Chemistry Update

Newsletter 329, 26 February 2021

Inside this Issue

Calendar of Events

Catalysis@York Poster Conference
Date: Wednesday 10 March
Time: 2pm—5.30pm
Location: Virtual

Open to all staff and PGR students. If you wish to attend this event, please register by **4 March** (the deadline for poster abstracts has now passed).

A Zoom invitation will be generated from these sign up lists, so please register for the event, even if you are not presenting a poster.

Plenary speaker is Professor Scott McIndoe, University of Victoria, Canada. Scott has wide ranging interests in catalysis, especially in measurement and discovery of catalytic processes using mass spectrometry.

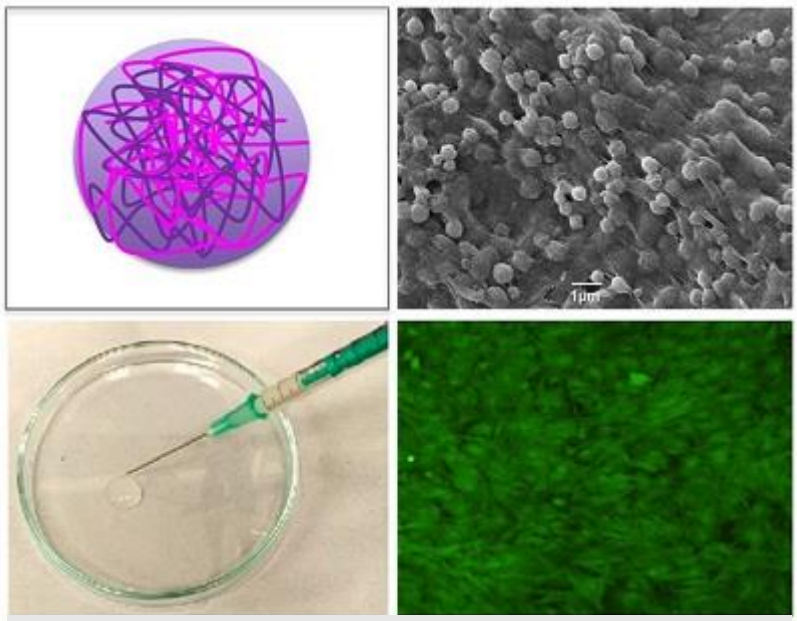
Equality and Diversity Seminar
Speaker: Prof. Saiful Islam, University of Bath
Date: Wednesday 17 March
Time: 1pm—2pm
Location: Virtual

Date of Next Issue:
26 March 2021

Injectable self-assembled microgels enhance stem cell growth

A new technology developed in the Department of Chemistry can fabricate injectable biocompatible microgels, with sub-micrometre diameters, that can release bioactive agents and hence enhance stem cell growth.

Self-assembled gels have great potential for wide-ranging applications including drug delivery and tissue engineering. These versatile materials spontaneously and reversibly assemble from small-molecule building blocks. However, the gels are often very weak, and this can make it difficult to fabricate them with controlled shapes and sizes. In particular, it is very challenging to make microgels with sub-micrometre particle sizes. Such microgels would have applications in biomedicine because their small size potentially allows them to be injected, meaning they could play a role in tissue repair or drug delivery.



Schematic of microgel (top left), electron microscopy image showing particles smaller than 1 micrometre (top right), injection of the micro-gel through a syringe (bottom left), stem cell growth encouraged by heparin-releasing microgels (bottom right).

In a major breakthrough, Dr Carmen Piras, working in the research team of Professor David Smith developed a new way of stabilising sub-micrometre self-assembled gel particles. She developed a way of making gel beads that were just 800 nanometres (0.8 micrometres) in diameter, and then stabilised them in a simple process using alginic acid, a naturally-occurring polymer found in seaweed, as a reinforcing agent.

Dr Piras demonstrated that these microbeads were stable to the injection process, were stable in cell culture medium and could be loaded with heparin, a bioactive agent. In collaboration with Dr Alasdair Kay and Professor Paul Genever in the Department of Biology, she then went on to demonstrate that her microgel beads could release heparin, encouraging enhanced stem-cell growth.

As Carmen explains: “Injectable systems that can release heparin and assist stem cell growth are of great potential interest in tissue regeneration. Stem cells are being explored to encourage recovery after tissue damage or major surgery. A simple, injectable, biocompatible microgel that can encourage greater stem-cell proliferation in the damaged area would be of great potential value.”

Reflecting more broadly on the research, Professor Smith said: “This approach to self-assembled microgels should be applicable to very many other self-assembling gels, each of which can have different types of activity and potential uses. This innovative fabrication method should therefore open up a wide range of applications that were simply not previously possible.”

