

Immunology News

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Catalysing collaboration:

towards the immunology of the future

Teaching:

change & innovation
during the pandemic

UK-CIC:

12 months of collaboration

Veterinary vaccines:

a new report with
the IVVN

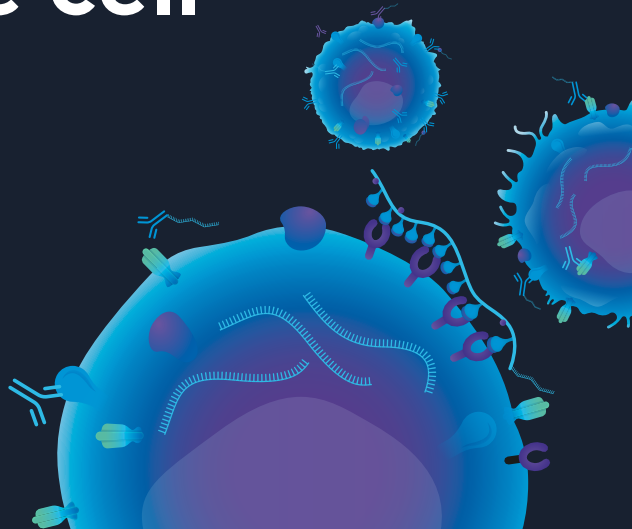
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Welcome to the autumn issue of *Immunology News*. Here, we showcase some of the important initiatives we have been working on to further support our members and the immunology community, such as new research funding to tackle autoimmune diseases collaboratively and the significant expansion of our career development offering, including a new grant scheme providing flexible funding to advance your professional development. We also look forward to the much-anticipated BSI Congress – we can't wait to reconnect with you in Edinburgh at the end of the year!

In this issue, BSI members, Dr Thomas Wilkinson, Professor Rob Nibbs and Dr Nigel Francis, contemplate what the future of immunology education will look like,

exploring the challenges and learnings of remote teaching during the pandemic. You will have the opportunity to delve into the value of veterinary vaccines, presented in a policy report created with the International Veterinary Vaccinology Network, and read up on 12 months of achievements and an unprecedented legacy of collaboration from the UK Coronavirus Immunology Consortium.

We hope you enjoy catching up on the Society's activities, our members' achievements and the world of immunology. We are always keen to hear from you so if there are any topics you want us to discuss, please share them with us.

Teresa Prados

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VIEW FROM ... THE BSI PRESIDENT



The last six months have been full of changes, both for the immunology community and society as a whole. Since my last message in March, our lives have slowly transitioned back to something resembling normality, and most of us can now go back into our institutions, see our colleagues, and restart our attendance at scientific meetings.

I'm delighted to say that the most exciting conference of the year is coming up very soon – BSI Congress 2021 will allow us to meet face to face again in Edinburgh. After the huge success of 2019 and two years of waiting, BSI Congress is shaping up to be the highlight of the year for many of us. Our Congress Committee have worked hard to put together an inspiring scientific programme and I would like to encourage all to register. Please make the most of the BSI initiatives to help you get there, including travel bursaries, carers' grant scheme and the subsidised crèche facilities.

Throughout the pandemic, the immunology research community has worked together at a national level through many projects to increase our understanding of the immunology of COVID-19. One of these projects was the UK Coronavirus Immunology Consortium, for which logistical support was provided by the BSI (pages 14–15). This unprecedented collaborative approach has enabled our community to achieve an incredible amount and make a real impact on public health and patient care during the pandemic. I am extremely proud of the combined efforts and achievements so far and I look forward to seeing this joined-up approach and the lessons learned from it shape the future of immunology research.

I am also pleased to highlight a recent policy report on the value of veterinary vaccines, created by the Society in collaboration with the International Veterinary Vaccinology Network (pages 16–17). I applaud the countless successes of the UK's veterinary vaccinology community – our strength in this area has been instrumental in tackling the threat of infectious cross-species diseases, including COVID-19. The importance of sustained investment in this area is clearly emphasised in this report.

Lastly, I would like to highlight the relentless work that the Society carries out to support our members. In particular, we have been actively listening to the career challenges that our members are facing, and the significant expansion of the BSI's career development offering, presented on pages 22–23, aims to go a step further in our mission to support current and future generations of immunologists.

I look forward to catching up with as many of you as possible at Congress at the end of November.

With best wishes

Arne Akbar

President,
British Society for Immunology
Email: president@immunology.org

VIEW FROM ... THE CHIEF EXECUTIVE

It's been another action-packed few months at the BSI, working non-stop to support our members, raise the profile of immunology and get everything in place for BSI Congress 2021! In 2019 I attended my first-ever Congress, and I cannot describe how fantastic it was to spend four days meeting our members and hearing about the most recent developments in immunology (plus who can forget the Congress party!). This time, however, I'm even more excited about the chance to finally reconnect with our wonderful community – if you want to explore what to look forward to, head to pages 6–7 for some of the highlights. Please do register as soon as you can to secure your place – the whole BSI team looks forward to welcoming you in Edinburgh!

In other exciting news, we've recently launched a major funding call to tackle autoimmune diseases collaboratively as part of our Connect Immune Research partnership. Funded together with the



Chernajovsky Foundation, this initiative follows a brand-new approach to immunology research, bringing together researchers from multiple conditions to uncover shared mechanisms and catalyse the benefits to patients' lives (see page 9).

In this issue we also have an inspiring article about teaching during the pandemic. BSI members, Dr Thomas Wilkinson, Professor Rob Nibbs and Dr Nigel Francis

(the 2020 Immunology Teaching Excellence Award winner) examine innovative ways to overcome the practical difficulties of remote teaching, especially in a laboratory, and point out the need to retain the best resources and techniques for the future.

Our work around Equality, Diversity and Inclusion continues to be a top priority and I'm delighted that the BSI was able to fund several ambitious and inspiring activities with our new Equality, Diversity & Inclusion activity grants. (Do turn to page 21 to find out more).

Please enjoy this issue of *Immunology News* and, as always, don't hesitate to get in touch if you have any questions or suggestions.

Doug Brown

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British Society for Immunology
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SOCIETY NEWS

BSI Forum: here to represent you

The BSI Forum is the place where the voice of our membership is fed into our activities. Chaired by Professor Ann Ager, the 18 elected members come from all sections of our membership. Their role is to act as our 'think tank' on issues relating to education and careers, public engagement, policy and public affairs, as well as communications.

The most recent meeting in June was an action-packed session focusing on four main areas. First, Forum looked into research integrity in scientific publishing. This set of established principles around honesty in research, accountability and fairness is incredibly important to the Society and to our members. They engaged in a productive discussion around different types of infringements and practical actions that can be taken not only by

journal editors but also by reviewers, publishers and early career researchers.

Secondly, we had a guest speaker, Dr Bnar Talabani, who has been working on vaccine engagement throughout the pandemic. She provided insights into how to be proactive in this area, target specific concerns and reach diverse audiences, for example ethnic minorities and a younger demographic. A few examples shared were running pop-up vaccination clinics in local religious centres, joining Team Halo (an international collaboration of doctors, scientists and healthcare professionals creating TikToks) and getting involved in BSI activities such as our popular COVID-19 vaccine Instagram Q&As.

Thirdly, Dr Doug Brown, BSI Chief Executive, shared the Society's upcoming five-year strategy, including our diversity and inclusion strategy which is core to our mission and values. Next was a presentation of our new career support

offering, developed after listening to our membership in our recent survey, and in collaboration with BSI Early Career Trustees, Dr Calum Bain and Dr Emma Chambers. This significant expansion in the careers support for members, launched in July, includes revamped schemes, new initiatives and further funding opportunities.

Finally, Forum took an overview of all the external affairs and outreach activities that the BSI has undertaken over the past few months to communicate the voice of our immunology community to the wider world. The BSI Forum and its members are here to represent you. If you would like to raise any issues for Forum to discuss, please contact your relevant Forum member – you can find a list of your representatives at www.immunology.org/forum or, email our Director of External Affairs, Jennie Evans, at j.evans@immunology.org.

Immunotherapy Advances ECR Editorial Board

As an official journal of the British Society for Immunology, *Immunotherapy Advances* aims to support the development of the next generation of immunologists. With this in mind, *Immunotherapy Advances* has developed a dedicated Editorial Board specifically for early career researchers (ECRs). The ECR Board members will join the editorial team of our brand new Open Access journal, develop their skills as peer reviewers, learn more about the editorial process and contribute to the growth and development of the journal.

The ECR Board members will work closely with more senior members of the Editorial Board to learn how to effectively review for a journal, as well as receiving experience in other Editorial Board activities. We hope that the ECR Board members will provide a fresh perspective on *Immunotherapy Advances*, supporting the journal's growth and offering ideas and opinions on future developments.

After calling for applications from ambitious and talented ECRs, we are delighted to announce the twelve new ECR Editorial Board members. Thank you to everyone who submitted an application.

- Dr Alsya Affandi** (Amsterdam UMC, Netherlands)
- Dr Rebecca Chukwuanukwu** (Nnamdi Azikiwe University, Nigeria)
- Dr Diana Cortes-Selva** (Purdue University, USA)
- Dr Akhilesh Jha** (University of Cambridge, UK)
- Dr Daniel Johnston** (University College Dublin, Ireland)
- Dr Elizabeth Mann** (University of Oxford, UK)
- Dr Mark Robinson** (Maynooth University, Ireland)
- Dr Malcolm Sim** (National Institute of Allergy and Infectious Diseases, USA)
- Dr Oskar Staufer** (Max Planck Institute for Medical Research, Germany)
- Dr Eda Tenorio** (Universidad Nacional Autónoma de México, Mexico)
- Dr Kirsten Ward-Hartstonge** (University of Otago, New Zealand)
- Dr Caroline Weight** (University College London, UK)



Please join us in giving them a warm welcome over on the *Immunotherapy Advances* Twitter channel @IMTadvances and find out more about the global Editorial Board here: academic.oup.com/immunotherapyadv/pages/editorial-board.

