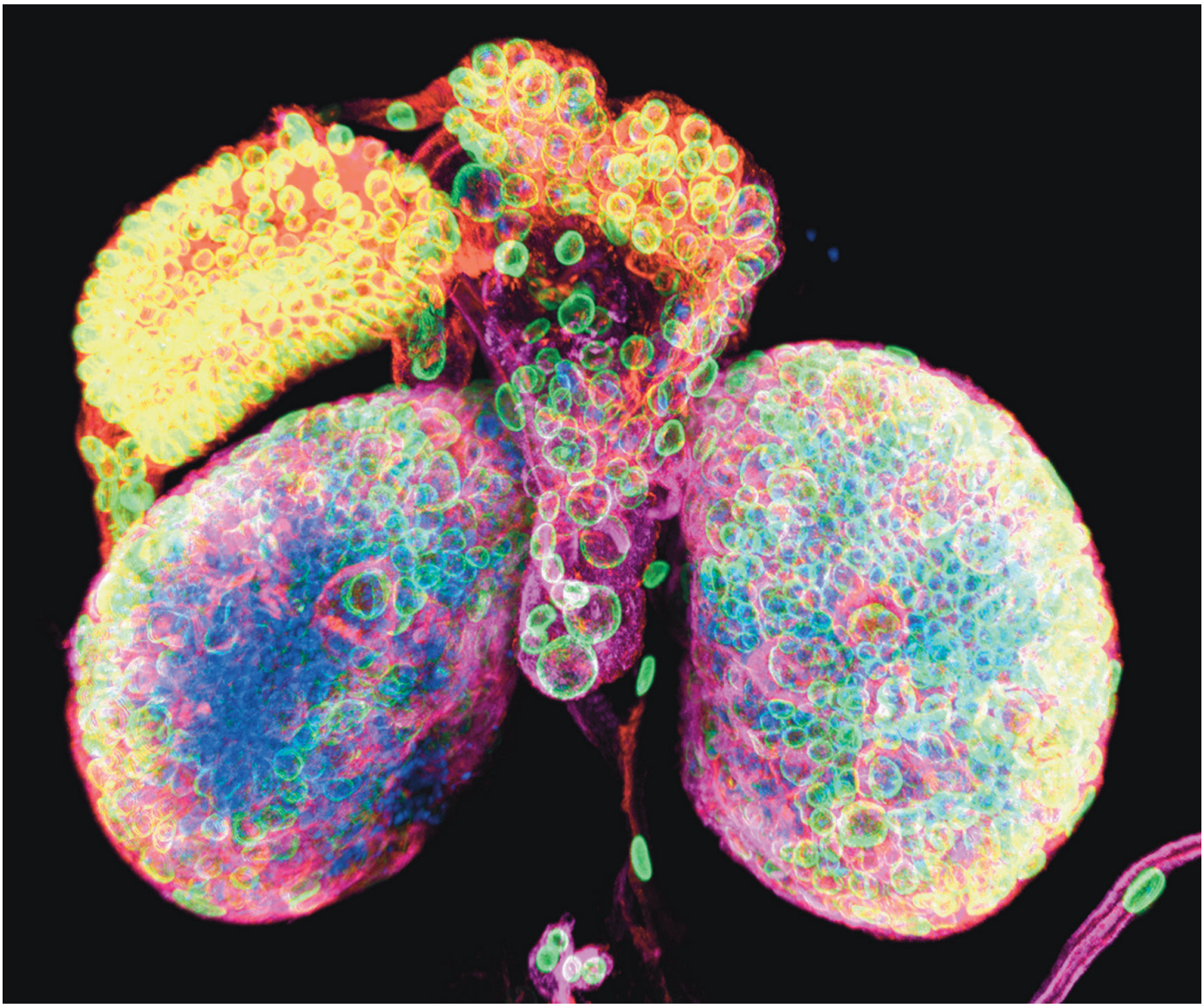
2022

BSCB Magazine

BRITISH SOCIETY FOR CELL BIOLOGY



BSCB

BSCB/BSDB Joint Annual Spring Meeting
3rd-6th April 2022 - University of Warwick UK

Topics include:
Cell and tissue signalling, trafficking, cytoskeleton and mechanics, neurobiology, nanoscale biology, constructing and deconstructing developmental biology, cell and tissue homeostasis, epigenetics and gene expression.

Phil Abitua (USA)
Sophie Acton (UK)
Cantas Alev (JAP)
Charlotte Aumeier (SWI)
Francis Barr (UK)
Marika Charalambous (UK)
Gautam Dey (GER)
Mark Dodding (UK)
Kristian Franze (GER)
Marco Fritzsche (UK)
Fanni Gergely (UK)
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Virginie Hamel (SWI)
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Angeliki Malliri (UK)
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Elias Spiliotis (USA)
Anne Straube (UK)
Nic Tapon (UK)
John Wallingford (USA)
Valerie Weaver (USA)
Dolf Weijers (NED)
Joachim Wittbrodt (GER)

Scientific Organisers:
Raman Das, Jens Januschke, Alison Twelvetrees, Tom Nightingale, Susana Godinho, Sally Lowell
PhD Reps: Lara Busby and Rowan Taylor
Post Doc Rep: Alex Fellows

Find out more at: https://tinyurl.com/BSCBDB2022

BSCB Magazine 2022

Editorial

Welcome to the 2022 edition of the BSCB Magazine. To begin, we would like to introduce ourselves as the new editors, taking over from Ann Wheeler's enthusiastic and diligent stewardship of the Magazine over the years. We would like to thank Ann for her continuing help and advice in putting this year's edition together.

The ongoing global pandemic has impacted on all of us. In our professional lives, the cell biology community has continued to do excellent science, while communicating it to peers and to a wider world that is becoming more and more aware of science. The pandemic has greatly increased the desire for rapid communication of scientific findings. A feature article on preprints discusses how this trend is becoming established practice in cell biology. We include reports from 'Cell la Vie', an online meeting between the BSCB and its French counterpart, the SBCF, that was organised by PhD students and early career researchers. A number of online symposia have been the great success of the pandemic and these are still ongoing; they include Motors in Quarantine and the UK Cilia Network (for a complete list see the BSCB website).

We are delighted to feature interviews with our Hooke and WICB winners, Stephen Royle and Vivian Li, and we congratulate them both on their achievement. You can also see the eye-catching pictures that won our Image Competition and enjoy Martha McLaughlin's winning entry to our Science Writing Competition.

Our students have continued to pursue their research callings, despite the difficulty of doing so under the various public health restrictions. We include reports from summer studentships funded by the BSCB that show just how motivating lab work can be. We hope that these reports will remind you of the funding and support that the BSCB can offer you for laboratory training, meeting organisation and meeting attendance, either in-person or remotely. It is more and more relevant to stay connected, so make sure to take advantage of the benefits offered by BSCB membership (which are described at the back of this magazine, but are in more detail on our website).

We bid farewell to Committee members who have completed their terms of office and who have given great service to the Society – Vas Ponnambalam as Secretary, and Anna Straube as Meetings Secretary. We welcome new members to the BSCB Committee, Viji M. Draviam and Darius Koester, and include short interviews with last year's new members, Victoria Cowling and Gipi Schiavo.

We also include the results of the recent survey of our membership (that is, you!). Please continue to keep in touch with the BSCB and contact us with ideas and initiatives – we are your Society!

Ciaran Morrison
Tom Nightingale

Front cover: Brain lobes from *Drosophila* larvae, illustrating the diversity of the cells that work together to generate a functional brain. This confocal image shows the nuclear envelope of nuclei in green (Lamin), the chromatin in blue (DAPI), tubulin in magenta and a cortical marker in red (dMoesin).

The image was taken by Chantal Roubinet, and was the winner of the BSCB Image Competition 2021
See page 12.

Magazine Editors: Ciaran Morrison and Tom Nightingale **Production:** Giles Newton, Deadlift Media **Printer:** Hobbs
BSCB website: www.bscb.org

Society News

BSCB President's Report 2021

I hope you enjoy this year's BSCB Magazine, which provides information about the many benefits of being a BSCB member, including the possibility of being awarded one of our prestigious prizes. In 2021, the BSCB awarded our first Raff Medal for PhD students to Flora Paldi and BSCB Postdoctoral Researcher Medal to Agathe Chaigne. We also awarded the Hooke Medal to Stephen Royle and WICB Early Career Award Medal to Vivian Li. The deadline for the 2022 prize nominations have already passed, but please watch out the email asking for nominations in 2022 – all BSCB PhD student/Postdoctoral members are eligible for the respective Medals, and any BSCB member can nominate candidates for the Hooke Medal/ WICB Early Career Award Medal. You can find out who is eligible for each Medal on our website (https://bscb.org/).

2021 was the year in which we all discovered the benefits and downsides of online meetings and conferences. Not having to travel long distances or stay in less-than-ideal accommodation was definitely a benefit. I was particularly excited by the variety of platforms used for online poster sessions. Being able to browse through PDFs of posters before a poster session enabled me to choose the posters I most wanted to view. Rather than trying in vain to read a popular poster in person behind a crowd of other scientists, joining an online presentation allows everyone equal access to the poster and presenter. It is also easy to move from one poster to another without searching the whole room to find where it is, negotiating a path through crowds around other posters.

More recently, hybrid conferences have enabled both in-person and online participation at talks and poster sessions. One I particularly liked used Zoom for the presentations, allowing those online to ask questions equally to those in the venue. In each of the two poster sessions, half of the poster presenters were online, and the other in person. They swapped around for the next poster session, so everyone could see all the posters being presented.

We really hope to see many of you in person for our 2022 BSCB/BSDB Joint Spring Meeting (3–6 April) at Warwick University (https://tinyurl.com/BSCBDB2022). As a BSCB member, your registration fees for our meetings are substantially discounted. If you are a PhD student or postdoc, you can apply for an Honor Fell travel award to help fund your registration costs and travel to this meeting. Group leaders who do not currently have any conference funds in their grants are eligible to apply for BSCB Company of Biology Travel Awards. Please visit our website to find out more about these awards, as well as other ways you can get involved with the BSCB.

The last BSCB Annual Meeting in-person was at Warwick University in April 2019! Since then, our meetings have been online. We all hope that 2022 will be a better year for in person meetings, with the option of online participation for those who prefer it. My best wishes to you all for 2022.

Anne Ridley
BSCB President

BSCB/BSDB Joint Annual Spring Meeting 3–6 April 2022, University of Warwick

It is with great pleasure that the BSCB and BSDB societies reunite to stage the Spring Meeting in April 2022. The societies have a long history in organising successful joint meetings and, as this is the first in nearly 2 years to feature in-person attendance, it holds a special significance.

The current pandemic has greatly limited large scale attendance at any event. For a significant time this impacted our normal ritual of seeing old friends, getting excited about new data, welcoming new staff/students to the cell and developmental fields, and partaking in a communal beverage (whether it is tea, coffee, a soft drink or something more boozy). The chance to meet up stands to much improve the quality of all our science (as well as the quality of our social lives).

Currently, developmental and cell biology are overlapping to a greater extent than ever, and the speakers selected offer much of interest to both communities, from cellular origins to whole tissue and organism phenomena (see associated poster for the full summary of topics). There is an exciting line up of invited speakers that plan to attend in person, whilst the programme has ample room for talks selected from the abstracts of PhD and post-doctoral researchers as well as flash talks from many poster presenters. Plenary speakers include Prof Jody Rosenblatt, Prof Anne Straube and Prof John Wallingford. There will also be a careers session run by the PhD and post doc representatives. As always there will be the excitement of the medal talks, from both societies, true celebratory events.

We are still very much aware that the situation is merely changed, to a large extent there are constraints on in-person attendance for many people, whether due to health restrictions, parental commitments, funding restrictions or travel arrangements. The spring meeting will therefore support hybrid attendance with the capability to attend and present all sessions remotely whatever the limitations imposed.

We do hope to see you all at Warwick University for what we hope is one of the first steps to a return to the collegiate community gatherings that we all got so used to (and ended up taking for granted).

Tom Nightingale, Alison Twelvetrees, Susana Godinho, Raman Das, Jens Januschke and Sally Lowell.

BSCB News

The BSCB has been working as always to support the cell biology community. Due to the current restrictions, our twice-yearly committee meetings have been online, which is something that we are all now very used to. Assuming that restrictions allow it, we are all very much looking forward to meeting in person (some of us for the first time) at the annual general meeting this year (Warwick BSCB/BSDB meeting). If you are keen to play a role in promoting cell biology in the UK and would like to join the committee, please contact our Secretary.

We would like to welcome new members to the committee – Viji Draviam and Darius Köster (see a brief introduction on p24). Victoria Cowling has joined Maria Balda in the role of summer school studentship coordinator, whilst Giampietro Schiavo has joined David Elliot to take on the Treasurer responsibilities. We would also like to thank Vas Ponnambalam (former Secretary), Anne Straube (former Meetings Secretary) and Ann Wheeler (former Mmagazine Editor) who are stepping down from their committee roles this year. They have all provided outstanding contributions to the running of the society and will be sorely missed.

The society recognises outstanding science at all points in a scientific career with a number of awards. These include the Hooke Medal, Women in Cell Biology award, the Raff (PhD) and the Postdoctoral Award. Excitingly, this year we are very pleased to announce a new accolade – the BSCB Inspiring Cell Biologist Award.

BSCB Inspiring Cell Biologist Award

This new BSCB award is to recognise the outstanding scientific achievements of a cell biologist from an underrepresented or disadvantaged ethnic community. It is to be given annually, and the awardee will present a lecture at the BSCB annual meeting and receive the Inspiring Cell Biologist medal. Eligible individuals are researchers with outstanding scientific achievements working in the UK or Ireland who belong to ethnic communities that are underrepresented in UK or Irish bioscience. Nominators and self-nominators must be BSCB members, but the candidate does not need to be. The BSCB committee recognises that exclusion and under-representation are contextual. Therefore, the selection committee considers the nominator's description of the nominee's eligibility, which may include belonging to a group which is excluded or underrepresented within the nominee's own personal or professional context. Nominees should conduct independent research at a higher education or research institution in the UK or Republic of Ireland. Nominations are encouraged for early career researchers as well as established senior scientists. Scientific achievements will be judged relative to the time from completing PhD training and nominators should include information on significant career breaks for consideration by the committee. We very much look forward to receiving nominations throughout 2022 for the first award in 2023. Please see the BSCB website for more information.

Meetings Calendar 2022–23

April 2022

BSCB-BSDB Joint Annual Spring Meeting:
3–6 April 2022. Warwick University, UK.
BSCB meeting

Spring 2023

Dynamic Cell V: Joint BSCB and Biochemistry Society Meeting.
BSCB meeting

BSCB-supported one-day meetings

British Microtubule Meeting
9 May 2022. Edinburgh, UK.
Abstract submissions are welcomed!
microtubule.bio.ed.ac.uk

Actin 2022
December 2022. Bristol, UK.

UK Trafficking Meeting
December 2022. London, UK.

BSCB-supported online symposium series

UK Cilia Network
www.cilianetwork.org.uk/symposia/

Motors in Quarantine
mechanochemistry.org/whatson/MiQ/#tab=up

Other cell biology meetings

Astbury Conversation: Seeing into cells (Online meeting)
25–26 April 2022.
astburyconversation.leeds.ac.uk/ehome/index.php?eventid=200183132&

Check the BSCB website for information about conferences and on how to apply for funding for 1-day meetings:

bscb.org/meetings/bscb-meetings/
bscb.org/meetings/sponsored-meetings/

About our Workshops

The Company of Biologists Workshops offer early-career researchers an unrivalled opportunity to join leading experts to share research and discuss interdisciplinary ideas in a stimulating environment. The programmes are carefully developed and are intended to champion the novel techniques and innovations that will underpin important scientific advances.

We offer around 10 funded places for early-career researchers to attend our Workshops along with 20 invited speakers.

We look forward to returning to in-person events in 2022. We will continue to monitor the ongoing situation and our priority remains delegate welfare. Follow us on Twitter for the latest updates.

Visit **biologists.com/workshops** for more information on how to apply.

