Immunology News

September 2024 | ISSN 1356-5559

Off to a flying start:

supporting early career immunologists

Bright Sparks: awardee

Solid foundations: Winter School

The future of mRNA: feature

British Society for immunology

www.immunology.org

Welcome to the autumn edition of your membership magazine.

In this issue of *Immunology News*, we are celebrating all those in the early stages of their career. On page 19, you can hear from our new Early Career Trustee, Dr Carolyn Nielsen, about what she's looking forward to in her new role. Then on page 21, we hear from a recent winner of our Bright Sparks award, Dr Matthew Sinton, about his work examining the role of adipose tissue in sleeping sickness. On page 29, you can find out what happened when our London Immunology Group went to King's Cross railway station armed with vaccine-themed fun and games. And turn to page 17 to find out more about the incredible potential of mRNA technologies, and how different sectors might work better together to reap maximum benefit from these.

You can find all the latest on our journals, and details of lots of exciting upcoming events, including our Winter School for MSc students, which is taking place in Sheffield in December (see page 25).

As ever, we want to hear about the topics you'd like to see covered in the magazine, so please do get in touch with your ideas. We always love hearing from you.

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Registered charity 1043255 in England and Wales/SCD047367 in Scotland. Registered in England and Wales as company 3005933.

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VIEW FROM …

THE CHIEF EXECUTIVE

A big welcome to our autumn edition of *Immunology News*, which celebrates all those taking the first steps on their immunology journey.

Supporting Early Career Researchers is central to our mission. Over time we have developed a raft of grants, resources and opportunities to meet the needs of those just starting out, many examples of which are featured in this issue. We're always looking for ways to celebrate emerging talent and the BSI Congress 'Bright Sparks in Immunology' sessions are one way of recognising exceptional work from PhD students and postdocs. On page 21, you can read about the fantastic work being done by Dr Matthew Sinton to uncover the complex mechanisms that take place in the body's tissues during infection by the parasite that transmits sleeping sickness, and how this led to him being named 'Bright Spark' in the postdoc category in 2023.

Our Winter School for MSc students has proved incredibly popular in past years and we are pleased to be running it again in December. This three-day residential event provides an opportunity to hear from immunologists working in a wide range of areas, as well as insight into the diverse careers open to those working in our field. Turn to page 25 to find out what to expect, and how this event will excite, inform and inspire.

Our Trustees perform such an important role for the Society, helping us to achieve our aims in the fullest sense and bringing a wealth of expertise to the table. In July, we welcomed Dr Carolyn Nielsen as one of two Early Career Trustees on the Board. Having representation from those in the early stages of their career ensures we are in tune with the emerging generation of immunologists, and are better able to serve their needs. Turn to page 19 to hear from Dr Nielsen about her own route into the field, as well as her motivations for taking on this role with the BSI.

Elsewhere in this edition you can find out about the new strategy for the BSI Clinical Immunology Professional Network, gain insight into how we manage our finances to ensure a thriving future for the Society, and reach for your party poppers because on page 8 we congratulate Sarah Green, our Membership and Operations Manager, on reaching the milestone of 30 years with the BSI! Read about the changes she's seen during this time, and why she loves working with the BSI members.

There is plenty more to discover in this edition, and I hope you enjoy it as much as we enjoyed putting it together for you. As ever, we welcome your thoughts, feedback and ideas, so don't hesitate to get in touch!

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

BSI Member Representative Forum: here to represent you

The BSI Member Representative Forum gives our members an opportunity to share their views and shape the activities of the BSI. Chaired by Professor Jim Brewer, the 18 elected members come from all sections of the Society and act as our 'think tank' for topics such as education and careers, public engagement and communications.

June's Forum meeting centred on the new BSI Clinical Immunology Professional Network (BSI-CIPN) strategy, presented by our Programme Manager (Clinical), Rosanna Flury. The aim of this presentation was to outline to Forum members the key aspects of the strategy and invite their views on its content. Forum members have extensive and varied expertise, so we were eager for their input on how to connect the academic and clinical communities. Rosanna briefed members on the background to the strategy, gave some insight on key strategic themes and associated activities, and outlined plans for implementation.

Forum members then had the chance to offer their thoughts and feedback on the strategy and clarify any questions they had surrounding the BSI-CIPN. This presentation and discussion session led to important and useful conversations, which will inform the BSI-CIPN's work to connect academic and clinical communities going forward.

The meeting also covered other topics pertinent to our membership, including the BSI journals, our upcoming strategy for 2026–2030, new BSI committee members beginning their cycle, and our membership survey, which we will be working on in the coming months.

To close the meeting, updates from across the BSI team were shared to demonstrate our continuing work to champion immunology through our various activities and lines of work.

If you would like to raise any issues for your Member Representative Forum to discuss during a future meeting, please contact your relevant representative – you can find a list on our website at www.immunology.org/forum. Alternatively, you can email our Director of External Affairs, Jennie Evans, at j.evans@immunology.org and she will pass on the message.

SOCIETY NEWS

Spotlight on the CARINA Network

Since February 2022, the BSI has supported the CARINA (CAtalyst Reducing ImmuNe Ageing) Network through project management, communications and events support. CARINA is a network of over 100 researchers, clinicians and other stakeholders who are interested in the ageing immune system throughout the human life course. In this article, we outline some recent activities from the Network, its successes thus far and our plans for the future, which we hope will help to bring about a sector-wide transformation in our approach to ageing research.

A fruitful CARINA Network meeting

The CARINA Network's third annual in-person meeting took place at Conference Aston in Birmingham on Monday 15 and Tuesday 16 July and sparked many important and interesting conversations.

The first breakout discussion addressed cross-discipline collaboration in ageing research. Then we welcomed CARINA's Public and Patient Involvement (PPI) representative, Debs Smith, for a panel session on public involvement within ageing research. This was followed by spotlight talks from three CARINA members to close the first day of the meeting.

The meeting's momentum continued into its second day with an inspiring keynote speech from Professor Chris Buckley. This was followed by more spotlight talks from CARINA members. Next, we heard from Lynne Cox, Co-Director of the UK Ageing Network, followed by BSI Chief Executive, Doug Brown, who spoke about the current momentum of CARINA and how this could be maintained going forward as the Network's funding comes to an end.

The meeting was hugely successful and filled with excellent immune ageing research and many interesting discussions!

Progress so far

The CARINA Network has successfully delivered a variety of projects since its inception. We recently announced the winners of our Early Career Researcher (ECR) Development Grants which are designed to assist our ECR members' career prospects. We also delivered free, bespoke patient and public involvement (PPI) training at the beginning of this year to help our members grow in confidence in understanding and implementing PPI in their research. To address common and specific questions from the public regarding vaccines for adults over 65, we created a free, easy-to-read guide, which explains how vaccines work and answers some common questions, as well as providing up-to-date information on the vaccines available for adults over 65 in the UK.

Future plans

Going forward, we plan to launch a mentoring scheme for ECRs and offer enhanced training on topics such grant writing and public involvement in research. We also plan to offer sandpit funding opportunities, increase our engagement with policymakers through roundtable and parliamentary events, and continue to deepen connections and collaborations between researchers and industry.

Megan Bailey
BSI Marketing and Communications Officer

With thanks to the funders of the CARINA Network:

UKRI Biotechnology and Biological Sciences Research Council

UKRI Medical Research Council

Find out more

Find out more about the work of the CARINA Network here: **www.immunology.org/partnerships/carina-network**

To join the CARINA Network, please email **CARINA@immunology.org**.

Follow the Network on X: **@CARINAnetwork**

SOCIETY NEWS

BSI Immune Therapies Summit 2024

Monday 25 to Tuesday 26 November, Cambridge, UK

The BSI Immune Therapies Summit is a unique event bringing together sector leaders from industry, academia and clinical spheres to discuss novel approaches and future challenges in immune therapies research.

BSI Immune Therapies Summit

Accelerating the next generation of immune therapies across diseases

Hosted by the British Society for Immunology

Scientific highlights

This event boasts an impressive programme, filled with internationally renowned speakers and engaging and interactive sessions. Attendees will benefit from many opportunities to build cross-sector networks and learn more about current insights and trends in immune therapy development. They will also have the chance to be part of the conversations that will help to drive forward the next iteration of immunotherapy research for patient benefit.

Keynote presentation

We are delighted that **Paul Peter Tak**, President and CEO of Candel Therapeutics, will be joining us and delivering the keynote speech: Viral immunotherapy: A new therapeutic strategy to induce systemic anti-tumor immunity.

Explore unparalleled and varied networking opportunities with sector leaders.

There will also be a number of exciting plenary sessions taking place during the Summit, as follows:

Targeting the right immune therapy to the right patient

Daniel Cua, VP Immunology, Janssen Pharmaceutical
Virginia Pascual, Director, Drukier Institute for Children's Health

Immune therapies for neurodegeneration

Marie Kosco-Vilbois, Scientific Advisor, AC Immune
Michal Schwartz, Professor of Neuroimmunology, Weizmann Institute of Science

Novel approaches to achieving immune tolerance

Kara Lassen, Head of Immunology, Roche Pharma Research and Early Development
Georg Schett, Professor of Internal Medicine, University of Erlangen

Cancer vaccines – hope vs hype

Pippa Corrie, Consultant and Affiliated Associate Professor in Medical Oncology, University of Cambridge
Kyle Holen, SVP, Head of Development, Therapeutics and Oncology – Research & Development, Moderna

Who should attend?

The BSI Immune Therapies Summit is aimed at senior leaders from industrial, academic and clinical research settings who are passionate about accelerating immune therapy development and building their cross-sector networks in this field.

Why should you attend?

At this event you can...

- Explore unparalleled and varied networking opportunities with sector leaders from industry, academia and health fields
- Listen to cutting-edge talks and discussions from top international experts
- Take part in holistic, cross-disease discussions on the latest developments across the spectrum of immunotherapy research
- Contribute to dynamic focus sessions

Find out more

Book your place at: **www.immunology.org/events/bsi-immune-therapies-summit**
Register before 31 October to benefit from reduced early bird fees.

Stay up to date by following: **@britsocimm**

Official conference hashtag: **#ImmuneTherapies24**

SOCIETY NEWS

30 years with the BSI!

Sarah Green, our Membership and Operations Manager, celebrated a major milestone in August: 30 years working at the BSI! We caught up with her to find out about the changes she has seen and her highlights from three decades with the Society.

How does it feel to be celebrating 30 years with the BSI?

When I first came to interview for a role at the BSI it was for a three-month trial! The idea was that if I liked them and they liked me, there was the prospect of a permanent role. It's bizarre to think a three-month trial could turn into 30 years.

What are some of the changes that you've seen during your time at the BSI?

