Science (CAMS) and previously head of analytical Strategy at Pfizer. Melissa will be talking about pharmaceutical analysis and the challenges and opportunities it faces in the future.

Looking further ahead, we will once again be hosting our Annual General Meeting in London in November. This is a great opportunity for you our members to hear about the group's activities, give us your suggestions and discuss plans for the following year. As well as to hear an update from our ECRM prize winners.

Finally, I hope you enjoy this edition of our newsletter. We aim to publish biannually, and we are keen to highlight more stories from across our membership. If you have anything you would like to share, be it a conference highlight, a paper publication or any other success big or small, please send us an email and a few words which we can try to include in the next edition.

ECRM 2025

24-25 April Sheffield, UK

Register Here: RSC Events page

Registration deadline 4 April 2025

Abstract Deadline - 28 March 2025

Submit Your Abstract

The meeting is open to everyone, and aims to engage early career researchers in debate and discussions about all areas of analytical biosciences, and provide the opportunity to build networks with other researchers in the field.

A number of keynote speakers have been invited who will give their perspectives on analytical biosciences from academia and industry. This will be followed by presentations from early career researchers. Together, this will provide an overview of current research into new technologies and applications of analytical chemistry in biological science.

Speakers

Tim Craggs
Exciting Instruments, Sheffield , United Kingdom
https://www.sheffield.ac.uk/mps/people/all-academic-s…

Claire Batty
Open University , United Kingdom
https://www.linkedin.com/in/claire-batty-65025413/

Alan O'Riordan
Tyndall National Institute , Ireland
https://www.tyndall.ie/people/alan-oriordan///

Juri Felix
Royal Botanic Gardens Kew, United Kingdom
https://www.kew.org/science/our-science/people/juri-felix

Hamish Stewart
Thermofisher, United Kingdom
https://de.linkedin.com/in/hamish-stewart-767b8331

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Human Proteome Organisation World Congress

By Hamish Stewart

The Human Proteome Organisation (HUPO) met in Dresden with a record attendance of nearly 2000 scientists, showcasing developments in protein science and related understanding of (mostly human) biology. While the protein science itself stood at the forefront, there was also great attention paid to bioinformatic approaches, while analytical technology vendors filled the exhibition floor and boasted of their capabilities in parallel lunch seminars.

Remarkable in recent times is the prominence of scale. Ever larger cohort studies are appearing, enabled by mass sample collections at biobanks, and by magnitude technological advances in analytical instrumentation such as mass spectrometers, and novel sample preparation techniques such as plasma enrichment. Humanity it transpires is so chemically diverse that massive studies are required to understand individual variation, a severe early stumbling block in the deep search for biological markers.

On the other end of scale is the reduction in experimental sample size down to a single cell, or even below. Driven now by variety between cells, rather than between subjects, and once thought impossible, proteomic measurements of single cells now approach the depth of bulk measurements only a few years ago. The sub-field, and the linked cell-type resolved spatial proteomics field, are perceptibly shifting from an initial technology or technique focus, to what can be discovered with them, which recently includes the discovery of a treatment for the fatal skin condition toxic epidermal necrolysis.

R&D 100 Awards 2024

By Hamish Stewart

Since 1963, the R&D 100 Awards has seen itself as the Oscars for innovation, and there was much to recognise at their 2024 ceremony. Between the golf resorts and country clubs of sunny Indian Wells, California, several hundred representatives from 16 countries gathered to celebrate their successes, via a well-supplied cocktail reception followed by a surf and turf. The way to get people to sit patiently through any long ceremony is always to feed them. Particularly, the great American national labs each sent substantial delegations, and one large group gathered for a picture around an enormous flag of Taiwan. The crowd stuck out at the holiday resort before the event began, as workaholics on laptops took group calls in the poolside shade; a contrast to the heavy builds and beards that dominated a law enforcement conference held the following day.

The winners covered an impressive diversity of technologies and disciplines, from analytical instruments to recycling, fusion power to paint. Even a home air sanitiser made the cut. Special awards were given to several victors in three categories. The gold in green technology was won by the Los Alamos National Laboratory's MENDS modular electrochemical nuclear decontamination system, while the corporate social responsibility prize was given to the Pacific Northwest National Laboratory's publicly accessible EGRASS web tool, that estimates the impact of severe weather and storms on critical infrastructure. The final prize, the market disruptor gold, went to the author's own Thermo Scientific Orbitrap Astral mass spectrometer, a powerful new analytical instrument and the most important invention since sliced bread.

Knowledge Sharing

What our committee members have been up to

Prof Mark Dickman's team's recent publication

Mass spectrometry-based mRNA sequence mapping *via* complementary RNase digests and bespoke visualisation tools†

mRNA medicines have emerged as a powerful new class of therapeutic, as demonstrated by the development and approval of two highly efficacious COVID-19 vaccines. RNA-based approaches have the potential for treatments beyond vaccines and infectious diseases as therapeutics for cancer, metabolic disorders, cardiovascular conditions and autoimmune diseases. It is important to characterise the identity, sequence and chemical modifications of mRNA medicines. In this study, we have developed and utilised mass spectrometry for the direct sequencing of mRNA. Partial RNase digests of mRNA using RNase T1 and RNase U2 were used in conjunction with automated, high throughput workflows for the rapid characterisation and direct sequence mapping of mRNA. Moreover, we have developed a bespoke software engineered to optimise and streamline the visualisation and data analysis generated from the sequence mapping of mRNA using mass spectrometry. The ability to rapidly identify, characterise and sequence map large mRNA medicines with high sequence coverage provides important information for identity testing, sequence validation, and impurity analysis.