@Co_Biologists #BiologistsWorkshops

Workshops 2022

Cell Size and Growth, From Single Cells to the Tree of Life
Organisers: Clotilde Cadart and Matthew Swaffer
Date: 3 – 6 April 2022
Venue: Buxted Park, East Sussex, UK

The Biology and Physics of Left-Right Patterning
Organisers: Gonca Erdemci-Tandogan and Daniel Grimes
Date: 5 – 8 June 2022
Venue: Buxted Park, East Sussex, UK

Creative Science Writing
Organisers: Buzz Baum, Enrico Coen, Mark Miodownik and Jennifer Rohn
Date: 26 – 29 June 2022
Venue: Wiston House, West Sussex, UK

Fostering Quantitative Modelling and Experimentation in Developmental Biology
Organisers: Sarah Bray and Richard Carthew
Date: 10 – 13 July 2022
Venue: Buxted Park, East Sussex, UK

Cell State Transitions: Approaches, Experimental Systems and Models
Organisers: Kevin Chalut and Austin Smith
Date: 24 – 27 July 2022
Venue: Wiston House, West Sussex, UK

From Physics to Function
Organisers: Johanna Ivaska and Xavier Trepat
Date: 9 – 12 October 2022
Venue: Buxted Park, East Sussex, UK

Developmental Metabolism and the Origins of Health and Disease
Organisers: Sally Dunwoodie and Alex Gould
Date: 24 – 27 October 2022
Venue: Buxted Park, East Sussex, UK

Genotype to Phenotype: Bridging Comparative Genomics and Cell Biology
Organisers: Gautam Dey and Eelco C. Tromer
Date: 13 – 16 November 2022
Venue: Buxted Park, East Sussex, UK

Toxic Metabolites in the Biology of Ageing and Cancer
Organisers: KJ Patel and Liz Patton
Date: 4 – 7 December 2022
Venue: Buxted Park, East Sussex, UK

The Company of Biologists

Propose a new Workshop
If you have a vision to run a Workshop but don't have the time to arrange the logistics or raise the funding, then please contact us.

Interview with 2021 Hooke medal winner Stephen Royle

Stephen Royle studied Biological Sciences at the University of Sheffield. He then pursued a PhD in the lab of Ruth Murrell-Lagnado at the University of Cambridge, UK, where he investigated the molecular mechanisms of P2X receptor trafficking. In 2002, he joined Leon Lagnado's group at the MRC Laboratory of Molecular Biology in Cambridge for his postdoc to work on synaptic vesicle endocytosis in neurons, and here he also discovered a novel mitotic function of clathrin. Stephen set up his lab at the University of Liverpool in 2006, and in 2013 moved to the Centre for Mechanochemical Cell Biology, Warwick Medical School as a Senior Cancer Research UK Fellow; there he has been a Professor since 2019. The Royle lab is interested in understanding molecular mechanisms of membrane trafficking and mitosis. Stephen is also on the Board of Directors of The Company of Biologists and the Advisory Groups of *Journal of Cell Science* and preLights. He is the recipient of the 2021 Hooke medal, established to recognize an emerging leader in cell biology.

What inspired you to become a scientist?
One aspect of becoming a researcher is having a scientific mindset; I do enjoy puzzles and have a curiosity about how things work. But career-wise, I kind of got a lucky break to get into research. One of our lecturers, who had links to industry, told us about a research opportunity at a company called GlaxoWellcome, with the option to defer from university for a year. This sounded interesting to me so I applied, but being a bit clueless about what I should include on my CV, I also mentioned that I'm really into music. I learned from the guy who interviewed me that they received hundreds of applications, and one of the reasons he called me in for an interview was that his wife was a musician. They later gave me the job, which is where I got the research bug and decided that I wanted to have a scientific career. I also realized that research in industry wouldn't really be for me and that I needed to get a PhD.

Your first stint into research at GlaxoWellcome was studying Alzheimer's disease. What drew you then to basic research and membrane trafficking?

When I worked at GlaxoWellcome, there was quite a buzz about P2X receptors, which are ATP-gated ion channels, and this sounded like the next big thing. I was actually set on being a neuroscientist at the time, which is why I later went to Leon Lagnado's lab. My first task as a PhD student was to clone a GFP-tagged P2X receptor and express it in neurons. We saw that it was trafficked by the neuron and localized to endosomes, which I ended up studying more carefully and that is how I got into membrane trafficking.

During your postdoc in Leon Lagnado's lab, you discovered a surprising non-endocytic role for clathrin at the mitotic spindle. Could you tell us where you've taken this line of research since starting your lab?

After finishing my postdoc, I had a really clear idea of what I wanted to do in my group, which was to find the

Cell Dynamics: Host-Pathogen Interface

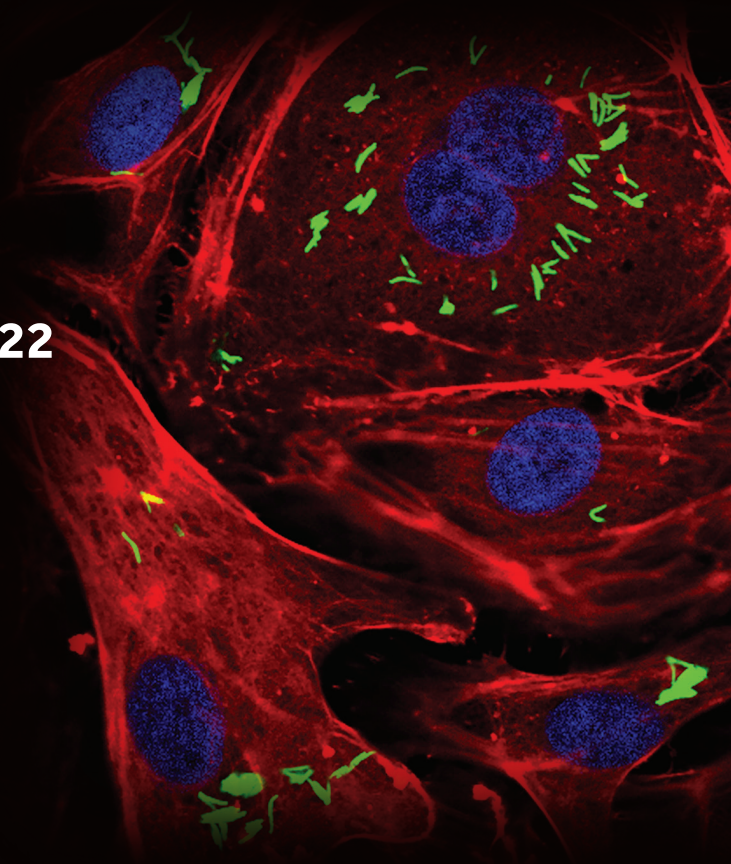
8-11 May 2022 – Wotton House, Surrey, UK

Register now

Abstract deadline: 4 March 2022

Deadline: 25 March 2022

biologists.com/celldynamics2022
#celldyn2022



Organisers

Michaela Gack
Maximiliano Gutierrez
Dominique Soldati-Favre
Michael Way

Speakers

Nihal Altan-Bonnet
Sonja Marie Best
Sara Cherry
Pascale Cossart
Eva Frickel
Freddy Frischknecht
Jae U Jung
Robin May
Serge Mostowy
Maria Mota
Mojgan Naghavi
Florence Niedergang
Felix Randow
Craig Roy
Thierry Soldati
Isabelle Tardieux
Teresa Thurston
Derek Walsh
Matt Welch

The Company of Biologists

Organised by Journal of Cell Science

Image: Maximiliano G. Gutierrez, The Francis Crick Institute, UK

binding partners for clathrin on the spindle and understand how it switches from acting in endocytosis to acting in mitosis. But it took a long time to get the lab running; I spent a year applying for money and not doing research during that time, which was really hard for me. Since establishing my lab, we've found that clathrin is part of a complex of probably four proteins at the spindle. We've worked out how the components of this complex bind to each other, and think they crosslink microtubules to stabilize the spindle. We've also revealed some aspects of how this is regulated, and together with the lab of Richard Bayliss, we've been working on solving structures of how the proteins in the complex interact. We are now trying to find inhibitors to break the complex apart, potentially as an anti-cancer approach to stop cells from dividing, but there is still a long way until we get there.

The other angle of your research is membrane trafficking, where your lab works on various projects. Is there one you are especially excited about?

What I'm most excited about at the moment is that we've identified a new kind of transport vesicle called intracellular nanovesicles; this is keeping us very busy because they still need complete characterization. This new discovery has really pleased me because when you work on membrane trafficking, there's so much known already that sometimes you think it's all been done. So I'd encourage everyone reading this to not be put off by working in fields that are well established. We still also work on clathrin-mediated endocytosis, and currently have a project on how chromosomes and membranes interact, which might be important for chromosome segregation and cancer.

Induced relocalisation methods often feature in your work. Why is this technique particularly powerful in answering the types of questions you are asking?

When I started my lab, I really wanted to use these kinds of inducible technologies; however, the grant I wrote on it didn't get funded. But then, Scottie Robinson developed 'knocksideways' and gave a talk about it in Liverpool. My student at the time, Liam Cheeseman, adopted this method to study mitosis and later actually won the JCS Prize [awarded to the first author of the paper that is judged by the Editors to be the best eligible paper] for that work. We have used this technique a lot, and when my students come up with a question, one of the first things they tend to ask is what happens if we mislocalise a factor. It's a very powerful method, because you can look at a cell before treatment, then 'hit it' and see how it responds immediately afterwards. Therefore, it's often a better method of choice than RNAi or gene knockout. In a recent project I mentioned, where we studied how chromosomes and membranes interact, I was amazed that you can move the ER to the plasma membrane – so it still surprises me what this technology can do.

You already mentioned that it wasn't easy getting your lab running. What advice would you give someone seeking independence?

I think science-wise, the important thing is to find a niche, either for a particular subject or a technique. You also need to develop a style that's your own. I like to think that our lab has a certain style of doing research that distinguishes us from other labs. And related to this, I think the biggest challenge when you're starting out is getting people to notice you and care about what you do. Many PIs who are starting their lab are paranoid about being ripped off and scooped, but actually, a more common problem is just being ignored. Therefore, networking is really important, and there are many ways to do this, including for example volunteering for things or asking a question at a conference. When people find out who you are and become interested in what you are doing, then opportunities come as a result of that. I don't think many new PIs really take advantage of this.

What kind of researchers do you find inspiring?

I think on the whole, scientists are quite conservative and risk averse. You just have to look at how people behave around the publication process. But actually, as a scientist you do want to take risks and experiment. So, I really admire people that are willing to take a chance and challenge the status quo. I'm also inspired by scientists in highly underrepresented groups, who are up against much more than I am but slug it out every day.

You are a big advocate of preprints, a bioRxiv affiliate who helps screen preprints, and you're also on the advisory group of preLights, the preprint highlighting platform hosted by The Company of Biologists. Where does your passion for preprints come from?

I'm simply frustrated by how long it takes to publish papers, which is on average nine months from submission – this is especially long when you consider that people in my lab are on three-year contracts. Coming in to work on an average day, you'll typically see people in the lab doing revision experiments to get a paper published, PIs writing rebuttal letters and fighting with editors – all instead of making new discoveries – it's a huge time sink. And all of this is happening at a time when we could communicate our findings immediately through the internet. Preprints let you do that and help science go faster, which is why I'm passionate about them. The pandemic really showed this; medRxiv basically saved lives. But also in basic biology, preprints have been driving the fast evolution of fields such as cryo-EM. Of course, peer review is important to a certain extent, and improves our papers, but never materially, I would say.

You run the blog 'quantixed' where, in addition to writing various opinionated posts, you also share some fun coding exercises. Could you tell us a bit more about what's behind this? And have you always been coding?

I've always been interested in coding and have been doing it for a long time at a low level, but I wanted to get better at it. When I moved to Warwick in 2013, I asked for a bit of code that someone in Leon's lab had written, and when I saw it was only a few lines long, I thought that I should have been able to write that. So I decided I'd seriously start improving my coding. This also comes back to the point about finding a niche; I realized that it's quite common in neuroscience for people to code and analyze data in an automated way, but this wasn't so common in cell biology. I started with analyzing small datasets, such as how long it takes to publish papers from my lab, and realized I can do this for the cell biology papers on PubMed and learn how to deal with such a scale of data. I've been documenting and publishing the results on the blog (https://quantixed.org/), and actually some of

the posts have had quite an impact. It's been interesting to see the difference in scale by readership; some of the analysis that I put on the internet, which were maybe an hour of work, have been seen by thousands of people, whereas if our lab publishes a paper, it takes months and it will probably only be read by hundreds.

And what lead you to embark on the huge project of writing the text book 'The Digital Cell: Cell Biology as Data Science'?

I wrote a post on quantixed titled 'The Digital Cell', which was a kind of manifesto; I had this idea that I would regularly put up tutorial-type posts showing people how to analyze biological data, and that is what the blog would be about. Richard Sever from Cold Spring Harbor Laboratory Press, who is also the co-founder of bioRxiv, noticed that post and asked me if I wanted to take on writing this as a book. I knew this would be a lot of work because some people who have written books warned me that I'd go mad if I did it. But I realized that if I published this book, I would have the chance to change how a lot of people do cell biology – and I like to think it has had an influence and I could contribute something valuable. In retrospect, it would have been a lot easier if I had already been teaching a course on this, as I had to write the majority of the materials from scratch, but I learned a lot and it was fun.

You are the recipient of this year's Hooke medal. What does this prize mean to you?

It actually means a lot, as it's a recognition of all the people that have been in my lab – I think it's been around 50 over the years, so I just want to say a big thanks to them. I'm not very keen on awards and medals, because they reward the individual for what is a team effort, but when you win one it's a really nice feeling. You also realize that people cared enough to nominate you and then the judges in the committee voted for you. There haven't been many winners outside of the golden triangle, so receiving this medal also shows that you can do good cell biology outside of the leading universities in Oxford, Cambridge and London.

Finally, could you tell us an interesting fact about yourself that people wouldn't know by looking at your CV?

I really love all kinds of music, whether it's free jazz, grindcore, soul or shoegaze. I play the guitar, drums and piano – actually, when I started university I still wanted to be a musician or a music producer, and I was playing in a band. In the end, it was probably a wise choice for me to do research, because the music industry kind of collapsed.

Stephen Royle was interviewed by Máté Pálfy, Features & Reviews Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.

Cell scientist to watch – Vivian Li

Vivian Li obtained her PhD from the University of Hong Kong in 2008, where she investigated the molecular mechanisms of human colonic development and tumorigenesis. Funded by a Croucher Foundation Fellowship, she joined the lab of Hans Clevers at the Hubrecht Institute in the Netherlands for her postdoctoral work. There, she identified novel Wnt signalling mechanisms at different subcellular levels and characterised intestinal stem cell genes using newly created transgenic mouse models.

Vivian established her group at the MRC National Institute for Medical Research, which is now part of the Francis Crick Institute, London, in February 2013. In her lab she uses genetic mouse models and organoids to investigate the regulation of intestinal homeostasis and cancer with a primary focus on the Wnt signalling pathway.

Vivian was awarded a Future Leaders in Cancer Research Prize in 2018 by Cancer Research UK and is the winner of the **2021 Women in Cell Biology Early Career Medal** awarded by the British Society for Cell Biology.

What inspired you to become a scientist?

I was always drawn to biology. When I was deciding whether to study medicine or science for a university degree, the human genome project featured a lot in the news. This was very exciting, and I thought it was a great time to get into science, as knowing the sequence of the entire genome would allow you to learn a lot about human diseases, such as cancer. So I entered a new molecular biotechnology programme in Hong Kong, which specifically trained scientists to do experimental work in a laboratory – although my parents probably would have preferred if I chose medicine, to be on the safe side [smiles].

Following your PhD in Hong Kong, you moved to the Netherlands to join Hans Clevers' lab as a postdoc. What prompted this move?

I did my PhD in a clinical lab at a pathology department, working on colorectal cancer. I really liked the topic and wanted to continue working in cancer research, but felt that I needed more advanced training in molecular biology and mouse genetics. I also wanted to experience a different research culture by doing a postdoc abroad.

Towards the end of my PhD, the Clevers lab published a major discovery where, using mouse genetics and lineage tracing, they identified Lgr5 as an intestinal stem cell marker. Hans Clevers actually came to Hong Kong and gave a talk, and I was really impressed by the scientific achievements coming from his lab. After finishing my PhD, I was lucky to receive a Croucher Foundation Fellowship, which supports scientists from Hong Kong to do a postdoc overseas, so I joined his lab. This was an incredible working experience that also changed my career plans, because I initially thought I would go back to Hong Kong right afterwards.

Your mechanistic work on Wnt signalling, a key pathway in intestinal stem cell homeostasis and cancer, has sometimes challenged the textbook views. What are some key issues that we still don't fully understand and that you are hoping to find out?

It's not easy to challenge the textbooks, and it's actually quite difficult to get such a paper published [smiles]. A key question in the field, and one we are particularly interested in, is how to target Wnt signalling safely and effectively in colon cancer. Over 80% of sporadic colon cancers have a truncating mutation in APC, a Wnt

pathway component, and this causes Wnt activation and tumour initiation. But even after 30 years of research, there is no approved drug in the clinic to target APC. The major challenge is on-target toxicity, as Wnt signalling is important in many normal tissues, and therefore Wnt inhibitor treatments are highly toxic; so, the pathway is generally considered undruggable. When I started my own lab, I thought this is something we could try to challenge by finding tumour-specific targets, which would avoid the toxicity issue. We identified USP7, a deubiquitylating enzyme, as a tumour-specific target against the APC truncating mutations, and we are exploring the therapeutic potential of targeting this molecule. Another research direction we are going into is understanding the link between Wnt signalling and immunotherapy. The immune checkpoint blockade has been used in the clinic for different tumours, but in colon cancer the response rate is really low, particularly for the types in which APC is mutated. There seems to be a clear association between high Wnt activation and poor response to the immune checkpoint blockade, and we are trying to understand why. So we're developing a project to look into the mechanisms of Wnt-induced immune evasion.

