BSI Congress 2019:
Looking to Liverpool

T cell response in IBD:
A new pathway

BSI Forum:
Representing you

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Welcome to the summer edition of Immunology News. Activities at the BSI continue to move on apace and we have been busy planning new activities to both support our members and represent immunology on a wider stage.

Preparation for our 2019 Congress is now truly underway and we look forward to welcoming many of you to Liverpool on 2–5 December. One of the Congress highlights is always our Bright Sparks session which takes place on the first afternoon of the event and showcases the work of our brilliant early career researchers. In this issue, we hear from a past winner of the PhD category, Tomas Castro, on his work on the role of IgG-mediated inflammation in patients with ulcerative colitis on pages 16–17.

The BSI is always keen to support members working in all sectors of immunology. On pages 22–23, one of our Editorial Board members, Mihil Patel, discusses his recent move from academia to industry, examining the challenges and benefits of moving between different sectors and giving his top tips to those considering such a move.

As well as supporting members in different sectors, we aim to work with subject areas aligned to immunology to drive research forward – you can read about our new partnership with the National Cancer Research Institute to address current challenges in immuno therapy on page 7.

Best wishes,

Jennie Evans
VIEW FROM …
THE CHIEF EXECUTIVE

What an action-packed few months it has been – time really has flown! As always, I’ve tried to get out and about as much as possible to meet our members and be at our events. I never cease to be amazed by the quality of work that you are all doing and your commitment and dedication to ever push the boundaries of knowledge through the work that you do. And I for one am thoroughly looking forward to BSI Congress this year in Liverpool, our flagship event. You can read more about Congress on pages 7–8. It is guaranteed to be our best yet with the programme and speakers we have on offer! Plus 2018 was a non-Congress year so I’m sure that you’re all chomping at the bit to come together as the BSI family again (and I’m told the social elements are just as good as the science…)! Please do sign up to attend and remember to submit your abstract by 9 September 2019.

Congress will also be a chance to meet your BSI committee members, of which we have some new faces after this year’s elections (see page 5). A huge thank you to them for joining the committees and to you all too for your nominations and votes – this year we had the highest ever number of both of these which is fantastic – it’s so great to see such engagement from you all. Your support for the committees enables them to continue to ensure the BSI remains relevant and impactful; do read pages 14–15 to find out what the BSI Forum has achieved in the last few years, it really is staggering how far we’ve come. And it doesn’t stop here; in fact, we’ve been turning up the temperature when it comes to engagement in Parliament, Whitehall and the devolved nations. Matthew Gibbard, our new Policy & Public Affairs Manager, gives a great overview of some of the new elements of our programme to influence the powers that be to ensure the best deal for UK immunology on pages 18–20. We have lots more to come in this space with plenty of opportunities for you all to get involved so do keep an eye out for more.

Thank you again for all of your ongoing support, I hope you enjoy reading another excellent issue of Immunology News and please keep up the great work!

With best wishes,

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

BSI London Immunology Group
Barrier immunology
18 September 2019
Holiday Inn Bloomsbury, London, UK
Abstract deadline: 19 July
Find out more: www.immunology.org/events
SOCIETY NEWS

New BSI committee members

Following our recent nominations call for positions on the BSI Board of Trustees and Forum, we are pleased to announce the following appointments. The turnout for this election was almost 20%. Congratulations to all the successful candidates and thank you to everyone who stood for election.

Board of Trustees

ALLAN MOWAT
BSI Trustee
Professor of Mucosal Immunology,
University of Glasgow
Allan is re-elected onto the Board and will commence his second term of office in July 2019.

DEBORAH DUNN-WALTERS
BSI Trustee
Professor of Immunology,
University of Surrey
Deborah will join the Board of Trustees from July 2019.

COLIN DAYAN
BSI Clinical Secretary and Trustee
Clinical Professor, Cardiff University
Colin will join the Board of Trustees from January 2020.

Forum

FAITH UWADIAE
BSI Forum Early Career Representative
Postdoctoral Training Fellow, Francis Crick Institute
Faith will join our Forum in June 2019.

FEDERICA VILLANOVA
BSI Forum Industry Representative
Flow Cytometry Application Specialist,
Miltenyi Biotec Limited
Federica will join our Forum in June 2019.

Find out more

You can read the full candidate statement from each person in the members’ section of our website at www.immunology.org/new-committee-members. We welcome them all to the BSI and look forward to working with them to provide a strong voice for immunology.
After 13 years at the helm, Danny Altmann is stepping down from his role as Editor in Chief of *Immunology* at the end of May. He has brought great vision and expertise to the journal, and has really made *Immunology* his own. It is with great sadness that we see him go. However, we’re pleased to announce that Simon Milling will be taking up the reins as our new Editor in Chief. Having served as a BSI Trustee since 2017, Simon has stepped down from the BSI Board to enable him to take up this new role with the Society. Simon’s first edition of the journal will be June 2019.

Danny Altmann’s farewell message:

“Having served from 2000 to 2005 as an editor at *Clinical & Experimental Immunology* and then from 2006 to 2019 as Editor in Chief at *Immunology* – a mind-boggling 19-year sentence on the night-shift for the BSI journals – the time has come to stand down and focus on other challenges for the research community. This has spanned a period of immense change in immunology research, funding, publishing-business models and competitor journals. It’s terrific to have been around for such a strong period at the journals, to have helped publish some really quite important immunology and to have had the privilege to get to know some amazing, stellar, colleagues around the world as editors.”

Arne Akbar, President of the British Society for Immunology, said:

"On behalf of the BSI, I would like to offer our gratitude to Danny Altmann for successfully leading our official journal, *Immunology*, for 13 years. The journal has been in very capable hands. All his hard work and dedication has driven the journal forward and contributed to its 60-year legacy, establishing it as a highly respected journal within the field. We wish him all the very best and every success for the future.

“Both of our official journals, *Immunology* and *Clinical & Experimental Immunology*, are crucial to the Society. The financial support they provide to us is used to benefit our members in the form of grants, travel awards, Regional and Affinity group meetings, our popular annual Congress and other key initiatives. I would like to encourage BSI members to continue their support of our Society and join the many scientists contributing to the BSI’s journals with their research.

“I would like to give a warm welcome to Simon Milling. Simon’s previous involvement with the Society as a Trustee provides him with a unique perspective of BSI activities and I look forward to the next chapter of *Immunology* with him as the new Editor in Chief. As the income from our two journals underpins the financial wellbeing of the BSI, he has an important role in the future success of the Society.”

Simon Milling’s introduction:

“I am excited to join *Immunology* as Editor in Chief and to work with the Editorial Team to help the journal through the next stage of its evolution. As some of you know, I am a mucosal immunologist and have been working at the University of Glasgow for the last 11 years. I have been actively involved with the BSI for the last few years and was delighted both to stand for this position, and to receive enthusiastic support in this from the journal’s Associate Editor, Awen Gallimore. I have already received excellent support from Danny and the BSI’s publishing team to manage a smooth transition.”

‘It’s terrific to have been around for such a strong period at the journals, and to have helped publish some really quite important immunology.’

Our official journals, *Immunology* and *Clinical & Experimental Immunology*, are at the heart of our Society, with the aim of promoting and advancing immunology to foster future innovation. Income from the journals supports a significant part of the Society’s charitable activities, including our grant schemes and education and careers initiatives. Society members receive free access to both journals via the BSI website. We encourage all BSI members to support our journals and consider submitting their work to our journals.
BSI & NCRI announce new partnership

The British Society for Immunology is delighted to announce a new partnership with the National Cancer Research Institute (NCRI) to bring our two communities together to drive collaborations to address current challenges in immunotherapy through a series of joint initiatives. The NCRI and BSI plan to work together to establish a series of joint initiatives that aim to accelerate the progress of immunotherapy in cancer. This will include enhancing the training for researchers and promoting knowledge sharing, identifying the challenges currently hindering progress in cancer immunotherapy and the formation of strategic research groups to address key research questions. To launch this exciting new initiative, our President, Arne Akbar, reflects on the history of research in the cancer immunology sphere and how we hope our new collaboration will fuel innovative approaches to treating these diseases.