There are so many memories! There have been lots of changes in different teams, of course. New CEOs have come on board, done what they set out to do, and then moved on to pastures new. I feel the Society now has a very clear idea of the direction we want to head in, and we have been listening hard to our members and taking their views on board.

One positive development has been the introduction of the five-year strategies. These give us a clear focus, by setting out what we want to achieve and how. It's important that our members – and the general public – can see our activities, and that we have a clear purpose. I personally feel that the changes driving us forward are positive, and have left the Society in a strong position, both for our members and for staff.

How has your own role evolved over the years?

I've gone from working on events to dealing with the corporate side of things, to working on *Immunology News*, and on the journals for a time. But it was when I was asked to help out with the membership side of things that I really found my niche. While I've loved all my roles, I'm a very logistics and data-driven person, and so looking after the membership naturally became my thing. Each day is different, and I love the work I do.

What would you say to someone thinking of applying for a job at the BSI?

I would welcome them with open arms! I would say be yourself and speak your mind, because we value your opinion. I've always found the BSI to be a very supportive place to work. We are a small team that listens and advises, and you never feel you're on your own – people look after each other. You're not just someone doing a job, you are appreciated and valued. It's a good organisation to work for.

'I personally feel that the changes driving us forward are positive, and have left the Society in a strong position, both for our members and for staff.'

And what's next? What are you looking forward to?

I really enjoy what I do so I wouldn't want to see any big changes to my role. It would be great to see the membership continue to grow. When I started it was very small and we're now over the 5,000 mark, so it's now about building retention and reaching the people who perhaps aren't aware of us. The merger with UKPIN last year saw us gain lots of clinical immunologists as members, and now we need to demonstrate what we can do for them, and how they can benefit. There will be more change to come and that's a good thing – we should never be standing still.

Thirty years is a long time for anyone to be in one job. I don't think I would still be here in this role if I wasn't in the right organisation, working with the right people, getting the right support. Everyone I've worked with, past and present, has been a part of that. In a way, they have brought me to where I am now.

SOCIETY NEWS

Shaping the future of our professional network for clinical immunology

Clinical immunology is a field that is playing an ever more important role in understanding and treating a wide range of conditions. Established in 2023, the BSI Clinical Immunology Professional Network (BSI-CIPN) aims to improve patient outcomes by strengthening the clinical immunology community and equipping it to tackle future challenges. Our membership currently stands at over 150 professionals from across the UK working in the clinical immunology field, including medics, clinical and biomedical scientists, pharmacists and nurses. In March this year, the BSI-CIPN Steering Group came together to define the network's vision and agree strategic priorities for 2024–2027. Here, we look at the strategic plan that resulted from that meeting.

Published in July, the network's new strategy sets out how the BSI-CIPN will support its members – and the wider professional and patient community – to be a strong voice for clinical immunology. The plan will be critical to guiding and supporting the work of the network over the coming three years, as its members and partners drive forward its implementation.

The BSI-CIPN strategy aligns with the main BSI strategy for 2021–2025, and will be delivered alongside the BSI's Diversity and Inclusion Framework. The priorities set out by the strategy will be delivered in accordance with the BSI's value framework: ambitious and committed, evidence-based and responsible, collaborative and inclusive, agile and energetic.

A mission to guide us forward

The BSI-CIPN Steering Group worked with the BSI staff team to define the mission for the network, and articulate its key purpose. This will provide the 'north star' for the network as members drive forward its activities over the coming years.

Several important themes arose during the strategic planning process, which have been distilled into guiding principles for the network. These will help to shape the BSI-CIPN's ambitious programme of activities, and ensure inclusivity and impact in all it undertakes. These guiding principles also reflect the wider BSI values.

British Society for Immunology

CIPN

Clinical Immunology Professional Network

The mission of the BSI-CIPN is:

Leading delivery of excellence in patient care in clinical immunology, through:

- Education and training
- Advocacy and engagement
- Research

The BSI-CIPN principals

The BSI-CIPN will be seen as the 'go to' organisation for matters relating to clinical immunology, and will work towards its mission by applying the following principles to its work and activities:

- **Raising the UK profile of clinical immunology** through sharing insight and stories, demonstrating what can be achieved for patients through the application of research and excellence in clinical practice.
- **Working across all disciplines in clinical immunology with relevance across all career levels.** The BSI-CIPN will ensure that its activities are balanced across these disciplines and professional groups and will support members to network, build their skills and strategically collaborate to maximise impact.
- **Playing a convening role with partner organisations**, and bringing forward new partnership opportunities with organisations from different sectors including charities, academia, industry and professional bodies. The BSI-CIPN will encourage and support the link between research and clinical practice in immunology.
- **Attracting a diverse membership**, representative of all roles and interests within clinical immunology. Membership should be inclusive of the wider immunology community, in line with the BSI Diversity and Inclusion Framework, as well as including representation from the UK devolved nations.
- **Delivering a demonstrable impact for clinical immunology** and driving targeted and tangible programmes of work that make a difference and add value.

BSI-CIPN strategic themes

The real crux of the strategy lies in its tangible and specific goals across three key themes; these goals will inform the activities of the network over the next three years. There were a huge number of ideas from members of the BSI-CIPN Steering Group when they met, and we are pleased to have been able to include most of these ideas in the plan.

Education and training

By 2027, we will have facilitated new educational opportunities to improve and standardise clinical immunology and allergy training relevant to all professional groups.

We will do this by:

- Continuing to develop and extend the reach and impact of the BSI-CIPN Conference, the leading UK event for all professional groups working and training within clinical immunology and allergy.
- Providing collaborative education opportunities, in partnership with key organisations, to enable trainees within clinical immunology across professional groups to achieve their educational goals.
- Developing educational content on immunology basic science for clinical professionals to support a broader understanding within services.
- Driving forward work on immunology-related clinical guidelines to ensure that relevant clinical guidelines capture the latest evidence and best practice to improve patient care.

Advocacy and engagement

By 2027, we will have identified and delivered on work to increase the prioritisation of clinical immunology within the four UK health systems, through collaborating with partners, patients and the public.

We will do this by:

- Facilitating the growth of the BSI-CIPN to increase our reach into the clinical immunology community, and supporting communication and engagement within the network.
- Integrating patient and public involvement (PPI) into BSI-CIPN work by connecting the BSI-CIPN and BSI PPI strategic plans, and facilitating links with patient organisations and the wider patient community.
- Working with partner and peer organisations to influence UK policy and strategy on clinical immunology by demonstrating the importance of investment and prioritisation of the discipline within national and devolved nation healthcare planning and delivery.
- Working with partner and peer organisations to identify and deliver on wider opportunities for influencing, for example on wider healthcare reforms and with relevant medical specialties.
- Developing targeted influencing work to support and grow the clinical immunology workforce across all professional groups.

Research

By 2027, we will have built better links between the academic and clinical immunology research communities, and facilitated opportunities for immunology research to positively impact clinical practice.

We will do this by:

- Forging links between the academic and clinical research communities to develop new collaborative opportunities – building on BSI strategic priorities in research – and facilitating networking opportunities wherever possible.
- Supporting the translation and communication of science and research to the clinical community on key issues to help impact clinical practice.
- Building strengthened links between the BSI-CIPN and the BSI journals.
- Promoting and showcasing immunology research within early medical, nursing and scientific careers, with a view to supporting the next generation of clinical academics.

What next?

We are already making headway with the implementation of the BSI-CIPN strategic plan, and look forward to driving it forward under the guidance and direction of the BSI-CIPN Steering Group, working with the wider BSI membership.

Our thanks go to everyone who contributed to developing the strategy, and for their expertise, dedication and commitment to the field of clinical immunology. We would also like to extend our thanks to our partners and supporters, who will be crucial to the success of the network's plans.

> 'The field of clinical immunology is of growing importance, and it plays a critical role in treating and understanding a vast breadth of conditions. This strategic plan for BSI-CIPN will help us drive forward our work to make a difference and improve patient care.'
>
> **Professor Siniša Savić, Chair of the BSI-CIPN**

Find out more

To find out more about the work of the BSI-CIPN, visit **www.immunology.org/clinical/bsi-cipn** or email **cipn@immunology.org.**

SOCIETY NEWS

How the BSI is managing its finances to ensure a thriving future for immunology

The British Society for Immunology is committed to supporting our immunology community to drive forward scientific discovery and in turn improve health outcomes. As we make progress on our current strategic plan, we will work with and for our membership to deliver for immunology and the wider community. Here, our Director of Finance, Membership and Publishing, Otto Balsiger, outlines some of the changes in the Society's activities over the last five years, and the impact of these on the BSI's finances.

Our spending explained

Over the last few years, driven by our strategy for the period 2021 to 2025, we significantly increased and expanded our work to provide support for our community, and to represent immunology to the wider world. A key part of this work has been to keep a tight watch on our finances and ensure the future long-term financial sustainability of the organisation.

Most of our income is used to fund activities under the three main strands of our strategy: connecting communities, championing careers and catalysing change. For example, we generate opportunities for our members to connect with others, establish collaborations and grow their skill sets in a supportive environment. Our flagship event, the BSI Congress, together with the annual comprehensive programme of Regional and Affinity Group meetings, is by far our biggest cost. Following our merger last year with UKPIN, we now also support the activities of our newly formed Clinical Immunology Professional Network (BSI-CIPN) and its annual conference.

Membership services are our next biggest area of spending, and these include the wide range of awards and grants that we offer to members, including our popular Conference Travel Grants which help with the cost of event attendance. During this strategic cycle, and responding to the needs of our membership, we also introduced our popular Career Enhancing Grants, to support our members in positive career development. Additionally, we carry out a variety of activities to influence and improve the external environment so that immunology can thrive and deliver positive outcomes for health. This includes our portfolio of policy and public engagement activities, often in collaboration with sections of our membership and with wider research projects. Finally, the last main area of cost is the publishing of our BSI portfolio of scientific journals, *Clinical & Experimental Immunology, Immunotherapy Advances* and *Discovery Immunology,* which facilitate innovation and research dissemination.

How are we funded?

A strong theme from our current strategy is to ensure our long-term financial situation is in good shape and to deliver our income diversification plan to reduce over-reliance on journal income. This will help ensure we are financially secure to support future generations of immunologists. This work has been progressing very successfully, and means we have seen a big shift in our income sources over the past few years. For example, in the 2018–19 financial year (a year in which BSI Congress took place) we received 64% of our income from our established journals. This was followed by our Congress and events income at 22%, with the remaining 14% of our income split between membership, investments and our corporate and partnership work.

However, our budget for 2024–2025 looks very different, as can be seen in Figure 1. With an expected overall income of £2.4 million (almost 10% more than 2018–19), the budget also demonstrates a distinct increase in the diversity of the main income streams.