Could you tell us what you aim to achieve by engineering functional intestinal organoids?

Apart from using organoids to study stem cell biology and develop colon cancer models, we've attracted many collaborators across London, including people from Great Ormond Street Hospital, who contacted me when I first set up my lab to apply organoid technology for intestinal tissue engineering. In this project, we want to reconstruct the small bowel with the aim of treating intestinal-failure patients, who can't absorb nutrients, water or electrolytes. These patients rely on intravenous administration of nutrition or, in severe cases, need small bowel transplantation. However, there is a shortage of donor organs, and complications, such as the body rejecting the donor organ, can occur. So, our aim is to grow a piece of the patient's own gut in a dish using the derived organoids, which can then be used for transplantation.

What are the greatest challenges in engineering complex tissues such as the small intestine for regenerative medicine?

At the moment, we're able to grow relatively small, one or two square-centimetre pieces of small bowel grafts in a dish using patient-derived organoids. The next challenge is to significantly scale up this process to whole-tissue engineering. While you can easily maintain a small piece of graft in a normal tissue culture dish, growing a thicker and larger piece of organ tissue is difficult, because the nutrients and oxygen cannot penetrate very easily. This is the reason why people are moving into vascular engineering in order to reconstruct and incorporate blood vessels into different engineered organs. Once this works, it will not only help us grow bigger tissues in the dish, but also aid the survival of the grafts following transplantation.

Looking back at the beginning of your independent career, what challenges did you face when starting your lab?

When you start your own lab, you're not only responsible for your scientific project, but also for recruiting and managing people. We all have years of training in doing science experiments, but I didn't receive training during my postdoc in how to be a manager, so dealing with some interpersonal issues was a bit challenging in the beginning. Luckily, the Crick and other institutes have leadership training programmes after you start as a PI, but I think getting such training during your postdoc would be very helpful. It also took time to get projects up and running in the new lab, which is probably expected, but it's still a bit frustrating when you have lots of exciting ideas and are ambitious.

And what advice would you give to someone seeking independence?

To people who are applying or planning to apply for group leader positions, I think what I would say is that your research proposal is more important than your CV. Many applicants will have excellent CVs, so the thing that can make you stand out from others is your research proposal, which should address important research questions using state-of-the-art technology; you'll need to have long-term and short-term visions and, most importantly, you have to identify why you and your research are unique and what you can bring to the institute.

You are this year's Women in Cell Biology Early Career Medal winner. What does this prize mean to you?

First of all, I feel very honoured to be the winner of this prize this year. I think starting your own lab from scratch is really challenging, particularly for women – I also had two kids and took time off, so things sometimes went a bit slower. The award doesn't specifically recognise my own achievement, but rather the six years of hard work by my whole lab. I'm very grateful to have such an amazing team working together, and that they trusted me at the start of my independence as a junior, young female group leader. They are the real stars behind the prize. Receiving this prize is very motivating, because it tells us that we are on the right track in our work.

What do you think is needed to help more women and underrepresented researchers take up leadership positions in science?

I think in the past few years, global initiatives for promoting women in science have been quite successful already. The representation of women at the group leader level has been improving, although it is not equal, and I feel that large parts of the scientific community are supportive towards women in science and women with young families. So, we should continue extending initiatives promoting other underrepresented researchers. Apart from addressing the diversity and equality issue at the higher management level and making organisations aware of biases, we should probably also focus more on encouraging early-career underrepresented researchers to apply for leadership positions. And encouraging women to get into science should already start at the high-school level, for example, by organising workshops and finding role models from underrepresented groups to share their experience.

As a mother of two, how do you balance research and parenthood?

Despite the work being demanding, it's very important to achieve a healthy work–life balance. Having two kids,

I try to make sure I prioritise my family as soon as I'm off work. Before, I worked quite a lot at the weekend, which I don't do much anymore. From time to time I work in the evening after putting my kids to bed; you just need to find your own routine that works for you and your family. I actually think having kids made me work more efficiently during the week – it's an extra kind of motivation to finish everything and fully be there for my family at the weekend.

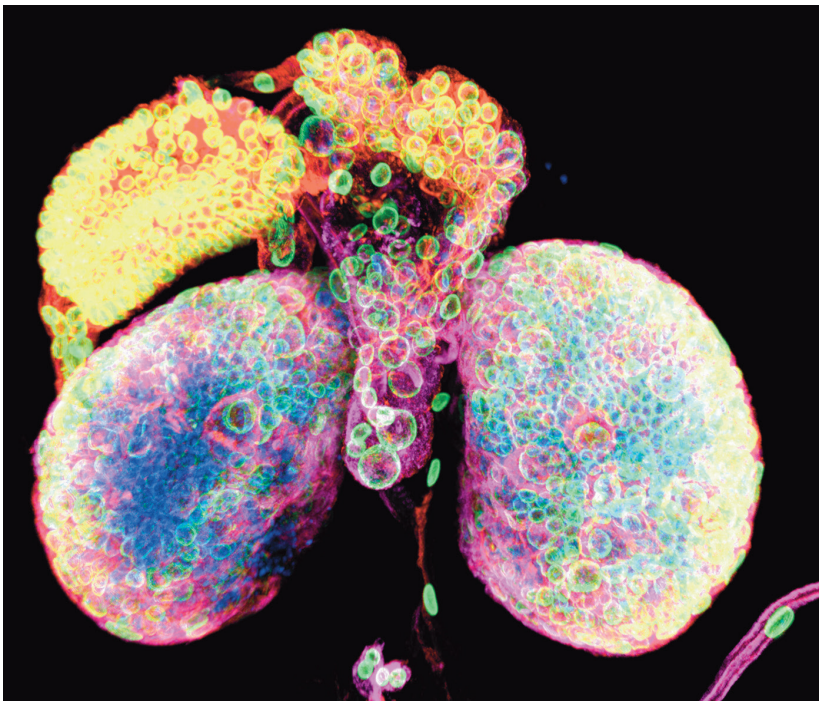
Finally, what do you do in your free time?

I mostly spend my free time with my family, as my kids are still young. Since the pandemic lockdown last year, I've been doing lots of cooking and baking with them. We have an allotment, where we keep our chickens and grow lots of fruits and vegetables, such as strawberries, rhubarb, courgettes and green beans. The kids love getting their hands dirty. It is very satisfying to harvest your own produce after months of hard work and cook a nice meal out of it. Also, it's particularly refreshing after spending long hours in front of my computer writing manuscripts and grants. As someone who grew up in high-rise buildings in Hong Kong, I really treasure the green space here in the suburbs of London.

Vivian Li was interviewed by Máté Pálfy, Features & Reviews Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.

Image Competition 2021

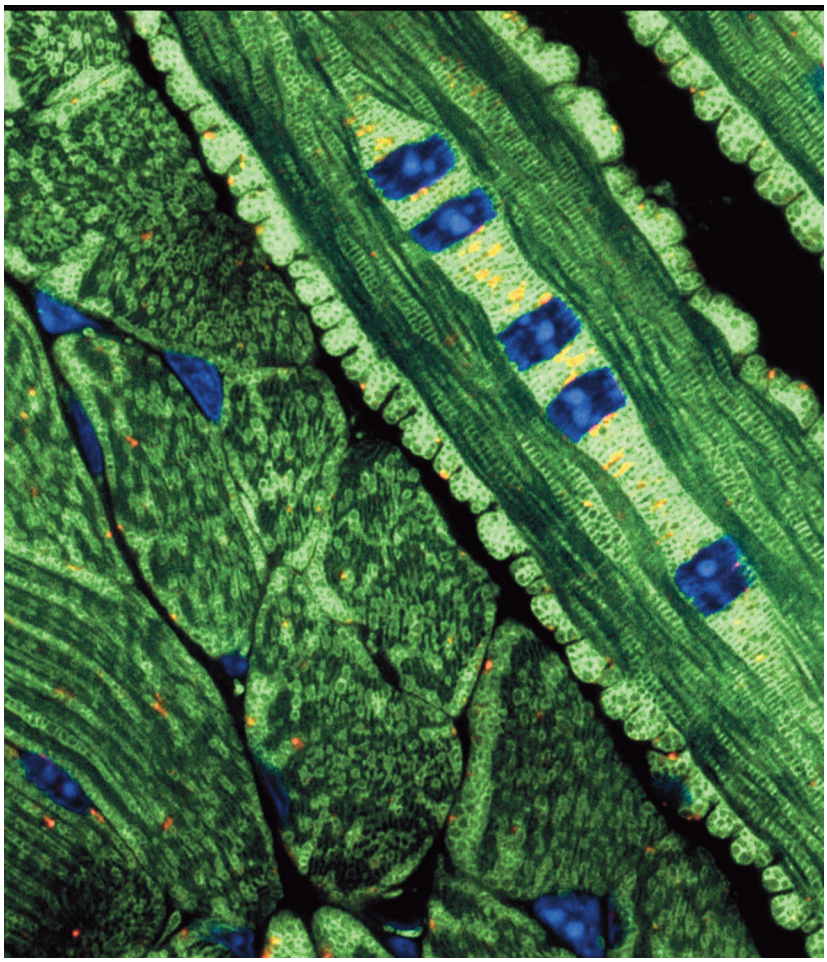
1st prize Chantal Roubinet



Psychedelic brain: these beautiful brain lobes from *Drosophila* larvae illustrate the diversity of the cells that work together to generate a functional brain. This confocal image shows the nuclear envelope of nuclei in green (Lamin), the chromatin in blue (DAPI), Tubulin in magenta and a cortical marker in red (dMoesin).

"During my PhD in Molecular Biology (University of Montreal; Canada) and in Biology of Cancer (University of Toulouse; France), I worked on the molecular mechanisms underlying the cortical remodelling and successive shape modifications that accompany symmetric cell division (S.Carreno and F.Payre Labs). I then joined the C. Cabernard Lab (Switzerland) for my first postdoc, to explore how asymmetric spindle and cortical polarity are coupled to regulate asymmetric stem cell division and cell fate acquisition, in vivo. More recently, during my second postdoc in the B. Baum Lab (UK), I explored a central and much less well studied part of the cell division process: how do nuclei divide? Nuclear division is one of the most fundamental and fascinating processes to study! Indeed, although nuclei are a defining feature of eukaryotic cells, we still do not know why cells have developed so many strategies to divide their nucleus, from closed to open mitosis. Understanding this, and investigating the role of asymmetric mitotic nuclear envelope remodelling on cell fate, is what I aim to study in the future."

2nd prize Alan Prescott



Mitochondrial organisation and turnover in the tongue revealed by the mitoQC mouse model. Images taken from a frozen sections of the tongue from the mitoQC mouse [1]. Mitochondria are labelled with GFP (Green) and mCherry (Red). Nuclei are blue. Large red dots are mitochondria in mito-lysosomes demonstrating turn-over of damaged or worn-out mitochondria in active tissues-in this case muscles of the tongue. This mouse model has revealed the distribution of mitophagy in diverse active tissues such as the heart and retina. In addition it unveils the tissue architecture as delineated by the distribution of mitochondria.

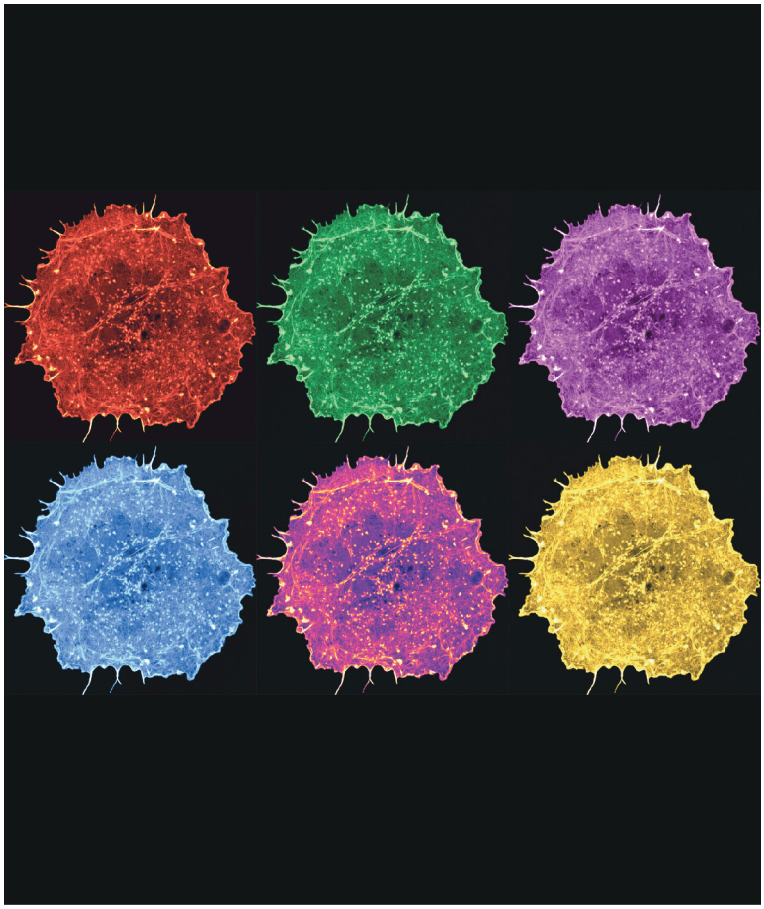
"I studied the Biology of Man and his Environment as an undergraduate, and then did a PhD characterising the microtubule cytoskeleton of the exocrine pancreas at Aston University. I then worked as a Research Fellow at the University of Keele and University of East Anglia before moving to Dundee where I am now a Senior Lecturer specialising in many aspects of cell biology particularly those studied by confocal and electron microscopy."

1. McWilliams et al. J Cell Biol. 2016. 214(3):333–45

3rd prize: Anh Hoang Le

Drops of colour. This is a still image from a live imaging movie of a COS-7 cell expressing the marker LifeAct showing the intricate network of the actin cytoskeleton. The image is inspired by the Pop Art style picture of Marilyn Monroe.

“I got my bachelor’s degree in Biochemistry from the beautiful University of Bristol. I then moved to the Beatson Institute in Glasgow to pursue my Doctoral degree in Cancer Cell Biology and have just recently graduated. Although my degree was in Biochemistry, I guess I was quite influenced by the many cell biologists who taught me and so it was a rather natural transition for me to go into cell biology for my graduate work. My PhD project was to investigate the function of a novel protein called CYRI-A. I used mostly super-resolution microscopy techniques along with 2D and 3D migration assays to investigate its cellular localisation and its role in cancer.”



Science Writing Prize Winner 2021 – Martha McLaughlin

The perfect recipe for a Petri-dish burger

"Do you think if I scraped these cells off this petri-dish and cooked them, they'd be like a teeny tiny burger?"

I looked up from the microscope, saw the horrified expression on my colleague's face and realised maybe I'd been staring at my cells for a little too long.

"I mean, these are just mouse muscle cells – right?" I continued, "They should taste like whatever mouse meat tastes like…"

After some musing, we decided that yes, maybe it would, but we were definitely sure we wouldn't be eating mouse meatballs. We'd stick to studying them.

But what if those weren't mouse cells in my petri-dish but cow or pig or chicken?

Welcome to cellular agriculture.

Also known as artificial or cultured meat, there have been many promises of meat grown entirely *in vitro* since Mark Post famously ate the first "petri-dish burger" in 2013. For good reason too, there are many moral and environmental reasons to cut down on animal products. Who better to put it starkly than David Attenborough who said "We must change our diet. The planet can't support billions of meat-eaters."

And we are changing.

Last year up to 500,000 people joined the approximately 7.2 million adults already eating meat-free diets in the UK (1) and in a survey of adults in England, just over half were open to trying cultured meat (2). But as there seems to be a need and a market for kill-free meat, why is it taking so long to get to our supermarket shelves?

It's not for lack of trying: there are many projects and start-ups working hard to produce affordable cultured animal products, but there are still some challenges to be faced. So, what will be the recipe for a perfect petri-dish burger?

Meat, being animal muscle tissue, is mainly composed of muscle cells, fat and collagen. To create our recipe, we'll look at how muscle and fat cells can be produced for consumption and the issues with growing cells at scale.

Just one look at Dwayne "The Rock" Johnson is a r eminder that muscle has an innate ability for growth in adults. When muscles need to grow or repair, stem-cell like satellite cells explode onto the scene and become myoblasts which after some replications mature into myocytes, forming new muscle fibres. For our purposes, satellite cells can be collected from live adult animals via small muscle biopsies then amplified and matured into muscle *in vitro*. However, satellite and myoblast cells have limited amplification capacity, so further work is needed to hold cells in the satellite cell stage and achieve optimum growth before maturation into muscle tissue (3).

For a lot of us over the 2020 lockdowns, just one look at ourselves was a reminder that fat, too, has the potential for growth. However, this is mostly due to the increase in size of individual fat cells (adipocytes) rather than replication. There are two ways we could produce new fat cells from an animal fat sample. We can capture a type of stem cell (mesenchymal stem cells), replicate these, and then differentiate them towards becoming fat cells. Or we can turn mature fat cells into a precursor type cell which can then replicate before differentiation back into fat cells. Again, these methods are limited by how many times the cells can replicate (4).

