Immunology News

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Sustainable Science:
small steps, big difference

BSI committees:
The voice of the membership

Celebrating vaccine research:
Get involved

The carbon footprint of science:
How can we 'go green' in our labs?

British Society for immunology
www.immunology.org

Welcome to the first issue of *Immunology News* in 2020. We have started the new year full of energy and excitement after the huge success of our Congress in December last year. We were delighted to see many of you come together in Liverpool and enjoy cutting-edge immunology while reconnecting with old friends and making new ones.

We're proud to form part of such an amazing community and we'd like to continue building it by encouraging all of you to participate in the upcoming committee elections. Our committees are formed by people who share a passion for immunology and want to play a role in shaping the future of the Society and immunology in the UK. We need members from all backgrounds, career levels and locations in the UK to get involved – please do take a look at page 8 and consider standing for election. In April, you will be able to have a say and vote for your representatives.

Another great opportunity to get more involved is at our 'Celebrate Vaccines' day on 26 March. We're running a mass public and social media engagement day to celebrate the importance of vaccines and the fundamental role of immunology research – read more on page 15.

In this issue, we're happy to be showcasing some of the fantastic work our members are doing to reduce their carbon footprint. Head to page 16 for some useful tips on sustainability that you can implement inside and outside your lab. Thanks for all your support!

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VIEW FROM …

THE BSI PRESIDENT

It's been three months since Congress 2019 and I still have fond memories of the whole event. As always, it was a pleasure to catch up with ex-colleagues, to reminisce about past glories and also reflect on the (temporary) emotional devastation from experiments going wrong, papers and grants being rejected, etc. In reality however, all these episodes were unique adventures that were shared by us and are a natural part of research. It was fantastic to see so many early career immunologists at the meeting, enjoying both the science and the social events. You are the future of the BSI and with the enthusiasm I have witnessed from you, the future of our Society is secure.

The level of effort required to make the Congress a success is immense, and this wouldn't be possible without the integrated work of the Congress Committee and the BSI office. A huge thank you to Gary Entrican, BSI Congress Secretary, and the rest of the Congress Committee, and to Doug Brown and the BSI office team. A special thank you, however, to Head of Events, Jane Sessenwein, for all her hard work in overseeing the organisation of the meeting. It was great to see members of the office team having a good time, especially on the dance floor, at the party!

We need *you!*

The success of the BSI depends on our members giving up their time to participate in committees involved in the smooth operation of the organisation. We now have upcoming vacancies on the Board of Trustees, on Forum and the Congress Committee as well as the positions of Education and Careers Secretary and Groups Secretary. Please consider the possibility of putting yourself forward for nomination to help us continue making the BSI a success. Details of these positions are available on page 9.

'Senior immunologists have gained a lifetime of experience in immunology and there must be a way for us to harness this for the benefit of our members.'

Engaging with senior immunologists

I would like to share some thoughts with you. General Douglas McArthur, who was a very prominent figure in the conflict in the Philippines during World War II, is credited with many memorable quotes, a number of which also have relevance for scientists. These include: *"the best luck of all is the luck you make for yourself"* also, *"we are not retreating – we are advancing in another direction"*. However, the one I would like to focus on is *"old soldiers never die; they just fade away"*. This persuaded me to consider what happens to older immunologists? While it is perfectly right and appropriate for the BSI to promote and support early career scientists, there does not seem to be any mechanism in place to support senior immunologists who are reaching the end of their careers. These individuals have gained a lifetime of experience in immunology and there must be a way for us to harness this for the benefit of our members.

To my knowledge, we have never engaged in a discussion with senior immunologists about what they would like from our Society. After all, the BSI is dedicated to supporting our members at all stages of their careers. Without question, most senior scientists and clinicians would like to have a stress-free, enjoyable existence, but, one does not lose an interest in immunology overnight upon retirement! A number of emeritus immunologists I have spoken with say that they miss the interaction with early career scientists and would appreciate occasional updates on research progress in their respective fields of interest.

BSI discussion group

To identify areas where our efforts should be focused in supporting senior members of our Society, the BSI is holding a discussion group and dinner in March where we have invited a group of senior immunologists to share their thoughts on how they would like to continue to contribute to the BSI. Conversely, we will explore what the BSI could put in place to support them. We will report back on the outcome of this meeting in due course. While not wanting to overstate the case, do remember that we will all be senior and retired members one day. Perhaps we should consider putting some processes in place before then.

