

Immunology News

December 2021 | ISSN 1356-5559

Better health for all through immunology:

our new vision, mission and strategy

Infectious:

fascinating stories
throughout history

Edinburgh highlights:

BSI Congress 2021

CEI at 55:

advances in translational
immunology

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Welcome to the winter edition of *Immunology News*. With our Congress just around the corner, we have been working hard to get ready for a record-breaking number of you (over 1,500 and counting!) to join us in-person or online. If you're wondering what to expect this year, turn to pages 9–11 for a selection of scientific highlights, networking opportunities and tips for how to make the most out of your time in Edinburgh. One of my favourites at Congress is the chance to interact with members from all around the world – the connections you make during the conference can be incredibly valuable for the year ahead and beyond. Our Trustees, Committee members and staff are looking forward to welcoming you and answering your

questions about the Society's work. The best way to discover how we plan to support you and represent immunology is by coming along to our AGM at Congress on Monday 29 November, plus you can tell us how we're doing and get involved. This issue is packed with a range of noteworthy articles about the BSI's activities and what our members are up to, including an interview with BSI member, Dr John Tregoning, about his new popular science book and our Tumour Immunology Group's preview of their upcoming conference. And there's much more in here that you don't want to miss!

Teresa Prados

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VIEW FROM ... THE BSI PRESIDENT



We're approaching the end of the year and with it, the much-anticipated BSI Congress 2021. This is a momentous event for many of us and for the Society. For those of us who have been part of the BSI for a significant period of our careers, it has been a welcome constant, an opportunity to congregate, catch up with old friends and meet new ones. If this is your first BSI

Congress, I would like to encourage you to use this occasion to get to know the Society better – we are a friendly bunch and we are always looking to socialise with fellow immunologists. No matter what sector or career stage you are in, there is a place for you at the BSI. Please do come say hello on Monday evening – the trustees, committee members and journal editors will be at the BSI stand (number 11).

I am pleased to highlight the new BSI strategy which sets out an ambitious plan for how we will support members and the discipline of immunology over the next five years. Our vision of better health for all through immunology would not be possible without our members driving scientific discovery and making a positive impact on health. I am continuously inspired by the hard work and dedication of BSI members and immunologists around the world – together we are changing the world for the better, delivering better health for people and animals.

Lastly, I would like to invite you to look back at the past 55 years of *Clinical & Experimental Immunology (CEI)*, the official journal of the BSI focusing on translational immunology (pages 18–20). As part of the BSI family of journals, *CEI* plays an important role in the advancement of immunological

knowledge. A big thank you to all the editors and in particular, Editor-in-Chief, Professor Leonie Taams, who marks her fifth year expertly leading the journal. And thank you to our members for continuing to act as ambassadors of the BSI journals – by supporting them you are ensuring the continued success of the Society.

Warm thanks to the BSI Board of Trustees, Forum and other focus groups for all their dedicated work over the last year. Finally, I would like to thank our CEO, Doug Brown, his Senior Management Team and the rest of the members of the BSI office for their excellent and continued hard work under duress during the lockdown. They work in the background of the Society, but the smooth and efficient management of the BSI would not be possible without them.

With best wishes

Arne Akbar

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

VIEW FROM ... THE CHIEF EXECUTIVE

Welcome to this bumper issue of *Immunology News*, which reflects another action-packed few months for the BSI! First, I'm delighted to announce that we have launched our new strategy (pages 6–7). Working with members, our committees and the BSI Board, we have brought together all of your feedback and ideas into an ambitious but eminently achievable strategy through to 2025. It is clear that immunology will provide the answers for many of our human and animal health challenges, which is why we are upping the ante to provide more support to our members than ever before. It is going to be quite the journey, and we look forward to working with you all to deliver on all our priority areas.

One of the major activities we will be delivering as part of our strategy is, of course, BSI Congress! We cannot wait to host you in Edinburgh for four days of inspiring science – don't miss our AGM – we would like to see as



many of you there as possible.

Please do turn to pages 26 to 31 to hear about what our Corporate Members are doing. Our Corporate Members are very important to us – we really value the relationship we have with them and we're incredibly grateful for their support.

Also, on pages 22–23 we showcase an innovative COVID-19 vaccine engagement project that we delivered in partnership

with the London Borough of Bexley. This was an ambitious project for us but one that resulted in huge success, and that we are now discussing how to take forward in a bigger way.

There is so much more to read in this issue, I hope you enjoy it. And, as always, a huge thanks to the BSI staff team for delivering such amazing initiatives, to our partners and Corporate Members and to you, our whole membership, for your unwavering support that has made all of this possible. I cannot wait to see many of you in Edinburgh! Keep up the good work.

Doug Brown

Chief Executive,
British Society for Immunology
Email: d.brown@immunology.org

SOCIETY NEWS

Make a difference for immunology!

The British Society for Immunology is run for its members and by its members. Over the next year, we have a number of vacancies that will become available on our committees.

For the success of our organisation, it is vital that we have Society members who are willing to stand for election and contribute their knowledge, expertise and experience to ensure that we are doing all we can to support our members and the field of immunology as a whole. This is a fantastic opportunity for you to get involved in the work of the Society

and to make a real difference to immunology in the UK. We would like to actively encourage nominations from members from all backgrounds, career grades and locations around the UK. You don't need to have previous experience of sitting on a committee, but you do need lots of enthusiasm and a willingness to get involved to help formulate our activities and policies.

Upcoming vacancies

In the new year, we will put out a call for nominations for the following positions:

Board of Trustees

- President
- Chair of Forum
- General Trustee

These roles are due to commence in December 2022.

- Early Career Trustee – due to commence in July 2022

Secretary roles

- Public Engagement Secretary – due to commence in December 2022.

Forum

- England Representative
- Early Career Representative
- Clinical Representative
- Veterinary Representative

These roles are due to commence mid-2022.

- Scotland Representative – due to commence at the end of 2022.

Nominations for all of these positions will open in the new year. Appointment will be decided by membership elections to be held in late spring. Please do consider putting your name forward to get involved with our committees.

BSI Forum: there 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.

In September, we met virtually for another important session discussing research culture and community, and diversity champions within the BSI. First, Forum focused on improving research culture, a vital focus of the new BSI strategy. Members shared their experiences of different aspects of the current culture that they have witnessed, as well as feedback on how it can be improved. It was evident that this discussion merits a significant focus to ensure careers in all branches of immunology can be more positive and fulfilled. Feeding in Forum's views, the BSI will publish an updated 'Careers in immunology' report as part of the 2021–2025 strategy.

Next, we delved into equality, diversity

and inclusion. This is a critical aspect of our five-year plan and as such, we are launching a BSI ED&I strategy shortly. With it, we are renewing our commitment to building a fairer, more inclusive immunology community and maintaining a two-way conversation with our community. An important part of that conversation is our regular meetings with Forum. In the most recent one, we specifically looked into how ED&I must be embedded into every aspect of the Society's work and members discussed the best approach of establishing diversity champions in every BSI committee, including Forum.

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.

Annual General Meeting

17:30–18:00, Monday 29 November 2021
EICC Edinburgh, BSI Congress 2021

All BSI members are invited to join us for our Annual General Meeting, which will be held at BSI Congress in Edinburgh. Come along to find out about the work of your Society, what activities we have carried out in the past year and what our plans are to support you and represent immunology in the UK. We encourage as many of you as possible to attend. If you have any queries, please contact us at bsi@immunology.org.

British Society for
immunology

SOCIETY NEWS

British Society for Immunology strategy 2021–2025

The British Society for Immunology has always stood shoulder to shoulder with our members to promote and support the discipline of immunology – never has this been more important than today. Our new strategy, developed in close consultation with members, sets out our vision for immunology and how the BSI will work to achieve this goal over the next five years.

We believe that immunology can change the world for the better, delivering better health for humans and animals. Our ambitious five-year strategy sets out how the BSI plans to play our part in delivering this vision of better health through immunology. We hope you will join us on this journey.

Our vision

Better health for all through immunology

Our mission

We are committed to supporting our immunology community in driving scientific discovery and making a positive impact on health



Connected community

By 2025, we will provide the immunology community with support to establish more connections and enhance collaboration, both within the field, and with other related scientific disciplines and between sectors. We will do this by:

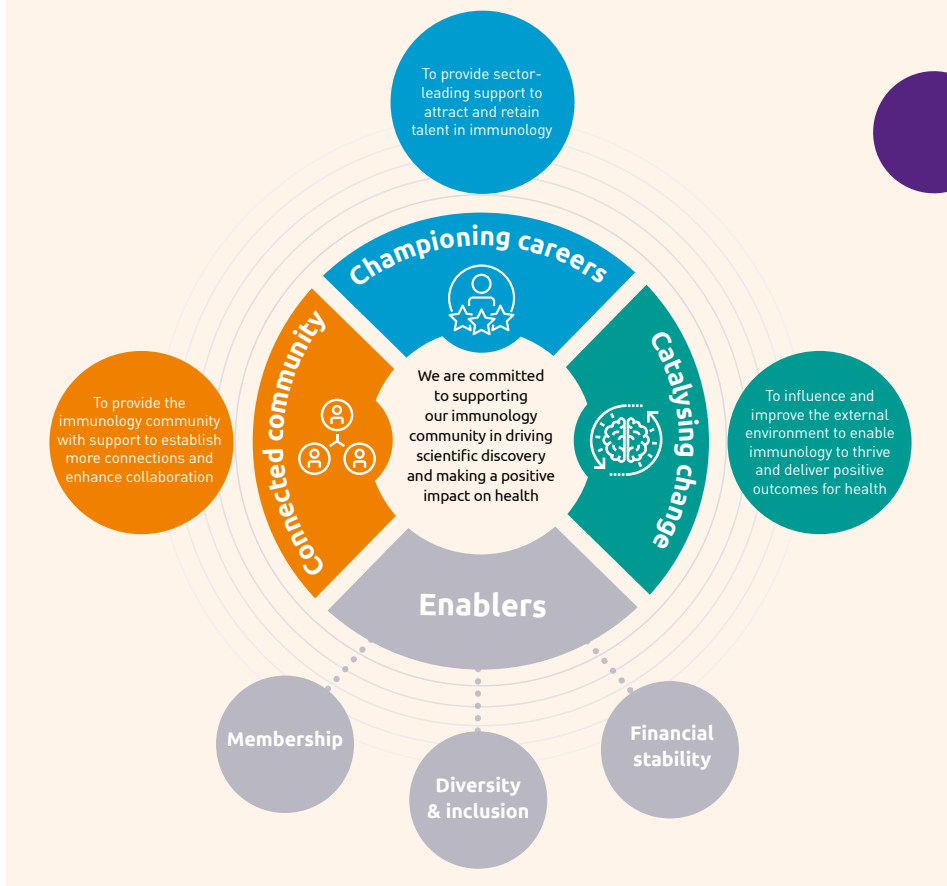
- Expanding our activities and support to further enable our members to network and engage with each other across the immunology community
- Increasing the number and diversity of interdisciplinary connections with industry as well as between immunology and other relevant research and clinical fields
- Initiating and supporting national and topic-specific research consortia efforts relevant to immunology