Alternatively, there are cell types that can replicate unlimitedly and wouldn't require regularly bothering animals with sharp pointy things. Stem cell lines collected from embryos or created from adult cells can produce mature muscle and fat cells, though this requires reasonably complex protocols many of which are currently not efficient enough to be commercially sustainable (4). Immortalised cell lines are another possibility, these are mature cells that have a mutation so that they can replicate indefinitely. An issue with both of these methods is that the cell lines required can be very difficult to make for some species, and many cell lines which would be useful for cellular agriculture are currently only from mice or humans (3) – not appropriate species for eating!

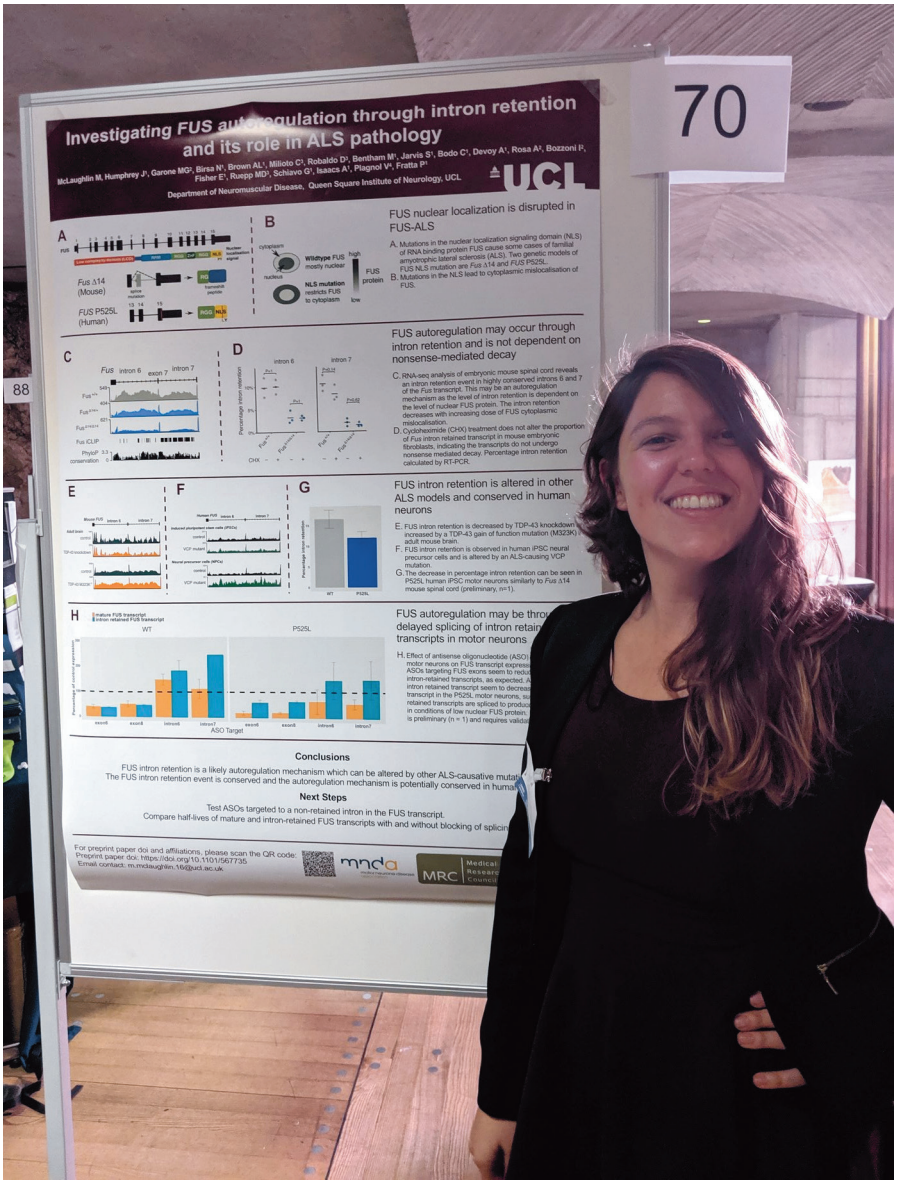
The seasoning of our burgers is more high "steaks" (sorry) than some mere salt and pepper. Some of the chemicals standardly used to control the cell-type differentiation required for our burgers are toxic or could have unacceptable side-effects if eaten, as they can affect our own cells the same way (4). Additionally, many cell-types can currently only be grown using animal serum – which slightly defeats the purpose of producing animal-free meat, even though fewer animals would be used overall. So, standard protocols need to be adapted to avoid these problem ingredients.

Lastly, to produce our commercial scale "petri-dish" burgers, we'll need to throw out the petri-dish. To optimise cell growth, most current methods first grow replicating cells floating around in large, stirred tanks

then mature those cells into the finished tissue in specialised containers – for example giving them a collagen scaffold to grow around to produce a meat-like texture (3). There is a lot of work needed to cut down on costs at this step – both for the food companies as well as for our planet. An Oxford university group recently calculated that switching our diets from traditional to cultured meat will lead to less global warming for some but not all predicted future methods of cellular agriculture (5). We need to get the most efficient growth from cells from the minimum amount of resources – both energy-wise and the raw ingredients to feed our cells with.

So, (skipping over the hefty hurdles of regulatory and cultural acceptance) imagine we finally get our supermarket "petri-dish" burger. Freshly sizzling from the grill, this might be the kill-free, (hopefully) more sustainable future of our food.

Sounds like a tastier option than my mouse meatballs.



References:

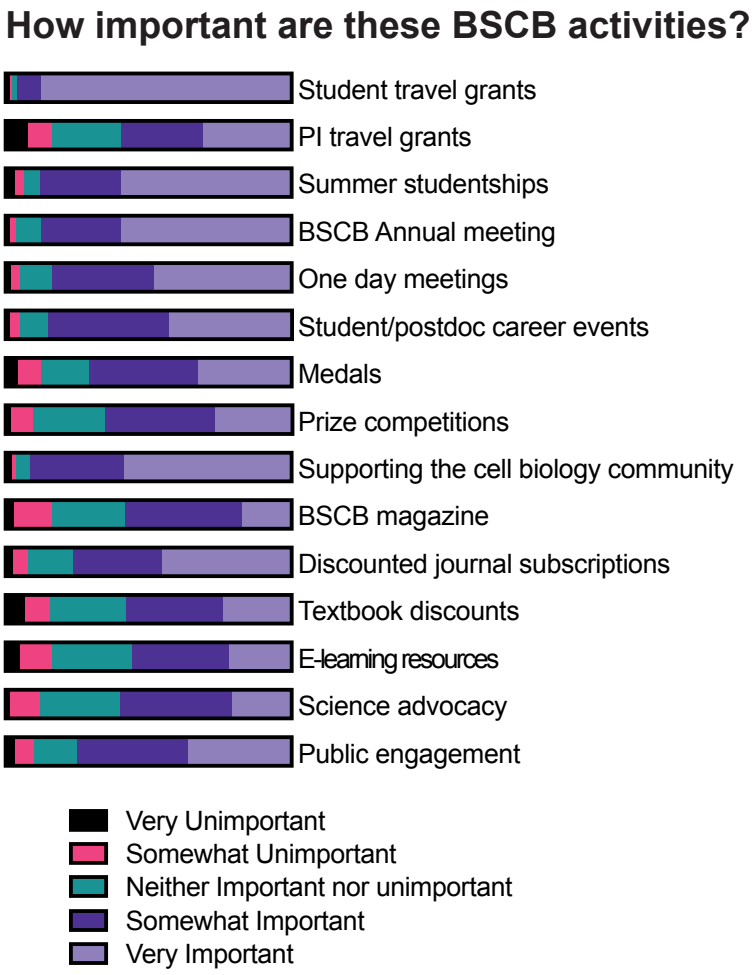
1. UK diet trends 2021 | Finder UK [Internet]. [cited 2021 Jun 29]. Available from: https://www.finder.com/uk/uk-diet-trends
2. Siegrist M, Hartmann C. Perceived naturalness, disgust, trust and food neophobia as predictors of cultured meat acceptance in ten countries. Appetite 2020;155:104814.
3. Post MJ, Levenberg S, Kaplan DL, Genovese N, Fu J, Bryant CJ, et al. Scientific, sustainability and regulatory challenges of cultured meat. Nature Food 2020. 1:403–15.
4. Fish KD, Rubio NR, Stout AJ, Yuen JSK, Kaplan DL. Prospects and challenges for cell-cultured fat as a novel food ingredient. Trends in Food Science and Technology 2020.; 98:53–67.
5. Lynch J, Pierrehumbert R. Climate Impacts of Cultured Meat and Beef Cattle. Front Sustain Food Syst. 2019; 3.

BSCB members survey

Representing and supporting our membership is the core aim of the BSCB. To get feedback about how the society is running and plan how best to support the UK cell biology community going forward, last year we carried out a survey of our membership. This was the first time we have done so since 2015 and, in the midst of a pandemic that was (and still is) changing the way we all go about both our personal and work lives, this was a good opportunity to take stock of things and plan for the future.

I must start by thanking everyone who filled in the survey: 247 of our 1,066 members responded, with good representation from all areas of the membership – although there was a bias towards responses from primary Investigators (60% of responses from ~30% of the membership). The overwhelming message was that the society is doing a good job, and there were lots of positives, but there were also some excellent suggestions for things we can improve and do better in future. Thank you all for engaging and for your constructive comments.

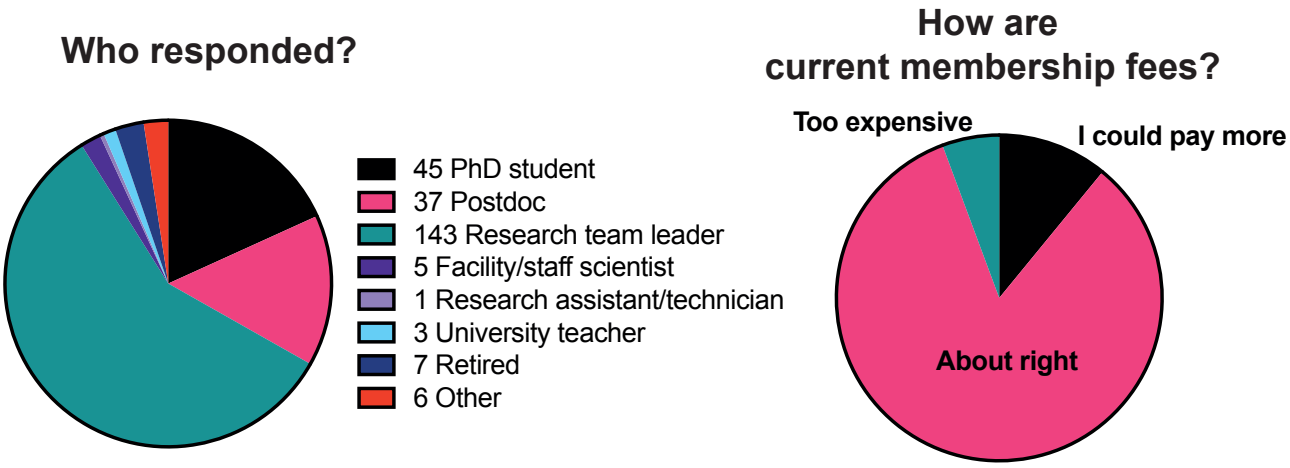
The BSCB carries out many different activities to support the community, and it was interesting to see how these were each valued. Unsurprisingly, student travel grants topped the list as the most important, followed by summer studentships and the organization of meetings (Figure 1, left). While there were no surprises, it was nice to see such strong support across the board. Suggestions for additional activities included more training workshops and career advice for junior researchers as well as support for online seminars. We hope to do more on these, but should clarify to anyone wishing to attend or organize such activities that they can already be supported through our small meetings and travel grants – these are not just for conferences!

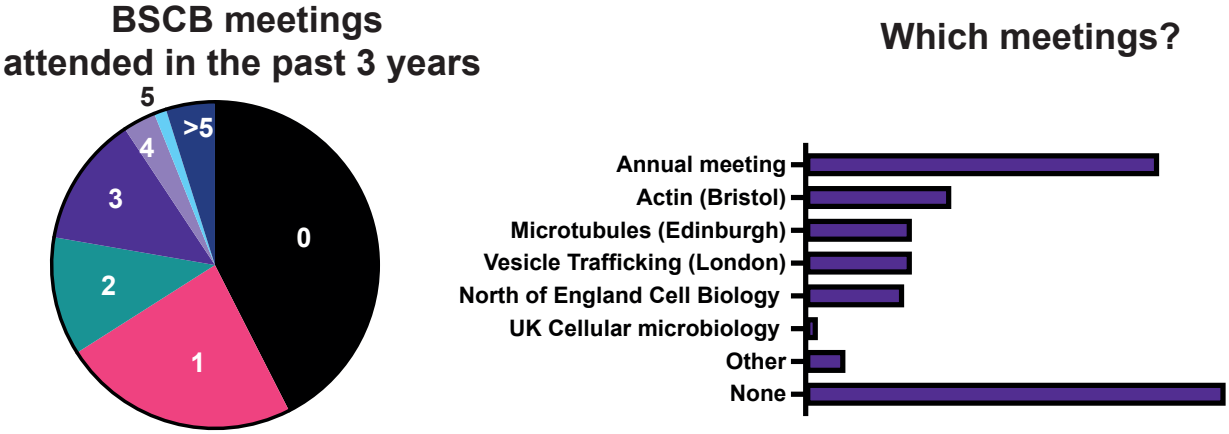


As a relatively small society, the BSCB often tries to engage with its peers, most notably through our regular joint meetings with the Biochemical Society and BSDB –- with which 43% and 19% of us share membership respectively. Both joint meetings had their fans and detractors, indicating the diversity of interests across the society. Surprisingly, although meetings were popular and subsidised for members, some 44% of respondents hadn't attended any BSCB-sponsored meetings in the past 3 years. There was a general sentiment that both the speakers and topics could be more diverse, and many good suggestions for session themes that we hope to cover in future meetings. It was clear from the membership that the one-day meetings supported by the society were extremely popular, and something we would like to encourage more. We would therefore be very happy to hear from anyone working in an underrepresented area who would like to be involved and help us support topics not previously covered. If this is you, please contact our Meetings Secretary Susana Godinho.

In this brave new post-Brexit world, it was also felt we should engage more with our sister cell biology societies in Europe. This is something we are keen to pursue and in September we had our first joint meeting with the French Society for Cell Biology (the SBCF). This was an online early career researcher-led event and was highly successful, thanks to the hard work by all the organisers. We hope this will be the start of many more collaborations with European cell biology societies in the future.

There were also several suggestions that the BSCB should work with other societies to lobby government to ensure the UK scientific community remains outward facing and well-supported. This is clearly critical to the future of cell biology research and the society has become engaged with this though the science policy group, led by the BSCB Science Advocacy Officer Jenny Rohn. This is open to anyone keen to be involved or simply stay





informed on science policy discussions. If you wish to join, please see our website for more information: https://bscb.org/science-policy/.

Given the changes to how people work that is driven by the pandemic, it was unsurprising that there were a significant number of comments around the use of technology. In particular, the need to explore hybrid formats for meetings and seminars. This is something the scientific community as a whole is wrestling with, and the balance between the need for in-person interactions and the better accessibility and reduced environmental footprint of online meetings will evolve rapidly as the ability to travel returns. Lockdowns have made online seminars a normal part of life for many of us and highlighted the benefits of this format. This will doubtless continue in the post-pandemic world and the society will support this through meeting grants to cover costs such as webinar software licenses. How we integrate livestreaming into in-person events is also being considered and something we hope to see more of in future.

A summary of the main survey results is shown in Figure 2, above. Many other good suggestions and useful comments were also made that will influence how the society will run in the future – for example we will strive to provide greater transparency to the prize and summer studentship application process by publishing outcomes, as well as allowing members to opt for an electronic rather than paper copy of this newsletter. It was fantastic to see such enthusiasm for the society and the willingness to engage in helping make things better. It is clear we have a great community, so I again thank all those that responded to help us in supporting the UK cell biology community in the future.

Preprints; powering the open science movement

Preprints are complete scientific manuscripts that are uploaded to dedicated, freely accessible preprint servers and have not undergone journal-organised peer review. They are often – although not always – submitted at the same time as, or near to, submission to a traditional journal.

Jonathon A Coates, postdoctoral researcher at QMUL, and Helen Robertson, preLights Community Manager.

Physicists have been sharing their work for free as preprints since the early 1990s. However, it wasn't until the launch of bioRxiv in 2013 that the biological science and biomedical communities began to adopt the use of preprints as a route for sharing new scientific advances. Sharing work as a preprint confers many advantages to both authors and readers in the scientific community, including quicker dissemination of new findings, free access, and the referenceable documentation of completed work. Despite this, scepticism of preprints persists in some pockets of academia. Here, we describe the history and use of preprints to date, as well as recent innovations around preprint review and collation and how preprints might impact the landscape of science publishing in the future.