Finally, I would like to wish you all a happy, productive and successful year.

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

VIEW FROM ...

THE CHIEF EXECUTIVE

What an end to 2019, and what a start to 2020! So many brilliant things are happening at the BSI – thank you again to all our wonderful members and supporters for making all of this possible. We finished the year with our flagship event, BSI Congress 2019. We have quite simply run out of superlatives to use to describe how amazing Congress was! We had the highest ever attendance, a fantastic scientific programme, great presence from our corporate supporters and so many other positives that you can read about on pages 6-7. What stood out for me (and I've been to more than my fair share of scientific conferences) was the positive vibe of the event – it really felt like we were one big BSI family! I am convinced that this will help all of you unlock your career potential, taking immunology to even higher places for the benefit of human and animal health. And I can assure you that the BSI will continue to be right there alongside you to help you succeed. Thank you again to those of you that came to Congress, and to those of you that couldn't make it – we look forward to seeing you in Edinburgh for BSI Congress 2020!

In other exciting news, we're pleased to announce that we have had a huge success in receiving our first ever significant grant to fund our vital childhood vaccination work and to support the global Gavi initiative. Details of what we will be doing with this funding are on page 15 and include a mass engagement from our membership. Thank you in advance for your help!

In addition to reading about our vaccination work, do flip to page 13 to hear from our Finance Director, Otto Balsiger, who provides an insight into how the BSI is funded, focussing on what are our main sources of income and how our costs are split between our activities. Do read more about this and get in touch if you're interested to hear more.

It would be remiss if we didn't acknowledge that the UK left the European Union on 31 January, and as the UK negotiates specifics during this year, the BSI will continue to work closely with the Government and others to highlight the risks and opportunities for immunology research to ensure that we remain *the* world leader in this discipline (pages 20-21).

A new year brings a new round of elections for BSI committee positions. I wanted to offer my huge thanks to those committee members that will be stepping down during this year. Their help and support have been essential for what the Society has achieved in recent years. This is why we are doing even more of a push this year to get the highest calibre of nominations ever for this round of recruitment! We have positions on Board, Forum and Congress Committee as well as in two of our Secretary roles (page 9). Please do consider nominating yourself and sharing these opportunities with your colleagues. The deadline for nominations is fast approaching (Tuesday 17 March) and after that we will need you to have your say by casting your votes for the nominees.

We're pleased to showcase environmentally friendly initiatives in this issue of *Immunology News*. You can read about green research practices on page 16 and find out what you can do to reduce the carbon footprint of your lab. We're continuing to make improvements from the BSI perspective, including for Congress 2020, and the article will share some useful tips on sustainability that you can implement in your own labs.

Thank you again for all you do for the BSI and immunology. I speak for the whole BSI staff team when I say that it is a real honour to be a part of this wonderful discipline and to be working with you all.

Doug Brown
Chief Executive,
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Celebrate Vaccines

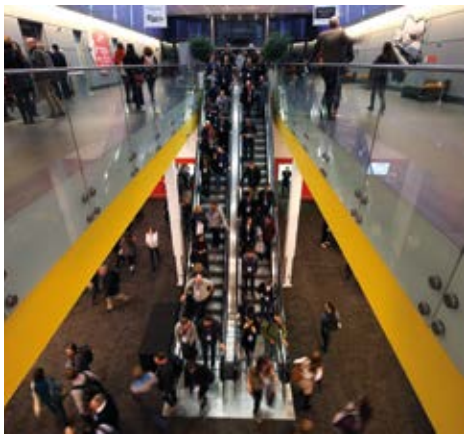
with the British Society for Immunology

SOCIETY NEWS

Liverpool highlights: BSI Congress 2019

In December last year, immunologists from all around the world came together in Liverpool for our flagship event: BSI Congress 2019. It was an amazing week of immunology, filled with a huge array of cutting-edge science, inspiring debates and plenty of opportunities to build collaborations.

"I had the great opportunity to present my research work in the form of a poster to peers and obtain their feedback and potential ways forward for my research"



"Many of the talks presented were extremely interesting and educational and I managed to establish invaluable connections."

"The possibility to choose between a variety of topics was great; I enjoyed the cutting-edge research!"