Immunology has flourished in recent years, with new discoveries of its intricate and elegant workings that allow us to understand its extensive reach into many areas of health and disease. This new appreciation of how our immune systems work to promote health and the varied consequences when this process goes awry places immunology at the centre of research into many disease areas.

One of the most prominent of these is cancer. The first suggestion that the immune system might play a role in treating cancer came as early as 1891 when the surgeon, William Coley, treated a patient who had a tumour on his tonsil by injecting it with bacteria and eliciting an immune response. The tumour began to break down and the patient lived for another eight years. More recently work led by Jim Allison and Tasuku Honjo on the PD-1 protein that acts as a ‘brake’ on immune cells has yielded exciting results. By blocking the action of PD-1, the immune system can be unleashed to attack tumours. Allison and Honjo won international recognition for this seminal work last year, sharing the Nobel Prize for Medicine in 2018.

Other areas of cancer immunotherapy have hailed significant successes including the use of Ipilimumab (anti-CTLA4) in conjunction with Pembrolizumab (anti-PD-1) to treat melanoma and the application of chimeric antigen receptor (CAR) T-cell therapy to treat certain types of leukaemia and lymphoma. However, many trials that initially carried great hopes have identified unforeseen side-effects and some – such as sarcoma, prostate or pancreatic cancer – appear resistant to immunotherapy approaches. There is therefore a lot of work still to be done to optimise cancer immunotherapy.

A central ambition of the British Society for Immunology is to create the appropriate environment to promote the interaction between researchers and clinicians in this field to facilitate translational research activity. With this in mind, another strategic goal is to interface our activities with the pharma and biotech sector. This will ensure that the UK has the right environment in terms of infrastructure, investment and skills to allow research into cancer immunology to thrive.

We are therefore delighted to announce our new partnership with the NCRI to bring the immunology research community and cancer scientists and clinicians closer together. Working together, we aim to facilitate dialogue between the two groups to drive new collaborations that address challenges in immune-oncology and advance understanding of the complex interactions between cancer and the immune system. Establishing these links to speed up discovery in the clinical research space will enable fresh thinking to refine approaches to how the immune system can be harnessed to target individual cancers. Knowledge sharing will be a key part of the initiative, allowing researchers and clinicians from both communities to keep up to date with the latest data.

With over 350,000 new cases of cancer diagnosed in the UK each year, it is imperative to move quickly to translate our endeavours into life-saving outcomes. Both we and our colleagues at the NCRI are committed to working together to achieve these aims through this initiative.

Arne Akbar
President, British Society for Immunology
BSI Congress 2019
2 – 5 December, Liverpool, UK
The UK’s top immunology conference is back – bigger and better than before.

Key dates
Abstract submission:
9 September 2019
BSI Congress bursary applications:
11 October 2019
Early bird registration:
25 October 2019
Congress dates:
2 – 5 December 2019

Why you should attend?
- Cutting-edge science
- Build your network
- Present your work
- Broaden your horizons

Keynote lecture
Doreen Cantrell
Professor of Cell Biology and Immunology and Wellcome Trust Principal Research Fellow, University of Dundee
17:30, Monday 2 December
Plenary sessions announced
Immunological challenges of controlling influenza
Katherine Kedzierska (Melbourne, Australia)
Peter Openshaw (London)
Alain Townsend (Oxford)

Tissue resident memory T cells
Donna Farber (New York, NY, USA)
David Masopust (Minneapolis, MN, USA)

Cancer immunotherapy
Ana Anderson (Cambridge, MA, USA)
Carl June (Philadelphia, PA, USA)
Cornelius Melief (Leiden, Netherlands)

The recognition and clearance of senescent cells by leukocytes
Arne Akbar (London)
Valeria Krizhanovsky (Rehovot, Israel)

Learning from cell signalling in immunodeficiency
Ulf Klein (Leeds)
Klaus Okkenhaug (Cambridge)
Sonal Srikanth (Los Angeles, CA, USA)

Mechanism of inflammation in immunodeficiency
Sophie Hambleton (Newcastle)
Andrew Snow (Bethesda, MD, USA)

24 themed sessions including:
- Immune recognition of microbiota species
- B cell activation and differentiation
- Inhibitory immune receptors and new immunotherapies

Joint session with UK PIN
The last day of the conference (Thursday 5 December) will be held jointly with the UK Primary Immunodeficiency Network (UK PIN). We’re delighted to be running several joint sessions with them, including two plenaries and parallel sessions on autoimmunity and pattern recognition in inflammation.

Find out more
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UNITIZED • Custom panels are supplied in a single-use cocktail per tube/plate, ready for addition of sample.
REAGENT • The stable reagent layer at the bottom of the tube helps ensure optimum tube-to-tube and batch-to-batch consistency.
• Cocktails can include calibration beads for absolute cell counting (optional).
ASSAY • Conjugates are suitable for flow cytometry.

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Immunology Teaching Award

We’ll soon be launching the call for nominations for our 2019 Immunology Teaching Excellence Award to highlight some of the outstanding immunology teachers based in UK higher educational institutes. The award rewards those who show a passion for immunology and education, along with the communication skills to make these complex subjects accessible to their students. We’re looking for exceptional communicators who are able to inspire the next generation of immunologists. Check out our website for further details.

IUlS2019 registration still open

Registration is still open for the 17th International Congress of Immunology taking place in Beijing, China on 19–23 October 2019. This is the largest global event in immunology and a great opportunity to hear from some of the leading international experts in the field. For more information and to register, visit https://iuis2019.org.

Congress committee update

We are delighted to welcome two new members, Alex Spencer (Oxford) and John Tregoning (London) to our Congress Committee. This committee is responsible for the planning and delivery of the BSI’s flagship event, BSI Congress, which takes place two out of every three years. Our grateful thanks go to our two outgoing committee members, Andrew Godkin (Cardiff) and Luke Foster (Birmingham) for all their hard work while on the committee.

UPCOMING BSI MEETINGS

We have lots of upcoming meetings covering a vast array of immunological topics. Find out more at www.immunology.org/events.

BSI meetings

BRITISH SOCIETY FOR IMMUNOLOGY CONGRESS 2019
2–5 December 2019
Liverpool, UK

BSI Regional and Affinity Groups

BSI Ulster Immunology Group
IMMUNOLOGY WITHOUT BORDERS
13–14 June 2019
Belfast, UK

BSI Greater Manchester & Wessex Immunology Groups
TYPE 2 IMMUNOLOGY
24 June 2019
Manchester, UK

BSI Histocompatibility & Immunogenetics Group
BRITISH SOCIETY FOR HISTOCOMPATIBILITY & IMMUNOGENETICS ANNUAL CONFERENCE
26–27 June 2019
Leicester, UK

BSI West Midlands Group & University of Birmingham
DISCOVERY TO CLINICAL APPLICATIONS OF REGULATORY T CELLS IN AUTOIMMUNITY AND TRANSPLANTATIONS
11 July 2019
Birmingham, UK

BSI London Immunology Group
BARRIER IMMUNOLOGY
18 September 2019
London, UK

BSI supported meeting

Co-hosted with British Society for Immunology
VALIDATE SCIENTIFIC CONFERENCE
2–3 October 2019
London, UK
New review series: Vaccines for emerging pathogens

Clinical & Experimental Immunology is pleased to present part 1 of our new two-part Review Series ‘Vaccines for emerging pathogens: from research to the clinic’ (guest editor: Diane Williamson, Defence Science and Technology Laboratory, Porton Down, UK). The Review Series is freely available to read and download.

This topic has been brought into sharp focus in recent years following significant outbreaks of viral diseases such as those causing severe acute respiratory syndrome and Middle East respiratory syndrome, as well as devastating outbreaks of diseases caused by the Ebola, Marburg, Zika and Lassa fever viruses, to name only a few examples. Additionally, bacterial infections leading to bubonic and pneumonic plague, most notably in Madagascar in 2018, as well as malaria in many tropical countries, melioidosis in south east Asia and tularaemia in northern Europe and North America, have incurred significant morbidity and mortality.