SOCIETY NEWS

BSI Congress 2021

Sunday 28 November to Wednesday 1 December 2021
Edinburgh, UK

The UK's top immunology conference is back – bigger and better than before. Reconnect with the immunology community across the UK in the beautiful city of Edinburgh!

Our much-anticipated flagship event attracts over 1,400 attendees from the UK and international immunology community. The extensive programme boasts a diverse selection of immunology topics covering cutting-edge research from leading scientists around the world. We also have a range of networking opportunities to allow you to exchange ideas and build links to aid your next career step.

Join us for an exciting and innovative mix of the highest quality basic and translational immunology research from around the world.



Keynote lecture

Dr Rafi Ahmed

Emory University, USA

18:00, Sunday 28 November

Help with your travel costs

BSI members can apply for a Congress bursary to assist with the costs of attending the meeting. Application deadline is **4 October 2021** and you can find more information at www.immunology.org/grants-and-prizes.

7 reasons to submit an abstract

Late-breaking abstract submission for poster presentations closes on Friday 22 October.

1. Disseminate your latest research ideas and ensure your work is accessible to other researchers in your field
2. Gain recognition in the immunology community
3. Debate immunology in a friendly atmosphere and receive valuable feedback
4. Showcase your innovative education or public engagement work in our dedicated poster category
5. Start discussions that will lead to future collaborations and further your career
6. Compete for a £250 poster prize
7. Keep up to date with cutting-edge research

BSI AGM – have your say!

We would like to encourage all BSI members to join us at our 2021 Annual General Meeting.

This is your opportunity to find out more about the work of your Society, what activities we have carried out in the past year and what we are doing to support our members and represent immunology in the UK.

Dates for your diary

BSI Congress travel bursary and carers' grant applications:

4 October 2021

Early bird registration:

22 October 2021

Late-breaking abstract submission:

22 October 2021



BSI Congress for all

Ensuring that the BSI Congress is inclusive is extremely important to us.

We introduced a number of initiatives at our last Congress which we are pleased to offer again at this year's Congress. The **BSI Carers' Grant** has been established for those who have caring responsibilities at home, whether this is looking after children or older members of the family, or those that need carers themselves. This grant scheme is intended to go towards the cost of the attendee's care arrangements during the time they are attending BSI Congress.

Apply by **4 October 2021** here: www.immunology.org/bsi-congress-2021-carers-grant.

We will also have an onsite crèche to provide subsidised childcare for delegates' children up to 12 years of age. You will need to register for this service in advance.

These initiatives are in addition to other provisions already in place, such as breastfeeding facilities, prayer and quiet rooms.

COVID-19 policy

Our plan is for this to be an in-person event, with all the benefits of networking opportunities and face-to-face interactions that this brings. However, we will also run an option for those who would like to tune in to sessions virtually. We will continue to follow the latest Government guidance on the COVID-19 pandemic and share any changes that may impact this face-to-face event with delegates and potential attendees as soon as possible. In all eventualities, we will strive to run the best event possible to serve the immunology community.

Education and public engagement posters

We know that our members work on a wide range of activities to promote and increase knowledge of immunology to diverse audiences, so we want to make sure all of these activities are showcased and valued at our Congress. We encourage submissions of abstracts to this category to showcase innovative techniques being used in higher education immunology teaching and novel approaches to engaging with the public on immunology.



Programme highlights

Plenary sessions

- Metabolic programming of immune responses
- Human genetic determinants of infection and inflammation
- Defining the state and functional relevance of T cell exhaustion
- Calling time on immunology
- Defining immune microenvironments in organogenesis, inflammation and cancer
- Immunology in action: controlling COVID-19

Plus 25 exciting parallel sessions!

BSI Regional and Affinity Groups

Our Groups have been closely involved in organising some of the parallel sessions at BSI Congress 2021 and they are very much looking forward to seeing you there. Head to page 25 to explore a great number of exciting sessions for you to join!

Bright Sparks in Immunology

12:30–16:00, Sunday 28 November

Our showcase of work from early career researchers in immunology.



Bright Sparks in Immunology provides PhD students and early career postdocs with experience of presenting their work to a large audience and debating immunology in a friendly atmosphere. This exciting event combines competition with excellent science and networking.

Joint sessions with the NCRI and the BBSRC

The BSI works with many different partners to support our aims and build effective collaborations. We're delighted to be running joint sessions at BSI Congress 2021 with the Biotechnology and Biological Sciences Research Council and the National Cancer Research Institute.

Monday 29 November

BBSRC joint session

Influence of co-infection on host responses

Tuesday 30 November

NCRI joint session

Advances in cancer immunology: bringing two communities together

Get the latest info
www.bsicongress.com

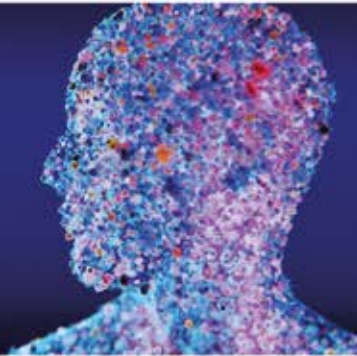
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If you have any questions, please email congress@immunology.org.



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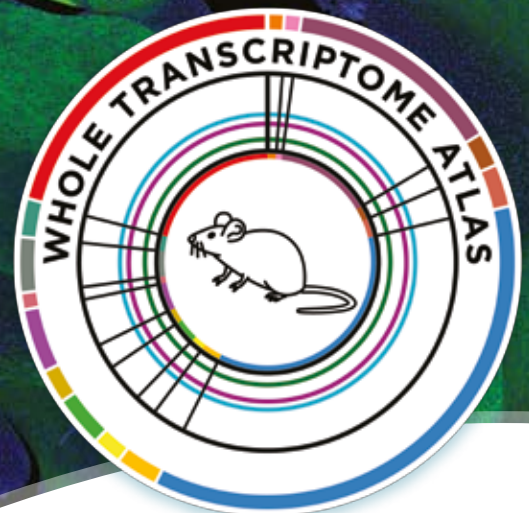
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SOCIETY NEWS

Connect Immune Research: new research funding to tackle autoimmune diseases collaboratively

Through Connect Immune Research, an initiative that allows us to work with autoimmune disease charities, we are excited to announce a new funding scheme to further interdisciplinary research and work to improve the lives of the 4 million people living with an autoimmune disease in the UK.

Connect Immune Research and the Yuti and Lorna Chernajovsky Biomedical Research Foundation have launched a major funding call to encourage collaboration between researchers who focus on specific autoimmune diseases. This £1.3m initiative, called 'Targeting shared mechanisms in immune-mediated inflammatory diseases', will offer pilot grants of up to £100,000 to researchers working on projects that could benefit patients living with more than one autoimmune condition.

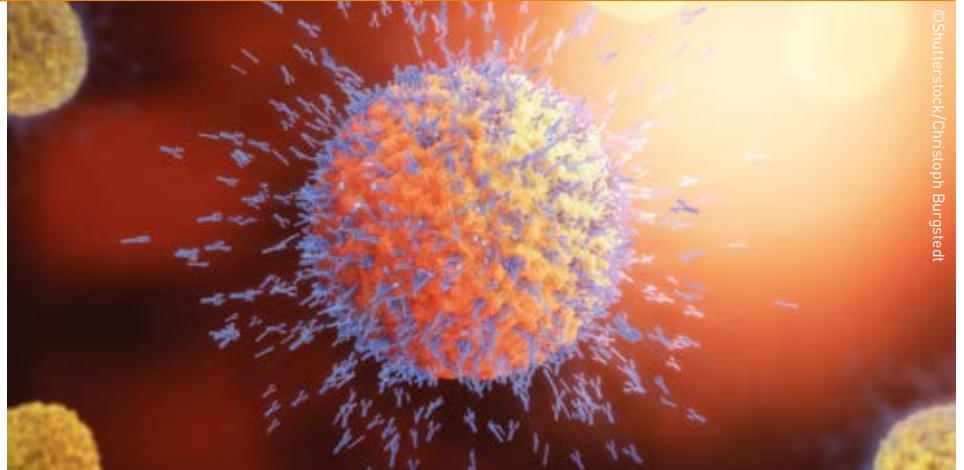
About the call

In May 2021, Connect Immune Research and the Chernajovsky Foundation held an expert meeting that brought together over 40 researchers and people living with multiple autoimmune conditions to discuss targeting shared mechanisms in immune-mediated inflammatory diseases and to catalyse new collaborations, research ideas and proposals for research. At this meeting, the participants explored and further defined priority topics in this area, as well as identifying gaps and opportunities for future research.

Applications are invited from research teams affiliated to a university, hospital or other recognised research institution worldwide, but the lead applicant must be based at a UK institution.



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Proposals should be:

- Highly innovative; potentially risky research ideas are encouraged
- Translational research only, defined here as research that seeks to advance and apply discoveries from basic discovery research and/or clinical findings through preclinical studies and towards clinical studies and trials. Development of drugs, diagnostics and devices are welcome
- Able to demonstrate how the outputs from the award could lead to benefit for patients living with more than one autoimmune condition

The funding will enable multidisciplinary groups of researchers to develop and progress innovative cross-disease research questions closer to benefits for people with autoimmune conditions. It is envisaged that successful candidates whose projects demonstrate the most promising outputs will be able to compete for further funding at a scale to quickly develop their research for patient benefit.

Involving people affected by medical conditions strengthens the quality and relevance of medical research. Applicants are encouraged to consider how the quality, feasibility or practicality of their proposal could be improved by involving people affected by immune conditions in its development or oversight.

How to apply

This call is being administered by Versus Arthritis on behalf of the Connect Immune Partners and the Chernajovsky Foundation. Full details of the scheme are available here: bit.ly/3yxCfDy.

Deadline: Wednesday 13 October 2021.