Brief history

Preprints are often considered a relatively recent innovation in scientific publishing. In fact, experiments with early incarnations of preprints go back to 1961, when the NIH instigated Information Exchange Groups with the purpose of rapidly disseminating early scientific results. However, opposition from journal publishers brought these groups to a close in 1967, and it was not until 1991 that preprinting was attempted again, this time in the physics community. What started as sharing papers via an email list rapidly developed into arXiv (pronounced 'archive') a server that hosts physics manuscripts that are not peer reviewed and are freely available to all. This would later form the blueprint for preprint servers in other scientific disciplines. Throughout the 2000s, various attempts were made to establish preprint servers for the biosciences, including 'Nature Precedings' from Nature Publishing Group, but ultimately none of these persisted.

It wasn't until the launch of bioRxiv in 2013 by Cold Spring Harbor Laboratories (CSHL) that preprints in the biological sciences had a well-established server and began to increase in popularity. Even then, submissions to bioRxiv did not really take off until the end of 2016, and it remains true that preprint uptake is more enthusiastic in some fields (such as neuroscience and bioinformatics) than others (including zoology and paleontology). Since the launch of bioRxiv, many other generalist and specialised preprint servers, such as EarthArXiv and ChemRxiv have been established in a similar model to arXiv. In 2019, CSHL launched medRxiv as an outlet for medical science preprints, which proved to become indispensable during the COVID-19 pandemic.

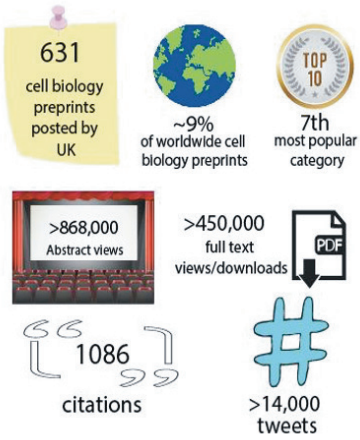
Since gaining traction towards the end of 2016, bioRxiv has seen a steady increase in the number of preprints both submitted and downloaded on a monthly basis. Over 100,000 preprints are indexed across bioRxiv and medRxiv, with over 94 million downloads. Cell biology ranks consistently in the middle of the pack in terms of submissions, with a total of ~7300 preprints submitted to date under this category on bioRxiv. Submissions to bioRxiv predominate from the US and Western Europe; these regions consistently post more preprints, which are downloaded more frequently, and are also more likely to be published in 'well-known' journals. As of 2020, the discrepancy between preprint posting and manuscript publications ('preprint adoption') was most pronounced in Russia, Iran and Malaysia. China, which produces ~15% of global citable documents, accounts for only 4.1% of all bioRxiv preprints. The UK has posted over 7000 preprints on bioRxiv, second only to the US, with over 60% of these eventually being published. Ireland has the highest publication rate for preprints in the world at 73%[1]. Within cell biology, the UK represents approximately 9% of the preprints deposited on bioRxiv (631 preprints), with the Universities of Oxford, Cambridge and Edinburgh being amongst the most prominent sources for these cell biology preprints. In total, cell biology preprints from the UK have been shared over 14,000 times on Twitter and received over 450,000 full text downloads collectively.

Preprinting a pandemic: the impact of COVID-19 on the preprint landscape

There was an unprecedented scientific response to the COVID-19 pandemic, with over 125,000 articles shared within the first 10 months, 25% of which were preprints. During the early phase of the pandemic, over 40% of the COVID-19 literature was first shared as a preprint[2].

Accordingly, preprints experienced a cultural shift in their use, and were suddenly being reported on by news outlets and being accessed by the general public. More impactful, preprints were, for the first time, being used to directly influence policy decisions.

Why were preprints so heavily utilised during the pandemic? Even after journal publishers adopted altered practices to speed up dissemination of COVID-19 science, the average time from submission to publication was still 68 days, assuming that a manuscript is sent for review. A consistent delay of that length of time for every COVID-related scientific advance would have been hugely impactful on the pandemic response. In comparison, the average time from submission to posting on bioRxiv and medRxiv was 48 hours.



UK & Ireland Cell Biology preprint landscape. Data derived from bioRxiv 2013–2019, filtered within dimensions based on any author being based in the UK & Ireland. All data is specific to the UK and the Cell Biology category on bioRxiv unless otherwise stated. All images reused with attribution from vecteezy.com.

Preprints that generated high attention were also subjected to much higher levels of scrutiny than papers ever normally experience under peer review - poor quality or outright incorrect preprints were taken down within hours or rapidly reviewed on an informal basis by the community on platforms such as Twitter or the comments section of the preprint servers.

However, the surge in news reporting and access by the general public naturally leads to questions around the 'quality' and reliability of preprinted science.

Problematic preprints?

The most commonly voiced concern around preprints is that they are not peer reviewed and should not be considered valid scientific outputs. However, a recent study indicates that, in most instances, the core conclusions of a preprint are comparable to the final peer reviewed version[3]. Additionally, over 70% of preprints are eventually published in traditional peer-reviewed journals[4]. Moreover, we know from numerous examples that the peer review process is not infallible. Indeed, poor quality or even fabricated papers represent a significant problem in the biomedical literature[5]. In principle, the peer review process is a good idea, but this does not mean that peer review identifies all problematic papers or inconsistent findings. Interestingly, it was not until the 1970s that peer review in its current form became commonplace. Perhaps surprisingly, the famous Watson and Crick paper describing the structure of DNA was not peer reviewed[6]. Even Einstein once complained because an editor wanted to send his paper out for review, resulting in Einstein sending his paper elsewhere[6].

As described, an influx of COVID-19-related research on bioRxiv and medRxiv helped to raise the profile of preprints in the public sphere. Whilst preprint accessibility is arguably a positive thing in terms of open science and the perception of science by the public, it is also true that some problematic and unvalidated preprints related to COVID-19 became mis-used by political bodies and conspiracy groups. However, mis-use is not limited to preprints. From Andrew Wakefield to the recent Surgisphere scandal, scientific misuse and misconduct is becoming more prominent, particularly in a highly polarised socio-political climate. It should also be noted that there should be a degree of journalistic accountability in the reporting of preprints. All preprints deposited on bioRxiv and medRxiv clearly state that they should not be reported in the press as conclusive. Whilst we can't avoid conspiracy groups sharing problematic preprints as validated science on social media, the press should have an obligation to use fact-checking and credible sources to ensure the trustworthy reporting of new science, be that preprints or peer-reviewed papers, and it does seem that some media outlets are now recognising this[7].

For scientists, a long-term concern has been that preprinting a manuscript will preclude it from inclusion in a journal, or result in their work being scooped by competing labs. In fact, the vast majority of publishers accept manuscripts that have been preprinted[8]. Although some have stipulations around the preprint server used or the version of the manuscript that can be posted, others actively promote it and have a two-way integration to allow simultaneous submission to a journal and bioRxiv. Further, eLife now mandates that any manuscripts submitted to the journal must be available on a preprint server. Concerns around scooping are also largely misguided; in fact, depositing work as a time-stamped preprint with a DOI means that any subsequent manuscript from a competing group should cite any prior preprints. To some extent, preprints help increase transparency and provide proper recognition for novel intellectual contributions, and certainly offer more protection than presenting new work at a conference.

Power of preprints

The power of preprints in the context of a global pandemic is now well-established: primarily the rapid dissemination of vital knowledge. Indeed, a major benefit of preprints is often stated as speeding up science. However, this could indicate that preprints are rushed or lower quality than peer reviewed publications, which we know is not often the case. It is therefore perhaps better to think of preprints as trying to put researchers back in control of when their work is shared. As Stephen Royle, Professor of Cell Biology at the University of Warwick, who is also on the scientific advisory board for the preprinting initiative preLights, says, "I advocate for preprinting because it is a great way to accelerate science. The benefits are most clear for areas that are moving fast like cryoEM or CRISPR, and can even save lives in the case of COVID-19. Even in my corner of cell biology, we have benefitted from new methods and findings being shared early".

By posting a preprint, researchers are able to sidestep reviewers, who can (and sometimes do) arbitrarily prevent publication, or editors who don't deem the work exciting enough. Moreover, a completed story can be shared without excessive reviewer demands and free from the bias of perceived journal prestige. This ensures that research is shared with the community entirely on its own merit and avoids an over-reliance on the peer-review process. When combined with Twitter, this can be a powerful dissemination route. Research has also shown that work first

posted as a preprint will receive more citations and higher dissemination than non-preprinted work[4]. bioRxiv can even provide a broad indication of trends or how popular manuscripts are online, perhaps making it more informative than the personal opinion of individual editors.

Another gatekeeper to disseminating research is the cost of both publishing and reading new findings. With the increasingly elevated costs associated with publishing (around £8000 for an open access article in Nature or Cell at the high end), publishing costs can represent a non-trivial part of a research budget, and is sometimes not covered by the funding body. Although many journals now offer discounts through 'Read and Publish' agreements or fee waivers, preprinting is always free. Complementary to preprinting, thinking about publishing more ethically, such as in society-owned and/or not-for-profit owned journals (including Journal of Cell Science or Development, both owned by the Company of Biologists) where the article costs and profits go back to the community, might be a more positive approach to formally publishing new findings in the future. In addition, preprints are free to access for everyone. The absence of institutional subscriptions can mean paying to read individual articles - a frustration for scientists and the public alike - and even as open access mandates become more common, published science is still not universally available. Preprinting your work therefore makes it available to a wider pool of readers who might not otherwise be able to access it for free.

Considering the advantages they present, it is clear that early-career researchers (ECRs) are often the group who benefit the most from preprinting. Preprints enable ECRs, who are often on short contracts or are unable to see the long peer review process through, to provide citeable evidence of productivity as a preprint DOI to hiring committees or in grant applications. In addition, this quicker release of work increases ECR visibility, which can offer new opportunities for collaborations. This is something Professor Royle echoes: "On a practical level, I support preprinting because the people working in my lab need to show productivity in order to progress their careers (and so do I!). The scientific process is embarrassingly slow for the 21st Century. The folks in my lab are working under tight time constraints and so preprints are a great way for them to share what they have discovered in a timely way".

Highlighting and reviewing preprints and their use in training

In light of the increasing popularity of preprints, pre-publication peer review services and preprint community discussion have become more abundant (such as Review Commons, ASAPbio and preLights). The idea of peer review is a good thing. Asking experts in the same field to critique methods and assess the claims of a paper is objectively a constructive thing to do when performed collegiately and fairly. Thus, community review of preprints presents a positive opportunity to improve manuscripts prior to journal submission. These services peer review preprints and provide authors with the review reports, which can then be submitted to a journal at the same time as the manuscript. This reduces the time between submission and publication. These reviews may also be published alongside the preprint providing valuable transparency and enabling readers to better assess a given preprint. Additionally, researchers can subsequently update a preprint (something that is not possible with a published article) based on feedback, which provides further transparency to the scientific process.

In 2018, The Company of Biologists launched a new preprint highlighting service called preLights. The pre-

Lights community is composed primarily of ECRs who identify interesting preprints and write news-and-views style posts to help researchers navigate the preprint literature. The authors are always sent the preLights post prior to posting on the website, and are invited to answer questions raised by the preLighters about their work or provide additional insight. The vast majority of authors engage very positively with the preLighters, and around two-thirds of preLights posts have comments from the author of the highlighted preprint. Although preLights is a community discussion platform separate from the formal peer review process, the questions asked and points raised in a preLights post can also help authors think differently about their research and refine manuscripts prior to journal submission. This is testament not only to the calibre of questions that ECR preLighters can ask, but also demonstrates the power of community discussion of preprints in providing feedback to improve manuscripts.

Despite the positive reception that preprint review has had from parts of the research community, it is worth considering how this might persist in the science publishing landscape. Many preprint review initiatives focus on ECRs who want to gain review experience and advocate for preprinting. However, more critical peer reviewing of preprints by senior academics is not happening frequently, likely because they do not have the time to review ad hoc manuscripts on preprint servers. As we see a new generation of researchers rise through the seniority ranks, preprint review might become more ingrained in academic culture. Further, if journal antagonistic peer review becomes more common, perhaps we will see a shift in this, but it is probably unlikely to occur outside of a centralised review-based initiative.

More recently, the podcast Preprints in Motion was launched, featuring individual preprints in a 45-60 minute discussion with the first authors (PhD students and postdocs). Preprints in Motion provides insight into the preprint and also allows the ECR to discuss both their research and why they chose to preprint the work. Additional episodes discuss the wider academic culture with leaders in open science.

Future

Having already established themselves as part of the publishing landscape, preprints look primed to take a more prominent role in the future. An increasing number of initiatives are aimed at involving ECRs in preprint posting, discussion and review (such as ASAPbio and prereview). As these changes hopefully filter through from ECRs to PIs and publishers, pre-publication peer review services might become more commonplace in the future.

Ultimately, preprints put scientists back in control of their own work and allow for the faster dissemination of science. Coupled with a more collegiate approach to peer review and responsible scientific communication, preprints are a positive move for scientific transparency for both researchers and the general public.

References

1. Abdill, RJ, Adamowicz, EM & Blekhman, R. International authorship and collaboration across bioRxiv preprints. eLife 9, e58496 (2020).
2. Fraser, N. et al. The evolving role of preprints in the dissemination of COVID-19 research and their impact on the science communication landscape. PLOS Biology 19, e3000959 (2021).
3. Brierley, L. et al. Preprints in motion: tracking changes between preprint posting and journal publication during a pandemic. 2021.02.20.432090 https://www.biorxiv.org/content/10.1101/2021.02.20.432090v3 (2021) doi:10.1101/2021.02.20.432090.
4. Fraser, N., Momeni, F., Mayr, P. & Peters, I. The relationship between bioRxiv preprints, citations and altmetrics. Quantitative Science Studies 1–21 (2020) doi:10.1162/qss_a_00043.
5. Else, H. & Van Noorden, R. The fight against fake-paper factories that churn out sham science. Nature 591, 516–519 (2021).
6. Baldwin, M. Credibility, peer review, and Nature, 1945–1990. Notes Rec R Soc Lond 69, 337–352 (2015).
7. Grant, B. Brave New Publishing World. The Scientist Magazine® https://www.the-scientist.com/editorial/brave-new-publishing-world-69367.
8. List of academic publishers by preprint policy. Wikipedia (2021).

Other links

Prelights – https://prelights.biologists.com/
ASAPbio – https://asapbio.org/
Prereivew – https://prereview.org/
Preprints in Motion – http://preprintsinmotion.com/

Meet the BSCB Committee: Giampietro Schiavo

Giampietro is the incoming treasurer of BSCB, and is currently learning the ropes from the current treasurer, David Elliott, who masters the finances of the many BSCB activities, striking a balance between expenditures and incoming grants.

Giampietro and Ely

Over the next year what will you be up to for the BSCB?

Having served as a Treasurer for another international society, I hope to use my acquired skills to help the BSCB in navigating the post-pandemic funding landscape to continue to support our students, early career scientists and more senior members during these challenging times.

Aspirations for the BSCB?

It would be wonderful to promote the profile of the BSCB as to become the reference organisation for all life science researchers in the UK and a springboard for our members to reach a wider collaborative network in Europe and across the world through partnership with other cell biology organisations. Nowadays, cell biology is central to so many life science disciplines that our role could be mighty!

Could you describe your research in a nutshell?

Coconut shell? I have a long-term interest in the mechanisms of action of protein toxins and how to exploit them as tools in cell biology. Using these incredible nanomachines, my team has clarified key steps in the mechanism of neurotransmitter release and membrane internalisation at synapses, and transport along the axonal retrograde transport route. This essential transport pathway, which allows for the delivery of various signaling complexes originating from the axon back to the neuronal cell body, is impaired in several nervous system pathologies, such as motor neuron disease, Alzheimer's Disease and peripheral neuropathies. We are now identifying novel pharmacological nodes to restore axonal transport in neurons in these pathologies.

What inspired you to come into Cell Biology?

I was trained in medicinal chemistry, hence I was not exposed to the beauty of a living cell until very late in my academic training. However, I fell in love the first time I gazed at differentiating neuronal cells under a microscope. My supervisor at the University of Padova, Professor Cesare Montecucco, encouraged me to study biology. And I never looked back.

What's been your best moment as a Cell Biologist?

Besides the revelatory experience of seeing a living neuron for the first time, it was probably discovering the high motility of neurons during differentiation and exploratory behaviour of growth cones, which scan the environment for attractive or repulsive cues. These phenomena are easily seen in the tissue culture dish, and mirror similar processes occurring in the nervous system during development and beyond.

What do you feel are the biggest challenges facing Cell Biology?

Probably the biggest challenge of cell biology is linked to its success. Cell biology is such a fundamental element of research in the life sciences that it has permeated many aspects of scientific discovery, from phenotypic drug screens to human neuron physiology. Its popularity may have given the false impression that cell biology is intrinsically simple and pitfalls have been eliminated. This perceived simplicity can lead a researcher astray towards finding artifacts instead of real discoveries and consequently creates problems of reproducibility. Rigorous training in the art of cell biology is the obvious solution.