Championing careers

By 2025, we will provide sector-leading support to attract and retain talent in immunology. We will do this by:

- Up-skilling and training more of our members than ever before
- Creating a more inclusive and supportive research culture and community, assisting our members and providing opportunities for a career in immunology
- Recognising and promoting outstanding achievements and performance from BSI members





Catalysing change

By 2025, we will influence and improve the external environment to enable immunology to thrive and deliver positive outcomes for health. We will do this by:

- Having demonstrable impact on public health, policy, practice and research funding issues important to immunology and our members
- Influencing public opinion and engagement in key immunology matters
- Maintaining the BSI as an internationally respected thought leader

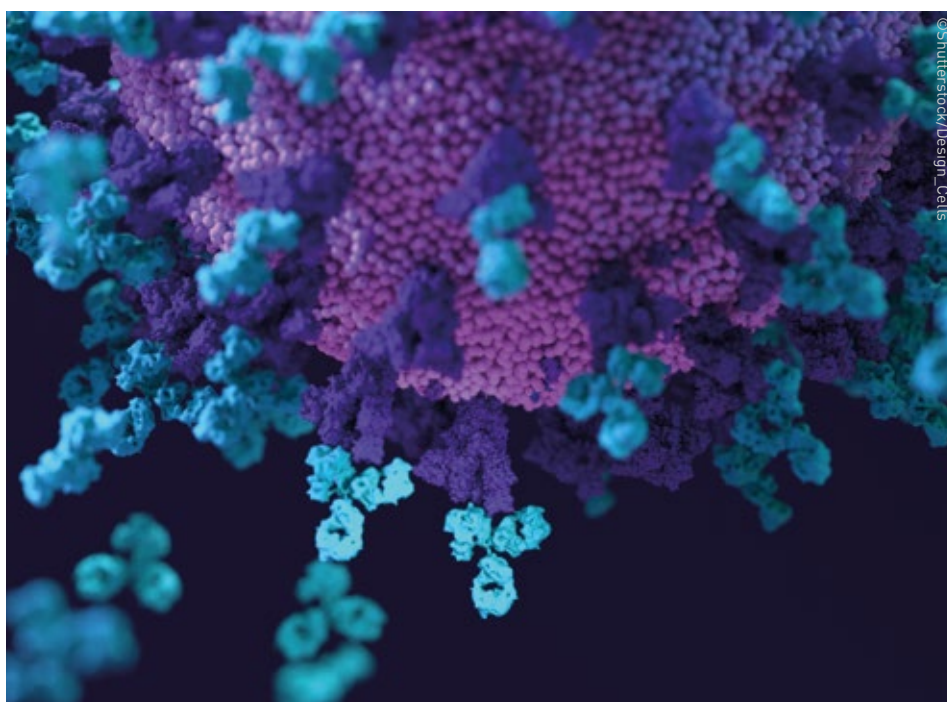
Our enablers

To deliver our ambitious strategic aims, we need to maintain the BSI as a sector-leading organisation. We will achieve this by:

- Creating a larger and more diverse engaged membership
- Embedding equality, diversity and inclusion in all our activities
- Ensuring the Society's financial sustainability

Our values

Our new values make it clear how the BSI will work to meet our mission. Our values tell you who we are as an organisation, what we stand for and ensure that our focus is clear for the challenges and opportunities ahead. Our values will be evident in what we do, how we do it, and how we work together. Through living these values, we will maximise the impact we make for immunology.



Our values:

- Ambitious and committed
- Evidence-based and responsible
- Collaborative and inclusive
- Agile and energetic

Find out more

Read our full 2021 – 2025 strategy on our website at www.immunology.org/about-us/strategy. If you have any feedback, please email membership@immunology.org.



BSI | Fluidigm Research Award

REIMAGINE
IMMUNE PROFILING



Fluidigm, in collaboration with the BSI, has decided to award two of the most impactful proposals in immunology which were aimed profiling in-depth all major immune cell types present in human tissue within a specific disease state. We are proud to announce the winners and the titles of their projects:



Dorit Verhoeven, MD
Amsterdam University Medical Center

Inborn errors of immunity - A multiparametric approach to uncover immunodysfunctions in infants



Wiebke Nahrendorf, PhD
University of Edinburgh

The effect of chronic infection on the bone marrow memory T cell niche

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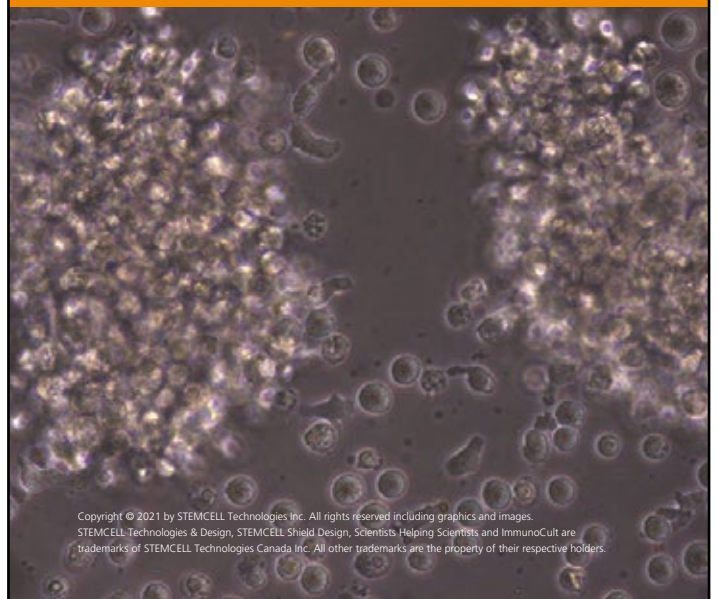
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SOCIETY NEWS

BSI Congress 2021

Sunday 28 November to Wednesday 1 December, Edinburgh, UK

There are only a few days to go until the return of our flagship event. We are looking forward to reuniting with many of you in beautiful Edinburgh, as well as meeting some new faces for the first time. We have a fantastic programme lined up for you with a mixture of parallel sessions, plenary talks, poster sessions and those much-anticipated networking opportunities!

Scientific highlights**Bright Sparks in Immunology, PhD and Postdoc**

12:30 – 16:00, Sunday 28 November

Keynote presentation

World-renowned immunologist Dr Rafi Ahmed (Emory University, USA) will discuss his highly influential work in shaping our current understanding of memory T cell differentiation and anti-viral T and B cell immunity.

18:00 – 19:00, Sunday 28 November

Metabolic programming of immune responses

Plenary session featuring Prof Andrew Mellor, Prof Edward Pearce and Dr Alice Prince

09:00 – 10:30, Monday 29 November

Human genetic determinants of infection and inflammation

Plenary session featuring Dr Carl Anderson and Dr Jean-Laurent Casanova

16:30 – 17:30, Monday 29 November

Defining the state and functional relevance of T cell exhaustion

Plenary session featuring Dr Andrea Schietinger, Dr Benjamin Youngblood and Prof Dietmar Zehn

09:00 – 10:30, Tuesday 30 November

Calling time on immunology

Plenary session featuring Dr Andrew Loudon and Prof Christoph Scheiermann

16:30 – 17:30, Tuesday 30 November

Defining immune microenvironments in organogenesis, inflammation and cancer

Plenary session featuring Prof Michael Brenner, Prof Reina Mebius and Dr Jacqueline Shields

09:00 – 10:30, Wednesday 1 December

Immunology in action: controlling COVID-19

Plenary session featuring Dame Prof Sarah Gilbert and Prof Paul Moss

16:30 – 17:30, Wednesday 1 December

**BSI AGM – have your say!**

17:30 – 18:00, Monday 29 November

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.



Make the most of your Congress experience

- ✓ **Get inspired at Bright Sparks** – make sure you arrive in time for our Bright Sparks session at 12:30 on Sunday 28 November, which highlights the best work from early career researchers. Be ready for innovative science, creative presentations and friendly competition for prizes.
- ✓ **Network** – the BSI Congress is the perfect opportunity to interact with others in your field who you wouldn't normally get a chance to meet. Why not make a point of talking to one person each day who you haven't spoken to before? You can be ready to connect online with anyone you meet by having your LinkedIn profile up to date. We'll be sharing updates from our LinkedIn

page throughout the conference; follow us for the latest news on all our activities: www.linkedin.com/company/british-society-for-immunology.

- ✓ **Preparation is key** – review the programme before Congress starts and prioritise attending those sessions which are most interesting and relevant to you. Download the Congress app to check the programme on the go and add sessions to your calendar.
- ✓ **Don't miss the poster sessions** – poster sessions are an opportunity to mingle and make new connections while discussing immunology. You might come across a new method or model that could be valuable to your own work.

- ✓ **Get your stamp in our 'Passport for Prizes' competition** – make sure you visit each exhibition stand to be entered into a prize draw!
- ✓ **Showcase your favourite immune cell** – the immune cell badges from BSI Congress 2019 are coming back! Head to the BSI stand to secure your immune cell(s) of choice and keep an eye on [@bsicongress](https://twitter.com/absicongress) on Twitter for some fun polls about future badges.
- ✓ **Dance the night away** at the Congress Party taking place at Brewhemia on the Tuesday evening. The party starts at 21:00 and tickets cost only £15 including two drinks vouchers – book via the Congress website.



Additional sessions

The BSI is hosting a number of additional sessions in which you can increase your knowledge on a range of topics that can boost your career and widen your horizons.

Engaging with the public about COVID-19 vaccines

– a panel discussion to increase your skills and confidence in having constructive conversations about COVID-19 vaccinations with the public.

16:00 – 16:45, Sunday 28 November

Immunology funding opportunities: meet the funders

– an interactive session to ask your questions to three of the key research funders on where their funding priorities lie and how to write a successful grant application.

13:15 – 14:15, Monday 29 November

Meet the BSI Trustees, Committee members and Editors-in-Chief

– come along to the BSI stand to meet our Trustees, Committee members and the Editors-in-Chief of our official journals to find out what their roles entail and explore how you can get involved.