Most noticeably, there has been a significant planned reduction in our journal income following previously publicised changes in our publishing portfolio. In 2021 we evolved our publishing strategy to focus on developing journals wholly owned by the Society. These changes resulted in the current strong BSI family of journals, all published by Oxford University Press, with three excellent platforms for research dissemination: our hybrid journal *Clinical & Experimental Immunology* and our two Open Access journals launched in the last four years, *Immunotherapy Advances* and *Discovery Immunology.* As a result of these changes, our journal portfolio will contribute 36% of our total income in the 2024–25 budget. These planned changes mean we now have a strong, diverse and modern journal offering for our members, which provides the BSI with a stable income stream, but one on which we are not overly reliant. As 2024–25 is a non-Congress year, our budget for this comprises more diverse funding. Our second largest income stream reflects the expansion of our activities and the income received for our work supporting external research projects, such as the CARINA Network on the immunology of ageing. Funded projects are an important new source of income for the Society, an area that we expect to develop in the coming years as we build relationships with our project partners and funders.

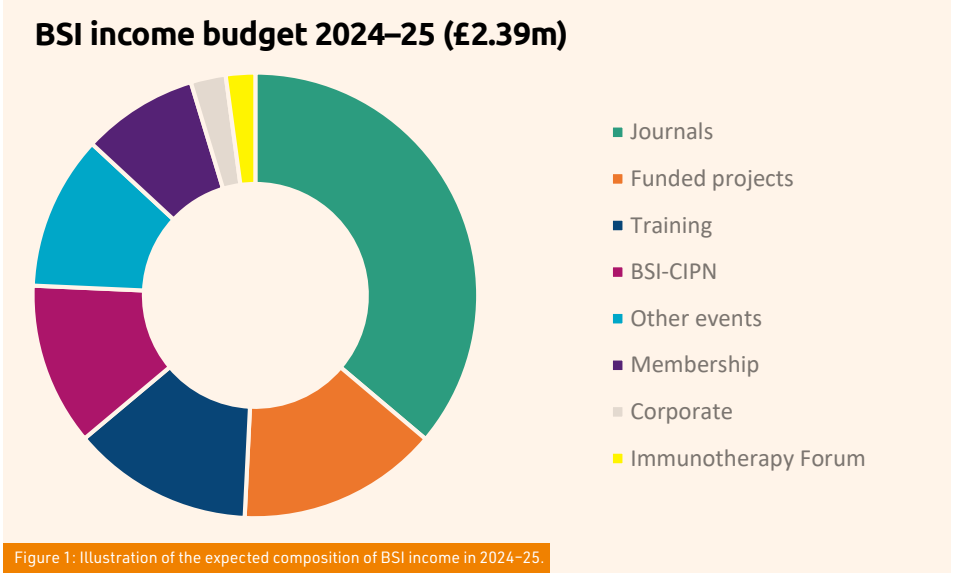


Figure 1: Illustration of the expected composition of BSI income in 2024–25.

SOCIETY NEWS

As part of our income diversification plans, we have also been hard at work developing and delivering a new training function within the BSI. One early result of this has been our hugely successful bioinformatics training run in partnership with the Glasgow Bioinformatics Core. This suite of courses attracted over 360 attendees last year, with excellent feedback from delegates. This year, we have continued to develop our course portfolio, with pilots run in areas including immunotherapy in clinical practice. With a strong growth plan in place, we expect income from all training courses to account for 13% of BSI total income next year.

Another addition to BSI activities is the creation of the BSI Clinical Immunology Professional Network (BSI-CIPN), following our successful merger with UKPIN. The BSI-CIPN forms an integral part of our current strategy to boost our support of the clinical immunology community, and also opens up new opportunities to generate income, including through the annual BSI-CIPN conference. You can read more about our plans to support BSI-CIPN on pages 9–10.

Income from all the activities listed above is crucial in allowing us to deliver on our charity remit and provide the strong support to members that the BSI is renowned for. It might surprise you that, in a typical year, membership fees only constitute a small percentage of our income – generally around 5%. This means that in themselves, they do not cover the cost of the many services we provide to members, such as grants, reduced fees to meetings/events and career support, which are all subsidised through income generated from other activities.

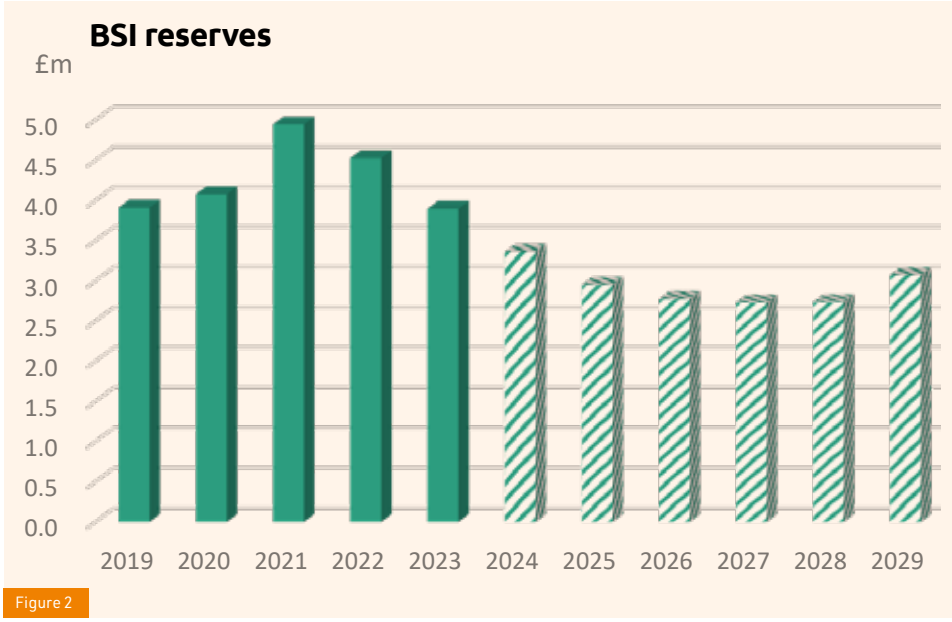


Figure 2

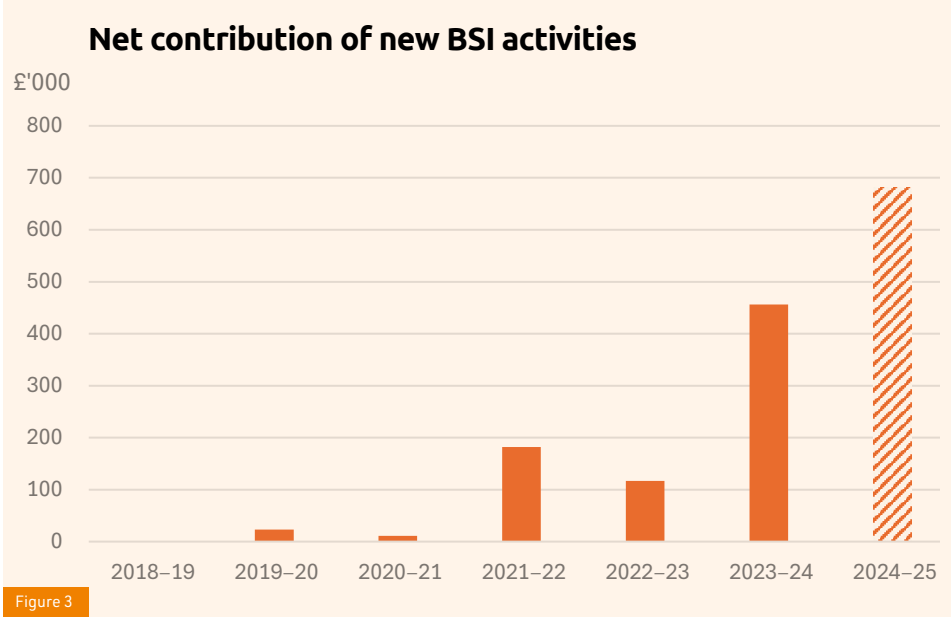


Figure 3

How have we been securing our financial stability?

To deliver our ambitious strategic aims, we need to maintain the BSI as a sector-leading organisation, and financial sustainability is key to this. Like many learned societies, our journals have traditionally provided a high level of stable income and, together with the strong performance of our investments, this allowed us to grow the BSI reserves to almost £5m in 2021. Figure 2 shows our well thought out plans to use some of our reserves to support the income diversification outlined above, and to provide initial financial support to develop the new long-term sources of income for the Society. Some of our reserves have also been used to further support our members in specific areas, such as through new initiatives like our Career Enhancing Grants. Overall, the BSI has had a great deal of success generating new sources of income over a relatively short period of time. Figure 3 shows the net contribution of these new activities to our funding.

The development of new income streams can take time as there is often a delay between investment and return, requiring the use of reserves. They have been built up for exactly this purpose and their use has been carefully planned to ensure they are used in the most effective way while ensuring the financial sustainability of the BSI.

Overall, our efforts to ensure that the BSI has a range of reliable, long-term income streams that support our overall mission is working. Despite challenging external factors, including the pandemic and changes to the publishing sector, the BSI is leading the way within the learned society sector to act innovatively to successfully develop sustainable and long-term new income streams. Ultimately, this will ensure the future prosperity of our organisation, meaning we can effectively support future generations of immunologists.

Otto Balsiger
Director of Finance, Membership and Publishing

SOCIETY NEWS

The STEM Village inaugural Immunology Symposium

The STEM Village was established to provide a platform for LGBTQ+ people in science, technology, engineering and maths (STEM), to improve inclusion for our community while challenging heteronormative stereotypes of what a scientist looks like. In recent years, The STEM Village has developed a number of immunology-focused events, and we are delighted to announce that the BSI will be supporting The STEM Village Immunology Symposium, hosted at the University of Manchester on International Day of Pride in STEM (18 November 2024).

The purpose of this event is to provide a platform for LGBTQ+ immunologists to present their work, and also networking opportunities with the wider immunology community. There will be presentations from a range of LGBTQ+ immunologists, while poster presentations are open to all attendees. Non-LGBTQ+ immunologists are encouraged to attend, as the event will be a great opportunity to find out about cutting-edge research, and to develop new connections with members of the community who typically receive fewer opportunities to share their work.

In addition to research talks already lined up from Professor Liz Jury (University College London), Professor Frederick Sheedy (Trinity College Dublin) and Dr David Bending (University of Birmingham), there will also be a range of talks on other important areas. Professor Adrian Liston (University of Cambridge) will discuss research culture and allyship, and Dr Ben Wilcock – the BSI's Programme Manager (Research) – will give a talk on the queer social history of Manchester. There will also be representation from the George House Trust, a charity that provides HIV support, advice, and advocacy in Greater Manchester. The event will follow a hybrid format so that people from around the world can join, including from countries where it is not safe to be open about their identities, and so that people who experience other issues such as disability or caring responsibilities can also participate.