1,399 delegates from 35 countries

4 days of world class immunology

30 sessions

43 exhibitors

621 abstracts submitted

90 orals

531 posters

62 invited chairs

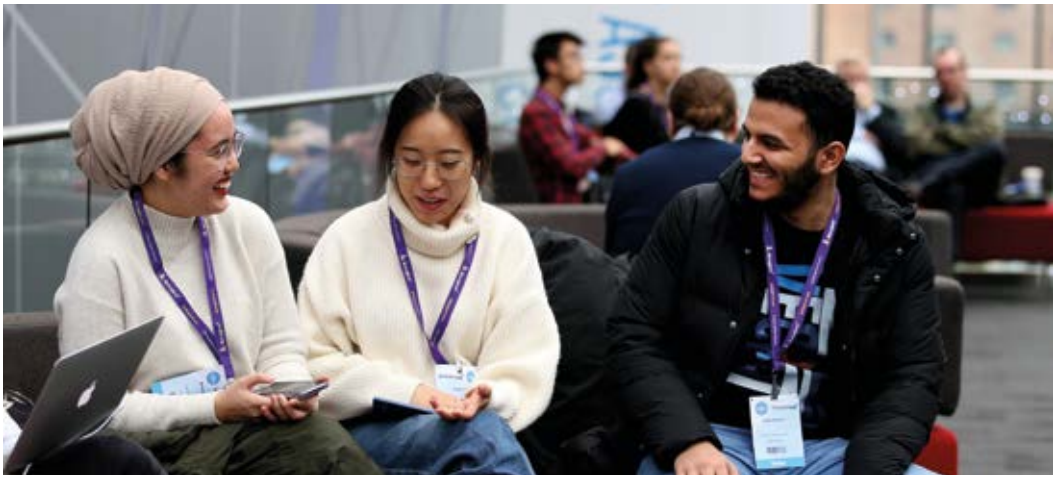
31 ♀ 31 ♂

76 invited speakers

36 female

40 male

"The BSI Congress 2019 was a great convention of immunologists where I had the opportunity to listen to speakers from all over the world. The Bright Sparks session was the highlight of the conference."



Save the date!

BSI CONGRESS 2020
30 November –
3 December 2020
Edinburgh, UK

Plenary sessions on:
- Calling time on immunology
- Stromal immunology
- T cell exhaustion
- Immunometabolism
- Lessons from challenge models
- Immunogenetics

Follow #BSI20 for updates!

SOCIETY NEWS

BSI committees: the voice of the membership

The current BSI Board of Trustees

Nominations for vacancies on the BSI's Board of Trustees, Forum and Congress committees, and for our Secretary roles, are now open. This is a fantastic opportunity for you to get involved in the work of your Society and make a real difference to immunology in the UK.

Our Trustees have the chance to make an active and dynamic contribution to the Society through their responsibility for setting and overseeing our strategy, governance and finances, and by working closely with our CEO and staff to support all our members. Our Secretaries have defined areas of responsibility – they report to the Board, and may be asked on occasion to attend Board meetings to provide activity reports on those areas. Forum is the Society's 'think-tank', charged with developing policy and overseeing other areas of activity for the Society. These activities include education and careers work, public engagement, media, policy and public affairs, which includes helping to formulate responses to external consultations. The membership of Forum is designed to be representative of the Society's membership, including individuals from all career grades and immunology sectors.

Please check your emails and the BSI website for details on how to nominate yourself. Nominations will close on Tuesday 17 March. Voting for all positions will be open from Tuesday 31 March to Friday 24 April and full details on how to vote will be circulated to members shortly. The election results will be announced on the BSI website the following week.

Why should I stand for election?

Joining a committee offers you exciting opportunities beyond your day job including contributing to a community of like-minded people, influencing scientific policy and developing your personal and professional skills. Being part of a BSI committee gives you a front-row seat to all the action, giving you the chance to inform how we support our members and promote and champion immunology and science to all.

We are looking for committee members from all backgrounds and career grades and are very keen to encourage nominations from across the spectrum of our membership. For most positions, you don't need to have previous experience of sitting on a committee, but you do need lots of enthusiasm and a willingness to get involved to help formulate our activities and policies.

Should you stand for one of the positions?

If you're considering standing for one of the positions available, ask yourself:

- Are you committed to immunology and to the Society and want to help shape our future?
- Are you willing to speak your mind and contribute to the voice of immunology?
- Do you want to get more involved and use your skills and experience to make a difference?
- Are you happy giving your time, thoughts and energy to represent your fellow members?
- Can you work collaboratively to support the BSI and promote equal opportunities in immunology?