In our Review Series, the life cycle of these pathogens and the epidemiology of disease have been reviewed in the context of potential points of intervention for the prevention of human infection. Afrough et al. review a range of emerging viruses and make the case for applying molecular techniques to understand viral pathogenesis. Sharpe et al. tackle how we understand the interaction of the host with a viral pathogen to expedite vaccine development. Morici et al. address progress in the development of vaccines for melioidosis, a bacterial disease which causes an estimated 165,000 human cases per year.

New technologies for vaccine formulation and administration are necessary in the context of rapid vaccination on a large scale. Wallis et al. review novel approaches for the design, delivery and administration of vaccines, discussing a range of vaccine formulations, presentations and parenteral administration routes. Miquel-Clopes et al. focus on vaccines that are designed to induce mucosal immunity to protect mucosal surfaces from pathogen invasion.

Where new vaccines are required under emergency conditions, it is essential for developers and manufacturers to work closely with the regulatory authorities and with the WHO to understand the requirements to bring a candidate vaccine as quickly as possible through development and into the clinic. This Review Series evidences the progress being made in vaccines for emerging pathogens.

BSI at the Big Bang Fair

On Saturday 16 March, the BSI took part in the Big Bang Fair at Birmingham’s National Exhibition Centre – a day of science exploration aimed at families. Throughout the day, BSI staff and volunteers delivered a range of activities focussed on vaccines and herd immunity. These included making plasticine antibodies and microbes, explaining antibody specificity using a magnet game and a herd immunity tombola! Overall, more than 2,000 people visited the BSI’s stand and we were delighted to able to spread knowledge of how vaccines work and why they are important.

You can read more about the event on our blog where one of our volunteers, Ilaria Chicca, has written about the experience: http://bit.ly/2JKIHT1.
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An introduction to the British Society for Immunology Forum

The BSI Forum is our ‘think tank’ and the place where issues and ideas are raised, discussed and developed for the consideration and approval of the Board of Trustees. These relate to education and careers, public engagement, policy and public affairs, as well as communications. The role of Forum is to help the Society in implementing its current strategic plan by providing a mechanism by which the voice of the membership can be fed into new activities.

How does Forum operate?
Forum members are elected to represent a section of the BSI membership. Their role is to put forward the views of the sector they have been elected to represent, as well as their own thoughts. Currently there are 18 elected members covering early career researchers, clinical and veterinary immunologists as well as national representatives from England, Northern Ireland, Scotland and Wales. My role as Chair of Forum is to lead discussions and also to feed back the thoughts of Forum to the Board of Trustees.

Forum meets four times a year in London when elected members work with BSI staff on all aspects of the Society’s work and current strategy. Items on the agenda are varied and range from how to increase diversity and inclusion at BSI meetings, to developing ideas for communicating with the public, and responding to questions from expert panels in science, health and Government. Forum members are also invited to represent the BSI at external events.

You don’t need to be an expert in all branches of immunology to be a member of Forum. However, you do need to be passionate about supporting the immunology sector so that it can continue to advance excellence in immunological research, scholarship and clinical practice in order to improve human and animal health.

Recent achievements
Professor Anne Cooke recently finished her term of office as Chair of Forum, a position she held from 2014 to 2018. During this time and under Anne’s dynamic and enthusiastic leadership, Forum developed and inputted to several BSI strategies – in particular to increase support and representation for early career researchers within the Society – which have been approved by the Board and put into practice. These include:

1. Creating two new positions on the Board of Trustees for early career researchers – Calum Bain and Emma Chambers were elected to these positions last year
2. All parallel sessions at BSI Congress to be co-chaired by an early career researcher onwards
3. Advising on the BSI Careers Review conducted in 2017, both in terms of identifying what areas it should cover and evaluating the final report to develop proposals for future careers support by the BSI
4. Providing feedback and advice on setting up the BSI mentoring scheme, which commenced in 2017 (initial training provided and mentoring available for one year)
5. Developing ideas and content for the Early Career Training Day aimed at postdocs, which was launched in December 2018
6. Advising on establishing an Industry Representative position on Forum

What does being a member of Forum involve?
As well as attending the quarterly meetings, Forum members also undertake an array of tasks for the Society, including representing us at various events. Examples of these include:

Parliamentary engagement
Rebecca Newman (Early Career Representative) attended the Royal Society of Biology ‘Voice of the Future’ event at the Houses of Parliament for early career researchers to ask questions of senior members of Parliament in a committee setting. Becky agreed that it was important for the BSI to engage with parliamentarians through schemes such as this to ensure that the BSI keeps raising important issues through multiple channels.

Anne Cooke (past-Chair), Helen McGettrick (England Representative) and Fane Mensah (PhD Representative) attended the ‘Future of Immunology’ event at the Houses of Parliament last year. This was a joint venture delivered in partnership by the BSI, AbbVie, Bioindustry Association and National Rheumatoid Arthritis Society and hosted by Grimsby Labour MP, Melanie Onn, who has an interest in inflammatory diseases.

‘You need to be passionate about supporting the immunology sector so that it can continue to advance excellence in immunological research, scholarship and clinical practice to improve human and animal health.’
‘I have joined an energetic group of people keen to share and discuss ideas and views on the future of immunology.’

Policy and public affairs
All members have the opportunity of inputting to BSI responses to policy consultations from Parliament. These include select committee consultations and All Party Parliamentary Group enquiries, which request evidence and expert views on topics ranging from the Life Sciences Industrial Strategy to Brexit (of course!).

Equality, diversity and inclusion
We are developing proposals for how the BSI can support equality, diversity and inclusion throughout its activities and in the wider immunology sector. The Forum was consulted during BSI policy development on ways to support members throughout their career.

Public engagement led by the Public Engagement Secretary
During her time on Forum, Early Career Representative Emma Chambers trained to be a BSI Vaccine Ambassador in our pilot scheme and went into parent and baby groups to discuss how vaccines work and answer parents’ questions on immunisations.

Education and careers led by the Education Secretary
Our Education Secretary, Helen Collins, along with three of our Early Career Representatives, Fane Mensah, Rebecca Newman and Laura Pallett, ran a well-attended session at BSI Congress 2017 to discuss the findings of the BSI Careers Report with the membership and gain their feedback to help us in the development of future careers activities.

Exploring international links with other immunology societies
Laura Pallet, (Early Career Representative) attended the Chinese Society for Immunology’s Annual Congress in Shanghai and visited the Key National Laboratory of Medical Immunology. Laura was able to contrast and compare life as an ECR with her peers and gain insight into academic and clinical immunology in China.

Election to Forum
On behalf of Forum I would like to say congratulations and give a very warm welcome to our newly elected members of Forum who are: Faith Uwadiae (Early Career Representative) and Federica Villanova (Industry Representative).

I have only been in post as Chair of Forum since January this year but it did not take me long to realise that I have joined an energetic group of people keen to share and discuss ideas and views on the future of immunology. The fact that Forum makes a difference is evidenced by its recent achievements.

I hope after reading this that you will be encouraged to stand for Forum in the future. Spot a Forum member you already know from the photo gallery to find out more about Forum. It is a great opportunity to gain experience in those all-important life skills such as committee work, networking and public outreach. Besides, it gets you away from your day job for a few hours and you can leave your mark on the BSI!

Ann Ager
Chair of Forum and Trustee, British Society for Immunology

Find out more
If you would like to find out more about the work of the BSI Forum, please email members@immunology.org.
A healthy lifestyle is all about balance; be it professional, emotional, nutritional or immunological. A vigorous immune response is required to fight malignancies and the multitude of microbes that seek to invade us, but these responses are tightly regulated to suppress overt immunity and return us to homeostasis. This immunological Goldilocks zone is exemplified in the dual nature of many (if not most) immune cell subsets, from effector versus regulatory T cells to ‘M1’ versus ‘M2’ macrophages, all acting in concert to mount appropriate immune responses.