This event is the first of its kind for immunologists, and hopefully the first of many. So if you love immunology, and you want to meet other brilliant immunologists and have a great day out in Manchester, find out more and register at: **www.immunology.org/events/stem-village-immunology-symposium**.

SOCIETY NEWS

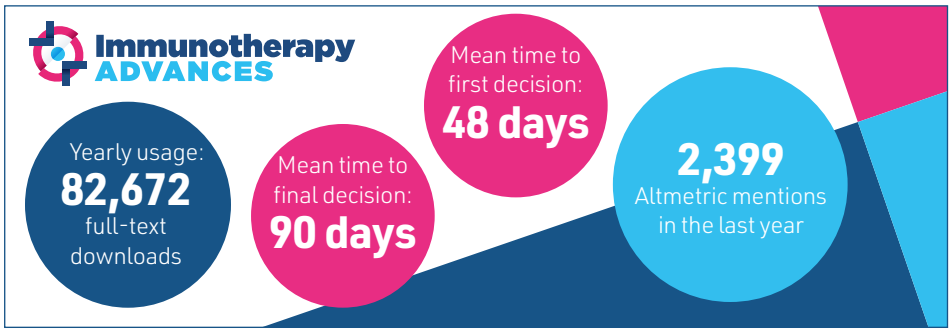
BSI journal *Immunotherapy Advances* gets first ever impact factor

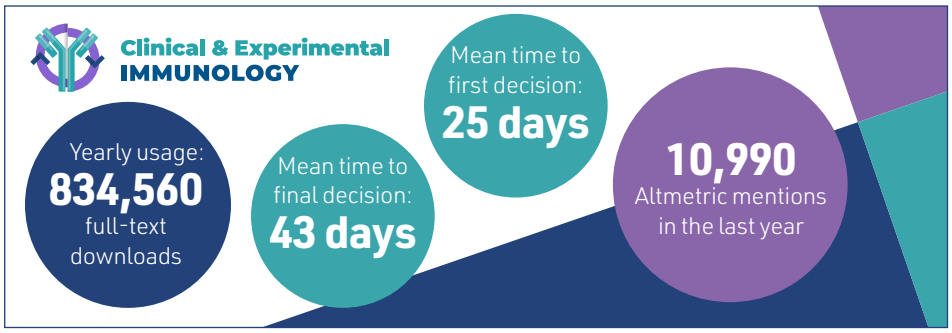
We are pleased to announce that our Open Access journal *Immunotherapy Advances* has been given an inaugural impact factor of 4.1, establishing it as a leading publication in the field of immunology. The announcement came as part of Clarivate's annual Journal Citation Report, and places *Immunotherapy Advances* in the second quartile for immunology journals.

This is a huge achievement for such a young journal, and we'd like to thank the editorial team, led by Founding Editor-in-Chief Professor Tim Elliott, for their incredible hard work, and everyone who has contributed to the journal's continued success, including authors, readers, reviewers and editors.

In the rest of our publishing portfolio, our journal *Clinical & Experimental Immunology* achieved an impact factor of 3.4. Our youngest journal, *Discovery Immunology*, does not yet have an impact factor, but hit a major milestone in April when it was indexed in PubMed Central, one of the largest and most widely used repositories for biomedical and life sciences articles. *Discovery Immunology* also published its first ever Special Collection in April, on checkpoint molecules in cancer immunotherapy.

Impact factors are of course just one of a range of measures that indicate the performance of a journal, and it is important to see them in their wider context. Here, we set out some of the other key metrics and milestones for our three journals. Together, these demonstrate that we are continuing to achieve our goal of publishing high-quality content that is timely and relevant to our research community.





We strive to offer the best possible service to our authors, including a rapid time to first decision, live Altmetric tracking on articles, no page or colour charges for members, integration with Publons, and the skills of a dedicated marketing team who promote articles to interested parties. BSI members also benefit from discounted publishing charges for all journals in the BSI family.

Profits from our journals are invested back into the BSI to benefit our members in the form of grants, travel awards, BSI Regional and Affinity Group meetings, our popular BSI Congress and other key initiatives. By submitting to one of our journals, you are supporting our work in all these areas and more.

Find out more

Find out more about our journals here: **www.immunology.org/publications/journals**

You can keep up to date with news from the journals by following **@CEIjournal, @IMTadvances** and **@discovimmunol** on X.

Immunotherapy ADVANCES

Harnessing the power of mRNA technologies

The BSI recently brought together a group of expert stakeholders from academia, industry, clinical practice, funding bodies and government, to examine how these sectors can work together to promote collaboration and drive forward mRNA technologies in the UK. Here, Ben Wilcock, the BSI's Programme Manager (Research), describes the outcomes of this meeting, which was held at the Royal Society in London.

Supported by an Educational Grant from Moderna, this meeting was part of a wider programme of mRNA-focused research delivered by the BSI, including two webinars delivered to BSI members earlier this year.

The meeting was chaired by Professor Colin Dayan (Cardiff University), and our invited speakers were Dr Katrina Pollock (University of Oxford), Dr Satwik Kar (Moderna), Professor Lorna Harries (University of Exeter) and Dr Lennard Lee (University of Oxford). Each gave an in-depth summary of their respective work in the field of mRNA, after which attendees took part in breakout group discussions to address the opportunities and challenges of developing mRNA technologies in the UK.

What is mRNA?

mRNA, or messenger RNA, is a type of genetic material that plays a crucial role in the production of proteins, which are essential for cell function. It acts as a messenger by carrying instructions from DNA in the cell nucleus to ribosomes, where proteins are made. In recent years, mRNA has gained attention for its use in vaccines, including for COVID-19. Such vaccines use synthetic mRNA to instruct cells to produce a protein that triggers an immune response, teaching the body to recognise and fight the actual virus. This innovative approach is a powerful tool for the development of new immune therapies and for combating diseases including viruses, autoimmune conditions and cancer.

A raft of potential applications

Discussions during our meeting highlighted the potential of mRNA technologies to revolutionise treatments for conditions affecting the immune system. The success of COVID-19 vaccines has demonstrated the broad applicability of mRNA in the UK,

'mRNA technologies are an exciting aspect of immunology, with immense potential to revolutionise treatments for infectious diseases, cancers, autoimmune disorders, and more. The speed, precision and adaptability of mRNA offers unprecedented opportunities for personalised medicine and rapid response to emerging health threats. To fully realise these benefits, it is crucial for all sectors – from healthcare providers and researchers to industry leaders and policymakers – to collaborate closely. By working together, we can ensure that the advancements in mRNA technology reach and benefit the widest possible population, improving health outcomes and transforming lives across the UK and beyond.'

Doug Brown, Chief Executive of the British Society for Immunology

particularly for infectious diseases, rare cancers, autoimmune disorders, paediatric illnesses and seasonal vaccines. Unlike traditional protein-based treatments, mRNA's ability to rapidly respond to emerging diseases and conditions allows it to respond to genetic mutations and facilitate the creation of necessary proteins to combat immune threats. This makes it a game-changing therapy.

Among the most promising areas for mRNA application is vaccine development, particularly for respiratory illnesses, cancers and human papillomavirus (HPV). The flexibility of mRNA supports both preventive and therapeutic uses, with a primary focus on infectious diseases and various cancers. This technology also holds immense potential for personalised treatments tailored to individuals based on race, age and sex, which could significantly improve healthcare outcomes.

Although the science behind cancer vaccines is progressing rapidly, progress towards full implementation is slow. Nonetheless, mRNA shows substantial promise for use in combating cancer, both preventively and therapeutically. In diseases like arthritis, it can be used as a cost-effective means of creating proteins in situ. What's more, replacement proteins produced by mRNA may offer breakthroughs for degenerative conditions.

The attendees of our meeting agreed that mRNA technologies offer a transformative approach to immunological treatments, with promising applications in vaccine development, cancer treatment and personalised medicine. Their rapid adaptability, cost-effectiveness, and favourable patient perception make them a compelling alternative to traditional therapies and gene therapy. However, there are currently significant challenges to large-scale development and application of mRNA technologies that need to be addressed if we are to reap maximum benefit from them.

Navigating challenges

Successful implementation of mRNA technologies means reaching as many people as possible and having a widespread geographic impact. Currently, however, there is significant regional inequity across the UK in terms of access to specialists and resources. Substantial infrastructure and investment are needed to bring mRNA technologies to market across the UK. In addition to funding and investment in pathways that facilitate development and implementation of mRNA on a national scale, attendees suggested that recruiting patients to UK-wide trials could help combat regional inequalities.

Another challenge identified during the meeting was the shortcomings of standard measures to determine patient characteristics and related treatment. For instance, while body size may impact treatment efficacy, there is clear evidence that the practice of tailoring treatment dosage by BMI and body shape alone is ineffective. One advantage of mRNA is that it can be personalised to the needs of the patient, but we need to ensure that the measures used to categorise patients' needs are thoroughly considered, and that we do not solely rely on standard measures in creating personalised treatments. While this challenge is not unique to the development and application of mRNA technologies alone, it is something that needs to be addressed and navigated.

Effective collaboration

Researchers, clinicians, industry representatives, policymakers and funders alike were positive about working together, and felt that collaboration could be enhanced by fostering a culture of openness and reducing competition and unnecessary bureaucracy. Joint funding structures and cohesive funding frameworks, such as single contracts and streamlined regulatory processes, were seen to be particularly important. Establishing pre-competitive spaces where questions can be explored jointly would promote a unified vision and purpose, and valuable lessons can be learned from overseas (such as in the US, where collaboration is generally more common) to help identify and overcome specific barriers in the UK.

Engaging experienced clinical trial units and securing public buy-in through patient engagement are also crucial. Specific solutions identified to tackle these challenges were ring-fenced funding, shared lab spaces, and secondments to facilitate knowledge exchange, and attendees also suggested that co-locating staff from spin-outs and academic teams strengthens partnerships and increases efficacy on both sides. It was also noted that collaboration between researchers and industry should take place as early as possible, preferably during drug development and clinical trials, and well before any treatment goes to market. Collaboration at this stage could have a significant positive impact on the speed at which treatments can be made available to patients.

This meeting and the associated webinars have underlined the immense potential of mRNA technologies and the importance of cross-sector collaboration in realising their full benefits. We'd like to say a huge thank you to all contributors for their invaluable insights and expertise, and to the members of the organising committee for their support in planning and delivering this event. Our gratitude also goes to Moderna for their generous Educational Grant, which made this meeting and the associated webinars possible. Lastly, we thank all attendees for their active participation and engagement.