18:00 – 19:30, Monday 29 November

How to accelerate your career through engaging with journals

– a panel discussion for early career researchers (ECRs) to ask questions about how to overcome barriers in building experience as a reviewer and gain skills and confidence through engaging with journals, including practical advice from other ECRs and the Editors-in-Chief of the BSI journals.

13:15 – 14:10, Tuesday 30 November

Education meet-up – an informal meet-up for anyone interested in teaching in which you will get the chance to discuss

current topics in the field and share ideas, techniques and resources.

18:00 – 19:00, Tuesday 30 November

Meet the BSI Groups – our Regional and Affinity Groups play a huge role in our work, connecting us with our members and running innovative events. Come to the BSI stand to meet representatives from our Groups and discover how you can get involved.

18:00 – 19:00, Tuesday 30 November

Presentation theatre – throughout the conference, you can pop in to the presentation theatre in the exhibition hall for a 15-minute showcase on a range of areas such as the value of veterinary vaccines, career development support and practical steps to make your lab greener.

At various times

Connect with us

Make sure you're following [@bsicongress](#) on Twitter to stay updated and include the official conference hashtag **#BSI21** in your posts to connect with other attendees.

Stop by the BSI stand (number 11) in the exhibition centre to say hello – we'd love to see you!

 Download the Congress app

Stay in touch

Follow our other accounts to keep up with our activities and stay connected with your fellow BSI members:



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Any questions?



www.bsicongress.com

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

Joint sessions

We work with many different partners to drive both knowledge sharing and collaboration between our research communities. At BSI Congress 2021 we're delighted to be holding joint sessions with the Biotechnology and Biological Sciences Research Council (BBSRC) and the National Cancer Research Institute (NCRI).

BBSRC JOINT SESSION

Influence of co-infection on host responses

11:00 – 12:45, Monday 29 November

Parallel session featuring Prof Jose Bengoechea and Prof Eleanor Riley

NCRI JOINT SESSION

Advances in cancer immunology: bringing two communities together

11:00 – 12:45, Tuesday 30 November

Parallel session featuring Prof Tim Elliott and Dr Sophie Papa. Organised with the BSI Tumour Immunology Affinity Group

BSI Congress for all

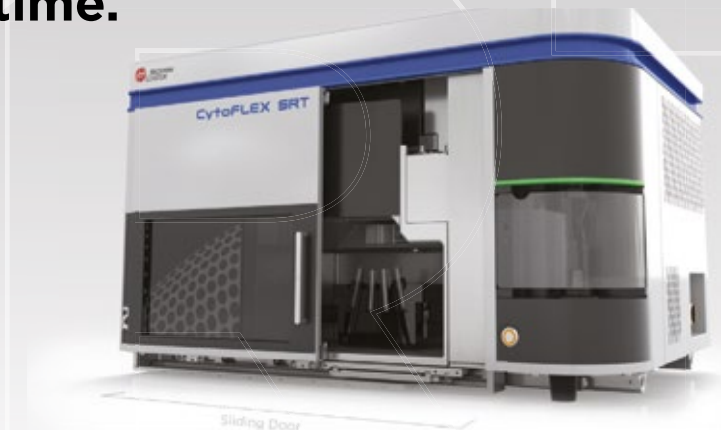
Ensuring that the BSI Congress is accessible to all is extremely important to us. We introduced new initiatives at our last Congress which we are pleased to offer again, including the BSI Carers' Grant to support the cost of attendees' care arrangements while attending the conference and a travel bursary to support as many of our members as possible to join us. We're pleased to offer onsite crèche facilities for delegates wishing to bring their children. Please head to the BSI Congress

website for details on all the facilities available, including prayer and quiet rooms, venue accessibility and bringing children and babies to Congress.



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SOCIETY NEWS

Grant success: supporting our members through our Career Enhancing scheme

A vital part of the BSI's mission is to support current and future generations of immunologists throughout their careers. To further our support, earlier this year we significantly expanded our career development offering, including a new flagship scheme for any type of career-related activity that will help boost our members' careers.

The BSI Career Enhancing Grants allows for tailored support for individuals in our community through flexible funding to help immunologists grasp the opportunities and tackle the challenges in their career path. This pilot scheme has been incredibly well-received by our membership – we received a large number of applications of very high-quality and we are delighted to have funded seventeen excellent applications. Here, we showcase four case studies of projects that we are funding with this scheme.

Dr Mariolina Salio, University of Oxford

A Clinical Research Fellow at the MRC Human Immunology Unit at Oxford, Mariolina has been a senior member of the former director's research group for several years and is now looking to transition to independence. In order to build her own group Mariolina is looking to undertake training in leadership for group leaders. This will be the EMBO Leadership course in Heidelberg in Germany. This four-day course will cover key aspects of leadership including values, scientific environment, research integrity, communication and feedback, team dynamics, motivation and conflict resolution. This highly regarded course has been attended by many senior leaders at Oxford and the BSI is very pleased to support Mariolina in attending this.

Sylvine Lalnunhlimi, King's College London

Sylvine has been a Research Assistant in the field of clinical research for several years but is now interested in getting training in clinical trials management after gaining some experience of it at King's College London. Having done some internal university training in the area, Sylvine is looking for accredited training in the form of the PRINCE2 project management course. In the grant application, Sylvine



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demonstrated a passion for clinical trials management and the BSI is delighted to support Sylvine in undertaking this globally recognised qualification.

Dr John McKendrick, University of Edinburgh

John is a postdoc studying the role of salivary gland (SG) macrophages in tissue regeneration following radiotherapy. In order to advance this research further, John would like to learn new skills and different techniques by visiting the Bajenoff lab in Marseilles, France to use high-powered microscopy and a range of reporter/KO mice to characterise the macrophage niche in the SG in healthy tissue and following irradiation to determine if CSF1 mediates macrophage-stromal cell crosstalk. The BSI is delighted to support this activity as it will allow John to upskill and advance the research project and enable applications for further fellowships in the future.

Dr Bruce MacLachlan, Cardiff University

Bruce is a postdoc at Cardiff University assessing antigen recognition by considering the full context of the complete immune synapse between T cells and antigen-presenting cells. Bruce is looking to generate pilot data to explore this research area further and to generate data for future fellowship applications and larger equipment bids. The BSI is very pleased to support Bruce with this project which will also build skills and create new collaborative links.

Many congratulations to the members who have been awarded funding – we are delighted to be able to support your career development through the BSI Career Enhancing Grant scheme.

Thank you to everyone who submitted an application. This scheme is very competitive and unfortunately, we are limited with the number of activities that we can support.

We would also like to thank the judging panel, led by BSI Education & Careers Secretary, Dr Donald Palmer, for their hard work and dedication that made this possible. We are proud to support our members to achieve the full potential of a highly fulfilling career in immunology through our extensive career development offering.

Find out more

Take a look at the full announcement of the grant winners here: <https://www.immunology.org/news/bsi-career-enhancing-grant-winners>.

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.

SOCIETY NEWS

Call for contributions: write about what matters to you

A mix of recent Society news, synopses of cutting-edge immunology research and feature articles showcasing what our members are up to, this magazine is the perfect opportunity to share your interests with your fellow members. As the BSI membership magazine, *Immunology News* aims to not only highlight how we're supporting our members and representing immunology on a wider stage, but also amplify the voice of our membership.

We're currently planning our content pipeline for 2022 and we would love to hear from you. Are you interested in honing your writing skills and having a platform to start conversations about issues that matter to you? This is your chance!

Whether you'd like to highlight your career path to others to provide

encouragement for those in similar positions, especially if you're working in industry or clinical settings, or you're an expert on a topic that might inspire others, please get in touch.

We're particularly interested in having a diversity of voices that represents our strong and vibrant community of immunologists from different backgrounds, career grades, immunology sectors and places around the world.

Here are a few topics that we'd be interested in featuring:

- Equality, diversity and inclusion, for example your lived experiences working in immunology or your involvement in activities promoting a fairer and more inclusive community
- Sustainable science such as practical steps you've used to reduce your carbon footprint or advice for others

- Mental health and well-being strategies that support an improved experience within immunology
- Your achievements, for example if you have recently received grant funding, passed your PhD viva or accepted a new appointment
- Creative pieces, for example poems or drawings about immunology

If you would like to pitch a submission, please get in touch to discuss your ideas and how they might fit in the magazine. In your pitch, please let us know a bit about yourself and the topic that you would like to write about. You can express interest by contacting us at media@immunology.org.

Let's keep in touch

Are your membership profile details up to date?

As a valued member of the BSI, we want to help you make the most of your membership by keeping you up to date with news on our grants, events and other activities to support immunology. To do so, it's important that we have your current information to ensure that you're eligible for the membership category that is right for you. By letting us know where you work or study, your career focus, areas of expertise and BSI Regional & Affinity Groups you're interested in, we can make sure you make the most out of your membership. Please take a couple of minutes to check and update your records.



www.immunology.org/update-your-details

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Infectious: fascinating stories throughout history

Infectious: Pathogens and How We Fight Them is a new popular science book written by fellow immunologist and BSI member, Dr John Tregoning. Immunologists dedicate their careers to answering questions about the power and complexity of the immune system. Dr Tregoning, a reader in respiratory infections at Imperial College London, has focused his research on infectious diseases. With this experience, he has written a timely homage to the scientific innovations in history that have led to the world being able to combat infectious disease. Here, we find out more about his book and join him in celebrating research efforts in the last hundred years, from immunology and virology to microbiology and epidemiology.

"It resparks the desire to learn about immunology," says Tregoning. "The immune system is incredibly complex and equally fascinating – the never-ending knowledge we're discovering drives every field. With this book, I hope to not only inform and educate others, but also celebrate how far we've come in the past hundred years, and maybe even make someone laugh!"

Infectious uncovers the marvels of the human body and its defences when it comes under attack while navigating through captivating success stories in immunology and virology. It's a mixture of scientific explainers and interesting anecdotes through the ages: Tregoning explains, "The book showcases the underpinning mechanisms of 'ologies under infectious disease, such as microbiology, immunology and epidemiology, but then also looks into

therapies and vaccines, connected by the history of science that runs through it to explain where these ideas came from."