How can I have a say?

If the available positions are not for you, you can encourage others to stand and have your say by voting in the elections. Your vote really does count. Your elected representatives will make numerous decisions on your behalf, such as fees for membership and Congress registration; which issues the BSI focuses on in our policy work; how funds for travel awards are apportioned; which meetings are funded; and many more issues besides, so engaging with the elections genuinely does make a difference.

You can only vote if you are a current member, so please ensure that your membership is up to date.*

Vacancies

BOARD OF TRUSTEES

- **General Trustee** – Trustees make active and dynamic contributions to the Board, using their wide-ranging skills, knowledge and experience to ensure good governance and the development of strategy for the Society. They feed into wider activities which help enhance the work of immunology. Trustees are appointed for four years. They are expected to attend Board meetings in London four times a year.

  Matthias Eberl finishes his term of office as Trustee. This role is due to commence at the start of 2021.

SECRETARY ROLES

- **Education and Careers Secretary** – This role works with the BSI to take forward our activities to support the education and careers of those working in the field of immunology. Taking their lead from our strategic priorities, they work to increase the support that the BSI provides to our members throughout their careers. Helen Collins finishes her term of office as Education Secretary. This role is due to commence in mid-2020.

- **Groups Secretary** – This person works closely with the BSI team to coordinate our numerous Regional and Affinity Groups and their activities. Taking the lead from our strategic priorities, the Groups Secretary works to ensure that our Groups provide goodsupport to members throughout the country. John Curnow finishes his term of office as Groups and Meetings Secretary. This role is due to commence at the start of 2021.

FORUM

All Forum members are expected to attend committee meetings in London four times a year. The following positions will start in summer 2020.

- **Northern Ireland representative** – this position is open to any BSI members based in Northern Ireland. Louise Cosby finishes her term of office this year.
- **Early-career representative** – this position is open to any BSI member who is up to three years into their postdoctoral (or equivalent) career. Rebecca Newman finishes her term of office this year.
- **PhD representative ×2** – this position is open to any BSI member who is currently doing a PhD. Fane Mensah and Antonios Psarras finish their terms of office this year.
- **Clinical representative** – this position is open to any BSI member who is working in clinical immunology at all levels.

For the PhD and Early Careers positions, we'd like to particularly encourage members based outside of London to stand up for nominations to ensure the geographic spread of our membership is fully represented.

CONGRESS COMMITTEE

We have four vacancies on this committee for general members commencing January 2021. Positions on this committee don't go out for election but rather are selected by an in-house panel to complement the existing expertise on the committee. Paul Bowness, Ian Humphreys and Irina Udalova are finishing their terms of office this year.

Dates for your diary

Nominations close:
Tuesday 17 March 2020

Voting opens:
Tuesday 31 March 2020

Voting closes:
Friday 24 April 2020

Results announced:
Monday 4 May 2020

"Our community consists of over 4,000 immunologists from 68 countries around the world from all backgrounds and career grades. I urge everyone to continue building this community by having a say and contributing to our strong voice, so we can represent immunology effectively at the highest levels."

Professor Arne Akbar, President

*Voting is open to all paid categories of membership. Please note, this excludes undergraduate members and low-income economy overseas members who do not have to pay a membership fee.

SOCIETY NEWS

New Honorary Members

At the BSI Congress, we were delighted to award Lifetime Honorary Membership of our Society to four members in recognition of their outstanding contribution to immunology and to the Society.

Professor Doreen Cantrell CBE is Wellcome Trust Principal Research Fellow, Head of the College of Life Sciences and Vice Principal of the University of Dundee.

Professor Anne Cooke is Professor of Immunobiology at the University of Cambridge. She recently finished her term of office as a BSI Trustee, serving both as the organisation's Vice-President and leading the BSI Forum during this time.

Professor Sir Andrew McMichael is former director of the Weatherall Institute of Molecular Medicine at the University of Oxford and founder of the MRC Human Immunology Unit.

Professor Peter Openshaw is Professor of Experimental Medicine, an Honorary Consultant Physician at Imperial College London and former President of the British Society for Immunology.

Immunology Undergraduate Prizes

This scheme is intended both to promote excellence in the study of immunology at undergraduate level, and to encourage gifted students to pursue further postgraduate study, or a career in immunology.