Another challenge facing Cell Biology is the intrinsic heterogeneity of the cell, a fascinating area of study with growing interest as revealed by the rapid development of various single-cell OMICs techniques. However, I also see the complexity and heterogeneity of cells as a fantastic opportunity to learn the fundamental principles controlling their make-up and behaviour.

If you were to start your PhD today, what would be the emerging topic you would like to focus on?

I would definitively spend less time in studying chemistry and instead focus on mathematics and statistical methods applied to complex systems, including machine learning approaches. Regarding the research topic, I would pick any of the projects that my PhD students and research fellows are currently pursuing!

At the BSCB meeting where would we be most likely to see you?

At the poster session, looking in awe at the wonderful science done by the new generation of cell biologists.

What's your favourite cell and why?

Dulcis in fundo: the easiest question is definitively the last. Neurons, of course. Not just one but the many types forming with glia and other cells the complex tissue that allows me now to write and the BSCB Readers to read this very last word!

Meet the BSCB Committee: Victoria Cowling

Victoria helps organise the summer school studentships, which give undergraduates the opportunity to try out working in a lab. This gives curious students the chance to find out if lab life is for them.

Aspirations for the BSCB?

To keep growing and connecting cell biologists with each other, to keep supporting research careers, to form new connections with cell biology societies in other countries.

Could you describe your research in a nutshell?

We are interested in how genes are regulated to drive changes in cell function and fate decisions, currently in embryonic stem cells, neurons, cancer cells and T cells. Specifically, we investigate how a structure on RNA called the cap is regulated to drive changes in gene expression, cell function and cell fate.

What inspired you to come into Cell Biology?

I got work experience in ICI (now AZ), Alderley Park, when I was 15. It was a school scheme – quite random. This really sold me on a job in the pharmaceutical industry. The aim was to do A levels, a degree, a PhD and then go back to industry. This hasn't happened but instead I collaborate with industry partners. Industry and academic research are no longer distinct.

What's been your best moment as a Cell Biologist?

I'm very lucky – I enjoy my job most days. I enjoy the process of doing research as well as the big results. Perhaps I most enjoy a good scientific argument which results in a glimpse of a way forward on a challenging problem. Strangely, I like being proven wrong (analyse that!).

What do you feel are the biggest challenges facing Cell Biology?

There are a lot of flashy methods around, generating high density data with immediate wow factor (I speak as a user). A challenge is asking, once the party is over and the lights are back on, what have we learnt?

If you were to start your PhD today, what would be the emerging topic you would like to focus on?

Ouch. I don't know. There are always many interesting biological questions to study. I'd be looking for a lab with interactive and engaged people.

At the BSCB meeting where would we be most likely to see you?

I struggle to sit still so I cannot name a specific place. Hopefully I'll be catching up with people that I haven't seen for a while and going for a nice solitary walk to meet a few cats.

What's your favourite cell and why?

I can't answer that – cells become more interesting as you get to know them. Currently in the lab we are working predominantly with T cells, embryonic stem cells and neurons. I'm interested in how cells use gene regulation to respond to signals, particularly when this results in them becoming different cells. I also have an emerging interest in organs and how they are obligate mixtures of cell types. For example, I've been learning about how the heart is about 50% fibroblast (in addition to muscle cells) and brain is 50% glial cells (in addition to neurons). The functional relationship between the different cell types of an organ is key to understanding how it works – and I have only just realised that!

Above: Victoria Cowling and Brownie

Meet the BSCB Committee

New Committee Member: Darius Vasco Köster (University of Warwick)

I am Assistant Professor at Warwick Medical School and part of the Centre for Mechanochemical Cell Biology. My research focusses on studying the mechanobiology of the cell surface by developing and employing reconstituted, minimal systems and cell experiments in combination with quantitative analysis to decipher the underlying biochemical and physical mechanisms. More specifically, I am interested in the interactions between the cell plasma membrane with the underlying actomyosin network and which underlying principles control the shape and dynamics of this active surface. Understanding of these mechanisms is crucial as they control vital processes such as cell motility, cell division and tissue formation.

After being trained as a Physicist at the University of Leipzig (Germany), I started working on cell membrane mechanics during my PhD in the groups of Patricia Bassereau and Christophe Lamaze at the Institut Curie in Paris. My work demonstrated that caveolae (specific cell plasma membrane invaginations) are important for maintaining the integrity of the plasma membrane and act as a buffer of membrane tension upon sudden stress. This highly interdisciplinary work between cell biology and physics included force measurements using optical tweezers on cells and following the fate of individual caveolae in isolated plasma membrane spheres upon mechanical stress using confocal microscopy.

To learn more about the role of actin dynamics on the organisation of cell membrane components I joined the laboratory of Satyajit Mayor at the National Centre for Cell Biology in Bangalore where I developed a minimal system of actomyosin networks tethered onto glass supported lipid bilayers. This system allowed me to study the dynamics and spatial organisation of actin networks and membrane components with live fluorescence microscopy at high spatiotemporal resolution and helped to uncover important principles that underlie membrane organisation in cells.

Since I started my independent group at Warwick in 2018, the aim is to combine minimal systems and live cell experiments to understand how cell shape and cell mechanics are controlled by actomyosin dynamics.

I am excited and proud to join the BSCB committee and look forward to speaking for early career researchers.

New Committee Member: Viji M. Draviam (Queen Mary University of London)

Viji M. Draviam is a Professor in Quantitative Cell and Molecular Biology and leads the BBSRC-funded Center for Cell Dynamics at the School of Biological and Behavioural Sciences, Queen Mary University of London. Her research interest is in the area of human cell division, with a focus on chromosome segregation and spindle orientation. Her group has significantly contributed to our molecular understanding of how microtubules capture chromosomes, and how cells regulate and recognise correct chromosome-microtubule attachments – an event vital for the accurate segregation of chromosomes.

She started her independent research as a CR UK Career Development Fellow at the University of Cambridge and a Senior Fellow of Wolfson College, Cambridge. Draviam received a PhD from Trinity College, the University of Cambridge and an MSc from the National Centre for Biological Sciences, Bangalore. Her post-doctoral research work was with Prof Peter Sorger at the Department of Systems Biology, Harvard Medical School and MIT, while her PhD studies were with Prof Jon Pines at the Gurdon Institute, University of Cambridge. She is a Jawaharlal Nehru Scholar, Turing Research Fellow and Fellow of the Cambridge Commonwealth Trust. She works closely with industry partners to develop new imaging and image analysis technologies. She has won several innovation awards including CambridgeSens Award, Cambridge and the Yunus Innovation Award, MIT. She is the co-founder of CellCentives, an international clinical initiative to help eradicate Tuberculosis and a co-mentor of ENERGISE campaign that promotes STEM education among women students.

Meeting report

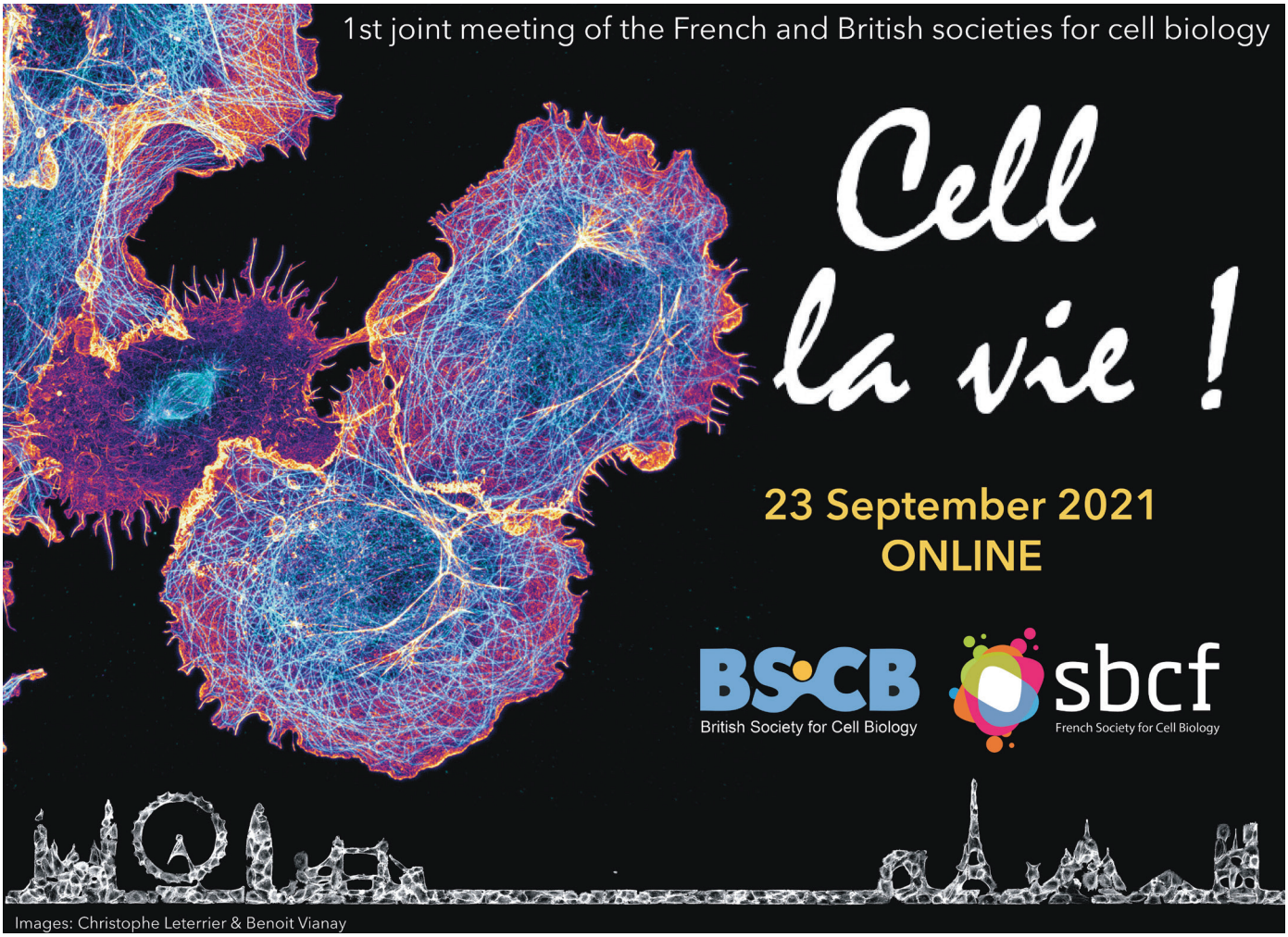
Cell La Vie Online 2021

23 September 2021, Gather Town

Cell La Vie is the first joint venture between the BSCB and the French Society for Cell Biology (SBCF). Cell La Vie Online 2021 took place in September, on the innovative online conference platform Gather Town.

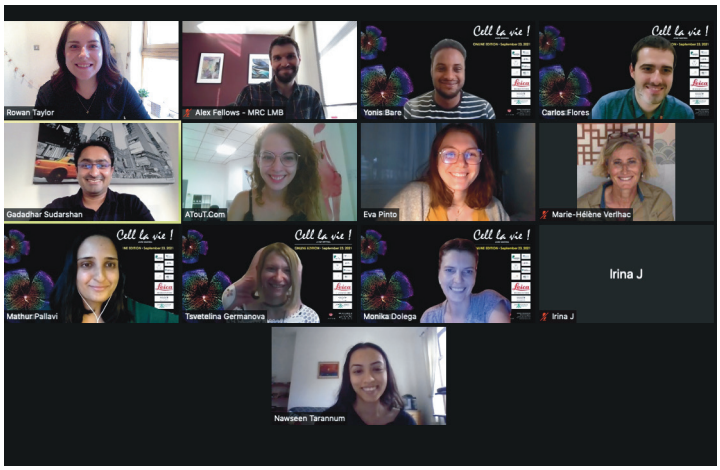
The BSCB has a longstanding history of organising highly successful joint meetings, such as with the Biochemical Society and British Society for Developmental Biology, and the past year was no exception. In 2021, BSCB and SBCF were to come together for the first time for a three-day conference, Cell La Vie, aimed at bringing together cell biologists from the UK, France, and beyond. Due to the COVID-19 pandemic and ongoing travel restrictions, the intended in-person conference could not take place. Instead, we decided to take advantage of this opportunity and hold a one-day online meeting, organised by PhD and early career researchers (ECRs) from the two societies, solely showcasing PhD students and ECRs in Cell Biology.

We decided against limiting the meeting with a theme and instead invited applications from scientists researching any aspect of Cell Biology. We gained a huge amount of interest, receiving over 550 attendance



Images: Christophe Leterrier & Benoit Vianay

registrations, 79 poster abstracts, and 84 talk abstracts, from across the globe. 14 oral communications were selected, all remaining abstract submissions were able to present a poster, and 14 posters were given the opportunity to present a 2-minute flash presentation. Broadly. these included themes such as cytoskeleton dynamics, new methods in cell biology, membrane trafficking, and synthetic biology. As a result, the schedule had something for everyone, and encouraged scientists to engage with research that was not necessarily related to their area of direct specialism.



We also invited four leaders in the field of Cell Biology, all of whom had been recognised with awards from the BSCB and SBCF that year for their extraordinary research. Vivian Lee (BSCB WICB Medal 2021, Francis Crick Institute, UK), Stephen Royle (BSCB Hooke Medal 2021, University of Warwick, UK), Léo Valon (2021 Young Researcher SBCF Prize, Pasteur Institute, Paris, France), and Aleksandra Chikina (2020 PhD SBCF Prize, Curie Institute, Paris, France) all gave fascinating talks on their scientific journey that inspired our audience of Cell Biologists from all career stages.

A major highlight of Cell La Vie 2021 was that participants were able to join the meeting virtually in a hugely interactive and enjoyable way. Gather Town (gather.town) is an online event platform and we created a personalised conference space for Cell La Vie Online 2021. Participants were able to create an avatar representative of themselves before entering the lobby, where organisers and other conference attendees were waiting to greet them. Approximately 300 people were active in Gather throughout the day. Moving around the event space and talking with other attendees through use of video/microphone/chat abilities allowed participants to network and share scientific ideas, reminiscent of in-person meetings. Attendees headed to the virtual auditorium to join talk sessions via Zoom and in between were able to explore the sponsor area and poster rooms, which contained over 70 posters. Attendees were waiting by their posters and were able to present, and receive questions from, willing audience members in their poster area.

Cell La Vie 2021 was a resounding success. All talks contained science of the highest standard and were delivered with confidence and enthusiasm. The superb collection of posters received excellent engagement from the attendees. The entire day was a credit to the postgraduate and early career scientists presenting and in attendance. It was an almost impossible task for the organising committee to select the prize winners for Best Oral Communication and Best Poster. Ultimately, 300 euros was awarded to Maxime Boutry (The Hospital for Sick Children, Canada), for his riveting talk titled 'ORP1L mediated PI(4)P transfer from lysosomes contributes to mitochondrial division. Another 300 euros was awarded to Irina Jahin (Kings College London, UK) for her winning poster titled 'Analysing mechanical-driven signals controlling cancer cell division. A final 300 euros prize for the Best Flash Talk was voted for by the Cell La Vie attendees and awarded to Nawseen Tarannum (University of Manchester, UK) for a deserving flash talk describing her research on the mechanical regulation of cell division orientation.

A massive thank you to everyone who attended and participated in Cell La Vie Online 2021, the entire organising committee, and Atout.com agency in particular, Yasmine Smiej, for their help and conference organising expertise. It was a joy to work with the French Society for Cell Biology and we hope there will be many more joint events to follow in the future. A final huge thank you to our long list of generous sponsorship partners, without whom the meeting would not have been possible: The Company of Biologists, LabEx Cell(n) Scale, Institut Curie, Biology of the Cell, American Association for the Advancement of Science (AAAS), Journal of Cell Biology (JCB), Journal of Cell Science, European Journal of Cell Biology, Leica Microsystems, AdipoGen® Life Sciences, and Jackson ImmunoResearch Europe Ltd.

Rowan D. Taylor,
University of Leeds (BSCB PhD Representative)

Cell La Vie Online 2021 Organising Committee:

Yonis Bare (CNRS, Montpellier, France),
Monika Dolega (University of Grenoble, France),
Alex Fellows (MRC-LMB, UK),
Carlos Flores (UCL, UK),
Sudarshan Gadadhar (Curie Institute, Paris, France),
Tsvetelina Germanova (University of Warwick, UK),
Pallavi Mathur (Curie Institute, Paris, France),
Eva Pinto (University of Rennes, France),
Sarah Porte (Cochin Institute, Paris, France),
Rowan Taylor (University of Leeds, UK).

Summer studentships

Using CRISPR–Cas9 to create a reporter cell line for APC/C

Molly Martin undertook a studentship with Dr Luca Cirillo at the Institute of Cancer Research, London

I have always been captivated by a career in research. However, the short-term nature of undergraduate laboratory work at university has made it challenging to comprehend the day-to-day responsibilities of a research scientist. To obtain invaluable laboratory experience, I completed a summer placement in the Cell Division Team at the Institute of Cancer Research (ICR). The lab focuses on proteins which govern entry and progression through mitosis.