In the gastrointestinal tract, maintaining immunological balance is particularly key. The gut is colonised by trillions of commensal microorganisms (our microbiome), with essential roles in nutrient salvage, pathogen exclusion and immune education. However, the gut represents a major mucosal entry point for pathogens, requiring the immune system to be primed to respond to invasive microorganisms that breach the intestinal epithelium.

**IBD – dysregulation of the immune response**

In certain individuals, a complex interaction of environmental and genetic factors results in the breakdown of the rules governing intestinal health. Exacerbated immune responses towards components of the microbiome lead to a spectrum of disorders collectively known as inflammatory bowel disease (IBD). Incidence of the two major subtypes of IBD – Crohn’s disease (CD) and ulcerative colitis (UC) – is increasing globally alongside Western lifestyles and causes significant morbidity and cancer-associated mortality. A dysregulated immune response is at the heart of IBD. Intense research has focused on pathogenic T cells, informed by seminal animal and genetic studies that implicate the IL-23–Th17 axis as a common contributor to both CD and UC susceptibility. In this setting, innate immune cells, such as macrophages and dendritic cells, integrate poorly defined triggers that drive IFNγ- and IL-17-producing T cells through the production of key cytokines, including IL-23 and IL-1β. These discoveries have driven a clinical revolution, with monoclonal antibodies targeting these cytokines showing therapeutic promise in IBD.

In contrast to T cells, whether and how B cells and the humoral immune response are altered in IBD is poorly understood. Immunoglobulin (Ig)A is a well-known immunological cornerstone of intestinal health. IgA, produced by intestinal plasma cells, is a predominantly non-inflammatory class of antibody secreted into the gut lumen where it binds to commensal microbes and keeps them away from the epithelium (a process known as ‘immune exclusion’). This function is essential in preventing intestinal invasion by opportunistic microorganisms. However, the assumption that intestinal humoral immunity is all about IgA has been called into question by genetic studies implicating a variant of FcγRIIA, an activating receptor for IgG, with susceptibility to UC.

**Potency of IgG antibodies**

Unlike IgA, IgG antibodies are potently inflammatory – they exhibit complement-fixing activity and can engage cell surface Fcγ receptors (FcγRs), leading to immune cell activation. This leads us to two unsurprising observations: 1) IgG-FcγR signaling is associated with numerous inflammatory and autoimmune disorders, such as rheumatoid arthritis and systemic lupus erythematosus, and 2) IgG is almost entirely excluded from the healthy adult gut. How could this receptor influence disease susceptibility in an IgA-dominated organ?

This was the question I began trying to answer in 2014 when I joined Dr Menna Clatworthy’s lab (University of Cambridge) as a PhD student, the result of which I was fortunate to present at the 2017 BSI Congress in Brighton. We had a simple hypothesis – that immune dysregulation in IBD leads to the emergence of pathogenic IgG that can drive disease. We began by profiling IgA and IgG binding to commensal microbes.
in stool samples, and made the rather remarkable observation that up to 80% of intestinal microbes from UC patients were coated in IgG. This was most evident in individuals with severe disease, where the levels of IgG and IgA binding were equivalent, whereas IgG was almost entirely absent in healthy controls.

**Utilising transcriptomics**

Having identified macrophages as the major source of intestinal FcγRIIA expression, we set out to define how IgG-mediated activation of these cells may contribute to IBD. For this, we are thankful that IBD research is greatly facilitated by the wealth of transcriptomic datasets deposited in free-to-access public repositories, aided by the relative ease with which clinicians can directly sample diseased tissue by endoscopic biopsy. Using this data as a starting point, we identified IL-1β as the dominant inflammatory response within intestinal macrophages in diseased tissue by endoscopic biopsy. Moreover, passive transfer of anti-commensal IgG to naive animals was enough to enhance disease activity and increase colonic macrophage IL-1β production, demonstrating a direct pathogenic role of IgG in the gut in vivo.

The FcγRIIIA variant implicated in protection from UC encodes a receptor with reduced IgG affinity. To mimic the effect of this variant in vivo, we made use of transgenic mouse strains with graded activating FcγR signalling due to absent or elevated expression of the sole inhibitory FcγR, FcγRIIB, the latter specifically in macrophages. This was necessary as mice lack FcγRIIA itself but express other functionally homologous FcγRs. Exacerbated FcγR signalling in FcγRIIB-deficient mice resulted in augmented intestinal disease activity and elevated macrophage IL-1β production. Importantly, this augmented IL-1β response was pathogenic, as treatment with a blocking IL-1 receptor monoclonal antibody effectively suppressed intestinal inflammation. In contrast, macrophage-specific overexpression of FcγRIIB was disease-protective relative to control mice, directly implicating the FcγR-macrophage-IL-1β axis as a major disease mediator.

**Last piece of the puzzle**

Given this strong IL-1β effect, the last piece of the puzzle was to define how this FcγR network influenced local T cell activity, a cell type heavily implicated in IBD susceptibility. We demonstrated an IL-1β-dependent increase in IL-17A production by colonic CD4+ T cells and γδ T cells in FcγR1IB-deficient mice, while macrophage-specific FcγRIIIB overexpression was enough to suppress this response. All together, our work delineated a mechanism whereby FcγR signalling in colonic macrophages induced a pathogenic IL-1β response, which in turn mediates activation of an IBD-associated T cell response, causing inflammation and disease.

We were pleased to have our study published recently but many unanswered questions remain. The most pertinent being whether we can target FcγR signalling in colonic macrophages to induce a pathogenic IL-1β response, which in turn mediates activation of an IBD-associated T cell response, causing inflammation and disease.

**Tomas Castro-Dopico**

Postdoctoral Researcher, Molecular Immunity Unit, Department of Medicine, University of Cambridge

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**REFERENCES**

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https://bit.ly/2IMk8nm

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**Could you be the next Bright Spark in Immunology?**

Bright Sparks in Immunology is our event to showcase the work of PhD students and early career postdocs who are submitting an abstract for Congress. To enter your abstract, just tick the relevant box on the abstract submission form for BSI Congress. If your abstract is chosen, you will be invited to present your work at this year’s Bright Sparks session, which will take place on the afternoon of Monday 2 December at the BSI Congress in Liverpool. For more information, please visit www.bsicongress.com.
The value of asking questions: the BSI Parliamentary Questions Programme

As part of our Policy and Public Affairs Plan, we have launched an ambitious Parliamentary Questions Programme designed to raise the profile of both the issues we campaign on and the BSI itself within Parliament, Government and the wider policymaking sphere. In keeping with the interrogative theme, here’s a Q&A guide to what this means and how it will benefit immunology and the BSI.

What are Parliamentary questions?
Parliamentary questions are asked by backbench Members of Parliament to Government Ministers about their ministerial responsibilities and departmental business. They are used to elicit information from and scrutinise policymaking of the Government. There are two types of parliamentary questions: oral questions and written questions.

**Oral questions:** every five weeks that the House of Commons meets, each ministerial team running each Government department must appear in the Commons chamber to answer questions that are asked in person. The most well-known oral question session is Prime Minister’s Questions, which are an exception to the five-week rule and have been held weekly on a Wednesday at 12:00 since 2003.

**Written questions:** backbench MPs may submit them at any time either via an online form on the parliamentary intranet or via hard copy at the House of Commons Table Office, and the Minister responsible will respond usually within a week or two. They can be more specific than oral questions and can receive more detailed answers.

Both oral questions and written questions and their answers are published in Hansard, the Official Report of the House.

Who chooses who asks the oral questions?
MPs are allowed to submit one oral question written in advance for which they are entered into a ballot called ‘the shuffle’, which will randomly draw around 20 names that are placed on the agenda (called the order paper). In order to ensure party political balance, the Speaker will choose some MPs on the day to ask questions in between those listed on the order paper, so it alternates between Members on the Government benches and the opposition benches.