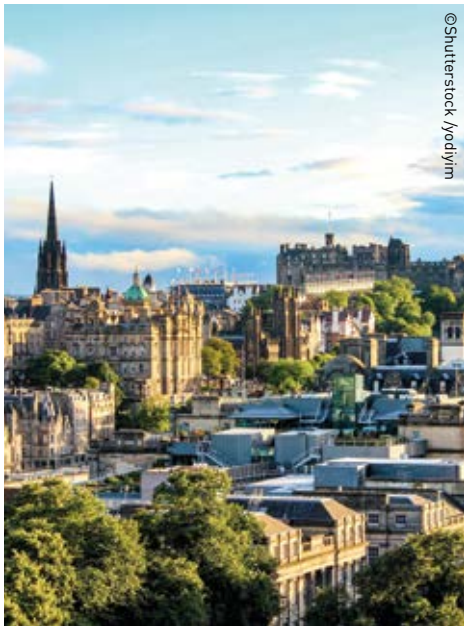
Applications for inclusion in this scheme must be made by the proposing University or Institute. The next deadline is 29 April 2020. Once the application has been accepted, nominations from successful universities and institutions should be submitted by 15 July 2020. For more information, please visit **www.immunology.org/immunology-undergraduate-prizes.**

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 2020
30 November – 3 December 2020
Edinburgh, UK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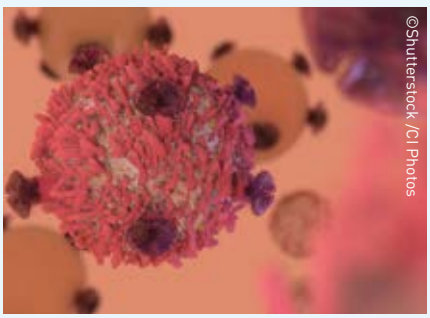
BSI Regional and Affinity Groups

BSI Tumour Immunology Group
CHECKPOINT BLOCKADE – UNDERSTANDING MECHANISMS, UNLOCKING NEW APPROACHES
19 March 2020
Birmingham, UK

BSI Oxford Immunology Group with the University of Oxford Immunology Network
OXFORD IMMUNOLOGY SYMPOSIUM
30 March 2020
Oxford, UK

BSI Comparative Veterinary Immunology Group with BBSRC UK and VVN
FRONTIERS IN COMPARATIVE IMMUNOLOGY SERIES: T CELL BIOLOGY
2–3 April 2020
Edinburgh, UK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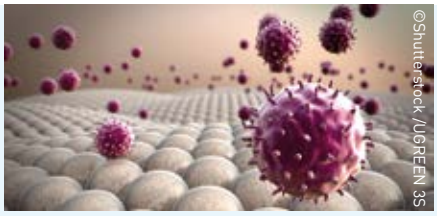
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BSI Comparative Veterinary Immunology Group
AVIAN IMMUNOLOGY FLOW CYTOMETRY WORKSHOP
3 April 2020
Edinburgh, UK

BSI Ulster Immunology Group
IMMUNOLOGY WITHOUT BORDERS: INNATE AND ADAPTIVE IMMUNITY CROSS-TALK
18–19 June 2020
Belfast, UK

BSI London Immunology Group
B CELL UK 2020
1 July 2020
London, UK

BSI West Midlands Immunology Group
FUNDAMENTAL MECHANISMS OF IMMUNE RESPONSES
9 July 2020
Birmingham, UK

BSI London Immunology Group
TRANSLATIONAL IMMUNOLOGY
16 September 2020
London, UK

SOCIETY NEWS

BSI Forum: there to represent you

The BSI Forum is the place where the voice of our membership is fed into our activities. Chaired by Ann Ager, the 18 elected members come from all sections of the Society's membership. Their role is to act as our 'think tank' on issues relating to education and careers, public engagement, policy and public affairs as well as communications. Forum aims to help the Society in implementing its strategic plan by providing a mechanism by which the voice of the membership can be fed into activities.

There are five positions in Forum that will become available this year. Nominations close on Tuesday 17 March. Find out more on page 9.

At the most recent meeting in January, Forum took an overview of the 2019 BSI Congress, discussing what worked well at the event and what could be improved. In particular, they focused on what the BSI can do to mitigate the environmental impact of the conference, on diversity and inclusion initiatives, including the creche and carers' grants, and on how the poster prizes are run. Also discussed were some new ideas for the BSI Congress this year, which will take place in Edinburgh.