My project aim was to create a reporter for the Anaphase Promoting Complex/Cyclosome (APC/C), an E3 ubiquitin ligase that targets mitotic regulators for degradation. APC/C activity is regulated through multiple mechanisms, including interaction with its co-regulator, Cdc20. Although this interaction has been studied *in vitro* and in *Xenopus* egg extracts, it is less well-characterised in living cells. Under the supervision of Dr Luca Cirillo, I used CRISPR-Cas9 technology to attempt to create an RPE cell line in which the APC/C subunit APC8 is tagged with the N-terminal half (NFAST) of the recently developed fluorescent reporter Split-FAST. Cdc20 will subsequently be tagged with the C-terminal half of the reporter (CFAST), allowing the formation of the APC/CCdc20 complex to be studied.

To introduce the NFAST sequence into the APC8 gene, we co-transfected RPE cells with plasmids containing Cas9 nickase and the APC8-NFAST construct. Two gRNAs in the Cas9 plasmid target Cas9 to the APC8 gene where it cleaves the DNA, and the APC8-NFAST repair sequence is subsequently inserted by homology-directed repair. Following the transfection, the cells were sorted, lysed, and screened by PCR. Despite many rounds of screening, we were unable to identify positive clones for the APC8-NFAST construct. This is possibly because tagging APC8 in RPE cells is lethal. To determine whether this is the case, we carried out an alternative transfection to tag APC8 with the fluorescent reporter mScarlet. Screening and sequencing results revealed colonies where the APC8-mScarlet tagging was successful, and these were validated by Western Blotting, live cell imaging, and growth curve analysis. The successful generation of the APC8-mScarlet cell line confirms that tagging APC8 is not lethal. Thus, the APC8-NFAST transfection may have been unsuccessful due to technical difficulties or experimental errors. Furthermore, cyclin B will now be fluorescently tagged in this cell line, enabling the interaction between APC/C and Cyclin B to be studied by fluorescence cross-correlation spectroscopy.

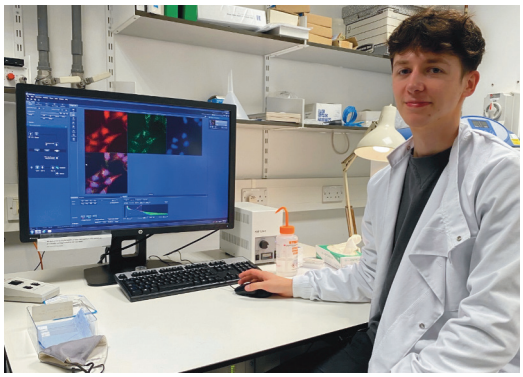
The most exciting aspect of the placement was that each day we were performing experiments for which no one knows the answer. This often meant that interpreting our results was not straightforward due to biological and technological variability, so experiments had to be repeated to confirm their outcome. Dealing with frustrating results and tackling experimental errors was a positive learning experience – it has taught me the importance of troubleshooting and adapting when things do not go to plan. When our experiments were successful this was incredibly fulfilling! Knowing that the project would contribute to the lab's research and ultimately further our understanding of the cell cycle was rewarding, and has confirmed that I would like to pursue a career in research.

Overall, my time at the ICR has been an overwhelmingly positive experience. It has given me a unique opportunity to develop my scientific skills and gain a deeper understanding of an area of cancer biology that I am passionate about. Given the limitations to practical work at university due to COVID-19, the hands-on nature of my placement has been particularly beneficial. My final year studying Biomedical Sciences at UCL will include a lab project and dissertation. I know the skills I have gained will be invaluable to completing this project and will continue to aid me in my postgraduate studies and future career.

I am incredibly grateful to the BSCB for providing me with this studentship which has enabled me to fund living in London over the summer. I am also thankful to the Cell Division Team for hosting me in their lab. Most importantly, I would like to thank my supervisor, Dr Luca Cirillo, who went above and beyond to make my time in the lab an enjoyable one. His patience, guidance, and enthusiasm has made this an insightful and enriching experience, and I am excited to see how the outcome of our project will contribute to his work in the future.

The role of Mon1b in regulating lysosome biogenesis

Harry Moxom joined Dr Paul Pryor's laboratory at the University of York



Lysosomes have long been regarded by most as organelles of static and unremarkable qualities, defined simply by their role in the disposal and recycling of cellular waste. However, undertaking the cell biology module in my second year of studies as a molecular cell biology student transformed such perceptions, proving lysosomes are highly dynamic structures that act as pivotal regulators of cell homeostasis at multivariate levels. With my interests in the lysosome and the cell, as well as my eagerness to pursue a career in molecular cell research, I applied for a BSCB studentship. I considered this critical to the development of my knowledge as well as confidence, since, like us all, much of our academic studies have been virtual, making it difficult to comprehend the world of research without wet-lab experience.

This summer, I was fortunate to be granted the opportunity to work in Dr Paul Pryor's laboratory at the Hull York Medical School, University of York to investigate the role of Mon1b in regulating lysosome biogenesis. Traditional research indicates Mon1b resides in a complex with CCZ1, implicated in allowing the exchange of Rab5 to Rab7, thereby the delivery of vesicular material to the lysosome. However, Dr Pryor's research goes further, to indicate broader interactions occurring among the Mon1b-CCZ1 complex with various other proteins. Therefore, my objective was to work towards validating the potential of other interaction partners of Mon1b complex and uncover whether such interactions have implications in regulating lysosome biogenesis.

The way in which we pursued this was by transfecting cells to express GFP or GFP-fusion proteins, which were then immunoprecipitated with an anti-GFP nanobody. The experience taught me tissue culture, transfection and immunoprecipitation, along with a competent understanding of why things do not go as planned and how to optimise for future experiments. Whilst much of what I was learning was novel, each mistake was a valuable learning experience which allowed me to employ troubleshooting. For example, the use of a lysis buffer containing EDTA for RNAi experiments is not applicable when lysing cells for affinity chromatography using nickel-beads, due to the metal chelating abilities of the EDTA.

I've thoroughly enjoyed the last month – working in the lab with a dedicated and wise PI, who taught me so much in such a short amount of time. I've learnt new techniques as well as Dr Pryor's tried-and-tested tricks of the trade, particularly his renowned skills in immunofluorescence. I believe I couldn't have learnt them from anywhere else within the boundaries of my degree. Importantly, this experience has taught me how to deal with the successes and failures that come with research. The data we produced inspired me to continue working in the lab beyond the placement, to contribute further to the research, which I hope to see published soon.

I'd like to thank the BSCB for the opportunity and funding they've given and Dr P. Pryor for his support and guidance over the placement. Foremost, I want to acknowledge Dr P. Pryor's patience and accommodation of my specific learning difficulties when teaching me calculations, dilutions, and stoichiometry. A career in research is now more than ever in the forefront of my plans beyond my undergraduate degree, and I hope to apply for a PhD in a similar field.

Examining DNA methylation dynamics throughout human lifetime by constructing an old-age epigenetic clock

Samuel Skoda worked with Dr Kristina Kirschner at the Beatson Institute for Cancer Research, University of Glasgow

In my study of biology I was always primarily interested in human health and longevity. Therefore I was thrilled to take the opportunity of first-hand research experience in this field, made possible by the BSCB Summer Studentship Grant. The COVID-19 pandemic limited my options to mostly remote work of biological data analysis, so I chose to focus on the development of epigenetic clocks, currently the most accurate biomarker of aging. Through several researchers in the aging field at The University of Edinburgh, I got in contact with my supervisor, Dr. Kristina Kirschner of Beatson Institute in Glasgow, who was really welcoming to an undergraduate student willing to take on his first proper research adventure.

Together we developed a project that intended to examine a major issue of the current epigenetic clocks (namely Horvath and Hannum clocks): a systematic underestimation of epigenetic age predictions in elderly subjects. We identified three possible hypotheses for the observed effect: a survivorship bias, an inherently logarithmic trend of biological aging, and technical issues of the current epigenetic clocks. I had to find ways to test the hypotheses while keeping in mind the less-than-ideal composition of our available epigenetic data, most collected only in the past decade. This was the most logically challenging and also the most engaging part of the project for me. Carrying out the analyses themselves was more challenging

than I expected and at times frustrating, I didn´t have much previous experience with programming in R and had to learn a lot. Even when I knew exactly what I wanted to do, it wasn´t always easy to convince the computer to do so. However, in time I got more efficient and it was very satisfying once the first results started coming in. Also, I liked how discussing the outcomes with the group members and adapting my next steps accordingly turned the project into a dynamic investigation rather than just a set of pre-made instructions to follow and complete.

The major finding of my project was to refute the arguably most popular hypothesis of the epigenetic age underestimation. Our unprecedented longitudinal analysis of individual subjects in Lothian Birth Cohort studies revealed that the older subjects with the largest prediction error were aging at a significantly slower rate than survivorship bias could explain. The underestimation in old age doesn´t result from lifelong consistently slower aging rate in relatively more healthy subjects (survivorship bias), but rather a change of rate of epigenetic aging that occurs later in life. Thus individual epigenetic age trajectories are not linear, as is assumed by the current clocks, but bent downwards during aging. Moreover, I confirmed the suspicion of earlier papers that the clocks´ CpG sites do not behave linearly with age, though this is surprisingly not a result of CpG saturation as was previously suggested. These findings underline the eventual necessity for the epigenetic clock field to shift from basic linear predictors to new, unconstrained non-linear models.

The other part of the project – constructing a new epigenetic clock specifically for elderly people – didn´t work out as expected. Using Elastic Net regression, the same method used in developing the current clocks, I was unable to create a model that would increase the prediction accuracy in external validation on other elderly datasets. This was likely due to the noise in old age data outweighing the aging signal. Because of this failure, it was not possible to clearly distinguish the two remaining hypotheses. We propose that rather than our attempt to simply constrict the training age range to make the predictor more specific, a more successful approach to training next generation epigenetic clocks may lie in utilising the non-linear models.

Luckily, due to its computational character this project was not much affected by the COVID-19 pandemic, apart from complicating the in-person lab meetings. Nevertheless, I´m grateful that this studentship allowed me to stay in Scotland over this summer and engage in a productive research, standing on an equal footing with established scientists while also observing their working process on their projects. This experience made me appreciate the different aspects of data analysis compared to lab work, which surely will be beneficial for my career decisions. As I am starting the third year of my degree soon, I want to continue my involvement in the aging research with the people I´ve got to know along the way, this time in the more experimental area of senescence and cancer.

And for the undergrads reading this, try it and apply next year, you will not regret it!

CRISPR Knockouts: *Dictyostelium*-1, CRISPR-Cas9-0

Ilona Wilson joined Dr. Jason King's lab at the University of Sheffield

In 2019 I applied to do a summer research placement in the King Lab at the University of Sheffield. Due to the pandemic, our project was cancelled and we had many setbacks trying to rearrange it for this year. Fortunately (and generously), the BSCB kindly gave us the opportunity to proceed with the project and I could finally get into the lab! The King lab works with the single-celled, soil dwelling, amoeba *Dictyostelium discoideum*. It's used as a model for studying the processes of phagocytosis and micropinocytosis; these are the bulk uptake of solids and liquids, respectively. These processes are important in immune cells, and better understanding of how they function could aid understanding of our own immune systems.

My project centred around the tethering proteins HOPS and CORVET, which are involved in different stages of endosome processing, and which may play important roles in phagocytosis and micropinocytosis. Both are comprised of several subunits. I aimed to use the CRISPR-Cas9 system to create knockouts of the Vps8, Vps18, Vps39 and Vps41 genes and analyse the effect of the deletion on phagocytosis and macropinocytosis. Unfortunately, the sequencing results of the CRISPR mutants showed there had been no deletions in any of our colonies. We tried again with Vps8 and Vps41, using slightly different primers, although the results of these were not available within the time constraints of the project.

We also created strains of *Dictyostelium* with the same subunits tagged with green fluorescent protein (GFP). The success of this cloning was mixed, with some constructs working well, others taking a lot of convincing and Vps8 not wanting to be amplified by PCR at all. For those that did work, the GFP protein was tagged to both the N-terminus and the C-terminus of the protein, and the plasmid transfected into wild type *Dictyostelium* cells and a PIKfyve knockout strain. The cells were imaged with an AiryScan confocal microscope to visualise localisation of the HOPS and CORVET complexes during phagocytosis. Surprise, surprise, the GFP did not localise as well as hoped in most of the cells, with Vps18 and Vps39 showing little to no localisation, only unidentifiable big green blobs! Happily, we did have some success with the tagged Vps41 in wild type cells, which showed a patchy ring of GFP localising to a yeast-containing vesicle formed from recent phagocytosis. We wanted to compare this response to that of the PIKfyve knockout strain, but, in keeping with the theme of the other constructs, the results were unclear! We had hoped that we would see a clear difference between the two strains, with a distinct lack of the localisation seen in the wild type compared to the knockout, which would suggest that the HOPS complex played a role in the phosphatidylinositol signalling pathway of endosome processing.

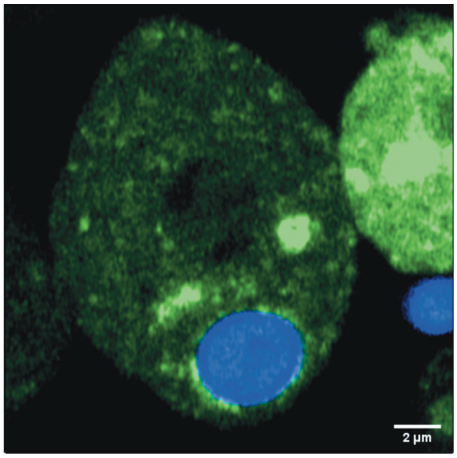


Figure 1. *Dictyostelium discoideum* cell after phagocytosis of a yeast cell (blue). Vps41 is tagged with GFP at the C-terminal.

Following on from the project, it would be useful to re-design some of the GFP constructs to hopefully achieve better localisation in the strains that didn't work so well and take more images of their yeast-containing vesicles to compare to the knockout strain. After all, what can you do but try again? If the CRISPR knockouts finally work, phagocytosis and macropinocytosis assays can be performed to assess whether the subunits are necessary for efficient endocytosis and what their role is within the complexes.

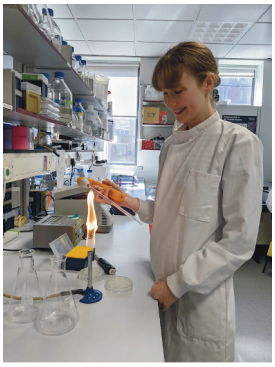


Figure 2. Me in the lab! Got to keep those plates sterile!

CRISPR–Cas13 System as a Tool to Understand the Role of Long Noncoding RNAs in Cell Division

Nicole Acuti joined Dr Lovorka Stojic at the Barts Cancer Institute, QMUL

As an aspiring scientist, I was disheartened when at the end of my second year, I had spent most of my biomedical degree at home and without gaining valuable laboratory experience, due to the COVID-19 pandemic. I was therefore extremely keen on engaging in a summer internship, not only to improve my laboratory skills, but also to expand my existing knowledge in a specific scientific field and make a small contribution to the advancement of science. I first met Dr Lovorka Stojic virtually to discuss a possible tutoring for my third-year university project. After learning of the exciting research her lab was doing in the field of long noncoding RNAs (lncRNAs) and discovering that she is a BSCB member, I contacted her again regarding the studentship and she did not hesitate to apply with me.

LncRNAs constitute a significant proportion of the human genome with some estimations exceeding 100,000 human lncRNAs. They have key roles in gene regulation and were shown to participate in many cellular processes, such as cell cycle, proliferation, DNA damage response and apoptosis. Consequently, the expression of many lncRNAs is deregulated in cancer. The number of functional lncRNAs is under constant debate. Since lncRNAs regulate gene expression through diverse mechanisms, such as act of transcription, via regulatory DNA elements or through their RNA transcripts, it is essential to establish if their function is RNA-dependent. I had the unique opportunity to implement a CRISPR-Cas13 system to deplete a novel lncRNA identified in the control of chromosome segregation by the host laboratory and to test whether this technology can be used to determine RNA-dependent functions of lncRNAs. The CRISPR-Cas13 system is similar to the more commonly utilized CRISPR-Cas9 system, but with the decisive difference that Cas13 specifically cuts RNA instead of DNA. The RNA-silencing Cas13 nucleases are guided to their target by a single guide-RNA (gRNA) and show diminished off-target effects compared to other loss-of-function technologies, such as RNA interference.

During my first weeks, I designed gRNAs targeting different regions of the lncRNA in question. To insert the gRNAs into the Cas13 vector backbone (pXR003)7, I annealed the oligonucleotides of the respective gRNAs. After subsequent plasmid linearization, I ligated the plasmid with each of the six gRNAs. Thereafter, I transformed bacteria with the ligation solutions, extracted plasmid DNA and confirmed the positive clones by Sanger sequencing. I selected one of the clones for each guide and purified DNA to use for transfection of human cells, together with non-targeting gRNAs and positive control guide RNAs.