Do Government Ministers know the questions in advance?
The questions submitted to the shuffle are known as substantive questions and these are published three sitting days ahead of when they will be asked in the Commons chamber, so the Minister will know these in advance and will have had the opportunity to prepare a response and seek any research or guidance needed from the appropriate civil servants. Each MP who asks a substantive question will, after the Minister’s answer, be offered the opportunity to ask a supplementary question on the same topic. The Minister will have had no advance warning of this supplementary question and so must be well briefed.

Example question to the Home Office:

**Question from Ben Lake MP to the Home Office:**
To ask the Secretary of State for the Home Department, what assessment he has made of the potential merits of extending international students’ post study leave period to find permanent skilled work.

**Response from Rt Hon Caroline Nokes MP, Minister of State for Immigration:**
In 2017, the Home Office commissioned the independent Migration Advisory Committee (MAC) to provide an objective assessment of the impact of international students in the UK for the first time.

In line with the MAC recommendations, we announced in the Immigration White Paper published in December 2018 that we will increase the post-study leave period for postgraduate students to six months, and doctorate students to a year. We will also go further, by increasing the post-study leave period for all undergraduates studying at institutions with degree awarding powers to six months. These changes will benefit tens of thousands of students and will help ensure that our world-leading education sector remains competitive globally.
‘We identify MPs who are interested in a topic in our agenda and email them all with suggested questions ahead of a particular department’s questions and explain why what we are suggesting is so pressing.’

Example question to BEIS:

**Question from Jim Shannon MP to Department for Business, Energy & Industrial Strategy:**

To ask the Secretary of State for Business, Energy and Industrial Strategy, whether the £7 billion of additional spending for research and development will be in addition to replacing EU funding lost after the UK leaves the EU.

**Response from Chris Skidmore MP, Minister of State for Universities, Science, Research & Innovation:**

At Spending Review 2015, the Government protected science funding, committing to invest £26.3 billion between 2016-21, and has since committed to an additional £7 billion by 2021-22 – the largest increase ever. The terms of the Withdrawal Agreement, if ratified, would provide for continued UK participation in EU Programmes, including Horizon 2020, to December 2020 and for the lifetime of projects under the programme. If an agreement is reached, projects approved during this period will be able to continue with an uninterrupted flow of EU funding. If we leave the EU without a deal in place, the underwrite guarantee and extension are Government commitments to provide funding required for the UK to participate in Horizon 2020 until the end of 2020 and for the lifetime of projects. In this scenario, HM Treasury will provide additional funding on top of existing departmental budgets – further demonstrating the Government’s commitment to the UK’s world-class research base.

**What departments have we targeted?**

We have asked MPs to ask questions to the Department for Health and Social Care on vaccines; to the Department for Business, Energy and Industrial Strategy on UK and EU science funding; to the Home Office on the importance of our immigration system allowing the UK to attract talent from around the globe; and to the Department for Education on getting more students into STEM education and increasing diversity within STEM.

**Does anyone else do this?**

Yes, we are competing for MPs’ attention with a multitude of other organisations. This includes their own parties – Ministers’ and Opposition frontbenchers’ aides will try to persuade backbench MPs to ask planted questions to highlight Government strengths or to underline their weaknesses, respectively.

**What are the benefits of doing this?**

Apart from allowing us to receive answers from Government Ministers about issues that concern and affect the BSI and its members, it allows us to build relationships with MPs. The objective being that eventually we will have a network of parliamentarians with whom we work closely to raise matters that are important to us and can influence Government policy on our behalf. It also raises our profile as a leading scientific society and puts the topics we care about on the agenda and in the public eye.

**Matthew Gibbard**  
Policy & Public Affairs Manager,  
British Society for Immunology  
Email: m.gibbard@immunology.org

Example question to BEIS:
Welcome to our new regular update on the BSI’s policy and public affairs work to highlight the programme of activities we undertake to advocate for immunological science and health to the Government, parliamentarians and policymakers.

Parliamentary Questions

Those of you who have read the article detailing our new Parliamentary Questions Programme will know that we have been suggesting questions for backbench MPs, whose interests overlap with the BSI’s policy agenda, to ask Government Ministers. At the time of writing, we’ve had a good level of success in parliamentarians taking this up in the first two months of activity. We’ve had 27 written questions tabled on our behalf to all four Government departments we were targeting, by 10 MPs, from five different political parties. These have been helpful almost without exception, either getting on the record that the Government is planning actions that align with our agenda or identifying an area requiring more scrutiny.

An example of the former was Chris Skidmore MP (Con, Kingswood), the Higher Education Minister, confirming to Bob Blackman MP (Con, Harrow East) that the Government would be seeking to increase the number of international students studying in the UK by over a third – to 600,000 by 2030, despite its retention of the net migration target. An example of the latter category has been a couple of responses to Rosie Cooper MP (Lab, West Lancashire) regarding the training of healthcare professionals on vaccines that don’t fully align with each other, and we plan to follow this up for clarification with the new Public Health Minister, Seema Kennedy MP (Con, South Ribble).

Our first success in oral questions came on 27 March when Rt Hon Stephen Crabb MP (Con, Preseli Pembrokeshire) questioned Health and Social Care Secretary, Rt Hon Matt Hancock MP (Con, West Suffolk) with two of our suggested questions on the role that vaccines have in combating the threat of antimicrobial resistance (AMR) to antibiotics. In his answers, the Health Secretary commented as an integral part of its five-year action plan to tackle AMR and committed to ‘[providing] the money that is necessary’ to tackle AMR. To watch the full exchange, visit https://bit.ly/2jfr4X.

Informing the debate

The next day, on 28 March, a Westminster Hall debate was held to discuss World TB Day and efforts to end tuberculosis globally. (A Westminster Hall debate occurs in the Commons’ lesser known secondary chamber and with the crucial difference that debates are led by backbenchers seeking ministerial responses on issues important to them, rather than the Government setting the agenda). The BSI prepared and distributed a briefing on the importance of funding research to develop a vaccine to protect against pulmonary TB in adults, and the contribution that drug-resistant TB is making to global AMR. We were pleased that a number of MPs used our briefing including Jim Fitzpatrick MP (Lab, Poplar and Limehouse) who namechecked the BSI, and Nic Dakin (Lab, Scunthorpe) who highlighted that TB hotspots exist here in the UK in London, Leicester, Luton, Birmingham, Manchester and Coventry. To read the full debate, visit https://bit.ly/2YsQeKc.

Building our influence

Coming up, we have face-to-face meetings planned in May with Anne-Marie Morris MP (Con, Newton Abbot) who chairs the All Party Parliamentary Group (APPG) on Medicines and Medical Devices and Chris Green MP (Con, Bolton West) who chairs the APPG on Medical Research and serves as Vice-Chair of the APPG for Life Sciences. We are hoping that these will be productive discussions around the challenges facing immunology today and will allow for the beginning of some fruitful working relationships.

Next on the agenda

The BSI is putting together a response to the recently announced Government consultation on ‘the design of UK funding schemes for international collaboration, innovation and curiosity driven blue skies research’, led by Professor Sir Adrian Smith. We will bring you more news on this in the next issue of Immunology News.

As always, we are keen for BSI members to get involved in our policy and public affairs work. If you wish to raise any issues that you have encountered with us, or if you want to write to your own MP but need some more information to get started, please do contact me at m.gibbard@immunology.org.

Matthew Gibbard
Policy & Public Affairs Manager, British Society for Immunology
Congratulations

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

Travel grant success

The following members were recently awarded BSI travel grants:

Sabbah Asghar, Carly Bliss, William Branchett, James Cameron, Fiona Carty, Alistair Chenery, Joe Chouhan, Sally Clayton, Mathew Clement, Megan Cole, Cherrelle Bacon, Guillaume Desanti, Natalie Edner, Jonathan Holbrook, Daniel Johnston, Tariq Khovraty, Taewoo Kim, Max Kirtland, Layaal Liverpool, Rikah Louie, Ruairi Lynch, David Malone, Elizabeth Mann, Dyana Markose, Stefania Martin, Brian McHugh, Michelle Naughton, Christina Nikolakopoulou, Lilian Nwosu, Hannah Prendeville, Michael Ridley, Sheree Roberts, Aoife Rodgers, Silvia Rosini, Helene Stern, Steve Webster, Carissa Wong and Louise Yindom.