Adding some historical perspective and unique insight, the narrative carries the reader along while being both entertaining and informing. The book describes different personalities behind some of the most important breakthroughs in controlling, preventing and treating infectious disease. "It's the tip of the iceberg!" declares Tregoning. "I wanted to readdress the balance by highlighting some incredible scientists that are less heard of. Even out of those sufficiently known, the ones getting into public discussions are few and far between. I tried covering lots of different areas so that even immunologists, who might know more about the immunology side, might be interested in finding out about

INFECTIOUS

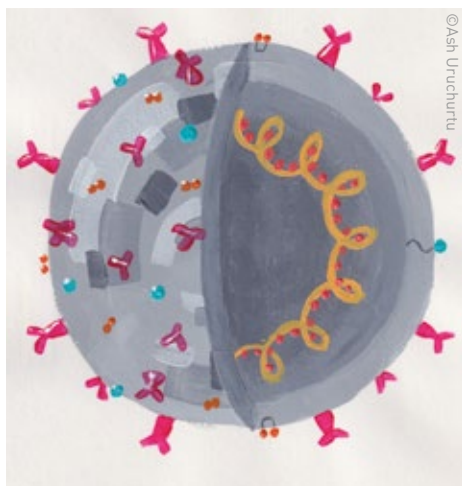


Pathogens and How
We Fight Them

DR JOHN S. TREGONING

less known microbiology or epidemiology."

I was curious to hear some examples of favourite topics and the stories behind them. Tregoning highlights Félix d'Hérelle, described in the book as a 'French-Canadian microbiologist with a rather striking beard-moustache combo that a modern-day hipster would be jealous of'. He enlightens me, "Félix d'Hérelle led a remarkable life through one of the most disruptive periods in history. In the early 20th century, he discovered bacteriophages but also travelled around the



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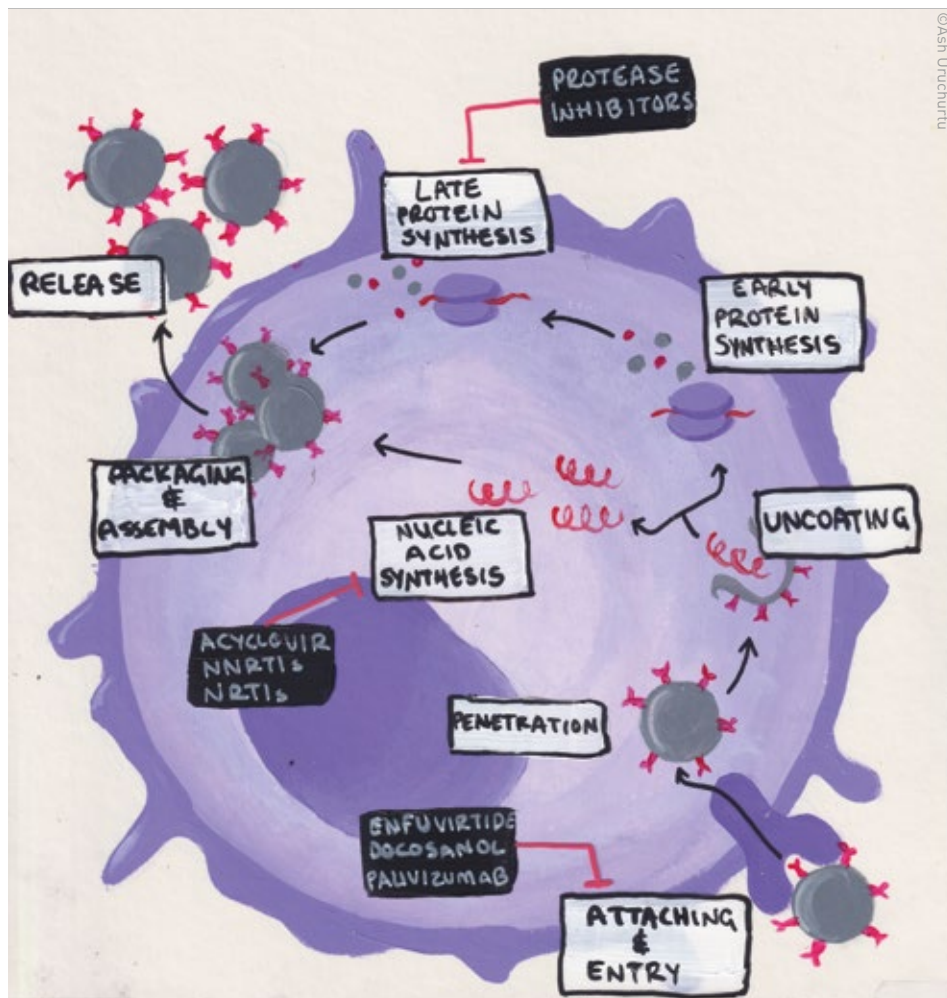
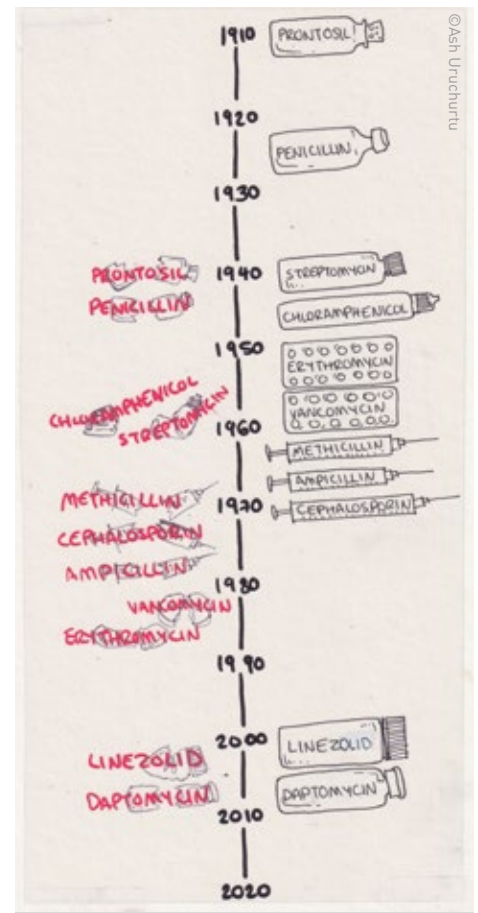
'It's inspiring to see a book that effectively communicates the complexity of infectious diseases, shining the spotlight on immunology at a time during which it has never been more prominent in public debate.'

world, had a run-in with the secret police in Soviet Russia and was arrested by Nazi armed forces in the Second World War."

Tregoning's first book was written during the pandemic and while this context is underlined throughout and grounded by the history of vaccines, the breadth of infectious diseases surpasses your typical overview. "It's not a book about COVID-19, or the vaccine or the pandemic – it's so much more than that," he explains. "I focus on the history of science rather than science itself, aiming for a lighter touch. And, as I said, it's meant to be a celebration of the enormous progress in the understanding of infectious diseases that has led to not just having a COVID vaccine within 50 days of sequencing the viral genome but has also paved the way

for HIV going from an untreatable disease to a chronic but manageable condition, HCV now being curable, and reaching 40 malaria-free countries globally. These stories get lost in the general doom and gloom."

Described as 'the best, most accessible, high quality science book I have read this year' by Jeremy Farrar (Director of the Wellcome Trust), *Infectious* is framed at a level understandable with GCSE science. However, Tregoning points out "I hope it can be of interest to scientists as much as non-scientists. Even for my fellow immunologists, we're all quite siloed in the areas we're experts in and this covers the bigger picture – it's an overview of the field we work in, and you'll be able to see 'where you fall' within this wider map."



When initially flicking through the book I wondered about how complex information on pathogens infecting the lungs could be distilled to produce something both engaging and informative. Tregoning has drawn on over 25 years of experience as a scientist to write over 300 compelling pages. The secret? Dedication and collaboration. "It's a huge collaborative effort involving so many different people," he explains. "I started from the framework I use in my lectures and from different talks at conferences and the BSI Congress. From there, the most important aspect was my network. I'm incredibly grateful to all my friends and colleagues who helped with various chapters. I also incorporated a lot of ideas that came from Twitter to ensure there was a diverse cast of scientists represented, especially those who don't usually get enough recognition."

This popular science book is illustrated with 10 illuminating illustrations created by BSI member, Ash Uruchurtu. "I knew I wanted some pictures for the book, so I applied for a BSI Communicating Immunology grant. Thanks to the amazing support from the Society, my stick diagrams were transformed into beautiful pictures. In particular, I'd like to thank Erika Aquino, BSI Public Engagement Manager, for all her support with the grant application – she was incredibly helpful getting this off the ground." Tregoning proudly adds, "Even better, these illustrations are under a

Creative Commons license so they're free for everyone to use. You can download them for all your science communications needs!"

It's inspiring to see a book that effectively communicates the complexity of infectious diseases, shining the spotlight on immunology at a time during which it has never been more prominent in public debate. The pandemic has been a challenging time

for all of us and immunologists have and continue to face up to those challenges with strong voices explaining where we're at and what we understand so far. Learning from this experience and maintaining this level of engagement with different audiences is vital and will make us better prepared for whatever the future may hold. When asked about his own takeaways, Tregoning

reflects "I now realise that writing a book is not a trivial thing to do. It has been one of my goals for a long time, so I took the opportunity when my lab shut down because of the restrictions to start this project. I'm eternally indebted to my wife without whom this wouldn't be possible. I also want to acknowledge Dan Davis, another BSI member, who provided inspiration as well as helpful and friendly advice."

Infectious ends on a familiar note: 'we certainly don't know everything, not even close', outlining remaining questions such as virus transmission, susceptibility among individuals, the link between the mind and the body and the unclear effect of the human genome in controlling infection. Tregoning concludes "I want to inspire, even if it's just one person, to get into immunology or infectious disease research. I'd love to see someone reading it on the tube, and maybe even laugh at something I've written. I hope readers enjoy uncovering the mysteries of the immune system while learning about the history of science as much as I've enjoyed writing it."