During the last two weeks of my studentship, I tested whether CRISPR-Cas13-mediated depletion of lncRNA can occur in HCT116, a human near-diploid cell line widely used to study chromosome segregation. I first optimised the best ratio between transfection reagent, gRNAs and Cas13 in these cells. I then conducted transient transfections of HCT116 cells with either active or inactive Cas13 and each gRNA. To determine efficiency of the lncRNA knockdown, I setup a qPCR using lncRNA-specific primers and I determined that our lncRNA was depleted up to 70%. After successful lncRNA knockdown, I analysed the impact of its depletion on chromosome segregation and mitotic duration by time-lapse microscopy. Unfortunately, as I was at the end of my internship, I did not manage to perform enough time-lapse imaging experiments to have conclusive results. However, the host laboratory is now using the CRISPR-Cas13 system to deplete lncRNAs in hTERT-RPE1 human diploid cells that stably express histone H2B-GFP, which allows for better visualisation of the chromosomes.

Although I encountered initial difficulties concerning the cloning, these instances were still invaluable experiences for me, as they imparted trouble-shooting skills and persistence. Fortunately, the project had not been affected by the COVID-19 pandemic and I thoroughly enjoyed my six weeks in the laboratory. By attending several meetings during my BSCB studentship at the Barts Cancer Institute (BCI), I fully immersed myself in the field of RNA and cell biology. I now feel confident and prepared in starting my third-year project. Following my graduation, I would like to commence a master's degree in translational cancer medicine and pursue a PhD.

In closing, I would like to thank Drs Lovorka Stojic and Giulia Guiducci at the BCI for their tremendous guidance and support, as well as the BSCB for providing me with this opportunity. I believe that my preliminary results are a stepping-stone for the host laboratory towards better understanding how RNA-mediated mechanisms regulate cell division.

Biochemical and biophysical characterisation of the migration of mammalian primordial germ cells

Menan Loganathan undertook a studentship with Professor Ewa Paluch at the University of Cambridge

'…The optimisation was arduous, with many setbacks. However, the project did have many highs. Each successful experiment was met with a mixture of jubilation and relief. I enjoyed learning how to use image analysis software like Fiji and how to analyse RNASeq data using R. It was always a pleasure to learn a new technique, whether it was microfabrication or making a gel from scratch. I gained a much greater breadth of knowledge than I expected.'

Investigating GLUT4 trafficking pathway regulation by the clathrin variant CHC22, in HeLa and human muscle cells

Abigail Smith worked with Professor Frances Brodsky at University College London

'My project was investigating GLUT4, the insulin-responsive glucose transporter, trafficking mediated by the clathrin heavy chain variant CHC22 in HeLa cells…As is the nature of research, however, this project was not without challenges. In the third week, there was a source of contamination in the tissue culture room which affected several cell lines including my own cell cultures and delayed setting up new experiments. This challenge taught me much about how to adapt and problem-solve in science. I replanned experiments utilising my existing samples to progress the project whilst waiting for the HeLa cell lines.'

The purification of mammalian intraflagellar transport (IFT) complexes

Dai Nakamura joined Dr Anthony Roberts' lab at Birbeck, University of London

'My research question was the purification of mammalian intraflagellar transport (IFT) complexes. I thoroughly enjoyed my time at Roberts Lab, both in terms of the practical exposure gained and the individuals I met.'

'Two moments that were of a personal highlight was when I got to see the transmembrane proteins localizing to cilia and seeing our expressed proteins as particles using an electron microscope.'

'The laboratory experience I have gained during the pandemic has completely changed my perception of research from being an independent, quiet profession to one that requires team cohesion and collaboration.'

Understanding the cellular mechanisms of a novel DUB class in genome stability

Tristan Copping undertook a studentship at Dr Ian Gibbs-Seymour's lab at the University of Oxford

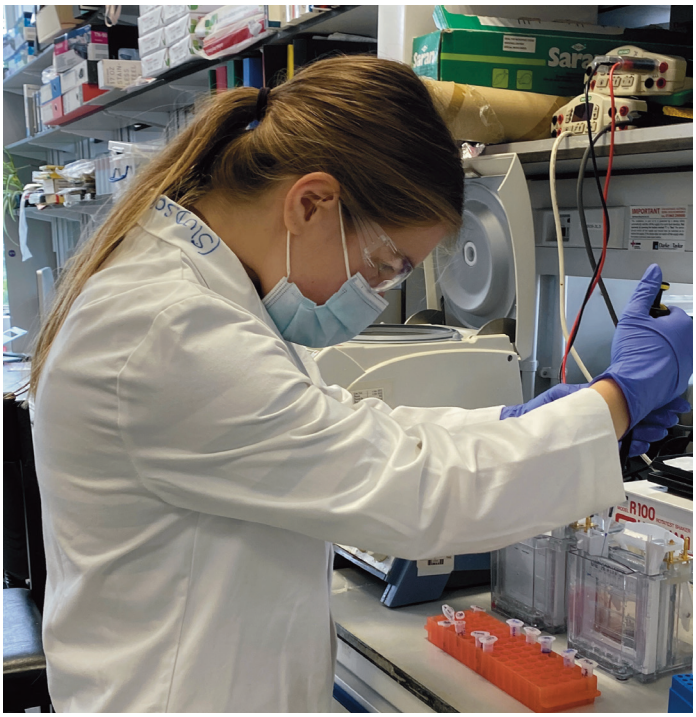
'My initial interest within Gibbs-Seymour Labs (University of Oxford) was their unique approach to the research of genomic stability, working with a novel family of DUB (Deubiquitinating enzyme), ZUP1. The experience itself was surreal, with my expectations being blown out of the water; the project itself was both stimulating and challenging with the efforts often being rewarding, expressing tangible change within the DNA repair mechanism.'

Using *Drosophila* embryos as a model to describe the dynamics of fluorescently labelled cell cycle proteins

Kathryn Brooks (right) undertook a studentship with Professor Jordan Raff at the University of Oxford

'Initially, I was quite apprehensive of how I was going to remember and perform all the techniques in time-pressured experiments. These involved the embryo preparation for imaging, and handling and crossing the flies to produce the desired fly lines. The aim was to image the embryos during a certain point in cell development, which I found challenging to begin with. However, everyone in the lab was so friendly and was always happy to help if I was having difficulty.'

'One of the highlights of my time in the lab was "coffee time", which is a tradition in the lab at 10:30 and 15:30 where everyone gathers for a little coffee break. I found these fun as I felt more integrated into the lab, and also an opportunity to learn more about what a career in science truly involves, from talking to everyone in the lab.'



RNA-mediated regulation of cell division

Sakina Amin joined Dr Mark Morgan's group at the University of Liverpool

'I spent 8 weeks with Dr. Mark Morgan and the laboratory members at the University of Liverpool. I was supervised by Dr. Horacio Maldonado Lorca, and we examined the role of αVβ6 integrin and TGFβ in breast cancer brain metastases. This enabled me to learn more about other research projects, get an insight into a real working laboratory environment and collaborate with other researchers.'

Society Business

BSCB funding to support members throughout their careers

Two joint officers support the BSCB's Company of Biologists' support funds for members' conference travel and career development. Folma Buss and Sharon Tooze came on board in summer 2019. The BSCB Honor Fell and Support Grants schemes continue to be popular and we ask that applications are uploaded at least 6 weeks ahead of time to allow for assessment and transfer of funds to successful applicants. We expect all successful applicants to acknowledge BSCB funding using our logos found on our website. We have recently updated our process for applying for all BSCB Travel awards to use an online portal which is part of the BSCB Members area. All funding applications from July 2019 should be uploaded in PDFf format to the application portal found at bscb.org/members-login/

Honor Fell Travel Awards, sponsored by the Company of Biologists provide financial support for BSCB members at the beginning of their research careers to attend meetings and courses. Applications are considered for any meeting or course relevant to cell biology. The amount of the award depends on the location of the meeting or course. Awards will be up to £400 for travel within the UK (except for BSCB Spring Meeting for which the full registration and accommodation costs will be made), up to £500 for travel within European and up to £750 for meetings and courses in the rest of the world.

The application form and more information about the scheme are available at https://bscb.org/competitions-awardsgrants/travel-bursaries/honor-fell-company-of-biologists-travel-awards/

Company of Biologists Support Grants are available for independent group leaders/PIs with no current funds for travel to attend meetings, conferences, workshops, practical courses, PI laboratory management courses and courses to re-train. For more information and to apply please see https://bscb.org/competitions-awardsgrants/cob-support-grants/

Childcare Award: The BSCB now accepts applications to provide financial help with childcare or care for dependents when the applicant is presenting at a scientific meeting. All claims will require approval with appropriate receipts. You will be notified within 2–3 weeks of the outcome. For example, these claims can be for:

- Home-based childcare/dependent care expenses incurred because of meeting attendance (funds may not be applied to normal ongoing expenses).
- Travel of a relative or other care provider to your home to care for your child(ren) or dependent while attending a meeting.
- Travel of a care provider to the meeting with you to care for your child(ren)

For more information and to apply please see: https://bscb.org/competitions-awardsgrants/travel-bursaries/childcare-award/

BSCB Imaging competition

The BSCB runs a competition annually so you can showcase the best of your research Images

Submission• Entrants must supply their name, address, email address, and BSCB membership number on entry and must be sent by email to Judith Sleeman. File size: 10 x 11.96 cm 300 dpi

Your entry should adopt the file name initial_surname.jpeg e.g. a_einstein.jpeg Entrants should supply a concise stand-alone caption limited to 50 words as a MS Word document, labelled initial_surname_caption.doc.

The deadline for entries is around Feb time each year.Prizes: 1st £200, 2nd £100, 3rd £50. Entries will be anonymized prior to judging.Winners will be published on BSCB web pages and will also be used to illustrate BSCB newsletters and other promotional material. Copyright will remain with the creator. If you do not agree that images may be used as stated you must stipulate this on the entry form.

For eligibility criteria and more information see: bscb.org/competitions-awardsgrants/image-competition/image-competition-rules/

BSCB Science Writing Prize

The BSCB Science Writing Prize aims to encourage writing skill development in young researchers on topics of key relevance to cell biology. Entrants have either communicated their own research projects or science stories in the literature, in a clear and concise way aimed at a non-specialist audience, or written essays that were not be limited to research per se, but tackled a bioethical or science policy issue.

General Rules: The winner receives a prize of £500 and has their winning entry published in the BSCB magazine and online (both on the BSCB website and subject to editorial acceptance on the excellent www.lablit.com website.

Each year shortlisted entries are judged by an expert. These have recently included; Dr. Jenny Rohn (a cell biologist at UCL, who is also a science writer, novelist, blogger, broadcaster, the editor of LabLit.com and the founder and chair of Science is Vital). Barbara Melville (science writer, former writer-in-residence at the MRC Centre for Regenerative Medicine and board member with the Association of British Science Writers).You must be a Student or Postdoctoral BSCB member to enter.

More information: bscb.org/writing-competition-rules/

The British Society for Cell Biology

Statement of Financial Activities for the Year to 31 December 2020

	Unrestricted Funds	Restricted Funds	Total 2020	Unrestricted Funds	Restricted Funds	Total 2019
Income from:	£	£	£	£	£	£
Grants	35,000	62,500	97,500	35,000	62,500	97,500
Investments	887	–	887	1,287	–	1,287
Charitable activities						
Meetings	–	–	–	759	–	759
Subscriptions	30,057	–	30,057	32,389	–	32,389
Other income	3,547	–	3,547	1,102	–	1,102
Total income	**69,491**	**62,500**	**131,991**	**70,537**	**62,500**	**133,037**
Expenditure on:						
Charitable activities						
Grants payable:						
CoB	–	4,650	4,650	–	63,663	63,663
Other grants	1,030	500	1,530	–	–	–
Studentships	20,865	–	20,865	17,600	–	17,600
Costs of meetings	3,374	–	3,374	18,697	–	18,697
Website expenses	588	–	588	690	–	690
Newsletter costs	4,075	–	4,075	3,493	–	3,493
Membership fulfilment services	13,724	–	13,724	14,933	–	14,933
Executive Committee expenses	–	–	–	1,923	–	1,923
Examiner's remuneration	2,760	–	2,760	2,707	–	2,707
Miscellaneous	219	–	219	2,286	–	2,286
Subscriptions	1,542	–	1,542	2,896	–	2,896
Insurance	1,117	–	1,117	1,114	–	1,114
Total expenditure	**49,294**	**5,150**	**54,444**	**66,339**	**63,663**	**130,002**
Net (expenditure)/income	20,197	57,350	77,547	4,198	(1,163)	3,035
Transfer between funds	–	–	–	–	–	–
Net movement in funds	20,197	57,350	77,547	4,198	(1,163)	3,035
Funds brought forward at 1 January 2020	225,813	24,135	249,948	221,615	25,298	246,913
Funds carried forward at 31 December 2020	**246,010**	**81,485**	**327,495**	**225,813**	**24,135**	**249,948**

BSCB Committee 2022

The Society is run by a Committee of unpaid volunteers elected by the Members. The Officers of the Society, who are all members of the Committee, are directly elected by the Members. The BSCB committee is comprised of eight office-holders (President, Secretary, Treasurer, Meetings Secretary, Membership Secretary, Magazine Editor and Web Co-ordinator) and up to 12 other ordinary members, including one PhD student representative, one postdoc representative and a schools liaison officer, who are coopted onto the committee.

The committee is always interested in hearing from cell biologists who wish to contribute to the society's activities. Members of the society are encouraged to nominate candidates for the committee or officers positions at any time. Formal nominations should be seconded by another member of the society. The committee is also happy to receive un-seconded informal nominations. Nominations should be sent to the BSCB Secretary.

The committee generally meets twice a year, at the spring meeting and in the autumn in London. Additional meetings are arranged from time to time. Items for consideration by the committee should be submitted to the Secretary prior to the meetings. The BSCB has charitable status (registered charity no. 265816). The BSCB AGM is held every year at the Spring Meeting.

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BSCB Ambassadors 2022

The BSCB Ambassadors are the society's advocates in the UK cell biology community. They should be your first point of call for information about what the society can do for you and also how you can get involved. They should also be the people readily available to ask about sponsoring you for membership.

Anyone who wishes to volunteer to become a BSCB ambassador at any Institutes not represented in the list below please contact the BSCB.

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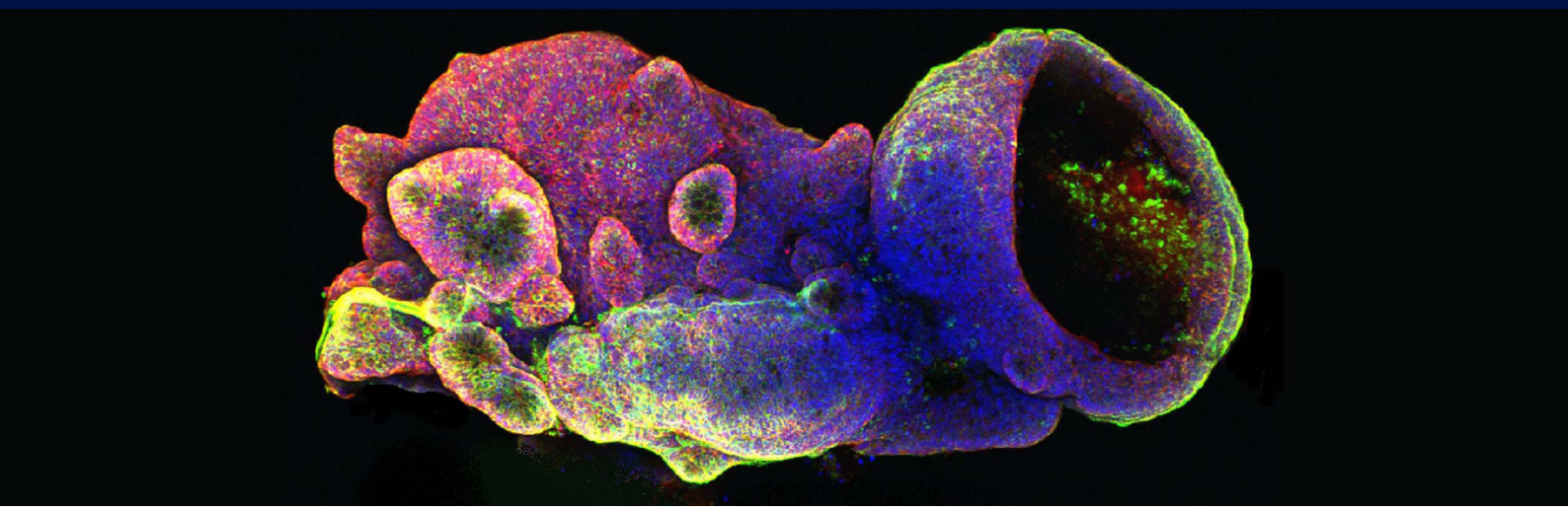

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