The work was funded by EPSRC and is published in *Chemical Science*, the flagship open access journal of The Royal Society of Chemistry.

Technician Commitment update

As part of the drive to develop career pathways for technicians at York, the University became a founding signatory of the Technician Commitment (2018). Over the last two years the University has worked on delivery of an action plan with the aims to ensure Visibility, Recognition, Career development and Sustainability for technicians working at the University across all disciplines.

There has been a high level of interest and engagement with the VC, Deputy Registrar, Dean of Faculty of Sciences alongside presentations to Council, UEB and the University Operations Group to help lead the culture changes and champion technicians in the organisation. The second stage was signed by the Vice Chancellor and submitted for review in December 2020. The first phase has strengthened the support and recognition of our technicians across the institution and resulted in the development of a community via TechYork. Technicians have been able to take advantage of the many opportunities that have presented themselves in the last couple of years with many more planned. The self-assessment and 36-month action plan are available to view on the TechYork Technician Commitment webpage. For more information please email technician-commitment@york.ac.uk.

New starters

Dr Naomi Elstone, PDRA in Ionic Liquids and Catalysis
Room: C/E102; Ext: 2536; Email: naomi.elstone@york.ac.uk

Dr Matthew Jones, PDRA in Chemistry at the Air-Sea Interface
Room: C/G119 (WACL); Ext: 1216; Email: matthew.jones@york.ac.uk

Shona Wilde, PDRA in the Wolfson Atmospheric Chemistry Laboratory
Room: C/G116 (WACL); Ext: 4757; Email: shona.wilde@york.ac.uk

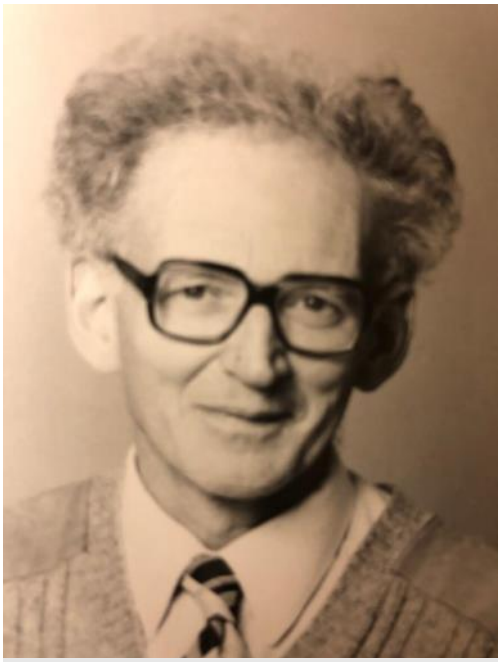
Dr Matthew Gyton, PDRA in Organometallic Chemistry
Room: C/E114; Ext: 2536; Email: matthew.gyton@york.ac.uk

Agata Lambrechts, PDRA in Science Education
Room: C/B013; Ext 2562; Email: agata.lambrechts@york.ac.uk

Dr Alex Henrique Miller, PDRA in Biological Inorganic Chemistry
Room: C/E014 & C/E002; Ext: 4587; Email: alex.miller@york.ac.uk

David Rowe 1925-2021

David Rowe, a pioneer of Management and Industry teaching in the Department of Chemistry, died on 22 January 2021 aged 95. He is remembered here by Tom Halstead, Robin Perutz, Barry Thomas and John Vernon.



David as Robin knew him in the 80s (Photo credit: Max Rowe)

We recently received the sad news of the death of David Rowe. Together with John Macintyre, David Rowe started the "Chemistry, Management and Industry" course in our degree (so -called Course 2) in 1973. David continued in the Department until his retirement in 1992. This course was highly innovative, very popular, and has influenced the shape of our degree to the present day. David and John Macintyre together vindicated the decision to teach this course within the Department of Chemistry, rather than to run a course jointly with another department as other universities chose. This way it had a strong chemical flavour and voices of experience from the chemical industry.

David's appointment from *50 years of Chemistry at York*: "We drew up a shortlist of four and were somewhat taken aback when one of the rejected applicants sent a long letter explaining why we had made a mistake in not interviewing him. How right he was! We added him to the list, and so met David Rowe for the first time. He presented us with such a coherent programme of learning, demonstrated the breadth of his interests by talking about his enthusiasm for geology and showed himself to be head and shoulders above the other four. David Waddington recalls that as he left the room, Eric James (the Vice Chancellor) said 'Have him. He is a scholar.' David Rowe's appointment turned out to be a godsend, not just for his contribution to the foundation of Course 2, but the role he went on to play in the Chemistry, Resources and the Environment (Course 3) option."

David joined the Department of Chemistry from ICI on Teesside. His deep knowledge of the chemical industry enabled him to teach with authority about chemical technology and its economic basis. *John*: "I remember how David prepared his teaching materials and structured site visits with such care and thoroughness."