The BSI's Policy & Public Affairs Manager, Matthew Gibbard, gave an overview of the new political reality we find ourselves in after the recent General Election, and Forum discussed which topics the BSI should focus on in our advocacy work. We again examined the issue of animal research and licences. We know this is a subject that affects many BSI members. The Society works with many partners on this topic, including the Royal Society of Biology and Understanding Animal Research, to make sure we provide a co-ordinated voice across the life sciences. Finally, Forum took an overview of all the external affairs and outreach activities that the BSI has undertaken over the past few months to communicate the voice of our immunology community to the wider world.

The BSI Forum and its members are here to represent you. If you would like to raise any issues for Forum to discuss at an upcoming meeting, please do contact your relevant Forum member – you can find a list of your representatives on our website at **www.immunology.org/forum**. Alternatively you can email our Head of External Affairs, Jennie Evans, at **j.evans@immunology.org**, who can pass the message on.

SOCIETY NEWS

How is your Society funded?

The British Society for Immunology has been promoting immunology and supporting immunologists throughout their careers for over 60 years. Our aim is to continue expanding our activities to benefit both members and the wider immunology community. Here, our Finance Director, Otto Balsiger, discusses how the Society is funded focusing on our spending and corresponding income to examine how we can expand in the next five years.

BSI spending

Looking at costs first, the annual cost of providing all our activities is just under £2m. Figure 1 shows the split of costs, first in a Congress year (filled) and second, in a non-Congress year (striped).

Our flagship event, the BSI Congress, and our annual programme of Regional & Affinity Group meetings are by far our biggest cost, accounting for just under half of our annual spend. This is followed by services for our members (22%), which includes membership, awards and grants and work to support education and careers. Therefore 70% of our annual costs in a Congress year is focused on delivering benefits to our members (including reduced registration rates for Congress). Other main areas of cost are external affairs, which incorporates our outwardly looking activities to engage with the public and policymakers to increase understanding of the importance of immunology, and the publishing of our journals.

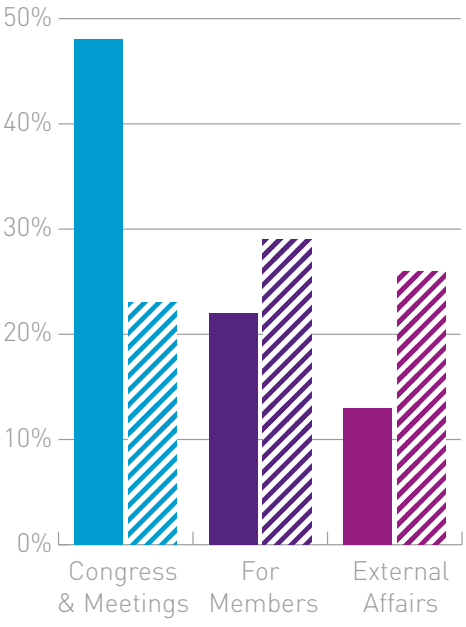

Figure 1

The cost split changes in a non-Congress year; however it is reassuring to note that providing services to our members and running our programme of group meetings still accounts for most of our annual spend (52%) with an increased proportion spent on external affairs and producing our journals.

We have achieved a huge amount in the last five years significantly increasing both our support of members and the discipline as a whole; however, building upon this work, we are aiming to achieve even more in the next five years. This will put pressure on our costs as we expand what we provide.

How are we funded?

So, how is the BSI funded? Figure 2 shows that approximately 85% of our income comes from our journals and Congress/ group meetings. The largest portion of our income by far comes from our two well-established journals, *Immunology* and *Clinical & Experimental Immunology*, which provide 61% of our total income in a Congress year and 70% in a non-Congress year. This is followed by Congress and meetings income at 25% in Congress years, falling to 16% in years without a Congress.

The remaining 15% of our income is split between membership, investments and our partnership work. Even though we now have over 4,100 members, income from membership fees provides less than one-tenth of our income and does not cover the cost of the services we provide to members, such as grants, reduced fees to meetings and careers activities.