About Connect Immune Research

Connect Immune Research brings together researchers from multiple autoimmune conditions to uncover the commonalities in their work to benefit patients. Our aim is that this will lead to new treatments, faster. The BSI chairs Connect Immune Research meetings, and our growing partnership of leading organisations dedicated to tackling autoimmune conditions includes: the type 1 diabetes charity JDRF; Versus Arthritis; MS Society; Alopecia UK; Bowel Research UK; Coeliac UK; and the Psoriasis and Psoriatic Arthritis Alliance.

As our CEO Dr Doug Brown says: "Immunology is a vital branch of medical science in which the UK leads the world with new discoveries. Connect Immune Research exploits this UK strength by bringing together the best brains in immunology to study different autoimmune diseases together. This initiative is just the start of a brand-new approach to immunology research and will, with even more support, lead to us transforming the lives of people living with autoimmune conditions."

Find out more:

For more information about the grant scheme or the Connect Immune Research initiative, please email Ben Wilcock, BSI Research Partnerships Manager at b.wilcock@immunology.org.



SOCIETY NEWS

Special collections: *Immunotherapy Advances*

Immunotherapy Advances is a fully Open Access journal, publishing scientifically rigorous research relating to manipulations of the immune system for the benefit of human and animal health in all disease areas.

While typically associated with cancer treatment, immunotherapies can be relevant to a wide variety of conditions. In order to demonstrate the extent of the scope of *Immunotherapy Advances* we have created a series of ongoing special collections which highlight different topics within the field and aim to provide an insight into a new area. In this article, our Journals Manager, Robyn Taylor, presents these cutting-edge collections, explores the published articles and offers a preview of new ones to come.



Professor Marianne Boes

Targeting immunometabolism

Led by Regional Editor Associate Professor Marianne Boes, this collection aims to provide a comprehensive overview on metabolites and micronutrients in both hosts and pathogens and how they contribute to driving immune responses.

This series includes articles focusing on the importance of iron in immunity,¹ the impact of adipose tissue wasting on immunity in cancer patients,² and the potential for targeting immunometabolic modulators for the treatment of COVID-19.³

Immunotherapy of allergy and asthma

This special collection is being overseen by Regional Editor Associate Professor Menno van Zelm, and aims to develop our understanding of the immunotherapeutic



Professor Menno van Zelm

treatment options for asthma and allergies.

This series includes a review looking at key lessons learned during the development of antigen-specific immunotherapies and how these can be applied to inform future interventions⁴ and an article investigating basophils as an emerging therapeutic target, having previously been considered redundant blood 'mast cells'.⁵



Professor Tao Dong

Adoptive cellular therapies

Led by Regional Editor Professor Tao Dong, this series will focus on adoptive cellular therapies as a treatment option for cancer, including chimeric antigen receptor (CAR) T cell immunotherapy, natural killer (NK) cell therapy and other forms of engineered T cell therapies. This collection is still welcoming submissions to join the first article in the collection looking at the evolving role of co-stimulation in (CAR) T cell therapies.⁶

Immune related adverse events in cancer immunotherapy

In this collection, led by Dr Stephanie Dougan, Regional Editor for North America, we will be focusing on the immunological side effects that come from treating cancer using immunotherapeutic approaches. Already in the collection is a study, looking



Dr Stephanie Dougan

at the link between statin use and skeletal myopathies in immune checkpoint inhibitor (ICI)-treated patients.⁷

Robyn Taylor

BSI Journals Manager

Email: r.taylor@immunology.org

REFERENCES

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- <https://bit.ly/3j0hXBM>

Upcoming collections

Recombinant antibody-based therapeutics

Led by Professor Stefan Barth, Regional Editor for Africa

T-cell targeted approaches to cancer immunotherapy

Led by Regional Editor Dr Adriana Bonomo and Professor Martin Bonamino

Innovative clinical trial design

Led by Editor-in-Chief Professor Tim Elliott

All collections are ongoing and we would still welcome submissions. To discuss an idea for an article, please contact journals@immunology.org or the relevant Editor.



Find out more:

- Read the latest articles: academic.oup.com/immunotherapyadv/issue.
- Follow us: @IMTAdvances
- Submit your article - BSI members get 20% off Article Processing Charges: academic.oup.com/immunotherapyadv/pages/general-instructions.



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BSI 2022 mentoring scheme

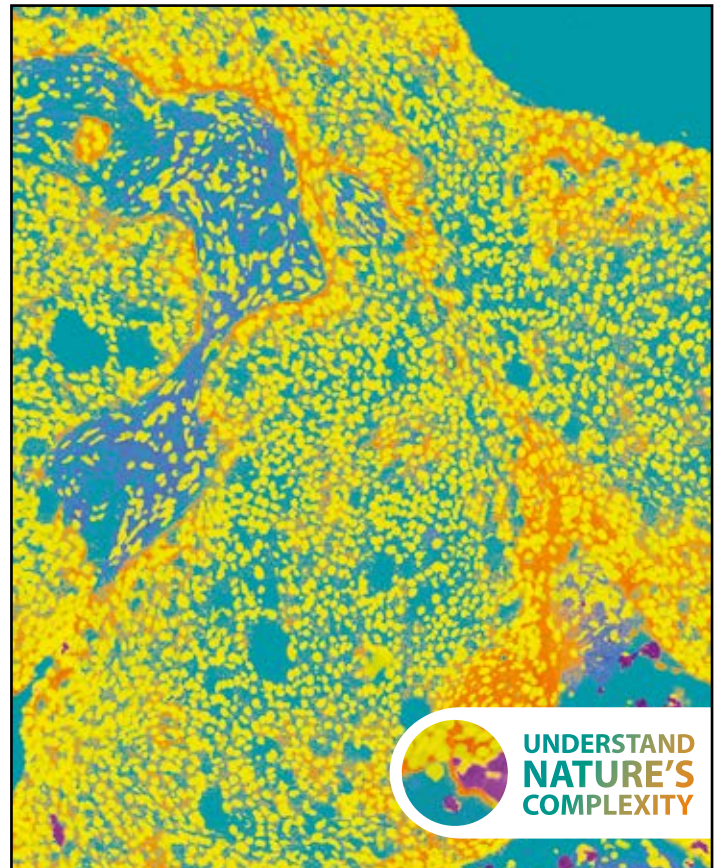
Applications are now open for mentors and mentees!

Over a 12 month period starting in January 2022, mentors and mentees will hold a series of online meetings that can be used to discuss career development, barriers faced at work and overcoming tough work situations.

Find out more and apply at www.immunology.org/careers/bsi-mentoring-scheme.

Deadline:
Monday 11 October 2021

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Teaching through the pandemic: what is the future of immunology education?

The COVID-19 pandemic caused an important global shift to remote teaching, which presented some new challenges for immunology educators and students. In this article, BSI members, Dr Thomas Wilkinson, Professor Rob Nibbs and Dr Nigel Francis discuss these challenges, what they have learned from teaching in a remote environment and the importance of retaining the innovative educational tools that have been developed during this time.

Practical difficulties

There is no doubt that the global COVID-19 pandemic has had a profound and lasting impact on the education sector. The rapid shift to emergency remote teaching in March 2020, when campuses were forced to shut their physical doors, threw up the obvious challenge of how to teach labs without access to physical teaching space or equipment. The response from the sector showed remarkable resilience to adapt and overcome, with an incredible willingness to share innovative ideas and best practices between institutions.

The outcome was that students can still acquire many of the skills associated with laboratory classes, including scientific inquiry and curiosity, data handling, analysis and presentation and the theoretical underpinning of immunological techniques. However, what has been lacking and cannot be replicated in the virtual space is the hands-on learning and the experience of using scientific equipment. This presents challenges for immunology educators both in the short term to upskill current students



but also in the longer term. Universities will need to realise that school leavers entering higher education over the next two to three years may have skills gaps resulting from having less time in labs.

Closing the skills gap

'Bridging the skills gap in the biopharmaceutical industry', a report published by the Association of the British Pharmaceutical Industry (ABPI) in 2019, highlighted a growing need to train and recruit immunologists at all levels, with the development of practical skills considered a significant problem. Therefore, even pre-pandemic, there was already concern over the number and quality of immunologists being trained. COVID-19 will, of course, have exacerbated this problem. Therefore, a concerted 'joined-up' approach will be

needed among educators to address the skills gaps in the industry as a whole.

So, what can be done and what new educational tools have emerged during the pandemic? Across the biosciences sector as a whole, some incredibly innovative teaching has been developed. Approaches can be broadly divided into four main strategies: videos, simulations, augmented / virtual reality and the generation or provision of datasets. Often several of these approaches have been combined. For example, a simulation is used to help students understand the theory behind a technique; then, a video is provided of an academic demonstrating the use of the equipment. This can be followed up by providing a randomly generated dataset to allow students to practise analysing and presenting experimental data.

'What has been lacking and cannot be replicated in the virtual space is the hands-on learning and the experience of using scientific equipment. This presents challenges for immunology educators both in the short term to upskill current students but also in the longer term.'

'One potential benefit of the pandemic is that academics have developed resources that allow students to virtually experience techniques beyond the scope of traditional laboratory sessions.'

Here, there is often the assumption that students will hopefully experience the technique at some point during their studies. However, one potential benefit of the pandemic is that academics have developed resources that allow students to virtually experience techniques beyond the scope of traditional laboratory sessions due to limitations of cost or access to the physical equipment.

Challenges of remote lecturing

Certainly, the shift to online teaching has been challenging for educators, not least because it is very different from face-to-face instruction, and we have not had training in, or much experience of, this form of education. Lecturing to a blank screen when all the students have their camera off makes it near impossible to judge whether the key messages are hitting home. As lecturers, we thrive on the buzz of the classroom and relish those 'light bulb moments' when everything suddenly makes sense to the students, and we witness that moment of understanding. That is not to say that all teaching online is bad. The increased willingness of students to ask and answer questions via chat functions on platforms like Zoom or Teams has enhanced the level of engagement of students in live sessions. Asynchronous videos have allowed students to learn at their own pace and at a time that is convenient to them, the latter being particularly important for international students.

The new normal

What have we learned from teaching in the remote environment? Firstly, it is hard work, probably harder than conventional face-to-face teaching. Nevertheless, we have shown what is possible. There has been an impressive level of inventiveness among academics who have let their creativity run free!