Interview by **Teresa Prados**



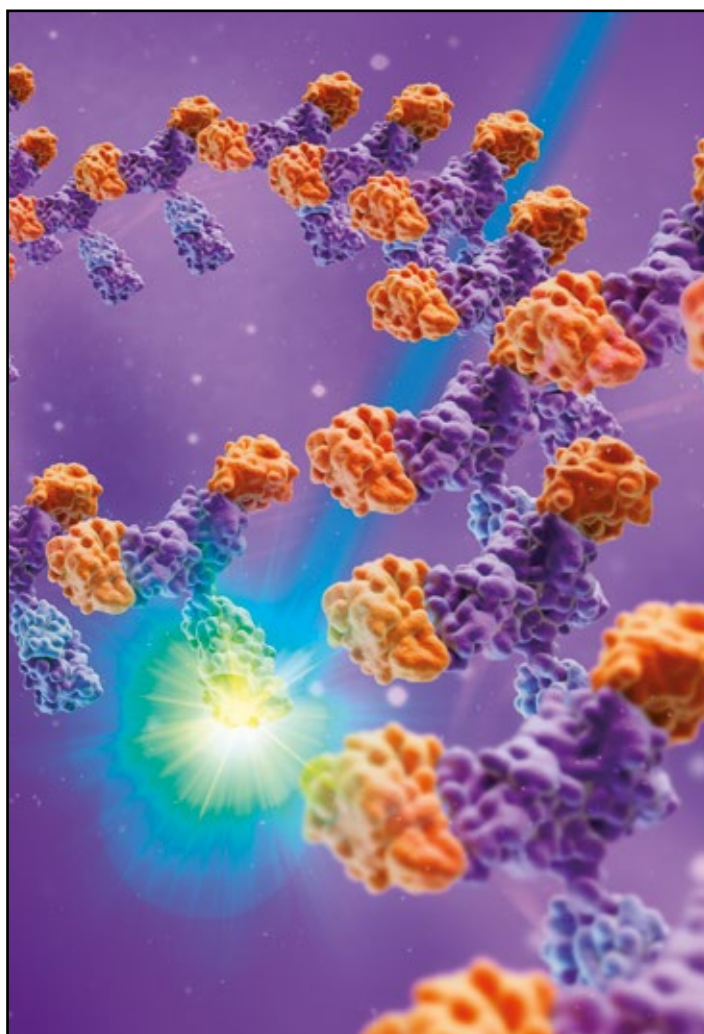
Find out more

Infectious: Pathogens and How We Fight Them is published by Oneworld Publications and is available in bookstores and online.

Dr John Tregoning will be presenting a poster at the BSI Congress about the book. If you're interested, do come say hi and learn more about *Infectious!*

You can download and use the illustrations from the book, funded by the BSI Communicating Immunology scheme and created by BSI member Ash Uruchurtu here: www.immunology.org/infectious-book-illustrations.

'I'd love to see someone reading it on the tube, and maybe even laugh at something I've written. I hope readers enjoy uncovering the mysteries of the immune system while learning about the history of science as much as I've enjoyed writing it.'



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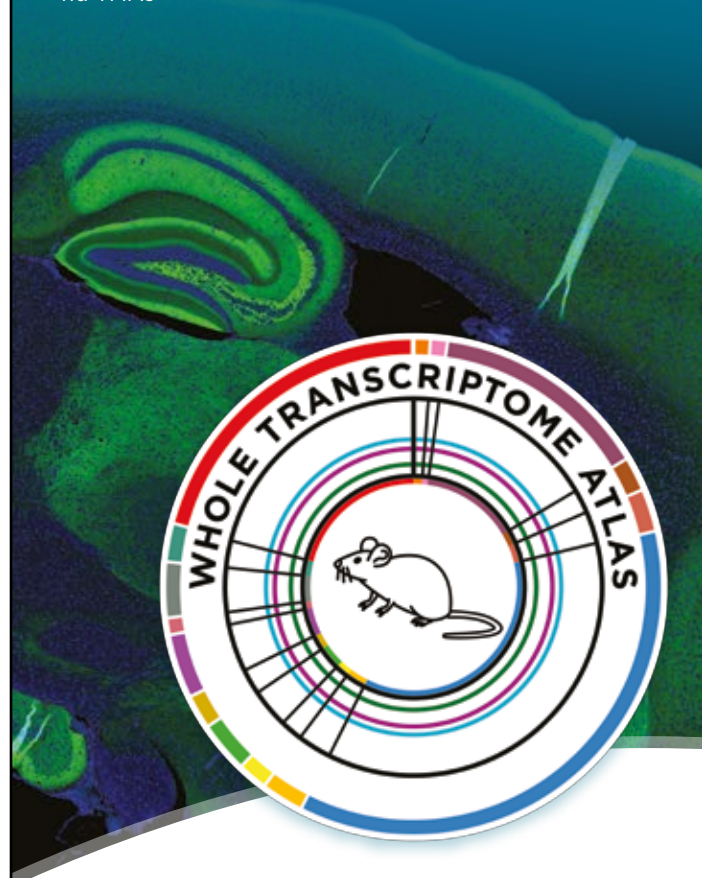


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in inflammatory bowel disease which revealed that a relative under-expression of cytokines could be equally important as cytokine over-expression in inflammatory disease pathogenesis.¹ Other highly cited publications from the journal's archive have further explored this cytokine imbalance in diverse immune-mediated inflammatory conditions.²⁻⁴ We're continuing to publish key research in this area, a prime example being a recent review on the role of IL-17 in inflammatory skin diseases,⁵ which was one of our top Altmetric score articles of 2020.⁶

Immunodeficiency

Dr Cindy Ma, Garvan Institute of Medical Research, Australia

As we look back on the 55th anniversary of *CEI* and reflect on the significant developments in the field of primary immunodeficiency, one advance stands out – the advent of next generation sequencing (NGS) and its application to diagnosing inborn errors of immunity (IEI). This is reflected in the report written by the International Union of Immunological Societies (IUIS) Expert Committee on Primary Immunodeficiencies/IEI, which has revised the classification of primary immunodeficiencies every two years since the early 1970s.

Indeed, when these reports were published in *CEI* in 1999 and 2003,^{1,2} ~100 genes had been identified to cause IEI in the ~30 years since the publication of the first report in 1970. With the rapid advances in NGS technologies, conventional molecular techniques such as genetic linkage, homozygosity mapping and candidate

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6. <https://bit.ly/2ZbaS6B>

gene sequencing have essentially been abandoned, making way for the almost-ubiquitous application of NGS to the unbiased discovery of known and novel genetic causes of immune dysregulation. Since the introduction of NGS in 2010 there has been exponential growth in the identification of genes as the underlying cause of IEI, with the most recent version of the IUIS report published in 2020 documenting 430 genes.³

Along with this, there has been a sharp rise in the number of primary immunodeficiency articles submitted to *CEI* which has led to my appointment as the journal's first Immunodeficiency Section Editor last year. This year to mark World Primary Immunodeficiency Week, the journal published its first primary immunodeficiency Virtual Issue⁴ which highlights reviews and original research from the last three years, focusing on topics including PID



diagnosis and pathogenesis in chronic granulomatous disease, Behçet's disease and other PIDs, as well as clinical guidelines on the management of non-infectious CVID complications from the UK Primary Immunodeficiency Network. With the support of my international Section Editorial Board encompassing a wealth of knowledge in the field, we are ready and looking forward to seeing more primary immunodeficiency themed articles submitted to *CEI*.

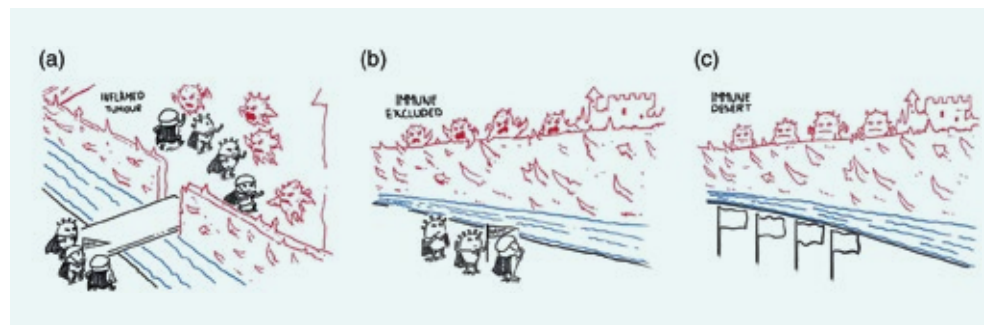
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Cancer immunity

Professor Tanja de Gruijl, VU University Medical Centre, Netherlands

When Dr Jim Allison wrote his review 'Cancer Immunotherapy: co-stimulatory agonists and co-inhibitory antagonists'¹ in *CEI* way back in 2009, our readers could not have surmised the revolution that his seminal work was about to unleash on the field of oncology. The unprecedented durable responses observed in metastatic melanoma upon CTLA-4 blockade reported only one year later, and the even more remarkable survival rates obtained with PD-1 inhibitors that would closely follow, led to immunotherapy of cancer being heralded the scientific breakthrough of the year in 2013 and to the Nobel prize being awarded to Dr Allison and Professor Tasuku Honjo in 2018.^{2,3} Since then, exciting new developments in



the field of cancer immunology provide us with glimpses of things to come. New findings, like the identification of additional immune checkpoints, the unravelling of the mechanisms of action of immune checkpoint

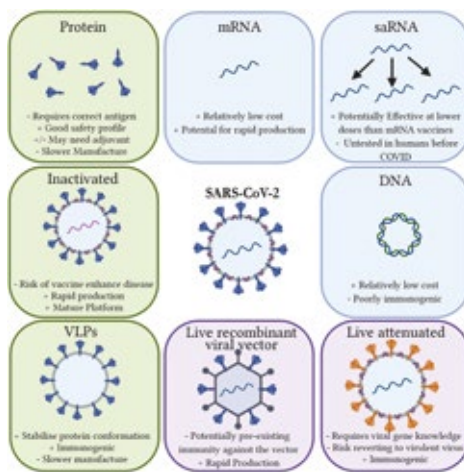
inhibitors, and the mechanisms underlying immune suppression and immune therapy resistance – both systemically and in the tumour microenvironment – are set to increase the clinical efficacy of cancer

immunotherapy in an ever-increasing number of indications.⁴⁻⁸ In the near future, novel treatment combinations and local delivery of immune modulators in earlier stages of disease should widen the scope and deepen the impact of this ongoing revolution. Naturally, *CEI* is committed to keeping our readers up to speed with these important developments.