See Paper here - DOI: https://doi.org/10.1039/d5an00033e

Dr Eamonn Reading's team's recent publication

Drug-resistant superbugs could kill two million a year by 2050 – now scientists say they've discovered how a simple mineral could be boosting the bug's "vacuum cleaning" defences

DOI: 10.1016/j.str.2024.12.012

The paper describes the role of Mg2+ in the process of eliminating antibiotics, potentially helping identify new ways to disrupt the action of these pumps in bacteria to help in the fight against drug resistance.

Background:
When bacteria are threatened by drugs - including antibiotics - they use a defence system that's like tiny vacuum cleaners to pump out the toxins. These pumps are not picky and can pump out many different drugs, making bacteria resistant to multiple antibiotics.

But now scientists from Southampton say they've discovered that these bacteria use the common mineral magnesium to work these pumps.

They hope that this discovery could help experts fight drug resistance by finding ways to disrupt these multidrug pumps in bacteria. This could make antibiotics more effective again

One of our speakers from last year's ECRM has got her first publication recently! Congratulations Tabatha

As shared on linkedin
The published research delves into the intricacies of cannabidiol (CBD) products in the UK, focusing on safety, accurate labelling, and compliance with regulations. As CBD continues to gain popularity for its perceived health benefits, ensuring the quality and safety of these products is paramount.

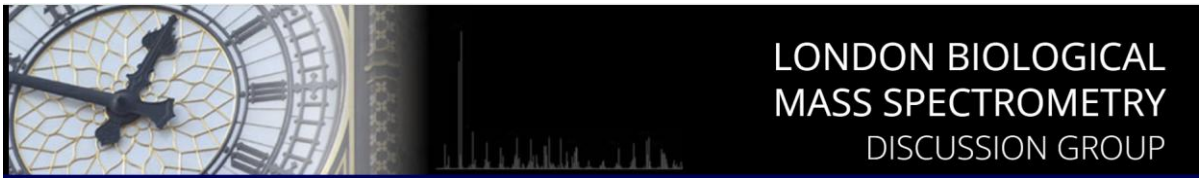
A few words from Tabatha
"*I'm thrilled to share that my first publication toward my PhD has been published "Validated LC-MS/MS methodology for the quantification of CBD, trace level THCA and UK controlled cannabinoids (Δ9-THC, Δ8-THC, CBN and THCV) in food samples" DOI: 10.1039/D4AY01946F.*
It delves into the methodology challenges of analysing cannabidiol (CBD) products, focusing on assessing the samples label accuracy and their compliance with regulations. We developed and validated the LC-MS/MS methods to accurately measure CBD and trace levels of controlled cannabinoids in food products and then conducted a comprehensive study on 148 CBD edible products. We found that 9% of the tested products did not contain detectable amounts of CBD, raising concerns about accurate labelling and 66% of samples had detectable levels of controlled cannabinoids. As CBD continues to gain popularity for its perceived health benefits, ensuring the quality and safety of these products is paramount. I'm so grateful for the collaboration and insights from my co-authors; especially Patrick Sears, Steve Corless, Rebecca Nash, Chris Hopley and Jon Griffin, it wouldn't have been possible without their support and invaluable contributions. I am looking forward to continuing this journey and sharing more publications in the future!"

Read it here : **https://pubs.rsc.org/en/content/articlehtml/2025/ay/d4ay01946f**

What others are up to

If you are interested in mass spectrometry and you are based closed to the capital or just want to have a day trip LONDON BIOLOGICAL MASS SPECTROMETRY DISCUSSION GROUP organizes great meetings regularly.
Sign up or get more information here: http://lbmsdg.org/
Next meeting 24th March, Gordon Museum, Hodgkin Building, Guys Campus, London

http://lbmsdg.org/events/



Share your own work

Part of being a member of the RSC is to allow one to build professional networks, meet people with similar interest and even find opportunities
to collaborate.

If you are a student and would like to highlight your first Publications on your research – we would like to offer you that opportunity.

The Analytical Biosciences group would love to help you by creating a platform of sharing News about you, our members with other members of our group.

We would like to hear about your scientific achievements, your publications or conference participations and presentations which you would be happy for us to share with our members.
We are hoping to highlight the work of our members and share the knowledge you all work hard to build day by day.

What we need:

- **Details of publication: Title, Journal, etc and a 50 words summary on why you think our members would benefit reading it**
- **Conference Participation – initial motivation to attend, what you liked about the conference, and who do you think would benefit from attending in the future**
- **Presentations – conferences, webinars – not all our members are academics, and our work may get presented, but not published – let us know if you have recently had the opportunity to showcase your work somewhere online or in person**

Or do you just have an analytical topic you are passionate about and would like others to learn more too – we welcome short high level summary articles written by our members.

Please drop us an email (rsc.abg@gmail.com) if you are interested in helping us help you sharing knowledge and highlighting your work.

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