COVID-19 has probably signalled the end of the traditional lecture. The new norm will be blended learning, with content provided upfront online for the up and coming lecture. Therefore, whether face to face or virtual, students will be better prepared for the teaching session ahead. Furthermore, having better prepared students should allow teaching staff to challenge students with more diverse material such as problem-solving in groups, quizzes and

discussions coming to the fore. For laboratory sessions, the vast majority of the preparatory material, including health and safety information, can be moved online ahead of time. Demonstrations of equipment and key learning objectives for individual sessions can all be provided by video with formative quizzes to allow students to check their understanding. This frees up more time in the laboratory for actual laboratory work. This is important because laboratory time is likely to be limited for the foreseeable future, so online preparation and grounding in the theory will allow students to maximise their time practising techniques and acquiring vital practical skills.

Support from the BSI

The BSI recently launched a Teaching Resource Hub that will be invaluable for academics to share novel solutions and resources to engage students with their studies in these changed times. With blended learning becoming more and more prevalent, shared expertise and resources will prove incredibly useful to enhance student learning and complement laboratory skills development. The recently formed BSI Teaching Affinity Group will look to help support educators and raise awareness of the importance of teachers within the immunology community.

Change for the good

COVID-19 has been challenging, but there are positives to take from the experience. The innovation that has been displayed has driven a long-awaited change to the conventional teaching model. This will allow students to develop additional skills that will be highly valued when they graduate and will hopefully go a long way to address the issues raised in the ABPI report.

As we highlighted in our recent *Immunology* article, alternatives to laboratory classes and laboratory projects have been developed through necessity. We should retain and adapt the best of these resources when laboratories reopen – not because we have to, but because we ought to.

Dr Thomas Wilkinson, Swansea University
Professor Rob Nibbs, University of Glasgow
Dr Nigel Francis, Cardiff University



BSI Immunology Teaching Excellence Award

Our Teaching Excellence Award highlights excellent immunology teachers in UK higher education institutes. The award recognises those who show a passion for immunology and education, along with the communication skills to make these complex subjects accessible to their students.

Dr Nigel Francis, Associate Professor at Swansea University Medical School, won the BSI 2020 Immunology Teaching Excellence Award. Huge congratulations!

The 2021 award is open for nominations. Find out more here: www.immunology.org/teachingaward.

Additional Resources

BSI Teaching Resource Hub:
<https://bit.ly/3lrEWDZ>

ABPI 2019 Bridging the skills gap in the biopharmaceutical industry
<https://bit.ly/3jncwtB>

Wilkinson *et al.* 2021 Reimagining laboratory-based immunology education in the time of COVID-19. *Immunology* 163 431–435 <https://doi.org/10.1111/imm.13369>

12 months of the UK Coronavirus Immunology Consortium

The UK Coronavirus Immunology Consortium (UK-CIC) has achieved much in the 12 months since its launch. In this article, we review what UK-CIC researchers have achieved by working in collaboration, and the legacy they hope to leave behind.

From early in the pandemic, it became clear that studying the immunology of SARS-CoV-2, the virus that causes COVID-19, would be one of the keys to bringing it under control. Learning more about how the virus interacts with our immune system had great potential for delivering real benefits to patients and public health, helping us understand how people become unwell, why some suffer more severe symptoms than others, and what immunity might look like.

A challenge of this scale required an innovative approach to tackle these unknowns at pace, and the UK – being home to many of the world's leading immunologists – was well-placed to take on the challenge. Collaborative science has always been a key part of academic research, but UK-CIC saw 20 research centres, with their immunologists and unique expertise, brought together in a way never seen before.

Collaboration is key

The concept of a national consortium on the immunology of COVID-19 came about in June 2020. Not long before, a paper identifying the immunology research

priorities for COVID-19 was produced by the British Society for Immunology and the Academy of Medical Sciences. These priorities were adopted to become UK-CIC's research themes. Its members would set out to understand the features of immunity in an initial infection with SARS-CoV-2, what makes some people more susceptible to severe disease, and whether immunity to other seasonal coronaviruses offered individuals any protection from SARS-CoV-2.

Theme 1 – primary immunity

The first research theme of UK-CIC, which focused on acute infection, sought to understand the initial immune response to SARS-CoV-2 and its relation to severe disease. Professor Tracy Hussell from The University of Manchester led the theme in close collaboration with colleagues at a number of centres around the UK including the Universities of Birmingham, Cardiff, Dundee, Edinburgh, King's, Newcastle, Oxford, Sheffield, and Wellcome Sanger Institute.

Researchers found that early T cell responses may be helpful in preventing serious infection with SARS-CoV-2, and may underlie the efficacy of vaccines against severe COVID-19. They also found that inflammation is present very early in those who go on to experience more severe symptoms, suggesting it may be possible to screen for this inflammation to intervene when needed at an earlier stage. Related to



UK Coronavirus Immunology Consortium

this, many cytokines appeared to be present in greater numbers in acute disease.

Theme 2 – protective immunity

Led by Professor Paul Klenerman, University of Oxford, UK-CIC's second theme sought to understand the specificity of the cellular response to SARS-CoV-2, and the efficacy of the immune response following prior exposure to the virus. This theme worked closely with the Protective Immunity from T Cells in Healthcare workers (PITCH) study which involves the Universities of Oxford, Liverpool, Sheffield, Newcastle and Birmingham. They also collaborated with two well-established cohort studies, the Avon Longitudinal Study of Parents and Children (ALSPAC) and Born in Bradford.

This theme has made significant contributions to vaccine studies, having released a number of influential papers exploring the longevity and strength of the immune response to SARS-CoV-2 at several timepoints after vaccination, both in working-age and older cohorts. UK-CIC research has shown that extended intervals between vaccines may be more immunogenic than a shorter interval, that mRNA COVID-19 vaccines may produce greater antibody responses in the weeks after vaccination, but that the Oxford/AstraZeneca (ChAdOx1) COVID-19 vaccine



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'Collaborative science has always been a key part of academic research, but UK-CIC saw 20 research centres, with their immunologists and unique expertise, brought together in a way never seen before.'

'Many researchers are now keen to explore how to carry forward this model of working for scientific challenges of the future.'

may promote stronger cellular responses. Collaborations within UK-CIC have also studied the strength of the immune response generated in children, the presence of autoantibodies following natural infection, and the response in immune-suppressed groups.

ISARIC4C

Throughout the last 12 months, UK-CIC is pleased to have closely collaborated with the ISARIC4C study, which began collecting data and samples shortly after the very first cases of COVID-19 were reported in the UK. The data they have shared with UK-CIC collaborators have been an invaluable part of its success.

ISARIC4C's involvement in UK-CIC is led by Professor Peter Openshaw (Imperial College London). It has made significant strides in our understanding of the virus, such as the durability of immunity to SARS-CoV-2 and how the inflammatory profile of the immune response changes with disease severity, including the identification of markers of severe disease specific to COVID-19.

Theme 3 – immunopathology

In their efforts to understand the immune response to SARS-CoV-2 on a molecular and cellular level, UK-CIC researchers have curated what is likely to be the largest collection of post-mortem tissue from COVID-19 patients in the world. Led by Professor Paul Kaye, University of York, Theme 3 has brought together researchers from universities including Cardiff, Newcastle, Sheffield, York, and the Wellcome Sanger Institute.

They have been able to define four main

subtypes of inflammation, which will aid in specifying the ways in which COVID-19 damages the body, and demonstrated that complement activation plays an important role in this.

Theme 4 – cross-reactive coronavirus immunity

Led by Professor Mala Maini, University College London, and sub-led by Dr Thushan de Silva, University of Sheffield, UK-CIC researchers sought to understand if immunity to other coronaviruses, such as those that circulate seasonally, could confer any immunity to SARS-CoV-2. It looks like this may be the case.

Firstly, researchers found T cells that cross-react with both common cold viruses and SARS-CoV-2 in some people tested, and they believe this may contribute to clinical protection. Interestingly, some people were found to have cellular responses to the virus without developing an antibody response. Further results also suggested that T cell responses are likely to be able to overcome the mutations seen in some variants of SARS-CoV-2.

Theme 5 – immune evasion

This team of researchers from the Universities of Cambridge, Cardiff and Glasgow, led by Professor Paul Lehner, University of Cambridge, has been working to understand how the virus 'hides' from the immune system, and what can be done to overcome this. Findings from UK-CIC research suggests that SARS-CoV-2 does try to evade recognition by immune cells. Other interesting work has suggested genetic differences in how the immune system is able to control infection, which

may explain differences in mortality rates in different populations.

Team science

Above all else, the success of UK-CIC has stemmed from its collaborative nature. By joining researchers together against a shared target, and removing the need to compete for funding between groups, UK-CIC researchers have been able to work to their strengths and focus on using the expertise of each group to their advantage. The sharing of samples and data across groups has been a cornerstone of the success of UK-CIC, with this having led to new insights and pools of data that others will benefit from in future. From a less results-driven perspective, many of the researchers have enjoyed being brought together in a unified effort during a time that has otherwise been difficult and isolating.