Infectious diseases

Professor Xiao-Ning Xu, Imperial College London, UK. Dr Daniel Douek, National Institute of Allergy and Infectious Diseases/National Institutes of Health/DHHS, USA

The concept of immunology, and particularly vaccinology, was originally derived from the field of infectious diseases and is largely attributed to Edward Jenner who experimentally discovered in 1796 that cowpox, or vaccinia, induced protective immunity against a human fatal infection – the smallpox. Since then, studies of infectious diseases have informed our knowledge of many aspects of the immune system. Studies investigating the roles of antibodies in Epstein-Barr virus (EBV)-associated cancers,¹ and later the role of T cells, have provided a base for the development of immunotherapies for EBV-induced cancers. Furthermore, many studies have revealed the role of tumour necrosis factor in mediating harmful hyperinflammatory responses observed in many infectious diseases.^{2,3} *CEI* has also made an important contribution to HIV/AIDS research over the years, by publishing several highly cited papers on key aspects of the immune response to HIV.^{4,5}



The exponential growth in our knowledge of immunology is evidenced by the rapid development of effective vaccines against the current SARS-CoV-2 pandemic. *CEI* has been proud to publish some of the crucial research helping us understand and combat SARS-CoV-2, a key example being

our COVID-19 Special Issue,⁶ which reflected on our understanding of the pathogen after one year of research. We're continuing to publish key research on this topic, including our recent Editors' Choice article on the prevalence of tissue-specific autoantibodies following SARS-CoV-2 infection.⁷

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Neuroimmunology

Professor Sandra Amor, VU University Medical Centre, Netherlands

Although the brain is widely considered to be an immune-privileged organ and immune responses in the CNS limited,¹ there has been a paradigm shift in neuroimmunology as reflected by some key papers in the field. The (re)discovery of a glymphatic system in the CNS has proven to be critical in removing aggregated aberrant proteins such as amyloid beta that contribute to Alzheimer's disease.^{2,3} Knowledge of the innate immune responses in the CNS has also highlighted a critical role in tissue homeostasis, as well as contributing to CNS damage.⁴ While several papers published have documented how immune responses contribute to multiple sclerosis,⁵ others have highlighted the critical role of innate immune

responses in neurodegenerative diseases such as Alzheimer's disease,¹ psychiatric diseases⁶ and more topically, in COVID-19.⁷

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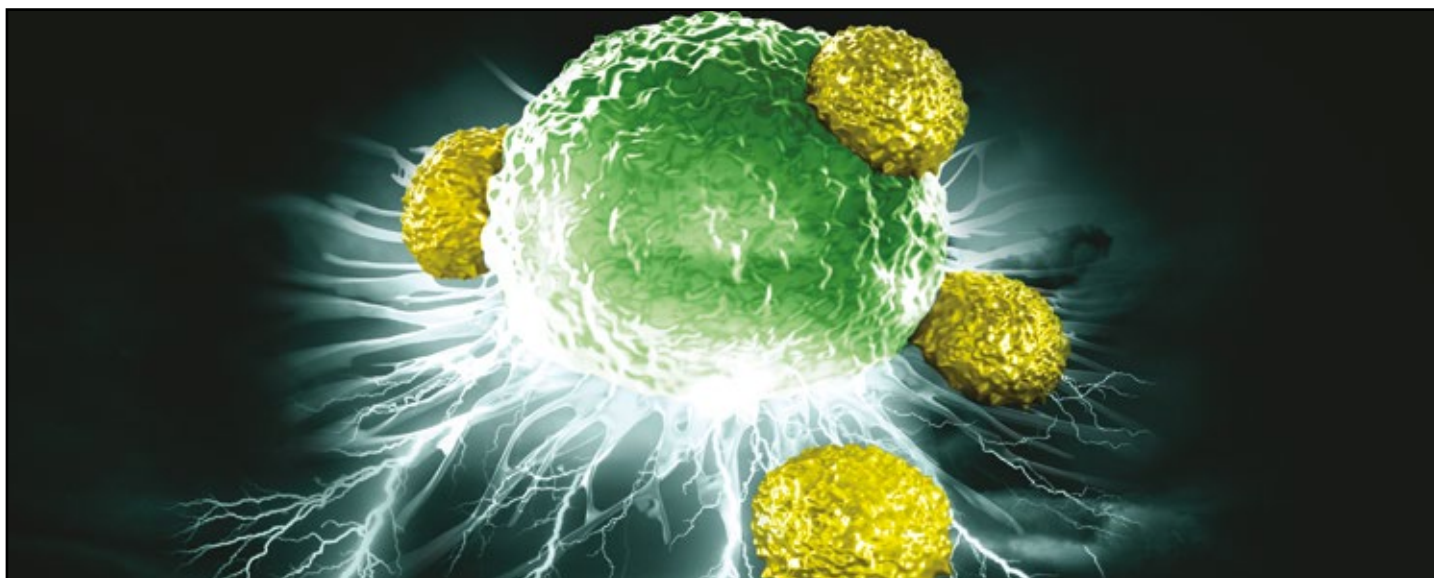
Find out more

You can read more about *Clinical & Experimental Immunology's* 55th anniversary celebrations in our news section: <https://bit.ly/3C5i4Q5>.

- Read our interview with *CEI's* Editor-in-Chief Professor Leonie Taams to learn about her career and hear her reflections on the past, present and future of *CEI*: <https://bit.ly/3pk8BRu>.

- Read *CEI's* September Editorial '55 years in the life of *Clinical & Experimental Immunology*' <https://bit.ly/3vtlLVq>.

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Having effective conversations about COVID-19 vaccines: a community engagement approach

There has never been a more important time for immunologists to engage with the public about vaccinations by listening to and addressing questions and concerns. While the BSI and our members are ideally placed to be expert sources of knowledge in these dialogues, working in partnership with organisations that support local communities is powerful in reaching wider audiences. Here, our Public Engagement Manager, Erika Aquino discusses our recent community engagement project in partnership with the London Borough of Bexley to amplify our mission to increase public understanding of the importance of COVID-19 vaccination.

A key aim of the British Society for Immunology is to represent our members and provide a strong voice on topics of immunology that benefit the public. The BSI collaborated with the London Borough of Bexley and Bexley Voluntary Services Council on a pilot programme to train 'vaccine champions' both within local community groups and in health/social care worker groups to have effective conversations with their peers about COVID-19 vaccines.

What was the aim of the project?

The programme was developed to train people who hold social capital in communities within the Borough by combining our expertise in immunology with the expertise of the local area and people. We provided them with the tools to have effective conversations about COVID-19 vaccines with their families, friends, colleagues and contacts, thus developing a network of vaccine champions and ultimately driving vaccine uptake.



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How did the training work?

We ran the training programme online through April to July 2021 and sessions were led primarily by BSI members who were skilled communicators, with appearances from local community leaders, such as faith leaders, and local healthcare professionals, such as GPs. The course content focused on developing understanding of how vaccines work and why they are important, as well as skills on how to actively listen to and answer specific questions and concerns.

The sessions were user-led, meaning that participants shared key questions they and their communities had on COVID-19 vaccines and the course content was adapted to address these. For example, when concerns about the COVID-19 vaccines affecting fertility were raised as a common reason for vaccine hesitancy, we invited expert reproductive immunologist, Dr Viki Male, to explain the latest evidence on vaccine safety and answer questions. When news about the very rare blood clotting side effect of the Oxford/AstraZeneca vaccine

emerged and guidance kept changing, the groups wanted more information and we ran a session about how to frame the risk of side effects versus risk of severe illness from COVID-19 and how to communicate with younger people. Participants could then confidently share that information. Sessions were supported by our public-friendly resources that participants could use, which you can find here: www.immunology.org/covid19-public-resources.

What were the outcomes and impacts for participants?

Participants were very positive about their experiences of the training, with 100% of the community leaders feeling better informed, more knowledgeable and more confident about having effective conversations about COVID-19 vaccinations. The health/social care workers were also positive about the training with 91% reporting that they felt better informed and more knowledgeable about COVID-19 vaccines, while 85% said that they felt

'This innovative community engagement project was a new venture for the BSI and proved successful in creating vaccine champions in Bexley with the confidence to have conversations about COVID-19 vaccinations with their communities.'

more confident about having effective conversations. All community leaders and 70% of health/social care workers reported having increased the number of people they talked to about COVID-19 vaccines.

After each session, participants were invited to provide anonymous feedback and comments were used to inform future training. Participants enjoyed the training sessions, noting how informative, interesting and helpful they were and praised the accessible language used by immunologists delivering the sessions. The health/social care worker groups valued having up-to-date, clear information that was helpful to share with their colleagues during an uncertain time in their working environment. Building a safe and trusted space allowed everyone to explore different views about vaccines without judgement.

What were the outcomes and impacts for the BSI?

The immunologists involved in delivering the training enjoyed the experience and found it useful to hear diverse perspectives on vaccines and prominent concerns. For some BSI members, this type of public engagement was challenging but it improved their communication skills and confidence in working with different audiences, and many repeated their sessions.

This innovative community engagement project was a new venture for the BSI and proved successful in creating vaccine champions in Bexley with the confidence to have conversations about COVID-19 vaccinations with their communities. Working in partnership with the London

Borough of Bexley was key to the success of the project because of their knowledge of how to engage with their local community and their connections to diverse networks in the area.

It's vital to work with community partners to reach individuals on the ground and for the public who are leaders in their communities and workplaces to have the knowledge, skills and the confidence to address vaccine concerns and have conversations with the people around them. The BSI is here to support everyone to become positive vaccine ambassadors.

Erika Aquino

Public Engagement Manager
Email: e.aquino@immunology.org

"I just wanted to say how amazing the training was and how well organised it was. I certainly learned a lot and have much more information to pass on to my community. It was fantastic to have such eminent speakers engaging with our small local group. Congratulations to all involved in planning and delivering the training."

Community leader participant

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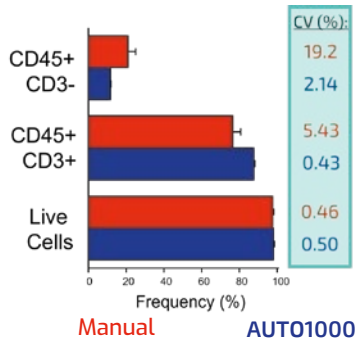
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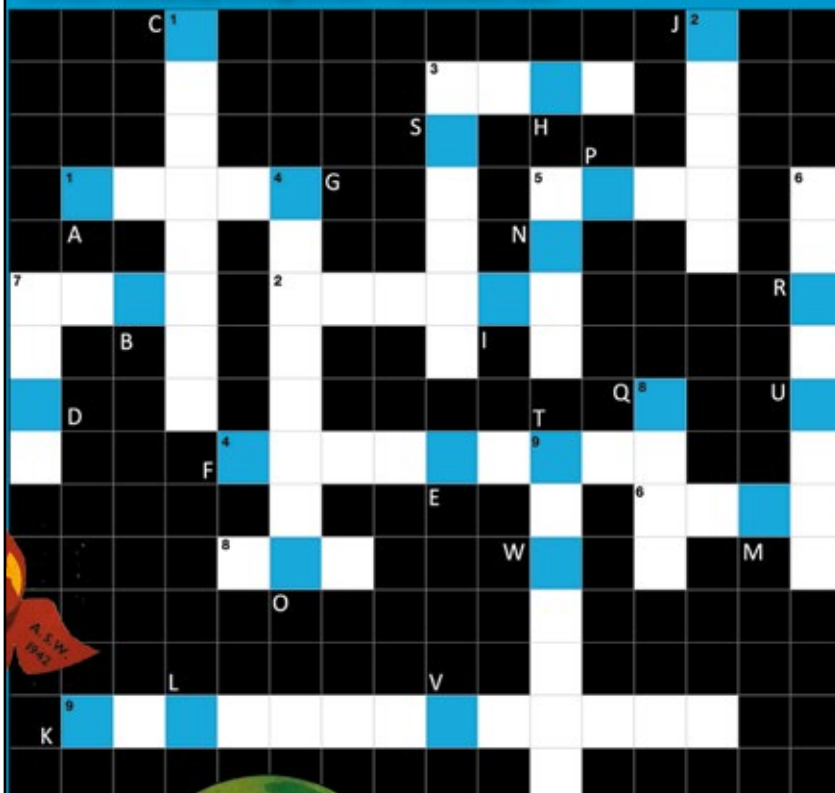
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DOWN