David Rowe on the Lyke Wake Walk on skis, March 1986, (Photo credit: David Goodall)

Barry: "We visited Steetley Magnesite to see how magnesia was obtained from the magnesian limestone bedrock. The morning stop was Thrislington Quarry where the raw material was extracted and then roasted to give the mixed oxide. Then on to the site on the coast where the magnesium oxide was separated from the calcium component. But first a break for lunch at a pub in Hartlepool. He led us in, looked at the lounge bar that was full and so took us into the saloon bar. The landlord was not too happy with students going in there but David insisted that there

David Rowe leading the annual Course 3 field trip from Saltwick Nab to Whitby in 1992 (Photo credit: Tom Halstead)

was much more space. It soon became apparent that this was the pick-up point for the local prostitutes but David never batted an eyelid."

David was a keen amateur geologist and one-time treasurer of the Yorkshire Geological Society. He had an extensive geology library himself. Not surprisingly, he also contributed to the "Chemistry, Resources and the Environment" (Course 3) option.

Tom: "He was in his element when leading the annual field trip from Saltwick Nab to Whitby. Having lived on Teeside during his time at ICI Billingham prior to joining the Department, he had acquired an extensive knowledge of the geology of Cleveland and the Jurassic rocks exposed on the coast."

David's outdoor activities included geology, walking and endurance fell running. He often walked with a group from Vanbrugh SCR and ran for the University of York Athletic Club. *Barry*: "On a trip to the Boulby potash mine, David mentioned the Lyke Wake Walk to me as the coach crossed its route. I was rather proud that a couple of years earlier I had completed the walk of 39 miles in just under 13 hours. David said he had done it on a couple of occasions, so I asked him how long it had taken him. He said 'just under 6 hours'. He had run it!" It's snowing gently as I write this, but early in March 1986, there was enough snow for the hardier chemists including David and his wife Lily to do the Lyke Wake Walk on cross-country skis.

A competitive runner (Photo credit: Max Rowe)

John: "David loved the outdoors: he knew the Lake District, the Pennine hills and the North York Moors intimately. He ran the Three Peaks race (over Pen y Ghent, Ingleborough and Whernside) many times, and on the last occasion he may have been the oldest competitor. He was interested in physical geography and geology the world over, such that he was always eager to hear accounts of my own travels and mountaineering."

Robin: "Whenever we planned an outdoor family holiday, whether Crete or the Pyrenees or Iceland, we consulted David and his wife Lily. They had invariably been there before us and had lot of good tips about walks and landscapes. We will miss David's deep voice, generosity and knowledge of the world around. Although I never went on the Course 3 field trip, he did give me and my wife a personal tour of Whitby geology – an outstanding experience."

David was a very active member of the Yorkshire Philosophical Society, in his retirement helping with cataloguing the library. He leaves two children, Max and Wanda. His wife Lily, who worked in the University Library, died in 2012.

- Robin Perutz, February 2021

New initiative - Chemical Biology group joins lab plasticware

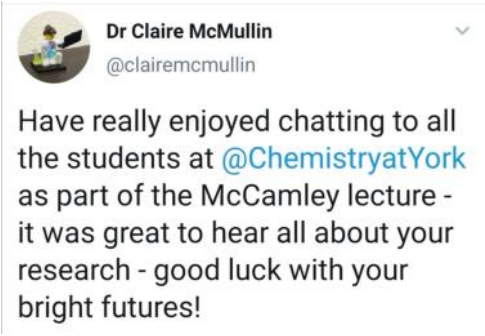
The Chemical Biology group in Chemistry has joined a scheme for recycling selected laboratory plasticware (after decontamination), adopting a working practice developed through cooperation between the Department of Biology and Tradebe LabWaste.



The recycling scheme accepts plasticware limited to pre-exposure of water-soluble chemical solutions or low hazard biological materials only. Decontamination follows recommended procedures. Currently only plastics made of two types of polymers, Polypropylene (PP) and Polystyrene (PS), can be considered, but watch this space. If you are interested, email chem-waste@york.ac.uk.

McCamley Lecture 2021

Dr Claire McMullin from the University of Bath was our guest for this year's McCamley Lecture, presenting a talk entitled "Computational Insights: Putting Inorganic Experimental Results in Perspective". The organisers this year were Nina Leeb, James Race and Dr Luke Wilkinson. Students and researchers enjoyed chatting to Claire via Zoom after the talk.



Online Department suggestion box

The online Equality and Diversity suggestion box has been extended to be a suggestion box for the whole Department. You can submit your thoughts/suggestions/ideas for general Departmental matters as well as matters relating to Equality and Diversity. You can find the Google form on the intranet homepage or at this link.