Patient and public involvement

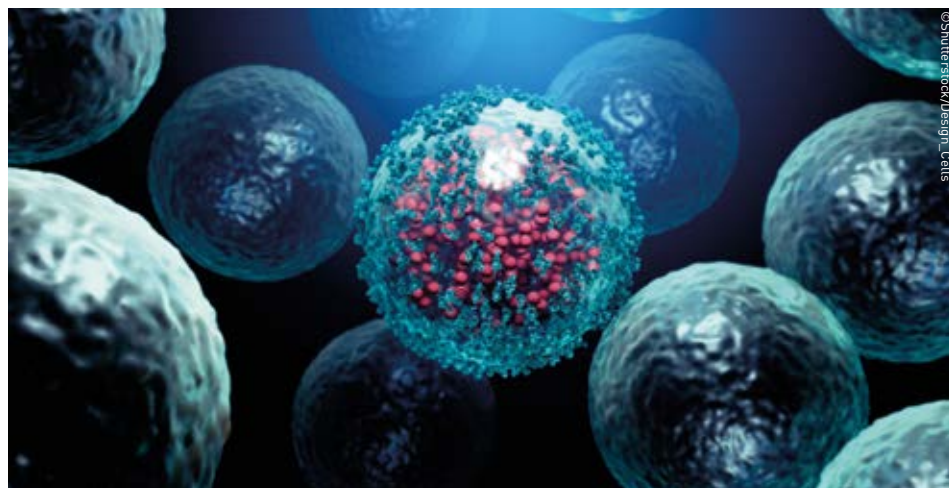
A unique aspect of UK-CIC has been its inclusion of a Patient and Public Involvement (PPI) panel from the day of its launch. A new experience for many of our researchers, this provided a valuable challenge to the questions underpinning their work and the impact it may have on the public or health policy. The UK-CIC PPI panel is an example of the way the public and scientists can work together throughout the research process, with their perspectives considered at each stage rather than once results are finalised.

Legacy

The COVID-19 pandemic has certainly created an unusual opportunity to do science in a new way, and UK-CIC is a testament to the potential of a truly team science approach. Many researchers are now keen to explore how to carry forward this model of working for scientific challenges of the future. Some are in discussion to set up formal collaborations between centres; others continue to expand on the work achieved over the last year; and many have a new appreciation for the benefits gained by PPI and will take this forward into their future work. We have learned so much from this unprecedented project, and must work hard to take lessons learned forward into the future of immunology research.

Gabriela De Sousa

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Find out more:

Visit the UK-CIC website to find out more about their work:
www.uk-cic.org.

Securing our future:

the value of veterinary vaccines

The BSI has collaborated with the International Veterinary Vaccinology Network (IVVN) to create a new policy report to raise awareness of the UK's world-leading research status in veterinary vaccinology. In this article, our Research Partnerships Manager, Ben Wilcock, discusses the findings of this report and explains its importance, both for the BSI's policy work and mission and for the veterinary vaccinology community.

The 'Securing our future' report was launched in mid-August. It provides recommendations to policymakers and funders about what the UK needs to do to maintain its position and explains why veterinary vaccinology is crucial to the international research landscape and global food security.

In addition to celebrating the UK's many successes in veterinary vaccinology and highlighting the economic benefit of UK investment in this area, the report makes the following recommendations:

- We urgently need to secure the future of funding for all aspects of veterinary vaccinology
- We need to see further investment in UK veterinary vaccine manufacturing capabilities
- We must support career development and opportunities for early career researchers
- We must provide a 'One Health' approach
- We need to work collaboratively with international academic and industry partners to protect animal and human global health

'RVF is just one of many diseases that affect both humans and animals, and immunologists must continue to work collaboratively to tackle the threat of infectious cross-species diseases, here in the UK and around the world.'



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UK investment, global food security and collaboration

With the global population set to reach over 9 billion by the year 2050, meat production will need to increase dramatically while also improving efficiency to mitigate the impact of climate change. Veterinary vaccines have a vital role to play in ensuring safe, sustainable food for everyone. Globally, and particularly in low- and middle-income countries (LMICs), people rely on local livestock for food. However, infectious diseases in LMICs are estimated to reduce livestock productivity by around 20%, increasing the cost and reducing the availability of food, leaving already impoverished people to go hungry. Veterinary vaccines increase farming efficiency and reduce losses to animal disease, improving the environmental

impact of livestock farming and helping to provide safe food for everyone over the decades to come.

Alongside the threats to global food security that a lack of investment in research on veterinary vaccinology poses, there needs to be a continued commitment for immunologists to work together to tackle cross-species diseases. The report stresses that, although human and animal diseases are often considered separately, it is increasingly apparent that the health of people, livestock, wild animals and the environment we share are intrinsically linked. One of the report's contributors, Professor George Warimwe from the KEMRI-Wellcome Trust Research Programme and the University of Oxford, is leading on the development of a vaccine for Rift Valley Fever (RVF), a viral disease that affects humans and a range of animals, including cattle, sheep, goats and camels. This vaccine, ChAdOx, uses the same viral vector as the AstraZeneca/Oxford COVID-19 vaccine, with the aim of designing a vaccine that could be used in humans as well as animals. Early trials showed that the vaccine gave 100% protection against challenge infections in animals. Professor Warimwe explains: "My approach is to recognise the fact that pathogens can move between humans and animals and to leverage knowledge from veterinary vaccinology and use that to benefit human vaccine research and vice versa. RVF affects both

humans and animals, so the solutions should not be separate. We need to have more collaboration between medical and veterinary researchers to accelerate the development of vaccines and be more efficient with resources.”

RVF is just one of many diseases that affect both humans and animals, and immunologists must continue to work collaboratively to tackle the threat of infectious cross-species diseases, here in the UK and around the world.

Why now?

While the UK is a world leader in the field of veterinary vaccine development, cuts to research funding threaten continued British success in this area. Although the recent announcement of a new Animal Vaccine Manufacturing and Innovation Centre to be established at the Pirbright Institute is welcome, manufacturing capability is still limited.

Funding cuts are not the only threat to the UK's excellence in the field of veterinary immunology and vaccinology. The UK's annual foreign aid budget was decreased this year from 0.7% of national income – the figure that the UK had committed to foreign aid since 2015 – to 0.5%, a difference of around £4 billion. As some of this budget is used to fund work on veterinary vaccines in LMICs, this cut directly threatens the development and provision of vaccines for use in these countries and could have a devastating effect on their agricultural security and economies.

Growing the next generation of veterinary vaccinologists

The report also highlights the lack of early career researchers whose research is focused on animal health, and the recent BSI careers report revealed that fewer than 5% of immunologists would consider a career in veterinary immunology. While recruitment is stable up to PhD level, a lack of funding for post-doctoral and early-career pathways coupled with a perceived lack of job or mentoring opportunities makes it less likely that good researchers remain in the field. As Professor Jayne Hope, Deputy Director at the Roslin Institute, University of Edinburgh, says: “We can attract people into PhD positions relatively easily, but we struggle to keep those people moving through the career path to post-docs and early career fellowships. That's partly to do with funding and partly to do with the perception that there's a lack of career opportunities”.

Our report explains how these barriers need to be removed to challenge the perception that a career in veterinary immunology is less viable than other career paths and, again, underlines the importance of sustained funding to support early career researchers.

Case study: foot-and-mouth disease vaccines

Many readers will remember the UK's foot-and-mouth disease (FMD) outbreak in 2001, which devastated the country's agriculture and tourism industries. At the height of the UK FMD epidemic, 80,000–93,000 animals per week were slaughtered to prevent further spread of the disease, and the outbreak is estimated to have cost £3.1 billion to agriculture, with further losses to tourism and business of around £2.9 billion. Following the catastrophic impact of the 2001 UK outbreak, the law was changed in the UK to allow animals to be vaccinated against FMD. However, continued investment in the UK's vaccine manufacture capabilities is needed to ensure that we – and the rest of the world – can cope with any future outbreaks of FMD and other diseases. “There's a huge global undersupply of the FMD vaccine. It's one of the biggest selling vaccines in the world, but it's still not enough,” says Professor Bryan Charleston, Director at the Pirbright Institute, which monitors and researches the disease.

While FMD outbreaks are fortunately rare in the UK, the disease is endemic in many LMICs. Repeated outbreaks have



a devastating effect on the economies of these countries, thought to cost at least £5 billion per year. The Pirbright Institute is working on the next generation of FMD vaccines, which Prof Charleston says, “induce a much stronger immune response, are more stable, can be stored for longer, and can be adapted quickly for new strains.” Securing sustained funding for zoological vaccines to mitigate the global effects of FMD and other diseases that threaten animal and human health is urgently needed.

The aim of this report is to emphasise the importance of sustained investment in veterinary vaccinology, and we hope that the report's audience recognises that for continued UK leadership in this area, we need to commit to respond to the challenges that we are facing. As Dr Elma Tchilian, Head of Mucosal Immunology at The Pirbright Institute and Chair of the BSI's Comparative and Veterinary Immunology Group says, “This report shows the strength of British veterinary vaccinology and immunology, but funders and policymakers need to be aware that they need to support research and career development if this is to be maintained”.

Ben Wilcock

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Acknowledgements

The BSI would like to thank the IVVN Advisory Group for their collaboration on this report: Dr Tim Connelley; Professor Gary Entrican; Dr Michael Francis and Dr Elma Tchilian from the BSI's Comparative & Veterinary Immunology Group. Thanks also go to all the veterinary immunologists who spoke to us as part of our research and First Create The Media for the text and design of this report.



Download now

You can download a full copy of the report from www.immunology.org/publications/bsi-reports.

BSI policy work update



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Parliament is in recess between the end of July and early September but rest assured that the BSI is not and has continued with its ambitious policy and public affairs programme.

In July, the Government published its Life Sciences Vision document which aims to provide a mission orientated plan for delivering scientific excellence over the next decade. It uses lessons learned from the UK science sector's response to the COVID-19 pandemic to meet bold ambitions that will deliver life-changing innovations in patient care. The Vision aims to bring together the NHS, industry, academia and medical research charities to set their sights on seven critical healthcare missions that have been identified. Immunology is set to play a big part in meeting these challenges, with missions including 'sustaining the UK's position in vaccine discovery, development and manufacturing' and 'enabling early diagnosis and treatments, including immune therapies such as cancer vaccines'. Another mission, 'mental health: redefining the problem and using novel approaches to identify new therapeutic and technological opportunities' will bring together a consortium of academic investigators and industry, which will '[leverage] the UK's investment and world-leading expertise in immunology'. The BSI has written to the Science Minister, Amanda Solloway MP (Con, Derby North), offering our assistance in

the development of the delivery plan and specific programmes through which these missions will be brought to bear, in order to ensure that decisions about immunology will be made with immunologists at the table. The plan for delivery will be set out by the Government after the Spending Review which is expected at the end of October and will likely establish departmental spending levels for the remaining years of the current Parliament.