The next application deadline is midday, 1 August 2019. More information at www.immunology.org/grants-and-prizes/travel-awards.

Ronald Ross Medal

Our congratulations to Eleanor Riley (Roslin Institute) who has been awarded the Ronald Ross Medal. This medal is only awarded every three years and recognises outstanding contributions to the advancement of tropical public health or tropical medicine. Professor Riley is a world leader in malaria immunology, with a unique background in basic sciences, veterinary medicine, human infectious diseases and global health, and has made major contributions to strengthening research capacity in Africa.

Communicating Immunology Grants

Siân Faustini and colleagues from the University of Birmingham will host a half day of games and craft for 9-11 year olds focusing on how the immune system works, how infectious diseases spread and how vaccines confer protection. Shona Moore and colleagues from University of Liverpool will run an activity at Bluedot Music Festival at the Jodrell Bank Observatory in July to simulate the outbreak of an infectious disease – through use of stickers, and how a vaccine can halt transmission. Lisa Whittaker and colleagues from Cardiff University and Tenovus Cancer Care will produce a 2–3-minute virtual reality experience showcasing T-cells and their role in the immune system and fighting cancer. This will be premiered at the Mthyfn Tyddffyn Science Festival in July. Finally, Ines Diaz del Olmo and colleagues from The University of Manchester work with SHE Choir to run a singing workshop at Bluedot Music Festival to explore the link between health and singing, with a particular focus on inflammatory lung diseases.

The next application deadline is 1 July. For more details, visit www.immunology.org/grants-and-prizes/communicating-immunology.

Summer Placement Award Scheme

This BSI scheme supports early career scientists to conduct extended placements in labs other than their own. Recent awards are:

William Mirfin-Boukouris (Keele University) to determine whether brain immune cells show altered inflammatory profiles when exposed to ‘stealth’ coated and ‘control’ nanoparticles.

Samantha Jones (Cardiff Metropolitan University) who will investigate the immunomodulatory functions encoded by HCMV.

The next application deadline is 1 September. You can find out more at www.immunology.org/grants-and-prizes/summer-placement-award-scheme.

Congratulations to new Fellows

Both the Academy of Medical Science and the Royal Society have announced their lists of new Fellows for 2019. Congratulations to the following BSI members on being elected as Fellows in recognition of their outstanding contributions to the discipline.

Royal Society

Charles Bangham, Chair of Immunology and Head of the Division of Infectious Diseases at Imperial College London. His work examines the virology and immunology of persistent virus infections, with particular focus on the human T-cell leukaemia virus (HTLV-1). His contributions to the discipline include discovering the virological synapse – how viruses such HTLV-1 are transmitted between cells.

Caetano Reis e Sousa, Assistant Research Director and Senior Group Leader, Francis Crick Institute. His work involves studying the mechanisms used by the immune system to sense infection, cancer and tissue injury, with a particular focus on the role of dendritic cells.

Academy of Medical Sciences

Clare Lloyd, Professor of Respiratory Immunology and Wellcome Senior Fellow at Imperial College London. Her work examines the molecular mechanisms that underlie common lung diseases, such as asthma or fibrotic lung diseases.

Helen McShane, Professor of Vaccinology and Deputy Departmental Head at University of Oxford. Her work looks at tuberculosis vaccination, in particular studying the safety, immunogenicity and efficacy of candidate TB vaccines through clinical trials.

Alison Simmons, Professor of Gastroenterology at the MRC Human Immunology Unit, University of Oxford. Her research focuses on defining innate immune pathways that underpin digestive diseases, such as inflammatory bowel diseases, Crohn’s disease and ulcerative colitis.

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

Set your alarm – adjusting to life in industry

BSI member, Mihil Patel, finished his PhD at Cardiff University last year and has since taken up the role of Research Scientist at GammaDelta Therapeutics. Here, he discusses how he found the transition from working in academia to industry and what he’s learnt as a result.

Viva day. Ironic that three and a half years of toil would be condensed into as many hours (3h 53min to be precise – my Chair timed it and thought nothing of taking candid pictures of me during the whole process). The success was followed with the post-viva formalities – corrections, dinners, smugness. Reality quickly crashed down on me, as I’d bled my supervisors dry of temporary funding. I needed a job. It was time to put an end to this extended state of adolescence.

Taking the plunge into industry

I was straight on to the job pages of big pharma companies, LinkedIn and recruitment agencies. It was clear from the get-go – now is a good time to be an immunologist. With immunotherapies being pushed hard by companies small and large, there were plenty of opportunities for someone straight out of a PhD with a range of cellular and molecular biology techniques.

To cut a long story short, the main reason for leaving academia was that I wanted to apply my skills learnt during my PhD in viral immunology in a more tangible way. After several Skype and face-to-face interviews, I accepted a position at GammaDelta Therapeutics. I had a fairly good idea of what I was getting into: a full-on cellular immunotherapy company. Exactly what I wanted.

Strict standards and electronic lab books

One aspect that I really value is how the workload is often shared between colleagues. As most of us can attest, almost all experiments during a PhD are solo efforts, regardless of how small and large. Here though, the work is very collaborative. If a large experiment is conceived, then the work is planned and executed by several scientists ensuring it’s performed faster and more efficiently. Unlike in academia, where a lab book entry can be minimalist, or non-existent, biotech companies use electronic lab books in which data is entered so that colleagues across different sites can access it and reproduce the experiment as needed. This also allows traceability and time-stamped entries, which is important when considering the filing of patent applications.

As our goal is to have a product in the clinic, many of the reagents we use in our preclinical studies need to adhere to strict standards to meet the guidelines of regulatory bodies. This means keeping strictly to use-by dates or sometimes using GMP grade materials and reagents. It’s for the same reason that some experiments are planned and executed to answer specific questions (referred to as data packages), rather than out of sheer academic curiosity. I knew this would be the case before coming to industry, but for me this is a good thing as before it

‘Unlike in academia, where a lab book entry can be minimalist, or non-existent, biotech companies use electronic lab books in which data is entered so that colleagues across different sites can access it and reproduce the experiment as needed.’
was all too easy to let ideas snowball into huge experiments, which wouldn’t always work due to workload management.

**Adapting to demands**

It’s true what you’ve most likely heard; in industry you need to be flexible. If certain projects need more resources, then colleagues will be drafted in from other areas to help at short notice. However, as a stoic optimist, I see this as an opportunity to learn something new and build my skill set. Lastly as this is a company, with boards and shareholders, there’s a set of business lingo which is always thrown around and roots itself into the office vernacular (’offline’ meetings anyone?).

Of course, there are things that can’t easily be replaced by moving out of academia. The flexibility of academia meant I was free to do a lot of outreach work at schools and festivals, which abruptly came to an end. Gone is the overt informality. I’m in a professional environment; I don’t walk around the office without shoes anymore or wear a bandana, and I even set an alarm in the morning. I’ve become more organised since starting here which is necessary as the company currently operates across two different sites in London. Most biotechs are based around Oxford, Cambridge and London so if this is a decision you are considering, then you need to consider setting your sights towards said ‘Golden Triangle’. This was tough for me as I’d become an adopted son of Wales during my PhD and was part of such a friendly lab, which I’m still in touch with.

**Science is science**

At the end of the day science is science. I still put the right controls into my experiment, I still attend weekly lab meetings and I still sing out loud when no one else is in the lab. The learning curve at first was steep, but this would have been the case if I was to do postdoc anywhere else. Moving from academia to industry is not something I regret. What I miss about academia is specific to my experience and circumstances during my PhD. As with academic labs, I suspect that all biotechs are different and have their own quirks and ways of working, though I feel quite fortunate to have landed on my feet here at GammaDelta Therapeutics.