The discussions have highlighted the need for a culture of openness, cohesive funding frameworks and streamlined regulatory processes to overcome existing barriers. By fostering a shared vision and purpose, we can create an environment where innovation thrives and public health outcomes are significantly improved. It is abundantly clear that the success of mRNA technologies in transforming healthcare depends on an unerring commitment to working together.

Ben Wilcock
BSI Programme Manager (Research)

The activities associated with this project are made possible through an educational grant provided by Moderna. Moderna has not directed or influenced the content of the project or any of its activities.

moderna

Find out more

For more information about this meeting or about the BSI's partnership work, please contact **b.wilcock@immunology.org**.

Representing early career immunologists on the BSI Board:

an interview with Dr Carolyn Nielsen

Our Trustees play a vital role in helping to ensure the BSI is well-run, financially sound, and that we can meet our goals and ambitions. In July, we welcomed two new Trustees to our Board, including Dr Carolyn Nielsen, who is a Senior Immunologist working on malaria vaccine immunology at the University of Oxford's Department of Biochemistry. Dr Nielsen is one of two Early Career Trustees on the Board, and we caught up with her to find out what she's looking forward to most.

What motivated you to put yourself forward for the role of Early Career Trustee?

I've been a member of the BSI since I moved back to the UK to start my PhD, and I've really enjoyed participating with the Society in a variety of ways. This role offered an opportunity to look behind the scenes and understand how the Society is run, and contributing to the governance and strategy side really appealed to me. As an early career researcher, I was also drawn to the opportunity to represent people at this specific career stage.

What are some of the challenges that immunologists can face early on in their career?

Something that comes up again and again when speaking to my peers is job security and the balance we have to strike between achieving career stability and pursuing the research we're really passionate about. People are often on short-term contracts, due to the nature of externally funded fixed-term grants. This can have all sorts of implications in terms of planning your professional development, but also your personal life. Many of us are going through big life changes at this stage of our career, juggling personal

'Something that comes up again and again when speaking to my peers is job security and the balance we have to strike between achieving career stability and pursuing the research we're really passionate about.'

and professional priorities. If you're pursuing independence as a scientist, you need a lot of support to navigate this period of uncertainty.

What can the BSI do to support people at this stage of their career?

I've been really encouraged to see the introduction of new schemes from the BSI such as the Career Enhancing Grants and continuation of the Conference Travel Grants. There is clearly a lot of effort being made to provide the smaller, flexible funds that can help people at inflection points in their career, such as by paying for things that are difficult to cover with other core funds. It's great to see grants that are flexible enough to be tailored to people's own skill set, or that can help them pivot into a new area. This is precisely the kind of initiative that promotes a healthy and inclusive research culture. I'd be really keen to hear from other early career researchers about what other types of help would be most useful to them, in academia or otherwise.

Can you tell us a bit about your own journey into the field of immunology?

I became very interested in human immunology during my undergraduate degree, and was particularly drawn to vaccine research since there was such a strong translational focus and clear line to potential public health impact. I knew pretty early on after this that I wanted to be part of vaccine science in academia, but I still tried to take advantage of available opportunities to gain some exposure to other sectors. During my Master's degree at the Johns Hopkins Bloomberg School of Public Health in the United States, I took part in a new internship programme linked to the World Health Organization. This was a really great way to get some insight into public health policy in action, and see the 'other side' of the vaccine development pipeline and the types of roles that might be available to me outside the lab later in my career. Then, during my PhD at the London School of Hygiene & Tropical Medicine, I spent a couple of months with GSK Vaccines in Belgium. It was fascinating to see vaccine research in an entirely different context, and I got to learn about the practical side of clinical trial design and collaboration management from a different perspective. Both experiences broadened my understanding of the vaccine development landscape, and I'm still in touch with people I met in both Geneva and Rixensart. I think giving students and early career researchers the opportunity to experience different research environments can be very rewarding.

> 'I've been really encouraged to see the introduction of new schemes from the BSI such as the Career Enhancing Grants and continuation of the Conference Travel Grants. There is clearly a lot of effort being made to provide the smaller, flexible funds that can help people at inflection points in their career.'

What are some of the ways the BSI supported you during your early career?

The BSI Congress has played an important role in my own career development and was one of the first places I gave an external talk. I have noticed over the years that Congress is particularly well attended by students, so the BSI is clearly doing a good job of making it accessible and attractive to emerging immunologists. I always come away with ideas and it's a pleasure to bump into people I know from different stages of my life. I've also participated in the BSI's mentoring scheme, which was another excellent resource.

What do you most look forward to in your new role as a BSI Trustee?

I really look forward to exchanging ideas with others on the Board and the BSI team, drawing on my own experiences but also hearing from members about what they want and need from the Society.

One area I'm excited to delve into is how people are finding ways to engage across different sectors. I took part in a leadership programme in Oxford a few years ago where we looked at mechanisms to help academics and clinicians collaborate more effectively, and it quickly became apparent how mindbogglingly difficult it can be to find the right person to approach when seeking collaborations outside your own familiar sphere, when you no longer know the jargon or have any connections.

So it seems to me, there's a real opportunity for the BSI to act as a connector. Congress certainly already serves this purpose, but there should be other ways to make this side of things easier, and it would be great to brainstorm what these may be.

Are there any particular challenges facing the field in your view, and what role might the BSI have in tackling these?

Communication with the public is always going to be an important and tricky area, and the BSI really stepped up during the pandemic, in a way that I thought was quite admirable. There are so many potential pitfalls when you're trying to communicate technical information to a lay audience, without overplaying the data or undermining your own point. Scientists like to state the caveats! One of the ways the BSI was useful during this time to me personally was in helping me to respond to the questions I was being asked by friends and family. I seemed to mainly get queries about the potential impact of COVID-19 vaccines on fertility, and I was immediately able to draw on the Society's evidence-based materials that addressed these questions. I realised there is a wide range of similar resources on a variety of topics that are concise and easy to share. I think communicating solid immunology advice in an accessible format will continue to be something the BSI can support members with very effectively.

> 'There's a real opportunity for the BSI to act as a connector. Congress certainly already serves this purpose, but there should be other ways to make this side of things easier, and it would be great to brainstorm what these may be.'

Find out more

To find out more about the BSI Board of Trustees, visit **www.immunology.org/about-us/our-people/governance/board-trustees**.

The secret role of fat in the immune response to sleeping sickness

Dr Matthew Sinton (R) receives his Bright Spark in Immunology award from Dr Donald Palmer (L), BSI Careers & Education Secretary.

The 2023 BSI Congress saw the return of our hugely popular 'Bright Sparks in Immunology' sessions, which recognise exceptional work from PhD students and postdocs. Here, Dr Matthew Sinton tells us more about his work on the role of adipose tissue in the immune response to sleeping sickness infection, which won him the award in the postdoc category.

What is the role of adipose tissue in infection?

When we think of getting an infection, the fat in our body isn't likely to be the first thing on our mind, but there's growing evidence that adipose tissue is an important player in the immune response to infectious diseases. We know that numerous infections lead to weight loss, and it has long been thought that this is because when we get sick, we often don't want to eat, and so begin to use up our lipid stores. However, there is a growing body of evidence showing that the adipose tissue changes its structure and function during infection, and that these changes actively contribute to the immune response. We still don't know a lot about the interactions between adipose tissue and the immune system, and we also don't know a great deal about the impact on our immune system of drawing upon these internal nutrient stores instead of getting our nutrients from our diet. Adipose tissue was once thought of as an inert energy depot, but we now know that it is an incredibly active tissue, exerting strong endocrine functions on various tissues throughout the body, while also maintaining communication with organs like the liver and brain. We also know that the fat cells within the adipose tissue, called adipocytes, secrete a range of immune factors – including cytokines like TNF-α and IL-6 – and hormones like adiponectin and leptin, which have also been shown to have immune functions. These have been studied in the context of obesity, which causes systemic inflammation, but obesity is a relatively modern phenomenon. So what happens in this tissue when we have an infection, and how might it contribute to the local immune response?

> 'There is a growing body of evidence showing that the adipose tissue changes its structure and function during infection, and that these changes actively contribute to the immune response.'

Studying sleeping sickness

During my time in Professor Annette MacLeod's Lab (University of Glasgow), we started to explore this question using the pathogen *Trypanosoma brucei*, which is an extracellular parasite that infects humans and animals in countries of Sub-Saharan Africa, leading to a disease called sleeping sickness. The parasite is transmitted through the bite of an infected tsetse fly, and once it enters the bloodstream, it starts to colonise tissues throughout the body, starting with peripheral tissues such as the skin and adipose tissue, and eventually making its way to the brain borders and even the brain parenchyma. Throughout the course of this infection, people develop severe pathologies, including narcolepsy-like symptoms, and excessive weight loss and adipose tissue wasting. Ultimately, if left untreated, the disease is fatal and even if treated it can still leave people with severe disabilities.

Our starting point was to look at what

> ‘We were really excited to share our findings with the field, as they highlight the important role of adipocytes in the immune response to infection.’

happens in the skin during infection, as the skin is an important reservoir for *T. brucei* transmission, and the parasites must survive the local immune response while they wait to be taken up by the bite of a tsetse fly. Additionally, there is a layer of subcutaneous adipocytes throughout the skin, making it an ideal tissue for exploring the role of adipocytes in the response to infection.

An intriguing discovery

We started off with a broad characterisation of skin from mice, using a combination of single cell and spatial transcriptomics, which was a team effort with Juan Quintana (a Research Fellow in the lab), and Praveena Chandrasegaran and Agatha Nabilla Lestari (both MSc students in the lab). Using this approach, we were able to determine not only which cell populations were changing during infection, but also where these cells were located and what they might be interacting with. One of the most striking initial outcomes of this analysis was the expansion and migration of gd T cells in the skin during infection. We identified a population of IL-17A$^+$ Vg6 cells in the dermis and epidermis under homeostasis, which then migrated to the subcutaneous adipose tissue layer during infection, which was fascinating to us. We were really intrigued because a number of studies have demonstrated that IL-17 is important for controlling adipocyte function. For example, Kohlgruber *et al.* (2018)[1] identified that IL-17A$^+$ gd T cells control adipose tissue thermogenesis, and shortly after, Teijeiro *et al.* (2021)[2] found that IL-17A is an important driver of adipose tissue expansion during obesity.

These studies made us wonder if these Vg6 cells might be having some effect on the subcutaneous adipocytes during *T. brucei* infection. Using a Vg4/6 knockout model, we observed that during infection, control animals lost significant adipose tissue mass as expected, but that the knockouts started out with less of this tissue and did not lose any during infection. This was a really exciting finding, but we wanted to know if the Vg6 cells were the only ones upregulating IL-17A during infection and, as we expected, they were not. We also found that T_H17 expanded in the adipose tissue during infection. We were fortunate enough to have received serum from patients infected with *T. brucei* through the TrypanoGEN+ network, and when we measured cytokines in these samples, we found that IL-17A was elevated in samples from infected patients.