Immunology research and COVID-19

The BSI is working with Jim Shannon MP (DUP, Strangford), the DUP Health Spokesperson, who led a Westminster Hall debate on 'immunology research and COVID-19' which was held at 13:30 on Thursday 9 September. The topic for this Westminster Hall debate was selected by the Backbench Business Committee, a panel of MPs responsible for determining the business of the House of Commons on a set number of days per year that are not reserved for Government business. These debates are a great opportunity to raise the profile of an issue, both among backbench MPs, but also to the Minister who will have to come to the debate and give an official response at the end of the debate, which customarily indicates the Government's position and the actions it is and is planning to take. At time of writing, the BSI is compiling a briefing for MPs which will champion the successes that the immunology sector has delivered during the COVID-19

pandemic and the role that it has played in ensuring that we can begin the journey back to 'life as normal'. It will also discuss the infrastructure and funding put into place that has created conditions allowing immunology research to flourish, and the importance of continuing this model into the future both for COVID-19 and future pandemic preparedness, as well as thinking about the possibility of replicating it to address other pressing public health issues, such as antimicrobial resistance (AMR) and ageing.

Parliamentary questions

Our outreach to parliamentarians through our parliamentary questions programme continued into July, before Parliament rose for the summer recess, with questions to Ministers in the Department of Health and Social Care. Topics included asking what plans are in place for evaluating the immunological effects of any prospective COVID-19 vaccine booster programme and asking about the long-term immune monitoring of people who have received heterologous vaccine doses. The Minister for COVID-19 and Vaccine Deployment, Nadhim Zahawi MP (Con, Stratford-on-Avon) responded to say that any future vaccine booster programme would have plans developed to evaluate its effect, and that the National Institute for Health Research has commissioned the National Immunisation Schedule Evaluation Consortium to undertake the Com-CoV trial which is gathering data on the long-term immune

'The BSI is compiling a briefing for MPs which will champion the successes that the immunology sector has delivered during the COVID-19 pandemic and the role that it has played in ensuring that we can begin the journey back to "life as normal".'

response of using different COVID-19 vaccines for the first and second doses. We will continue to use parliamentary questions as a method to scrutinise Government decision making and bring certain issues to the attention of the responsible Ministers when Parliament returns for the autumn.

Matthew Gibbard

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Find out more:

Read the Government's Life Sciences Vision in full: <https://www.gov.uk/government/publications/life-sciences-vision>



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The BSI at the European Congress of Immunology

The 6th European Congress of Immunology (ECI), hosted by the Turkish Society of Immunology and the Immunological Society of Serbia, took place online on 1–4 September 2021. The scientific programme offered over 30 symposia and several plenary sessions staged by world-renowned immunologists and clinicians in addition to joint symposia with guest societies.

The British Society for Immunology was delighted to attend virtually, interacting with our global immunology community through the state-of-the-art virtual platform, and organising two sessions.

On Thursday 2 September, we ran an interactive panel discussion for early career researchers (ECRs) led by editors from our official journal, *Immunotherapy Advances*. 'How to accelerate your career through engaging with journals' looked into what scientific journals can do to support the career development of ECRs. The panel comprised the journal's Founding Editor-in-Chief, Professor Tim

Elliott (University of Oxford), Regional Editor for Europe, Associate Professor Marianne Boes (University Medical Center Utrecht) and two members from the recently established ECR Editorial Board, Dr Alsya Affandi (UMC Amsterdam) and Dr Elizabeth Mann (University of Oxford).

The session covered how ECRs can get involved in the editorial and peer review process of a scientific journal and how journals and Editors can engage with ECRs, helping them to build their skills, encouraging them to contribute as journal ambassadors and reviewers while supporting them through the process and ensuring they are recognised for their contribution.

On Friday 3 September, members of the EFIS Vaccine Task Force examined the main challenges that Europe has faced with vaccine rollout programmes during the pandemic. The panellists of the session entitled 'The EFIS Vaccine Task Force: Challenges and opportunities for vaccine uptake across Europe' were Professor Peter Openshaw (Imperial College London), Professor Anne Spurkland (Scandinavian Society for Immunology), Professor Felix Wensveen (Croatian Immunological Society)



and Professor Aurelija Zvirbliene (Lithuanian Society of Immunology). They summarised experiences from their countries and identified some of the effective solutions and future opportunities to the challenges of vaccine engagement in Europe.

This European Federation of Immunological Societies taskforce was established in February 2020 to pool resources and expertise across European immunology to play a key role in reversing the downward trend in childhood vaccination rates as well as other vaccination programmes by providing a strong, engaging, evidence-based and collective voice.

The BSI is very much looking forward to participating at the 7th European Congress of Immunology, which will be hosted by the Irish Society for Immunology on 1-4 September 2024 in Dublin. We hope to see many BSI members there!

charles river

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Congratulations

This is the section of the magazine where we celebrate the achievements of our members. Our congratulations to all who are mentioned here.



BSI Equality, Diversity & Inclusion activity grants

Earlier this year, we launched a new grant scheme to help fund activities and events that promote diversity and inclusion across the immunology community and the wider biomedical sciences. Our aim is to bring together people from different backgrounds, experiences and perspectives to support innovation and research through a diversity of ideas and to solve challenges faced by the immunology community and the wider world. These ambitious and inspiring activities should aim to accelerate culture change and promote visibility with respect to equality, diversity and inclusion. Over the course of the grants, these activities will promote a more diverse, fair and inclusive immunology community.

The BSI is delighted to fund the following projects run by BSI members:

Dr Bronwen Burton and **Dr Caroline McKinnon** from the University of Bristol are being funded to decolonise and diversify some immunology units on the university curriculum.



Dr Anne Corcoran and **Elizabeth Wynn** from the Babraham Institute have been awarded the grant for honoraria for Black speakers and those from other underrepresented ethnicities taking part in EDI talks to recognise the work they do that falls outside the remit of their research.

Dr Calliope Dendrou and **Madeleine Welland** from the University of Oxford are being funded to host a symposium on mental health, coupled with pre-symposium engagement events for improving psychological safety.

Laura Eghobamien and **Adeola Onumonu** from the Black Medical Scientific Network are funded to host an outreach programme for young Black undergraduates in the first or second year of studying for a scientific degree.

Dr Harriet Groom from the University of Cambridge is being funded to run an event centred around the lack of diversity in study subjects for STEM research.

Professor Jayne Hope, **Professor Gary Entrican** and **Dr Omar Abdelsalam Alfituri** from the Roslin Institute at the University of Edinburgh are funded to hold a workshop that aims to capture the lifelong experiences of two late-career immunologists, focusing on the challenges they have faced and the opportunities they have seized.

Professor Anja Muller, **Professor Maria O'Connell** and **Dr Rosemary Norton** from the University of East Anglia have been awarded funding to host an open forum to discuss race and race relations in science.

The 19th Tore Godal prize awards

Congratulations to BSI member **Wasihun Hailemichael** from Debre Tabor University in Ethiopia, who received the 19th Tore Godal Award which recognises outstanding young researchers for their stellar work in research.

The Tore Godal Award is given in the name of the world-renowned Norwegian researcher and global health leader Dr Tore Godal. In the most competitive year to date, the award saw 69 research entries and awarded three researchers: Shimelish Nigusu, Tewachew Awoke and Wasihun Hailemichael.



The Dr Katharine Giles ABSW Award

Congratulations to BSI member, **Professor Sheena Cruickshank** from University of Manchester, who won a 2021 Association of British Science Writers Award. Professor Cruickshank won the Dr Katharine Giles Award for best popular article written by a scientist or engineer for her article in *The Conversation* entitled 'Inflammation: the key factor that explains vulnerability to severe COVID'.

The judges said: 'An article that summarised the links between inflammation and the main risk factors for severe disease resulting from COVID-19. It bravely provided a clear explanation of the underlying science, despite its many complexities.' You can read the article here: <https://bit.ly/3k45x7l>.



We would love to hear from you about your achievements. Have you or a colleague recently received grant funding, passed your PhD viva or accepted a new appointment? If so, let us know by emailing media@immunology.org or tagging [@britisocimm](https://twitter.com/britisocimm) on Twitter.

FUTURE FOCUS

How to make the most of the BSI career development offering

The British Society for Immunology recently announced a significant expansion in the careers support we offer to our membership, including revamped schemes, new initiatives and further funding opportunities. This is a vital part of our mission to support current and future generations of immunologists throughout their careers. In this article, our Education & Careers Officer, Eolan Healy, explores the different ways in which we support our members to achieve the full potential of a highly fulfilling career in immunology through our extensive career development offering.

We know that the last 18 months has been a difficult time for many of our members. At the BSI we regularly monitor the immunology sector for the latest career development opportunities and, moreover, always listen to the needs of our membership through feedback, surveys, Forum, social media chatter, and so on. As a result, the BSI Trustees have approved the release of significant additional funds to put towards supporting our career development activities for members.

The BSI is therefore proud to announce an exciting new range of grants and schemes. Due to immunology's fast growing and dynamic impact on the world of science and medicine and on wider society in general, those working in the field require a huge range of skills and knowledge to effectively adapt to an ever-changing career landscape. Early career immunologists, in particular, need to



navigate a wide range of pathways and to effectively horizon scan a growing number of avenues.

New career support

Our new career-related offering for members can be divided into 'career-enabling foundation support' which helps members at all levels to thrive in their roles and includes core activities that facilitate career progression such as our Conference Grants, Communicating Immunology Grants, Carers' Grants and career development webinar series. In addition, we have activities including offering a crèche at Congress and running our regular Winter Schools aimed at Master's students. Over the coming year, we will also be updating our 2017 Careers Report to examine what the current challenges and barriers are that immunologists face in progressing their careers. We are also launching two new grant schemes: our Regional & Affinity Group Conference Grants and our Regional & Affinity Group Carers' Grants – more on these below.