Reducing reliance on journal revenue

These figures clearly show that our journals have been subsidising activities across the Society for many years, including:

- maintaining low BSI Congress registration fees
- freezing membership fees
- maintaining the levels of our grants and awards for members
- external affairs
- international collaboration
- working with our partners

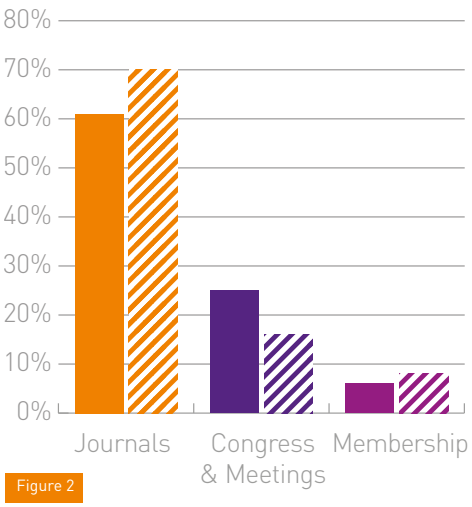

Figure 2

Journal income has been consistent for several years, but the move towards open access – at some point in the next few years – is likely to considerably lower journal income impacting our ability to continue subsidising activities.

For the BSI to be financially sustainable, we are now working towards reducing our reliance upon journal income. We plan to do this by both increasing income from our current activities and create new income streams.

Rude financial health

The Society is currently in excellent financial health, with a good level of reserves, and work has already begun on this diversification of our income; many BSI group events now cover their own costs, Congress exhibition and sponsorship income has risen, and we have received our first large grant to fund vaccine external affairs work. By being proactive and taking these significant steps forward at an early stage, we will secure the future financial stability of the BSI. We are now in the process of developing further plans as part of our work to finalise our 2021–2025 strategy.

Otto Balsiger
BSI Finance Director
Email: **o.balsiger@immunology.org**

Find out more

More financial details can be found in our 2018–19 annual report: **bit.ly/BSIAnnualReport19.**

SOCIETY NEWS

Celebrating vaccine research

Recently, the BSI has focused our external affairs work on childhood vaccination, conducting a variety of policy, media and public engagement initiatives, with the aim of improving public understanding of the importance of vaccination and increasing overall uptake rates of childhood vaccinations in the UK (see *Immunology News*, December 2019, pages 12–14). Through this work, we have established ourselves in 'vaccine advocacy' circles, which led us into our next project.

The next GAVI Replenishment Conference will be hosted by the UK on 3–4 June this year. GAVI, the Vaccine Alliance, was established 20 years ago with the aim of protecting the most vulnerable children in the world from preventable infectious diseases. Through working with partners including the Bill & Melinda Gates Foundation, the World Health Organization and UNICEF, to date GAVI has immunised more than 760 million children and helped low-income countries to prevent more than 13 million future deaths through its support for routine immunisation programmes and campaigns. The June conference will see world leaders announce their country's monetary contribution to GAVI's next strategic cycle, which aims to raise $7.4 billion to immunise 300 million children and save more than 7 million lives.

As a strong supporter of vaccination, the BSI has been working with the UK's Department for International Development and other partners including the Bill & Melinda Gates Foundation, UNICEF, Wellcome Trust and RESULTS UK, to carry out a series of events to highlight the importance of vaccination in improving global public health. The BSI comes to this collaboration to represent the voice of researchers who work on vaccines. We have several projects planned which we hope many of you will get involved with, either in person or by supporting us on social media. Vaccination is such a success story for the immunology community; we call on you to support us in highlighting the importance of this and the role that researchers play on an international stage.

Celebrate Vaccines

We're running a mass public and social media engagement day on Thursday 26 March. As part of this, we are funding members to run engagement events on vaccines – 18 events will take place around the country, from Edinburgh to Brighton, in settings including schools, hospitals, evening talks and city centres. We're so excited by the BSI community's response to this call; details will be on our website soon. Please do support your fellow BSI members in their activities; however, if you can't get to the events in person, there's still lots you can do to support 'Celebrate Vaccines'.

Show your support on social media

We will soon launch a social media campaign using the **#CelebrateVaccines** hashtag to show our community's support of vaccination. As part of this, we're developing some animations to tell the story of how vaccines work and the role of researchers in developing new vaccines. We'd like to encourage all BSI members to get involved on 26 March and tell the world why the immunology community supports vaccination so strongly.

Download our public engagement kit

We're developing several new resources to assist our members in talking to the public about vaccination. This includes everything from hands-on activities for science stands to presentations to give at schools. Many of the 26 March events will make use of these, but we hope they will also become a long-lasting resource that our members can use. In the longer term, they will all be available to download for free from our website, with kits available on request from our office too.

What else do we have planned?