A dual approach

To try and figure out how IL-17A might be interacting with adipocytes during infection, and given that we now knew multiple cell types were upregulating this cytokine, we took two approaches. One was to delete IL-17A itself (using an *Il17af*$^{-/-}$ mouse model) and the other was to delete IL-17 receptor A (IL-17RA) from the adipocytes themselves (using an *Adipoq*^{Cre} × *Il17ra*$^{fl/fl}$ mouse model). We found both of these models to be protected from weight loss and adipose tissue wasting (as they were in the Vg4/6 model that we used), strongly supporting the idea that IL-17A drives these phenotypes during *T. brucei* infection. However, there was an additional really exciting finding that arose from using the IL-17RA deletion model, which was that the parasite burden in the adipose tissue was higher than that in littermate controls. In fact, there were around double the number of parasites in the tissue when the adipocytes could no longer sense IL-17 signalling through IL-17RA, which was completely unexpected.

There are a number of possible causes for this. One is that IL-17 signalling through IL-17RA may induce the expression of antimicrobial peptides that can directly kill the parasites. Alternatively, the adipocytes may be releasing specific factors that are able to coordinate the local immune response. When we performed cell–cell communication predictions, we found that during infection, adipocytes upregulate numerous genes, including those encoding P-selectin and CCL12. So, it is plausible that recruitment of various immune cells is impaired when adipocytes can no longer sense IL-17.

We also found that adipocyte precursor cells (preadipocytes) are heavily involved in the production of cytokines/chemokines during infection (e.g. *Il6, Il15, Il18bp, Cxcl9* and *Cxcl10*) and presentation of antigens (e.g. *H2-DMa* and *H2-M3*). Together, this gives the impression that adipocytes and their precursors are switching their focus to supporting and/or coordinating the local immune response during *T. brucei* infection.

Sleeping sickness is transmitted by the bite of the tsetse fly

Final thoughts

We were really excited to share our findings with the field, as they highlight the important role of adipocytes in the immune response to infection. Hopefully this is something that will be tested in other infectious disease models. The prevalence of obesity and metabolic disorders is rapidly increasing globally, and it is vitally important that we study adipose (and other) tissues from new angles, so that we can understand both how they contribute to immunity, and how this contribution is impaired if the tissue becomes dysfunctional.

Dr Matthew Sinton, University of Manchester

REFERENCES

1. Kohlgruber *et al.* 2018 *Nature Immunology* **19** 464–474 https://doi.org/10.1038/s41590-018-0094-2
2. Teijeiro *et al.* 2021 *Nature Metabolism* **3** 496–512 https://doi.org/10.1038/s42255-021-00371-1

Congratulations

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

National Teaching Fellowship Scheme

Congratulations to **Dr Sophie Rutschmann**, who started her term as BSI Careers & Education Secretary in July, for being awarded a National Teaching Fellowship. This scheme recognises individuals who have made an outstanding impact on student outcomes and the teaching profession in UK higher education. Dr Rutschmann, who is based at Imperial College London, will become part of a community of over 1,000 National Teaching Fellows representing more than 40 disciplines.

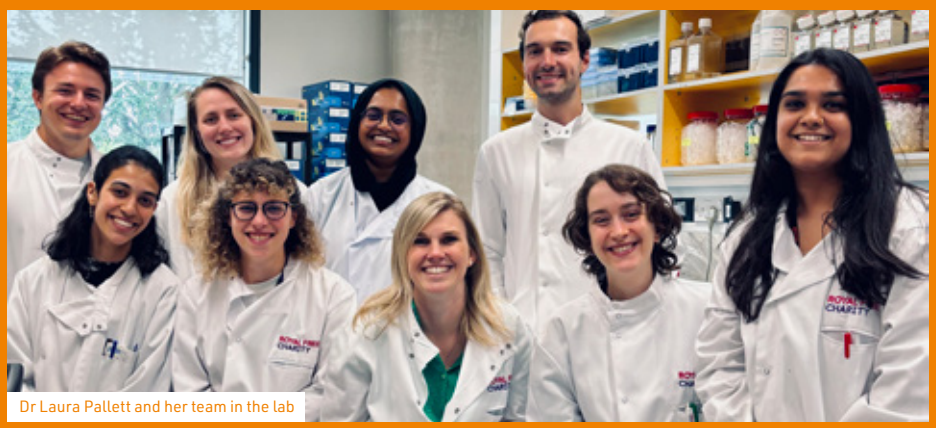
Lister Prize winners

Congratulations to the following BSI members who have been named Lister Fellows. They will each receive £300,000 from The Lister Institute of Preventive Medicine to spend on furthering their research.

Sarah Dimeloe,
University of Birmingham
Rebecca Drummond,
University of Birmingham
Elizabeth Rosser,
University College London

Roger Williams Legacy Grant

Many congratulations to **Dr Laura Pallett** (University College London), who has been awarded the 2024 Roger Williams Legacy Grant for her project 'Living off the Land: Uncovering the metabolic preference of liver-resident T-cells.'



Dr Laura Pallett and her team in the lab

BSI Equality, Diversity & Inclusion Activity Grant

Many congratulations to the latest awardees of this grant:
Laura Eghobamien,
Black Medical Scientific Network, Celebrating Diversity in Science
Dr Matthew Sinton, The STEM Village, Immunology Symposium for LGBTQ+ immunologists

Communications and Engagement Grant

Congratulations to all those successful in the latest round of this grant:
Dr Iris Mair, University of Edinburgh – Connecting environment, immune system and researchers – an artscience approach
Professor Adrian Hayday, King's College London – Vaccination, a Time Machine
Dr Joanne Pennock, University of Manchester – Outbreak!

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**.

FUTURE FOCUS

BSI Winter School: equipping the next generation of immunologists

An important part of the BSI's mission is to support future generations of immunologists. To this end, we are once again running our popular BSI Winter School this year. This is a three-day residential event for MSc students (or equivalent in industry and other areas) that provides an opportunity to hear from, and be inspired by, leading immunologists working across the UK. The 2024 Winter School will take place on 2-4 December in Sheffield, and promises to be a dynamic and varied learning experience.

What happens at Winter School?

Over the three days of the BSI Winter School, attendees will have the opportunity to hear some of the UK's leading immunologists discussing their latest research. Topics will include the immune system across a person's lifetime, infections and vaccinations, and how data and technology can be used in immunology. These talks are intended to increase knowledge of work taking place in the UK, as well as to support learning during a Masters course, and during a researcher's early career more broadly.

Alongside the talks, we will be hosting careers panels where attendees will be able to hear from a range of people about how they got to where they are. There will be guests working in academia, industry and clinical settings, as well as from the wider science community, including representatives from charities, teaching and public engagement.

The event will also offer networking opportunities, including with our speakers, so attendees can learn more about different sectors, the opportunities they offer and the people that work in them.

What are the benefits of attending?

The BSI Winter School will help attendees to:

- Learn about cutting-edge research taking place across the UK
- Discover the wider immunology sector
- Find out about career opportunities
- Hear about a range of people's professional experiences, successes and challenges
- Network with leading researchers from a variety of fields and with other Masters students

There will also be a session on how to engage the public with complex scientific ideas, looking at how to identify your audience and different methods to engage with them. Attendees will have the opportunity to put these skills into practice by working in groups to plan a public engagement activity that showcases an area of research featured during Winter School.

All the elements of the Winter School programme have been carefully chosen to build skills, confidence and knowledge about the immunology sector, and help attendees explore future career options.

Part of a suite of support

Winter School is just one example of a range of careers support on offer to BSI members. We also run a mentoring scheme for early career immunologists, providing support over the course of 12 months with decisions relating to their career path, as well as independent support and advice.

We also offer a number of grants for members, including our Career Enhancing Grant, which is aimed at those just starting out in their career. Members can apply for up to £5,000 in flexible financial support to help them grasp opportunities and tackle challenges in their path. This could be funding for a pilot project to gain proof-of-concept data, a placement or training to learn new skills, or the purchase of new equipment to carry out research.

Other grants include our Communication and Engagement Grant for public engagement activities, our Equality, Diversity and Inclusion Activity Grant, and travel grants to attend conferences and BSI Regional and Affinity Group events.

And, of course, we also offer a wide range of training courses, many of which are extremely popular with early career immunologists. This includes our bioinformatics courses, which equip wet-lab immunologists, biologists and other life scientists with the skills and confidence to perform their own bioinformatic data analysis.

Find out more

Register for Winter School here: **www.immunology.org/events/bsi-winter-school**

Find out about other BSI careers support here: **www.immunology.org/careers/bsi-careers-support**

Find out more by contacting **careers@immunology.org.**

Dr Michael Parkhouse
1935–2023

The BSI is saddened to learn about the recent death of Dr Michael Parkhouse, who made an outstanding contribution to the field of immunology over a period of more than six decades.

Michael Parkhouse (Mike) was born in London on 28 December 1935 to Welsh parents – Vernon, a headmaster, and Mwvanwy, a teacher – two years before his brother, William. At the outbreak of the second world war, the boys were evacuated to Swansea Valley and lived with their grandparents until the end of the war, attending the local primary school. By then, Mike was reported to be very competitive, highly intelligent and with a fervour to learn. He continued his education in London, completing grammar school and obtaining a degree in zoology at King's College London, where he developed an interest in host–pathogen interactions.

After earning a PhD at the Royal Postgraduate Medical School at Hammersmith Hospital, Mike joined the group of Dick Dutton at The Scripps Clinic and Research Foundation in La Jolla, California, for a Postdoctoral Fellowship to study lymphocyte activation. He continued his postdoc with Edwin Lennox at the Salk Institute, where he worked on the biosynthesis of immunoglobulin heavy chains. Armed with a robust background in biochemistry and immunology, Mike was recruited in 1967 by John Humphrey as an independent staff scientist to the Division of Immunology of the MRC National Institute for Medical Research (NIMR), in Mill Hill, London, which was an exciting and internationally renowned environment for immunology research. Here, Mike conducted pioneering studies in immunoglobulin research, collaborating with many famous researchers, such as Brigitte (Ita) Askonas, who later became Head of the Division of Immunology after John Humphrey's departure. With Ita, Mike would develop a long-lasting friendship based on scientific interactions, mutual respect and loyalty.