The second part covers 'career-enhancing initiatives' that provide more intensive and targeted support, through initiatives such as BSI Summer School and our highly popular mentoring scheme. We also plan to introduce some new initiatives over the coming months including expanding our training offering and running a masterclass series from

leaders in the field, touching on specific topics. Most excitingly, we have also launched a new Career Enhancing Grant to provide significant financial support to help members progress in their careers. In this article we will take a closer look at some of the new career offerings from the BSI and give an insight into their structure and support offering.

Career Enhancing Grants

This flagship new BSI grant scheme aims to provide flexible financial support to help immunologists grasp the opportunities and tackle the challenges in their career path.

There are many different paths towards a highly rewarding career in immunology, each one with its own benefits and barriers. To provide valuable support to BSI members at all career stages, across different areas and reaching sectors beyond academia, we developed this grant scheme that allows for tailored support for individuals in our community. We launched this as a pilot initiative to complement our wider career development offering. The end goal? To give your career a boost and help you achieve your full potential.

The grant allows members to provide funding for any type of career-related activity that will help you go a step further in building your skillset and advancing your professional development. The amount you can apply for is variable – we accept

'To provide valuable support to BSI members at all career stages, across different areas and reaching sectors beyond academia, we have developed this grant scheme that allows for tailored support for individuals in our community.'

"I'm delighted to be part of the launch of this new careers package and in particular, the new BSI Career Enhancing Grants. There's already so much value in belonging to the Society but this greatly increases the benefits available to members. The possibilities of these grants are endless, and I encourage folks to think carefully and innovatively about how to make the most of this incredible opportunity."

Dr Donald Palmer, BSI Education & Careers Secretary

"Two years ago, I started as an ECR Trustee in the hope of supporting and promoting early career researchers. I wanted to encourage the BSI to provide more support and funding for ECRs – I'm proud to have played an important role in the development of the new and exciting BSI Career Enhancing Grants!"

Dr Emma Chambers, BSI Early Career Trustee

"The BSI has provided important support for immunologists at different stages in their career, but I am fully appreciative of how tough it is to be an early career researcher in the current climate. I have worked hard to ensure our voices are heard and I'm delighted to have contributed to the development of this new Career Enhancing Grant scheme from the BSI."

Dr Calum Bain, BSI Early Career Trustee

applications for any amount from £100 up to £5,000. Grants are made by competition and assessed by our dedicated grant panel, chaired by BSI Education & Careers Secretary, Dr Donald Palmer.

This grant allows you the flexibility to be creative with your career aims and ambitions. Some examples from our members include securing funding for pilot data, taking workshops/internships in science communication or publishing, funding for new lab equipment or attending a relevant networking event. This grant covers people in all sectors of immunology, including those outside of academia, and is open to UK-based immunologists who do not already have a faculty position or personal fellowship (or equivalent).

Regional & Affinity Group Conference Grants

This new grant scheme aims to support members in attending in-person BSI Regional & Affinity Group conferences. For this pilot year, there will be 10 grants available for each BSI Regional & Affinity Group face-to-face conference, with grants awarded on a first come, first served basis to eligible BSI members. We hope this scheme will help make our events more accessible to a wider range of BSI members.

Find out more: www.immunology.org/grants-and-prizes/bsi-regional-and-affinity-groups-conference-grants.

Regional & Affinity Group Carers' Grant

In addition to the already available carers' grant for our Congress, the BSI is now proud to have a carers' grant for our Regional and Affinity Groups' conferences. The grant can be used to help cover the cost of care arrangements during the conference, for example, to look after children, or for additional care for the applicant themselves during the conference. The funding available is £100 for a one-day conference or £200 for a two-day conference.



Find out more: www.immunology.org/grants-and-prizes/bsi-regional-and-affinity-group-carers-grant.

Medical Elective Grant

The Medical Elective Grant offers the chance for medical undergraduate students to get financial support to undertake a formal immunology-related placement in a selected laboratory for their medical elective. Medical electives can provide key experience for budding researchers who wish to acquire cutting-edge skills and develop laboratory experience. Applicants can apply for up to £1,500 (depending on the location of the placement). This grant is reviewed quarterly, with the next deadline on 1 December 2021, and applicants are asked to apply four to six weeks prior to the commencement of the placement.

An example of a previous medical elective placement funded by the BSI is that of medical student Charlotte Grant who worked in the MRC Unit in The Gambia on tuberculosis research. You can read more of Charlotte's story here: www.immunology.org/news/medical-elective-in-the-gambia.

Find out more: www.immunology.org/grants-and-prizes/bsi-medical-elective-grant.

The above is a brief overview of the BSI's new enhanced careers offering. Immunology researchers and graduates develop many skills and attributes over the course of their careers which are

highly transferable and sought after by other sectors and by industry as well as academia. Nevertheless, it is a competitive environment that immunologists are in and many alternative careers such as science communications or publishing will be open to the whole of biosciences and a plethora of researchers and graduates. Availing of the careers support that the BSI offers is the ideal way for immunologists, especially at early career stages, to broaden horizons both beyond academia and within it.

In light of the COVID-19 pandemic it is more important than ever to stand out from other applicants, and making the most of your BSI membership can help you achieve your career goals. Whether you want to remain in academia and use our new grants and schemes to help you take the next step or whether you want to shift into a different but related sector, the BSI is here to support and help you at every step of the way.

Eolan Healy

BSI Education & Careers Officer
Email: e.healy@immunology.org



Find out more:

Find out more about our new career offering

www.immunology.org/news/new-bsi-career-development-offering.

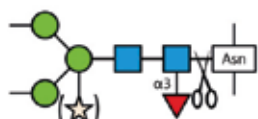
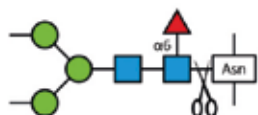
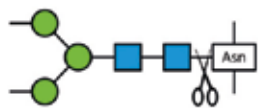
If you have any questions, please email us at careers@immunology.org.

Cutting Out Sugar?

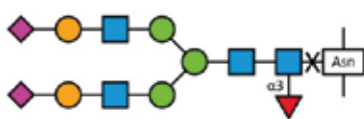
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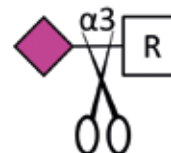
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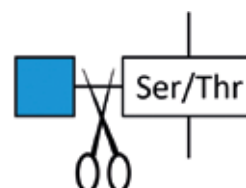
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BSI Regional and Affinity Groups at Congress 2021:

Inspiring parallel sessions

Our Regional & Affinity Groups have been closely involved in organising some of the parallel sessions at BSI Congress 2021 and they are very much looking forward to seeing you there. Visit the Congress website www.bsicongress.com for more details.

Monday 29 November

BSI London Immunology Group
Immune development and function from foetal to neonatal life

Chairs: James Harker and Naomi McGovern

Invited speakers:

- **Petter Brodin**, Karolinska Institutet,
- **Florent Ginhoux**, A*STAR
- **Frits Koning**, Leiden University
- **Sejal Saglani**, Imperial College London

BSI Tumour Immunology Affinity Group and BSI Edinburgh Immunology Group
Unique immunological landscape of the tumour microenvironment

Chairs: Yi Feng, Awen Gallimore and Alan Serrels

Invited speakers:

- **Seth Coffelt**, University of Glasgow
- **Catherine Fridman**, Paris Descartes University
- **Gareth Jones**, University of Bristol
- **Jeffrey Pollard**, University of Edinburgh

BSI Greater Manchester Immunology Group and BSI Ulster Immunology Group
Regenerative inflammation and tissue repair

Chairs: Yvonne Dombrowski and Kimberly Mace

Invited speakers:

- **Paul Martin**, University of Bristol
- **Veronique Miron**, University of Edinburgh

Get involved with our Groups!

Learn more about our Groups and find which ones fit with you: www.immunology.org/bsi-regional-and-affinity-groups.

Follow them on Twitter: bit.ly/BSI_Groups_Twitter.

Tuesday 30 November

BSI Tumour Immunology Affinity Group & National Cancer Research Institute
Advances in cancer immunology: bringing two communities together

Chairs: Richard Buchanan and Sarah Dimeloe

- **Tim Elliott**, University of Oxford
- **Sophie Papa**, King's College London

BSI Greater Manchester Immunology Group
Emerging functions of the Innate Lymphoid Cell (ILC) family

Chairs: Matthew Hepworth and David Withers

- **Tim Halim**, University of Cambridge
- **Kazuyo Moro**, RIKEN

BSI Wessex Immunology Group
Ocular immunology

Chairs: Adnan Khan and Jessica Teeling

- **Virginia Calder**, University College London
- **Colin Chu**, University of Bristol

BSI Edinburgh Immunology Group
The influence of sex hormones and chromosomes on inflammation and immunity

Chairs: Douglas Gibson and Stephen Jenkins

- **Jean-Charles Guéry**, INSERM
- **Sabra Klein**, Johns Hopkins Bloomberg School of Public Health

BSI Yorkshire Immunology Group
Understanding immunity through the RNA lens

Chairs: Dimitris Lagos and Claudia Ribeiro de Almeida

- **Jorge Henao-Mejia**, University of Pennsylvania
- **Rose Zamoyka**, University of Edinburgh

Wednesday 1 December

BSI Wessex Immunology Group
Advances in the field of antigen processing and epitope discovery

Chairs: Edd James, Emily Milodowski, Emma Reeves and Linda Wooldridge

- **Chris Garcia**, Stanford University
- **Edd James**, University of Southampton
- **Nicola Ternette**, University of Oxford
- **Linda Wooldridge**, University of Bristol

BSI Edinburgh Immunology Group & BSI Greater Manchester Immunology Group
Immunology at the interface: Understanding barrier immunity

Chairs: David Donaldson and Joanne Konkel

- **Francesco Colucci**, University of Cambridge
- **Tracy Huseell**, University of Manchester
- **Neil Mabbott**, University of Edinburgh
- **Niki Moutsopoulos**, National Institute of Dental and Craniofacial Research

BSI Neuroimmunology Affinity Group
Immunology of neurodegeneration and regeneration

Chairs: Sandra Amor and David Owen

- **Erik Boddeke**, University Medical Center Groningen (UMCG)
- **Alerie Guzman de la Fuente**, Queen's University Belfast

BSI Inflammation Affinity Group
Innate inflammatory signals regulating T cell responses

Chairs: Emily Gwyer Findlay and Robert Snelgrove

- **Minsoo Kim**, University of Rochester Medical Center
- **Inés Pineda-Torra**, UCL

BSI Inflammation Affinity Group
Immune mechanisms in cardiovascular disease

Chairs: Cecile Benezech and Pasquale Maffia

- **Claudia Monaco**, University of Oxford
- **Paul Welsh**, University of Glasgow

BSI Mathematical Modelling Affinity Group
Mathematical and systems immunology

Chairs: Aleksandra Kmiecik and Ben Seddon

- **Becca Asquith**, Imperial College London
- **Mark Coles**, University of Oxford

Immune Update

The BSI journals

A round-up of new research published in the British Society for Immunology's official journals *Immunology*, *Clinical & Experimental Immunology* and our new Open Access journal *Immunotherapy Advances*. Members can access these journals free of charge at www.immunology.org/journals.