Mihil Patel
Research Scientist
GammaDelta Therapeutics
www.gammadeltatx.com
Ensuring that the BSI Congress is accessible to all is extremely important to us. This year for our Congress in Liverpool, on 2–5 December, we are rolling out two new initiatives to help those with carer needs to attend. Our aim is to make this event accessible to as wide an audience as possible.

**Crèche**

We will have an onsite crèche at the BSI Congress 2019 in Liverpool to care for delegates’ children aged 0–12. You will need to apply in advance to secure a place for your child/ren. The BSI will subsidise the creche and childcare, however subsidised fees will apply.

**Carer grants**

For those who have caring responsibilities at home, be this looking after children or older members of the family, or those that need carers themselves, the BSI is launching a new grant scheme to help cover the costs of bringing in extra support while you attend the BSI Congress. Grants of up to £300 will be available.

These initiatives are in addition to other provisions already in place to increase accessibility at Congress, such as breastfeeding facilities. More information on both the schemes listed above and how to apply will be available on the BSI website shortly.

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**Attending an immunology conference while on maternity leave**

BSI member Emma Chambers recently attended the European Congress of Immunology (ECI) while on maternity leave with her daughter Jamie. Here, she writes about the experience.

Last year, I had my daughter, Jamie, and wanted to go to a conference while on maternity leave to keep up with the latest immunology studies. As ECI was in Amsterdam, and the journey was doable with a young baby, I applied for a BSI travel grant to attend. Prior to my application, I had been successful in my application to my division’s maternity/paternity fund – to cover the costs of my daughter attending, as I was still breastfeeding, and my husband’s costs – as he was kindly providing childcare while I was at the meeting. Luckily, my BSI travel grant application to cover my costs was also successful.

While on maternity leave, you’re allocated ‘keeping in touch’ (KIT) days to use when you want to attend conferences or just to go into the lab to keep on top of your work. At UCL, you’re given KIT days back as annual leave when you return to work. I decided to use some KIT days to attend ECI to ‘keep in touch’ with the current immunology findings in Europe. So, I wrote my abstract soon after my daughter’s birth, and was selected to talk at the meeting in an ageing and immunity session. Additionally, after I had registered, I was also asked to chair a session.

On the first day of the ECI, I chaired the session on mononuclear phagocyte development (predominantly in mice), not my area of expertise. I was a little nervous about this, but after discussing how to split the chairing with the other chairperson, I felt more at ease. Chairing the session meant that I listened more intently to talks, and actually I really enjoyed it and learnt more than I expected.

The following day, the BSI held a ‘meet-up’ in the evening at their stand for BSI members. I took Jamie along as I thought it would be good to get her into immunology early, and I had a great time speaking to other members and friends. I think Jamie enjoyed her time at the meeting too! The next day I had my talk in the afternoon, which went well – and I got excellent feedback from the audience. I really liked the session as it covered a lot of human work, and I found it interesting hearing about the other speakers’ ageing research.

Overall, I found attending the ECI a rewarding experience and I would like to thank the BSI for my travel grant and for facilitating my attendance. Having time to listen to research and catch up with friends and colleagues, I generally found my attendance to be a rewarding experience. I hope this article highlights that there are ways to continue attending conferences when you have a small family – and that the BSI is providing funding opportunities to facilitate attendance of young parents at conferences.

Emma Chambers
Postdoctoral researcher, University College London
BSI Regional & Affinity Group update

It’s been a busy few months for our Groups with lots of conferences taking place. Here our Group reps take you on a whistle stop tour of some of their activities.

**BSI Immunometabolism Group**

Upon inception, our aim for the BSI Immunometabolism Affinity Group was to create a UK-based network of like-minded researchers. With this in mind, on the 14–15 March 2019, we hosted our inaugural meeting, ‘Fueling the immune response’, in Newcastle.

We are pleased to report that the meeting was a success (if we say so ourselves!). It was very well attended (attracting 161 delegates), made a huge ‘splash’ on our social media platform (@BSI_immunomet on Twitter), and featured a great line-up of distinguished speakers, including an inspiring tour de force on autophagy from our keynote speaker, Prof. Doug Green. Feedback from our attendees was exceptional, with an overwhelming majority of participants agreeing that the talks were excellent, that the balance of early and more established researchers was ideal and indicating that they would attend this event again. A central point to highlight was the sheer abundance of unpublished data presented at this meeting. This was truly in the spirit of a collaborative atmosphere, and served to pique the interest of our audience. Our meeting also boasted plenty of networking opportunities, including a dancefloor which proved popular among some of our delegates.

**BSI Infection & Immunity Group**

In March 2019, the BSI’s Infection & Immunity Affinity Group held a one day workshop on ‘Trauma immunology’ at the University of Birmingham, attended by 60 delegates. Its aim was to highlight our developing understanding of the importance of the immune response in progression and outcome of traumatic injury.

Keynote speaker, Professor Karim Brohi (QMUL), a trauma surgeon, described the distinct clinical trajectories that patients experience following major injury. Using some arresting clinical case studies, he highlighted that understanding the early immune events following traumatic injury is crucial to developing new interventions to enhance survival and recovery following major trauma. Other speakers examined, among topics such as, ultra-early immune response to trauma and neutrophil responses during inflammation, infection, and sepsis.

A key message that resonated throughout this meeting was the importance of furthering our understanding of the early immune response to traumatic injury and was summarised in the final slide from the keynote speaker, which simply stated ‘Time for trauma immunology’.

Attendees and speakers alike clearly enjoyed the event, with speaker feedback including:

“I must thank you for inviting me to this great meeting! One of the best meetings I have attended in the last 5 years.”

“I very much enjoyed the meeting – it was a real privilege to attend. Really brilliant programme.”

**BSI Inflammation Group**

The University of Edinburgh Centre for Inflammation Research and the BSI’s Inflammation Affinity Group co-hosted an international conference, ‘Inflammation: from initiation to restoration’ over 24–26 April 2019, in Edinburgh.

The 200 attendees enjoyed a superb selection of talks from a stellar cast of international and local speakers, examining the role of inflammation in causing tissue damage and the loss of tissue homeostasis, through modulation of the immune system by inflammatory processes, and into the repair and regeneration of tissue and resolution of inflammation.

These sessions were complemented by excellent short talks, a very well received Early Careers Day, and a terrific evening with the award-winning Science Ceilidh group (including dancing the ‘Dashing White Blood Cell’), all enhanced by some beautiful Edinburgh sunshine!

Building on the success of our inaugural meeting on B cells in November 2018, the BSI’s Comparative & Veterinary Immunology Group (CVIG) organised a second meeting on ‘Non-conventional T cells in health and disease’. This topic is of great interest to veterinary immunologists because of the wide variations in numbers of these cells in commercially important animal species.

This was a very stimulating and informative meeting, which brought together experts in large farm animals, chickens, mice and humans, providing an excellent opportunity to compare non-conventional T cells across these species. The excellent organisation, stunning setting overlooking Tower Bridge and the Thames, and good food and refreshments, all contributed to the lively discussion and success of the meeting. Feedback was that, “this was a great little meeting – there should be more like this”, with the conference receiving 4.7/5 on the feedback survey. The meeting was attended by 100 delegates. We are grateful to the BSI and the UK Veterinary Vaccinology Network (UK VN) for their support.
**Immunology**

**Knowns and unknowns of tissue-resident memory T cells**

In this Editorial, Altmann considers the gaps in our understanding of tissue-resident memory T cells (TRM). Non-circulating T cells remain after a localised immune response. Why this subset of memory cells is different from the circulating population is unclear. The differences between CD4 and CD8 TRMs are also a mystery. While recent research has discovered a core transcriptomic signature for TRMs, there is little variance between sites. Tregs, macrophages and dendritic cells also show tissue-specific resident phenotypes. Transcriptomics has been able to explain tissue residence, but larger questions still remain. Altmann suggests that longitudinal transcriptomic profiling may be able to determine where TRMs come from and why they remain.