Mike Parkhouse with his wife Erika Abney

The NIMR was also famous for many other areas of life science research, including parasitology, and accordingly Mike expanded his research programme from immunoglobulin synthesis to the immune response to model antigens and pathogens, initially collaborating with Bridget Ogilvie on pioneering research to identify surface antigens of the nematode *Trichinella spiralis*. Eventually his research interests encompassed a broad array of parasites and he accumulated a large number of collaborators from Latin America, particularly Mexico, as well as research trainees, whose admiration and loyalty he always merited. After Ita retired in 1988, Mike moved to the Institute for Animal Health at The Pirbright Institute as Head of Immunology, where, ever inquisitive and creative, he turned his attention to the immune response to viruses in cattle and pigs. In 1999, Mike transferred his research group to the Gulbenkian Institute in Portugal, where he continued to work until his death in 2023.

The breadth of Mike's scientific knowledge was astounding. He is well known for his work on the immune response against an array of pathogens, including African swine fever virus, foot-and-mouth disease virus, and even murine gammaherpesvirus, and he could tell you many things you didn't know about all of these. Mike is less well known for his pioneering work on basic immunology, particularly in humoral immunology.

'Eventually his research interests encompassed a broad array of parasites and he accumulated a large number of collaborators from Latin America, particularly Mexico, as well as research trainees, whose admiration and loyalty he always merited.'

'Mike was a very entertaining person. His wit, deployed copiously during his conferences and seminars, made his talks very enjoyable to all who listened.'

Perhaps owing to the wide range of his research work, and his modesty – which always prevented him from blowing his own trumpet – nowadays almost nobody remembers that he was the first to show that immunoglobulin variable and constant regions are synthesised as a single polypeptide chain from the same mRNA molecule.[1] In 1967 this was ground-breaking. More people (still not many) may know that he was the first to identify the murine homologue of IgD,[2] and to generate an IgD specific antiserum.[3] This work demonstrated that IgD is an evolutionarily conserved Ig class and opened the way to subsequent studies on B cell ontogeny, activation and class switching.[4,5] He also found a hexameric form of IgM[6] with powerful complement fixing activity.[7] Sadly, also few people know that Mike was the first to show the presence in normal splenic B lymphocytes of the IgM associated molecules Igα (mb-1, aka CD79a) and Igβ (B-29, aka CD79b).[8] These molecules are necessary for surface expression of IgM and mediate signal transduction downstream of the surface receptor. Their role was simultaneously described by Michael Reth in a myeloma cell line.[9] The impact of Mike's immunoglobulin work could still be appreciated years later.

The great love of Mike's life, Erika Abney, with whom he made the fundamental discoveries on IgD, joined his group at the NIMR in January 1972 as a postdoc. In September 1975, Erika was to return to Mexico to take the position of independent researcher at the Universidad Nacional Autónoma de México. As she recounts, on her last day at Mill Hill, she was waiting at the bus stop for the famous 240 bus, as many have done through the years. There, she was joined by Mike who promptly kissed her. This encounter would affect the rest of their lives. Soon after, Mike organised a sabbatical in Mexico City, arriving with his three children from a previous marriage – Luke, Vana and Dafydd – in tow. Michael stayed 16 months and married Erika on 26 August 1976. They all returned to London in May 1977, with Erika becoming a mother to Mike's three children. Michael re-joined the NIMR and Erika went to work with Martin Raff at UCL.

"I met Parkhouse while waiting for the 240 bus, when I was a PhD student at Mill Hill. Ten months into my PhD I recognised Parkhouse as an NIMR employee, so accepting a lift from him seemed safe, but I had no clue as to whether he was a scientist or an electrician. Hence I explained to him in very basic terms, that bugs need to stick to our cells in order to infect, and preventing this might help prevent infection. He replied: 'I work on lymphocyte cell surface molecules and know how to make monoclonal antibodies, so this could help your PhD project, and isn't your boss leaving next month?' Thus started a great collaboration and my introduction to the immune system, influencing the rest of my career."
Anne O'Garra, Francis Crick Institute

"Mike moved to the Gulbenkian Institute in late 1999, by which time I was preparing my move to the Pasteur Institute. I had known him very well for many years, but sadly we only overlapped briefly in Oeiras. In those days the institute was undergoing a profound renovation, so Mike had no attributed space, no lab and no office. It often happened that I would arrive in the morning after Mike (he was an early bird) and find him occupying my desk, from where, after long, hilarious conversations, I had to evict him in order to get on with my work. Mike endured the vagaries of his situation at the Gulbenkian Institute with stoicism, and rapidly developed close interactions with the junior group leaders and their students. He would dine with them frequently at the Pombalino, his favourite restaurant. This is where, according to him, 'the wine is so cheap that one doesn't have to finish the bottle'. After I moved to Paris I kept in close touch with him during my frequent visits to London. I am glad that, in spite of his obvious frailty, he managed to attend the 50th anniversary meeting of the Portuguese Society for Immunology in March 2023 where he received the tribute of the Society for his contributions to Portuguese Immunology."
Paulo Vieira, The Pasteur Institute, Paris

Mike was a very entertaining person. His wit, deployed copiously during his conferences and seminars, made his talks very enjoyable to all who listened. In less public settings, he was wont to call on a large repertoire of jokes, most of them unprintable here. He was a *bon vivant* and *gourmet* of refined tastes, with an encyclopaedic knowledge of the best typical, inexpensive restaurants in practically any town. He had first-hand experience of all of them, acquired on multiple trips to meet his numerous collaborators around the world, especially in Spain, Portugal, Mexico and Venezuela. The suggestions were always worth a try. Mike was also a performer, having played Shakespearean characters and performed stand-up comedy in village halls. His musical abilities were also well known. As a close friend of his said, "he played any instrument that one could blow or strum". He was also a *connoisseur* of classical music (a real opera buff) and, in that peculiar British fashion, never failed to follow the latest cricket scores. He ran almost daily, until the severity of his treatments prevented it.

Mike developed oesophageal cancer in 2013. In 2014, he discharged himself from the Royal Free Hospital, where he was receiving intensive chemotherapy, and, dressed in a smart, light suit, attended the Memorial Meeting at the Royal Society for Ita Askonas. At the memorial, he delivered a remarkable presentation covering molecular mechanisms of host immunity and pathogen-induced immune evasion, finishing off with his work on cysticercosis. This work was the result of collaborations with many past members of his lab, from Venezuela, Spain, Edinburgh, Mexico and Peru. He actively pursued these collaborations until the very end, on 1 October 2023.

In a research career spanning 64 years, Mike authored 300 research publications. All his friends and fellow immunologists will profoundly miss him.

Anne O'Garra, The Francis Crick Institute, London and **Paulo Vieira**, The Pasteur Institute, Paris

We would like to thank Erika Abney, John Skehel, John McCauley and Tony Minson for sharing their memories of Mike Parkhouse with us.

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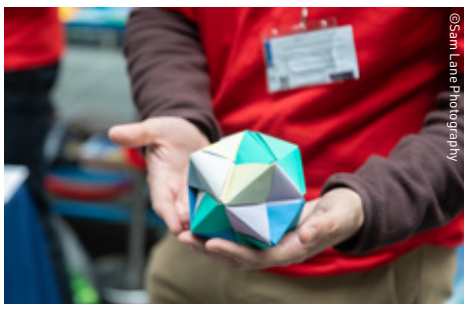
All aboard the immune express!

Promoting vaccine awareness at London King's Cross train station

Our Communication and Engagement Grant provides financial support to help BSI members develop and deliver activities to engage with the public in a wide range of formats. We recently supported members of the BSI London Immunology Group to arm themselves with a raft of fun and innovative materials and take to the concourse of one of London's most bustling transport hubs.

In the last year there has been a resurgence in the number of measles cases in the UK, despite the illness reaching elimination status in 2023 (according to 2022 surveillance data). Two doses of the measles, mumps and rubella (MMR) vaccine provides long-term protection and is given to babies and young children as part of the NHS vaccination schedule. Despite this, uptake of the MMR is at a record low, with as many as 10% of children not being fully protected by school age. A recent large-scale outbreak in Birmingham and smaller outbreaks in London have prompted the initiation of an MMR 'catch-up campaign'. London is one of three areas being specifically targeted by this campaign.

With support from a BSI Communication and Engagement Grant, members of the BSI London Immunology Group (BSI-LIG) took to London's King's Cross railway station to answer questions and discuss vaccines with members of the public.



Armed with colouring and origami packs, immunology-themed children's games and BSI vaccine pamphlets, we successfully engaged with over 180 people throughout the day. We strategically positioned ourselves next to the family waiting area, and many of our conversations were with parents of young children, who had genuine concerns and simply wanted to learn more about vaccines.

Fun and games

We engaged younger children with immunology-themed fun and games. This included a spinning wheel to find out which immune cell they were and how that immune cell protects them.

We used the BSI's 'antibody challenge' game, where the children had to find which colourful 'germ' interacted (via magnets) with which antibody to demonstrate antibody specificity. These children's activities gave parents an opportunity to engage in conversation and raise questions or concerns regarding vaccinations with a member of the team.

Older children and young adults were keen to know more about university degrees in immunology and relevant career pathways. The team had a great time talking passionately about the work they do, and inspiring the next generation of immunologists.

For those running for their train, we had prepared activity packs with antibody-themed origami and colouring sheets, as well as pamphlets covering topics such as MMR, COVID-19 and polio vaccines, vaccination during pregnancy, a guide to childhood vaccination and careers in immunology. Several resources were accessible in no fewer than 15 languages!

Teamwork makes dreamwork

The event was conceived and organised by Katie Flaherty (BSI-LIG's Public Engagement Lead), Dr Laura Pallett and Dr Louisa James with support from Chris

Snowden-Smith (Careers and Public Engagement Officer at the BSI). BSI-LIG committee members from across London joined Katie on the day, running activities, answering questions and participating in discussions. Several members of the team had never participated in outreach work prior to this event.

Regardless of our level of prior experience of outreach, we all thoroughly enjoyed the activities and the opportunity to talk enthusiastically about vaccines and immunology with members of the public. Now that we have a winning formula, our plan is to hold similar events in train stations across London.

William Traves (Imperial College London), on behalf of the BSI London Immunology Group.

The team would like to thank Isabel Herrera from SpaceandPeople, without whom this event would not have been possible.

Get involved!

Find out more about the BSI London Immunology Group:

BSI LIG page: www.immunology.org/london-group

@London_immuno

ligbsicommittee@gmail.com

Immune Update

The BSI journals

A round-up of new research published in the British Society for Immunology's official journals written by ECR board members of *Immunotherapy Advances* and *Clinical & Experimental Immunology*. Members benefit from discounted publication fees and have access to these journals free of charge at **www.immunology.org/journals.**

Discovery Immunology

γδ T cells in the female reproductive tract: active participants or indifferent bystanders in reproductive success?