1. Pathogen jumps from animal to humans (8)
2. Sly master transcription factor (5)
3. ELISA/LUMINEX alternative – your worries will resolve with time (2-4)
4. Type of ELISA comes with crisps as standard (8)
5. Checkpoint inhibitor ligand expressed on tumour cells and activated myeloid-derived cells (2-2)
6. Live imaging system used to sight changes in cell biology without ever leaving the incubator
7. Fourth bell in the Church of Pathogen Recognition tolls when LPS enters (4)
8. Sorting cells with magnets! (4)
9. Platform for detecting and quantitating multiple secreted proteins simultaneously (7)

ACROSS

1. Two-faced god of kinases (5)
2. Lonely Hearts Ad:
Born executioner seeks partner with abnormal features or wearing an IgG1/IgG3 coat. Likes anagrams & AC/DC. (2, 4)
3. Suppressive Th cell driven by 2 Down (3)
4. Small glue and big eaters of the brain (9)
5. Conserved patterns associated with pathogens/TLR ligands (4)
6. Transgenic T cell with the head of a lion, body of a goat, tail of a snake (3-1)
7. Buddhist master transcription factor (4)
8. Pro-inflammatory Th cell driven by 7 Across (3)
9. Platform for analysing cell marker expression using fluidics and lasers (4-9)

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 & Fluidigm immune profiling research award winners



We co-sponsored two research awards for high-throughput and high-dimensional immune profiling with our Corporate Member, Fluidigm. We were delighted to present the award to the two most impactful proposals which aimed to profile in-depth all major immune cell types present within human blood within any disease state. Congratulations to the winners!

Dorit Verhoeven, Amsterdam University Medical Center, Netherlands – 'Inborn errors of immunity – A multiparametric approach to uncover immunodysfunctions in infants'

Dr Wiebke Nahrendorf, University of Edinburgh, UK – 'The effect of chronic infection on the bone marrow memory T cell niche'

The winners will be able to analyse 25 samples of their choice using a combination of the award winning Maxpar® Direct™ Immune Profiling Assay and the new, high-throughput, CyTOF XT™ high-dimensional cytometer. The standard of applications for this award was very high; thank you to all who took the time to enter the competition.

Fundraising at the Manchester half marathon

Congratulations to **Liz Greene** and **Lee Thawley** who ran the Manchester half marathon on Sunday 10 October. On their fundraising page they shared their story and highlighted the lack of collective research into the cause of autoimmune disease, raising over £1,000. Through Connect Immune Research, we work together with

leading organisations dedicated to tackling autoimmune disorders to bring together researchers from multiple conditions to uncover the commonalities in their work to benefit patients. We are incredibly grateful for their fundraising efforts and for supporting research into autoimmune disorders.



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 [@britsocimm](https://twitter.com/britsocimm) on Twitter.

Communicating Immunology Grants

The BSI is delighted to fund the following projects.

Dr Rosemary Norton and the **BSI East Anglia Immunology Group**, from the University of East Anglia, have been awarded funding to exhibit at the annual Norwich Science Festival 2021 using the BSI's vaccine engagement activities to raise awareness of COVID-19 vaccines, vaccine development and the drug discovery pipeline as well as their own research.

Dr Dannielle Wellington, from University of Oxford, has been funded to run a stand at the IF Oxford Festival 2021 to explore what a virus is and how they are sensed by our innate immune system and how the more highly tuned adaptive immune system is activated.

Associate Professor Jaime Adame-Gallegos, from the Universidad Autonoma de Chihuahua, has been funded to bring interactive immunology education to children and teenagers from marginalised communities in rural areas in Mexico. The funding will also support the translation of BSI resources and outreach materials into Spanish.

Hannah Baer, from the University of Glasgow, has been awarded funding to deliver the 'Great Immune Escape' game to children at schools in the greater Glasgow area. The game uses a playful approach to explain the different ways pathogens evade the immune system.

Professor Matthias Eberl, from Cardiff University, has been funded to further develop the 'Superbugs' educational online resource with additional content about immunology and vaccines. They will also translate the website into Irish and interact with wider communities through schools and science festivals.

Professor Adrian Liston, from the Babraham Institute, has been awarded funding to develop the 'Virus Fighter' online game about viruses and vaccines with additional features to enhance the educational value of the game. They will share teaching resources based on the game and interact with the public at future science festivals.

The next application deadline is 15 January 2022. We're particularly keen to hear of projects for engaging the public about COVID-19 in digital or online formats. Please get in touch with Erika Aquino (e.aquino@immunology.org) or visit www.immunology.org/grants-andprizes/communicating-immunology.

Corporate Members

The British Society for Immunology runs a Corporate Membership scheme with the aim of strengthening our relationship with industry and furthering our charitable objectives. We thank our Corporate Members for their support and contribution to scientific and clinical immunology and we are pleased to highlight their activities here. Corporate support is vital to the British Society for Immunology, enabling us to engage with immunologists to support their learning and advancing the science of immunology. For more information on the scheme, visit www.immunology.org/corporate-members or contact Jane Sessenwein at j.sessenwein@immunology.org.



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Working in harmony: Unmasking the heterogeneity of the immune system

Much like an orchestra, where every instrument must be in perfect harmony, the many players of the immune system need to operate as a seamless unit to maintain our health. A single instrument out of tune or a single musician not in time can throw off the whole piece. Such an imbalance can have disastrous implications in the immune system, leading to over- or under-reaction of the immune system to pathogens or disease.

Given our current understanding of immunity, it is easy to forget that the term "immunology" first appeared in scientific literature in 1902. The foundations of immunology began with Emil Behring's and Paul Ehrlich's identification of neutralizing antibodies as well as

Ilya Mechnikov's identification of phagocytic cells. These discoveries became the foundations for acquired and innate immunity, respectively.

Since those early days of immunology, researchers have been working tirelessly to understand cellular and molecular mechanisms driving immune homeostasis and response due to injury, disease, or environmental exposures. Initial characterization of immune cells enabled by microscopy, cytometry, and functional assays have expanded our understanding of the immune system. However, while these tools have provided a great starting point for interrogating immune function, they don't provide the resolution necessary to unmask the heterogeneity vital to the immune system's operation.

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Finally, in light of recent events, InvivoGen has developed an expanding set of tools to foster research on SARS-CoV-2 infection and immune responses which range from COVID-19-related cell lines, antibodies, inhibitors and proteins.

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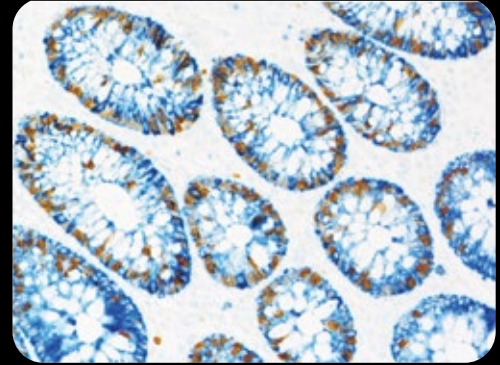
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Checkpoint Blockade:

a BSI Tumour Immunology Group conference

The British Society for Immunology's Tumour Immunology Group is a UK-wide group that aims to create a platform to connect active researchers with a key interest in advances in cancer immunology. Here, committee members of the Group tell you more about their upcoming Checkpoint Blockade conference, taking place on **23 March 2022 in Birmingham**, including some exciting speakers to look forward to and plenty of networking opportunities.

Collaborative therapeutics

Beyond the transformative process of carcinogenesis, for a tumour to grow and become established in the body there is often a failure in the immunological control keeping this at bay, a concept called tumour immunosurveillance. Various methods of immunological escape are facilitated by adapted tumour cells, including the manipulation of immune cells through 'immune checkpoints'. These ligand-receptor systems are essential to balance immune activity and prevent autoimmunity; however, tumours can overexpress ligands that send 'off' signals to T cells and therefore suppress anti-tumour responses.

Cancer immunotherapies are typically designed to promote or enhance immune responses against tumours, and the introduction of drugs targeting immune checkpoints has been revolutionary for an ever-growing list of cancers and has changed clinical practice. Although immune checkpoint inhibitors have proved an effective treatment for many patients who previously did not have any therapeutic options left, not all patients benefit. Researchers are now coming together to dynamically address this by combining collective understandings of fundamental immunology, biology of the tumour and its microenvironment, and rational therapeutic strategies.

Connecting at conference

The BSI Tumour Immunology Affinity Group (TIG) seeks to connect scientists and clinicians researching cancer immunology to create a diverse and collaborative group of researchers to answer the key questions in the field. Before the COVID-19 lockdowns, our Affinity Group organised a sold-out inaugural one-day conference called 'Checkpoint Blockade – Understanding mechanisms, unlocking new approaches'; however, this meeting was sadly postponed due to these world-

changing events. We now have the pleasure of announcing that we are rescheduling this meeting in keeping with the original theme, which will be held on 23 March 2022 in Birmingham.

This meeting, hosted by Professor Gary Middleton (University of Birmingham), will bring together experts from different areas of cancer immunology research to discuss the story of immune checkpoint blockade – from biology to clinical translation.

What's on offer?

This story begins with our first session 'Molecular mechanisms of immune checkpoints', in which we will hear about the nuances of checkpoint inhibition – what happens to the cell upon checkpoint blockade and how we can exploit these cellular programmes. One of the speakers that we will hear from during this session is Professor Simon Davis (University of Oxford), who will explore the intricate biology of T cell checkpoint receptors.

During lunch, attendees will have the opportunity to participate in a poster session and interact with a range of partners from industry and specialist partners including the National Cancer Research Institute.