Altmann 2019 *Immunology* 157 1–2


**Tregs promote tissue repair via Th1 and Th17 responses in LPS-induced ARDS**

Acute respiratory distress syndrome (ARDS) is associated with strong regulatory T cell (Treg) infiltration in the lung, but the role of Th cells in bacterial-induced infectious acute inflammation is ill-defined. Tan et al. investigated the effect of Treg depletion on Th activity in a mouse model of ARDS. ARDS was induced in a mouse model using lipopolysaccharide (LPS). Depletion of Tregs with a PC61 anti-CD25 antibody interfered with inflammation resolution by downregulating neutrophils, upregulating macrophages and impairing lung epithelium and endothelial cell proliferation. The Th1 and Th17 responses were also impaired. Treg depletion may impair conversion Th cells, leading to a reduced pool of Th1 and Th17 cells. Th differentiation may also be impacted by reduced TGF-β expression. The data show that Tregs are vital for tissue repair and the resolution of LPS-induced pulmonary inflammation by their modulation of Th1 and Th17 responses.

Tan et al. 2019 *Immunology* 157 151–162

https://bit.ly/2Yw3pt4

**Sensing between reactions – how the metabolic microenvironment shapes immunity**

Perception of potential threat is key for survival. The immune system constantly patrols the organism scanning for potential pathogenic or malignant danger. Recent evidence suggests that immunosurveillance not only relies on classic receptors, but is also based on sensing of the metabolic environment. Metabolites interact in numerous ways with immune cells and are therefore more than just reaction intermediates. This new perspective opens the door for potential, future therapeutic strategies. Lötscher & Balmer describe how immune functionality during infections, cancer or autoimmunity, as exemplified by short-chain fatty acids, lactate and reactive oxygen species, can be shaped by metabolic intermediates.

Lötscher & Balmer 2019 *Clinical & Experimental Immunology* doi:10.1111/cei.13291


**EAntibody responses elicited in infants born to mothers vaccinated in pregnancy**

The maternal tetanus, diphtheria and acellular pertussis (Tdap) vaccination programme in the UK has successfully reduced cases of pertussis in young infants. It is important to investigate the persistence of maternal antibodies during infancy and the possible interference of maternal antibodies with infant responses to vaccines. Rice et al. recruited mother–infant pairs from vaccinated and unvaccinated pregnancies and measured concentrations of immunoglobulin (Ig)G against pertussis toxin (PTx), filamentous haemagglutinin (FHA), pertactin (Prn), diphtheria toxin (DTx), tetanus toxoid (TTx) Haemophilus influenzae type b (Hib) and Streptococcus pneumoniae in mothers and infants at birth, and in infants at 7 weeks and at 5 months. They found, among other results, that Tdap-vaccinated women had significantly higher antibody against Tdap antigens. All antibodies were actively transferred to the infants with higher transfer of DTx and TTx antibody in Tdap-vaccinated pregnancies compared with unvaccinated pregnancies. The results support maternal immunisation as a method of protecting vulnerable infants during their first weeks of life.

Rice et al. 2019 *Clinical & Experimental Immunology* doi:10.1111/cei.13275

https://bit.ly/2JKqFj4
Systemic clinical tumour regressions and potentiation of PD1 blockade with in situ vaccination

Despite advances in treatment, indolent non-Hodgkin’s lymphomas are incurable and do not respond well to checkpoint blockade. Here, Hammerich and colleagues show that despite being able to directly prime T cells, the ability to induce protective responses requires cross-presentation of tumour antigens. With this knowledge they developed an in situ vaccine combining three aspects to i) increase tumour immunogenicity (radiotherapy), ii) promote the recruitment and differentiation of dendritic cells (Flt3L) and iii) promote the uptake of tumour antigens [ITLR3 agonist]. This approach is shown to induce responses in preclinical models and patients, although the trial is ongoing. Inclusion of PD-1 blockade dramatically increased the efficacy of the approach in the preclinical model. These findings highlight the importance of ensuring tumour antigens are presented in an effective way to promote anti-T cell responses.


Different antibody responses in ducks vs chickens following influenza infection

Ducks are known to be more tolerant to avian influenza viruses (AIV) than chickens. Aquatic waterfowl are a reservoir that shed but do not show clinical signs. However, the mechanism for duck tolerance of AIV is not fully understood. Yang et al. have identified the humoral immune response as possibly having a critical role in influenza resistance. They infected ducks and chickens intranasally or intravenously with H9N2 AIV, then compared kinetics and magnitude of antibody responses. They found that ducks had a weaker antibody response than chickens after intranasal infection, with lower titres and delayed seroconversion. However, after intravenous infection, ducks had a more robust antibody response at 2–3 d.p.i. Ducks also showed limited viral dissemination compared with chickens, who suffered systemic infection. These findings indicate the humoral response could be important in AIV resistance in ducks.


Chronic inflammation permanently reshapes tissue-resident immunity in celiac disease

Gamma delta T cells take centre stage in a huge undertaking by Mayassi et al. which furthers understanding of celiac disease (CeD) and Vδ1+ T cells. Innate-like NKR expressing Vδ1+ intraepithelial lymphocytes were lost in CeD, and did not recover in patients adhering to a gluten-free diet. Transcriptional analysis combined with TCR sequencing found that the intraepithelial lymphocyte compartment was permanently reshaped in CeD. Patients with CeD had reduced BTNL3/8 expression in small intestine biopsies. While mucosal BTNL8 expression was recovered in patients adhering to a gluten–free diet, this did not restore the Vδ1+ phenotype. This work indicates that the changes that occur to the tissue-resident Vδ1+ compartment are permanent and occur early on in CeD.


Longitudinal profiling of human blood transcriptome in healthy and lupus pregnancy

It is now recognised that the generation of maternal immunological tolerance is required for the successful survival of any allogeneic foetuses. SLE is a systemic autoimmune disease associated with inflammation in joints and other organs. Moreover, female patients with this disorder have an increased risk of pregnancy complications such as pre-eclampsia and other adverse effects, which seems to suggest a failure to establish foetal tolerance. To investigate this hypothesis, the authors performed transcriptional profiling of whole-blood from healthy and SLE mothers at various time points throughout their pregnancy. They observed downregulation of multiple immune signatures, including type 1 IFN from healthy and non-complicated SLE pregnancy, consistent with the idea that pregnancy modulates the immune system. However, in SLE patients that exhibited pregnancy complications there is a failure to downregulate these transcriptional signatures together with the presence of activated CD4 T cells. These observations highlight the importance of establishing foetal tolerance and the potential to use these immunological signatures as biomarkers to determine healthy pregnancy.


Regulatory effects of local microenvironment in the lung

Svedberg and colleagues have revealed a critical role for the airway microenvironment in regulating immune cell activation. They show that alveolar macrophages, unlike macrophages from other sites, are hypo-responsive to IL-4 despite comparable levels of IL-4 receptor expression. Metabolic profiling demonstrated that alveolar macrophages have a distinct metabolic state, with impaired glycolysis and reduced respiratory capacity that limits their ability to respond to IL-4. The hypo-respondent phenotype was lost following in vitro culture, accompanied by increased glycolytic activity. This demonstrates that the airway microenvironment regulates the activity of alveolar macrophages by modulating their metabolic state. As well as highlighting the important role of the local microenvironment in regulating immunity, this study raises the possibility that airway responsiveness could be modified therapeutically by targeting metabolic pathways.

Svedberg et al. 2019 Nature Immunology doi: 10.1038/s41591-019-0410-x
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Miltenyi Biotec Ltd. | Almac House, Church Lane | Bisley, Surrey GU24 9DR, UK | Phone +44 1483 799 800 | Fax +44 1483 799 811
macs@miltenyibiotec.co.uk | www.miltenyibiotec.com

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