Clinical & Experimental Immunology

GM-CSF gain of function mutation in a Behçet's disease-like disorder marked by extreme pathergy

Behçet's disease (BD) is a rare disorder characterised by systemic vasculitis mainly affecting men in the Middle East and Central Asia. BD is generally recognised as an autoinflammatory illness caused by hyper-reactivity of mainly the innate immune system. This study describes a single Dutch family suffering from BD-like disease with extreme pathergic responses, but without systemic inflammation.

Rösler *et al.* carried out whole-exome DNA sequencing, identifying an extremely rare heterozygous variant in *CSF2* affecting one of the N-glycosylation sites on GM-

CSF. An assay measuring phosphorylation of a molecule downstream of the GM-CSF receptor revealed the variant GM-CSF to have increased signalling activity compared with wild-type.

As increased levels of GM-CSF have previously been shown to promote severe inflammation, the hyperactive GM-CSF seen in this variant is thought to mimic several aspects of BD.

These findings may provide cause to re-evaluate existing genetic data of atypical BD patients to check for GM-CSF pathway-related mutations and offer new

opportunities for personalised treatment.

Rösler *et al.* 2021 *Clinical & Experimental Immunology* **204** 189–198 <https://bit.ly/3frTEXX>



Immunotherapy Advances

Type 2 immunity is maintained during cancer-associated adipose tissue wasting

Cachexia is a metabolic syndrome characterised by loss of fat and muscle mass observed in cancer and other chronic diseases. Gastrointestinal malignancies have disproportionately high rates of cancer-associated cachexia (CAC) which significantly reduces quality of life and treatment options in these patients.

This study sought to characterise the immune landscape of CAC in pancreatic and colorectal cancers. Lenehan *et al.* observed changes in fat and muscle mass during cachexia in a mouse model of pancreatic cancer. RNA sequencing revealed that IL-6 and IgG are strongly elevated in wasting

adipose tissue (AT) of tumour-bearing mice, however a regulatory T helper 2 signature is maintained. These findings were consistent in human AT from colorectal cancer patients and



stand in contrast to the strong inflammatory skewing observed in other AT pathologies such as obesity and diabetes.

These findings have implications for the field of immunotherapy, as there is a known association between adiposity and responsiveness to immune checkpoint blockade in cancer patients. Further studies are needed to fully characterise the immunologic shifts that occur in AT and other target organs during the development of CAC.

Lenehan *et al.* 2021 *Immunotherapy Advances* **1** ttab011 <https://bit.ly/3xnkCpl>

Immunology

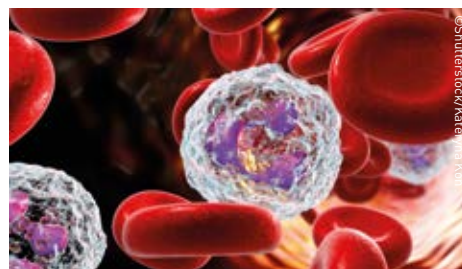
The red blood cell as a novel regulator of human B-cell activation

Non-immune cells are increasingly recognised as important in regulating immunity, but the role of red blood cells (RBC) remains relatively unexplored, despite their abundance in the circulation and a cell surface rich in potential ligands. This study sought to determine whether red blood cells influence the activation state of human B cells.

Lennon *et al.* separated RBC from whole blood and observed an increased expression of B-cell activation markers. Reconstitution reduced the levels of B-cell activation markers

as well as decreasing proliferative responses and IgM secretion. To confirm whether exposure to RBC affects B-cell function, unstimulated CD19⁺ B cells were incubated in the presence of RBC. This resulted in decreased levels of IgM and inhibition of proliferative B-cell responses, but inhibition could be abrogated by either removal of sialic acids from RBC or blocking the corresponding lectin receptor CD22 on B cells.

Although the biological relevance of any of the changes in B-cell function *in vitro* remains to be established, taken together, these data



point to RBC as regulators of a wide range of B-cell activities.

Lennon *et al.* 2021 *Immunology* **163** 436–447 <https://bit.ly/3AbjYgR>

Around the journals

A summary of some of the latest papers from the world of immunology. Written by Edd James, Louisa James, Donald Palmer and Laura Anderson.

Distinct transcription factor networks control neutrophil-driven inflammation

Neutrophils are an important component of innate immunity, being abundant, but relatively short lived and have diverse functionalities. More recently, neutrophils have been demonstrated to be transcriptionally active, adapting and changing their transcriptional programme while trafficking to naïve tissues.

Here, Khojraty *et al.* use transcriptional and chromatin profiling of neutrophils in a mouse model to show that during inflammation they undergo chromatin remodelling at two transition stages (bone marrow to blood and blood to tissue).

This remodelling is linked to factors KLF6 and RUNX1, which modulate neutrophil maturation, RELB, IRF5 and JUNB which drive effector responses and RFX2 and RELB which promote survival. Interestingly, these factors work to either open or close chromatin during the transition stages. Furthermore, knockout of JUNB reduced neutrophil-mediated tissue destruction following acute myocardial infarction.

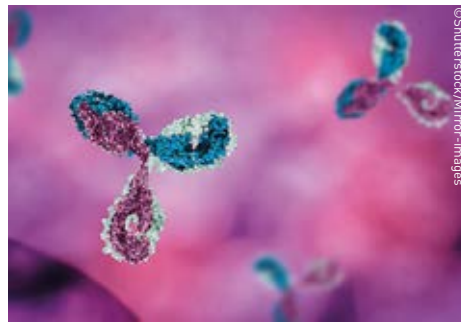
These results identify the blueprint for transcriptional regulation of neutrophils and could enable the control of neutrophil responses at different stages for therapeutic benefit.

Khojraty *et al.* 2021 *Nature Immunology*
DOI: 10.1038/s41590-021-00968-4

Dynamic regulation of B cell complement signalling is integral to germinal centre responses

The germinal centre (GC) is essential for the production of highly functional, affinity matured antibodies. In a recent study, Cumpelik *et al.*, revealed how the complement pathway plays a crucial role in regulating normal GC function.

The authors found that the GC-specific transcription factor BCL-6, downregulates the expression of delay accelerating factor (DAF/CD55), an enzyme which accelerates the decay of C3 convertase and limits the formation of the anaphylatoxins C3a and C5a. Accumulation of C3 convertase at the B cell surface permits signalling through C3a and C5a receptors which, in turn activates mTOR-dependent B cell proliferation. Concurrent upregulation of CD55 prevents the formation of the membrane attack



complex, which would result in B cell lysis. Disruption of complement signalling, either by overexpression of DAF or receptor knockout, resulted in a defective germinal centre response.

This study highlights how the complement pathway regulates humoral immunity through affinity-driven positive selection of germinal centre B cells.

Cumpelik *et al.* 2021 *Nature Immunology*
22 757–768

Role of the aged microenvironment in age-related immune dysfunction

Ageing is associated with immune dysfunction often leading to chronic inflammatory diseases. Barkaway *et al.* further explored this phenomenon by examining age-associated alterations in neutrophil trafficking.

In an IL-1 β -induced model of inflammation, the authors observed enhanced neutrophil adhesion on endothelial cells (EC) in aged mice in comparison to young. However, in aged mice there was reduced neutrophil infiltration into the

perivascular space (reverse transendothelial migration; rTEM). Further studies revealed that CXCL1 was elevated in aged tissue (due to mast cells), while the chemokine receptor ACR1 was upregulated on aged EC. Such changes led to aged neutrophils exhibiting reduced CXCR2 migratory activity. Finally, in an animal model of lung damage in which rTEM contributes towards tissue destruction, blocking CXCL1 in aged mice provided protection against such damage.

This study highlights the potential role of the aged microenvironment in age-associated immune dysfunction.

Barkaway *et al.* 2021 *Immunity* 54 1494–1510



Potential yeast-based vaccine platform for East Coast Fever in cattle

East Coast Fever (ECF) is a tick-borne infection caused by the parasite *Theileria parva* that affects cattle in sub-Saharan Africa. It is an economically important disease, causing more than one million cattle deaths and financial losses for farmers of approximately 300 million US dollars annually. However, current immunisation procedures for ECF are costly, laborious and difficult to standardise on a commercial scale.

Here, Goh *et al.* suggest a safe, affordable, stable and orally applicable vaccine candidate for ECF using *T. parva* antigens with *Saccharomyces cerevisiae* as an expression platform. *In vitro* analyses confirmed the effectiveness of the vaccine platform in inducing IFN γ responses in bovine PBMCs and enriched bovine CD8⁺ T cells. Additionally, the researchers showed that oral administration of the vaccine platform in mice induces an antigen-specific antibody response.

Further experiments to verify induction of protection in cattle are needed but this study highlights the oral application of yeast expressing *Theileria* antigens as a strong vaccine candidate for ECF in sub-Saharan Africa.

Goh *et al.* 2021 *Frontiers in Immunology*
DOI: 0.3389/fimmu.2021.674484



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