The second session 'Tumour genetics and microenvironment influencing checkpoint blockade' will explore how the genetic, epigenetic, and metabolic characteristics of tumours can shape responses to checkpoint inhibition, and how the stromal microenvironment formed by the tumour for its survival is also crucial in determining the impact of this therapy. This session will host talks from Associate Professor Ping-Chih Ho (University of Lausanne) on the impact of immunometabolism on checkpoint blockade, Dr Shoba Amarnath (Newcastle University) on innate lymphoid cells within the tumour microenvironment and Professor David Withers (University of Birmingham) on real-time tracking



of immune cell changes in response to checkpoint blockade.

The final session, 'Novel therapeutics and combinations', will explore rational combinations of different checkpoint inhibitors and with cellular immunotherapies, with an additional focus on treatment stratification. Attendees will hear from an industry specialist who will discuss their research into combination therapies and will provide an update on ongoing clinical trials. The conference will be closed by Professor Gary Middleton, who will outline his work on patient stratification and on immune-related adverse events from inhibition of immune checkpoints. There will then be an opportunity for networking into the evening. The excitement around tumour immunology at this moment in time is truly astonishing, and we are immensely proud to organise a meeting dedicated to checkpoint inhibition which represents the cornerstone of a new era for cancer therapy. See you in Birmingham next year!

The BSI Tumour Immunology Group

Find out more

Are you interested in joining the group and participating in upcoming activities? Visit www.immunology.org/tumour-immunology-group.

Registration and abstract submission will open soon. Keep an eye out!



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Immune Update

The BSI journals

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

Clinical & Experimental Immunology

Importance of neutrophils in upper airway bacterial clearance in COPD patients

Chronic obstructive pulmonary disease (COPD) is characterised by airflow obstruction and excessive pulmonary inflammation. In this study, Lea *et al.* sought to determine the phagocytic ability of lung macrophages and neutrophils in COPD.

The sputum cells of 14 COPD patients, 8 healthy smokers and 9 healthy never-smokers were separated into macrophages and neutrophils, then subsets of each cell type were exposed to *Streptococcus pneumoniae* or non-typeable *Haemophilus influenzae* (NTHi). Internalisation of bacteria was assessed by gentamycin



protection assay and flow cytometry for *S. pneumoniae* and NTHi, respectively. Greater phagocytosis by sputum neutrophils compared to macrophages was observed for

both bacteria. This finding was most clearly observed in healthy smokers and COPD patients, indicating that neutrophils are an important phagocytic cell in the upper airways in these groups.

These results indicate that sputum neutrophils are more effective phagocytes than sputum macrophages, with a greater capacity and more rapid phagocytosis.

Lea *et al.* 2021 *Clinical & Experimental Immunology* **206** 99–109 <https://doi.org/10.1111/cei.13638>

Immunotherapy Advances

Adaptive immunity and vaccination – iron in the spotlight

Iron is an essential cofactor in cellular biochemistry, however both iron deficiency and iron overload are widespread across the human population. Recent genetic and clinical studies have pointed to the availability of iron as a key factor regulating adaptive immunity. The level of circulating iron (bound to transferrin) that lymphocytes can obtain varies depending on dietary iron availability.

Iron homeostasis is controlled by the hormone, hepcidin, which is upregulated during inflammation via IL-6 to decrease iron

availability. Limiting iron availability during inflammation poses a compromise to the host between protecting against siderophilic bacterial infections (e.g. *Vibrio vulnificus*) and concurrently impairing adaptive immune responses against other pathogens.

In this review, Preston *et al.* highlight the evidence supporting the importance of iron in immunity and discuss potential immunotherapeutic interventions that could correct iron deficiency to improve immunity in the context of vaccination and infectious disease.



Preston *et al.* 2021 *Immunotherapy Advances* **1** ltab007 <https://doi.org/10.1093/immadv/ltab007>

Immunology

Distinct responses of human peripheral blood cells to different misfolded protein oligomers

Peripheral immune cells may play a prominent role in neurodegeneration associated with aberrant deposits of misfolded proteins, such as Alzheimer's disease, amyotrophic lateral sclerosis and Parkinson's disease. In this study, Leal-Lasarte *et al.* explore the effects of a misfolded protein oligomer on human peripheral immune cells. The authors used the N-terminal domain of the HypF protein from *E. coli* (HypF-N), which is well-characterised and behaves similarly to protein oligomers associated with amyloid diseases. HypF-N forms two different oligomers *in vitro* under different conditions (A and B) which both display spherical morphologies

but differ in their core region, with type A oligomers showing a higher degree of surface hydrophobicity.

Exposing type A and type B HypF-N oligomers to peripheral blood mononuclear cells revealed different immunoregulatory mechanisms associated with the balance of key cytokines, T regulatory cell function and Th1/Th17 differentiation. Type B, but not type A, led to a reduction in CD4⁺ cells, while type A oligomers promoted enhanced differentiation towards FoxP3⁺ regulatory T cells and suppressed lymphocyte proliferation more than regulatory T cells treated with type B oligomers.

Together, these data provide new insights



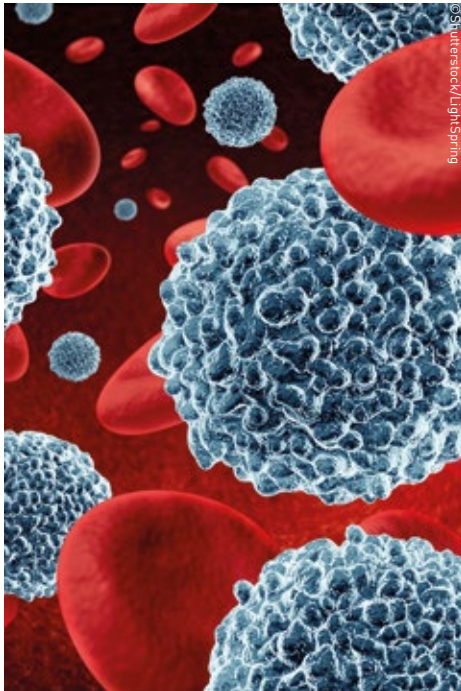
into the characteristics of immune imbalance associated with neurodegenerative disease.

Leal-Lasarte *et al.* 2021 *Immunology* **164** 358–371 <https://doi.org/10.1111/imm.13377>

Around the journals

A summary of some of the latest papers from the world of immunology.

Written by Edd James, Louisa James and Donald Palmer.



Circadian clocks guide dendritic cells into skin lymphatics

The ability for dermal dendritic cells (DCs) to migrate into afferent lymphatic vessels is important for inducing immune responses and is tightly regulated by several factors including chemokines. Whether these migrations are influenced by circadian rhythms to the same extent as has been demonstrated for lymphocytes homing in lymph nodes is unknown.

Here, Holtkamp and colleagues show that the migration of DCs followed a circadian rhythm. Interestingly, the migration was driven by the endogenous circadian rhythm and the pattern of migration regulated by the rhythmic expression of CCL21 and adhesion molecules including LYVE-1, CD99 and JAM-A. Antibody blocking of these molecules significantly reduced the ability of DCs to migrate, confirming their importance in circadian trafficking.



These results indicate the role of circadian rhythm in DC trafficking and it will be important to determine whether these findings can be exploited in vaccination and immunotherapy to maximise responses.

Holtkamp *et al.* 2021 *Nature Immunology* **22** 1375–1381

The expansion of human T-bet^{high}CD21^{low} B cells is T cell-dependent

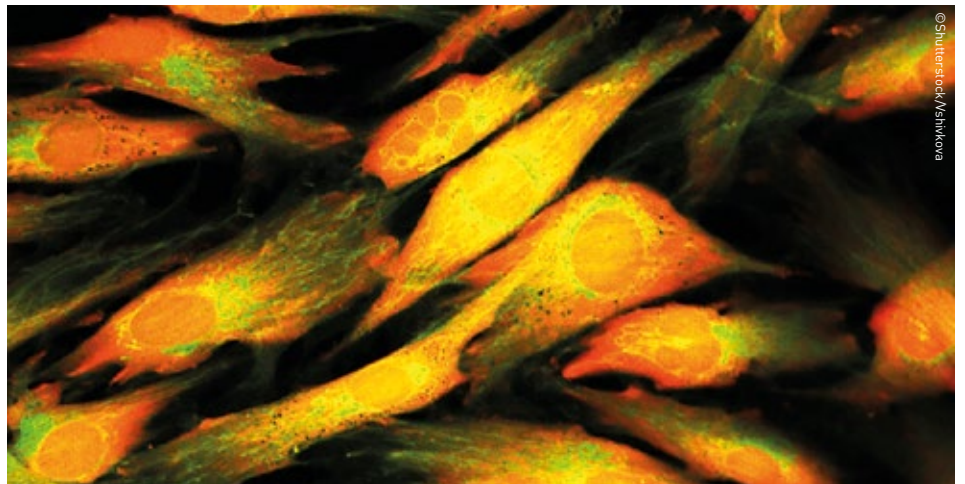
CD21^{low} B cells are an extrafollicular B cell subset present in the circulation and peripheral tissues. Although relatively rare in healthy individuals, CD21^{low} B cells are expanded during acute and chronic infection, and in individuals with certain autoimmune disorders.

In this study, Keller and colleagues show that the differentiation of CD21^{low} B cells depends on the induction of T-bet and requires a synergistic combination of BCR-signalling and IFN γ . By analysing B cell phenotypes in patients with monogenic immunodeficiencies, the authors make unique use of inborn mutations in specific signalling pathways to show that, along with BCR signalling, T cell-dependent CD40L, IFN γ and IL-21 are critical for the generation of human CD21^{low} B cells.

Autoreactive CD21^{low} B cells have been implicated in the pathogenesis of autoimmune disorders. In identifying the pathways leading to the generation of CD21^{low} B cells, this study provides possible avenues for therapeutic intervention.

Keller *et al.* 2021 *Science Immunology* **6**
doi: 10.1126/sciimmunol.abh0891

Distinct human Langerhans cell subsets orchestrate reciprocal functions and require different developmental regulation



Langerhans cells (LC) reside in the epidermis of skin playing an integral role in antigen capture and processing. However, whether these cells display heterogeneity, like dendritic cells or macrophages, has not been fully explored. The study by Liu and colleagues addresses this issue.

Using single-cell RNA sequencing, mass cytometry, flow cytometry, along with functional studies, the authors, based on phenotype and functionality, identified four distinct LC subsets in the epidermis of human skin; two steady-state (LC1 and LC2)

and two activated LC subsets. Interestingly, the authors were able to generate LC1 and LC2 from HSCs. LC1 appeared to uptake antigen more readily than LC2 and secrete cytokines related to innate immunity. In contrast, LC2 appeared to be associated with inflammation and exhibit a regulatory role.

This study highlights LC functional heterogeneity which may play a role in skin inflammatory disorders.

Liu *et al.* 2021 *Immunity* **54** 2305– 2320



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