During pregnancy, the reproductive tract undergoes many morphological, cellular phenotypic and immunological changes including immune tolerance. Although gamma delta (γδ) T cells play important roles at mucosal sites, their function within the reproductive tract is undefined, especially as there are many changes to γδ T cells during pregnancy. It is unclear whether these changes are the cause or consequence of subsequent problems. In addition, there are considerable differences between γδ T cells in mice and humans, complicating the translation of findings from animal studies to humans.

In this paper, the authors describe these differences when discussing changes in γδ T cell diversity during pregnancy, their role in protecting against bacterial vaginosis, yeast and fungal infections, and potential cytotoxicity function of γδ T cells in tumour progression. The authors also report on the links between problems during pregnancy and dysregulation of γδ T cells.

The authors highlight that single-cell TCR signalling would ultimately answer many outstanding questions regarding the function of different subsets of γδ T cells during pregnancy in humans, and particularly their role during exposure to pathogens.

Foyle & Robertson 2024 *Discovery Immunology* **3** kyae004 **DOI: 10.1093/discim/kyae004**

Summary by Dr Caroline Weight, Lancaster University, UK

Clinical & Experimental Immunology

Fine-tuning precision cancer immunotherapy bi-specifics

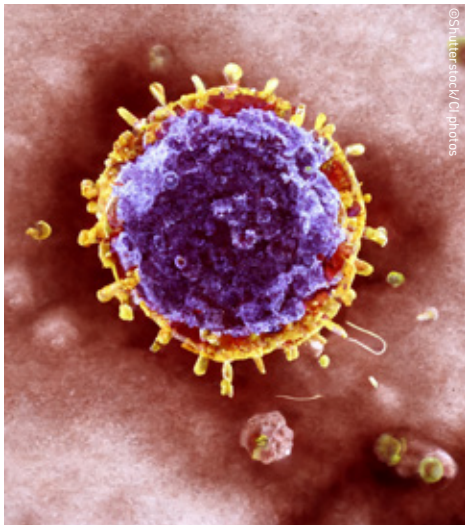
ImmTACs are bi-specific cancer immunotherapy agents with two binding arms that bridge non-cancer-specific T cells and tumours. One arm is comprised of a tumour-specific T cell receptor (TCR), while the other contains an anti-CD3 single chain fragment variable (scFV) domain. When both arms are engaged, any T cell can be redirected towards cancer cells. However, these drugs must be optimised for effective tumour targeting and T cell activation.

Here, Roberston *et al.* present a detailed study of how modulating the affinities and kinetics of both arms contribute to efficient T cell activation. Intriguingly, the highest affinity variants were not the most effective, uncovering an optimal window associated with the off-rate (half-life), and the duration of the bridging interaction. Mathematical modelling indicated suboptimal T cell activation when CD3 is engaged for too long. Optimal ImmTACs will be the product of a high-affinity engineered TCR, and a low-affinity anti-CD3 binding domain to minimise but maintain optimal bridging time.

This work will facilitate development of better and safer cancer immunotherapies.

Robertson *et al.* 2024 *Clinical & Experimental Immunology* **215** 105–119 **DOI: 10.1093/cei/uxad120**

Summary by Dr Malcolm Sim, University of Oxford, UK



Immunotherapy Advances

Lytic efficiency of immunosuppressive drug-resistant armoured T cells against circulating HBV-related HCC in whole blood

This paper explores the recurrence of hepatitis B virus-related hepatocellular carcinoma (HBV-HCC) after liver transplants due to circulating tumour cells (CTCs).

Lin *et al.* developed immunosuppressive drug-resistant armoured HBV-specific T-cell receptor-redirected T cells (IDRA HBV-TCR), using an immunofluorescence panel to differentiate HCC cells from PBMCs. They identified and quantified CTCs in blood with specific antibodies (AFP, GPC3, Vimentin, pan-Cytokeratin and CD45). The panel was then used to ascertain the ideal number of IDRA TCR-T cells that can result in maximum lysis of free-floating HBV-HCC cells. Their observations highlighted that at least 20,000 IDRA HBV-TCR T cells per millilitre of blood are required to lyse ~63.5% of HBV-HCC cells within 16 hours, even when used with Tacrolimus and Mycophenolate Mofetil (MMF).

The authors highlight that the number of IDRA-HBV TCR T cells required can be achieved by the adoptive transfer of 5×10^6 IDRA-HBV TCR-T cells/kg, showcasing the potential of these engineered T cells as a prophylactic treatment to prevent HBV-HCC recurrence post-transplant.

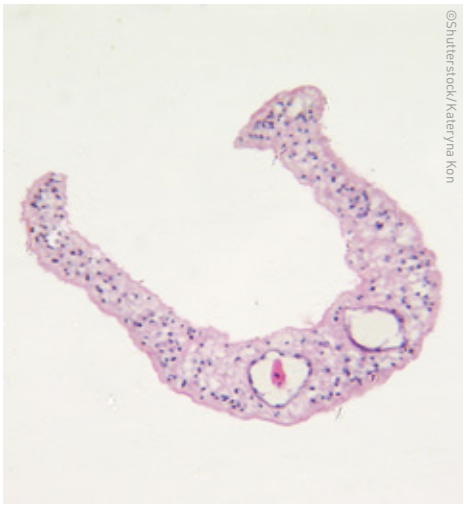
Lin *et al.* 2023 *Immunotherapy Advances* **3** ltad015 **DOI: 10.1093/immadv/ltad015**

Summary by Abigail Joyce, BSI Editorial Coordinator

Around the journals

A summary of some of the latest papers from the world of immunology written by ECR board members of our official journals and the BSI Editorial Coordinator.

Early symptom-associated inflammatory responses in controlled human schistosome infection



A better understanding of immune responses during acute schistosome infection is needed to define correlates of protection and inform vaccine development. This study looked at cellular and cytokine responses in the first two months of human schistosome infection, using PBMC and serum samples from cases of infection with cercaria-stage parasites (either male or female).

At week four after infection (the peak of reported symptoms), the researchers observed an expansion of activated CD38+ classical monocytes, which was especially strong in those reporting symptoms of acute schistosomiasis. There was also an expansion of T helper 1 (TH1)/TH2 cytokine-expressing HLA-DR$^+$ EM CD4 T cells at this time point. Eight weeks after infection, inflammatory responses were followed by an expansion of TH2 and regulatory cell subsets.

These results demonstrate the shift from TH1 to both TH2 and regulatory responses in acute infection with schistosomiasis.

Houlder *et al*. 2024 *Science Immunology* **9** DOI: 10.1126/sciimmunol.adl196

Summary by Amy Edmunds, Managing Editor of *Immunology News*

Distinct developmental pathways generate functionally distinct populations of NK cells

This article proves the existence of two separate pathways of natural killer (NK) cell development in mice.

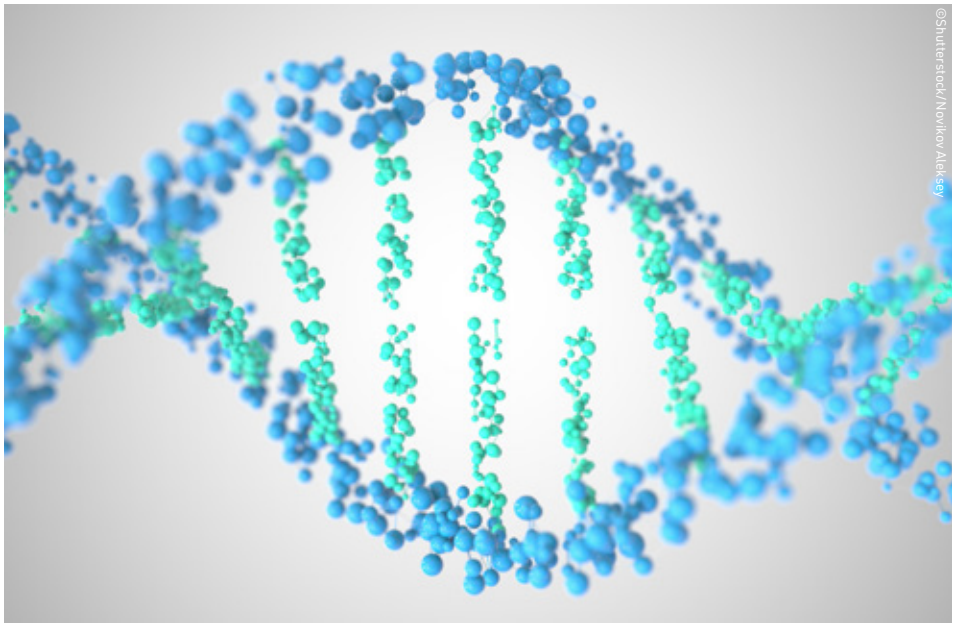
A bone marrow progenitor population called early NK progenitors (ENKPs) gives rise to Ly49H$^+$ NK cells that expand upon MCMV infection. In contrast, NK cells that develop from early innate lymphoid progenitors (ILCP) – the earliest defined innate lymphoid cell progenitors – show less LY49H expression and do not respond to MCMV infection. However, they express more interferon γ in response to Salmonella and herpes simplex virus infection.

Interestingly, the authors show functional and transcriptional similarities between two main human NK cell populations: CD56^{dim} and CD56^{bright} cells. As such, CD56^{dim} NK cells resemble ENKP-derived cells, while CD56^{bright} are similar to ILCP-derived NK cells in mice. Thus, the NK cell developmental pathways may be conserved in many vertebrate species.

Ding *et al*. 2024 *Nature Immunology* **25** 1183–1192 DOI: 10.1038/s41590-024-01865-2

Summary by Dr Marzena Lenart, Jagiellonian University, Poland

The potential of whole exome sequencing for diagnosing inborn errors of immunity



Inborn errors of immunity (IEI) cover a range of disorders characterised by susceptibility to infections, malignancies, allergies and immune dysregulation. This study evaluates the genetic diagnoses of a large cohort of IEI patients in Türkiye that consisted of 303 individuals who were recruited from 21 different clinical immunology centres using whole exome sequencing (WES) on mostly paediatric patients.

The study highlights the importance of next generation sequencing, particularly WES, in diagnosing IEI; however, one of the main limitations of WES is observed to be its inability to detect certain structural variants. The research underscores the limited success of WES in the genetic diagnostic methods for IEI, suggesting that the adoption of whole genome sequencing (WGS) could potentially enhance diagnostic yields compared to WES.

The findings of this study contribute significantly to the genetic basis of IEI and support the development of more effective diagnostic tools.

Erman *et al*. 2024 *Journal of Clinical Immunology* **44** 157 DOI: 10.1007/s10875-024-01759-w

Summary by Sevda Dogan, BSI Journals Manager

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