To highlight every immunologist's favourite day – 29 April, which is of course International Day of Immunology – we are developing a new policy report to celebrate the UK's contributions to vaccine R&D and the impact of this work in improving global public health. We'll bring you more details on this project soon.

Celebrate Vaccines is a hugely important initiative for the BSI, allowing us to partner with the international community to champion the importance of vaccine research and the critical role it plays in improving global public health. We're immensely proud of the contribution that immunologists make to this and hope that you will join us to **#CelebrateVaccines** and ensure the expert voice of the immunology community is raised loud and proud in support of vaccination.

Jennie Evans
Head of External Affairs, BSI
Email: **j.evans@immunology.org**

> 'Vaccination is such a success story for the immunology community; we call on you to support us in highlighting the importance of this and the role that researchers play on an international stage.'

The carbon footprint of science:

How can we 'go green' in our labs?

We have just started a brand-new decade and have already been bombarded with the news of tragic and upsetting environmental disasters taking place across the globe. You will already be aware of the staggering numbers of lives, both human and animals, lost in the recent bushfires in Australia. Alongside this, we have many people taking up challenges such as 'Veganuary' and pledging to shift to more eco-friendly habits. We are moving in a promising direction, but the rate of climate change is getting faster and faster, and many of us want to be able to do more in our daily lives to reduce our carbon footprints.

Eco-unfriendly labs

As scientists, we have a challenging, but very rewarding job. Unfortunately, modern labs have an obscene carbon footprint. On average, a lab uses approximately four to five times more energy than an average work place of the same size.[1] Unfortunately, this negates the positive impact we strive to have on the planet. The equipment, reagents and plastics we use every day use a huge amount of energy and generate an enormous amount of waste. However, from a data perspective, many of these items are arguably a necessity for generating high quality outputs.

Outside work, many of us are conscious of reducing waste by limiting use of single-use products; plastic being the most obvious. We might feel guilty about using plastic straws or disposable water bottles, so why do we not have this mentality in our labs? A large part of the reason is because we justify these habits to save time and money.

So, what is the biggest problem?

Some of the largest energy users in labs are –80°C freezers and fume hoods. These freezers use about 20kWh per day. This might not sound like much, but it's 65× more energy than a regular household freezer. This energy usage significantly increases if freezers are not defrosted regularly. Fume hoods are another culprit; one fume hood uses the same amount of energy as three homes![2] Closing hoods when they are not in use can significantly reduce this output.

In terms of waste, plastic and chemicals are a huge problem. The University of Exeter calculated that their Bioscience department alone, made up of 280 scientists, used enough plastic to make 5.7 million 2-litre bottles in a single year. They have scaled this up to reveal that in 2014 the total plastic waste from the global, ~20,000 research institutions, was approximately 5.5 million tonnes.[3] Unfortunately, the lack of lab recycling results in most waste going to landfill or incineration.

What can you do?

At the Institute of Infection, Immunity and Inflammation at the University of Glasgow, we have set up an eco group to try to reduce our energy usage and waste output by introducing sustainable lab initiatives. We conducted an energy audit and found that over an average weekend, our building uses the equivalent amount of energy that a small house uses in a year. On an average day, most of this energy is consumed by centrifuges (see figure 1). This is a ridiculous amount of electricity usage that could be immediately reduced by turning computers and lab equipment off when they are not in use. At the recent British Society for Immunology Congress, we displayed a poster detailing some of the green initiatives that we use (take a look at **#BSI19**).

Here are some easy changes you can make to reduce your lab's carbon footprint (most of these ideas were based on initiatives from other fantastic eco groups at other universities which you can find on Twitter (**@My_Green_Lab**, **@UoBGreenLabs**, **@GreenLabsBham**, **@LEAFinLabs**):

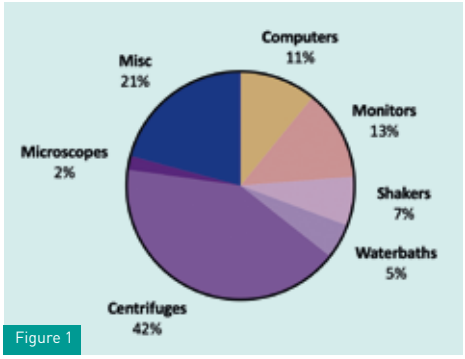

Figure 1

- Does your lab have a recycling bin? You can recycle clean (uncontaminated) plastics (e.g. rinsed media bottles, unused plastics), glove boxes, plastic and paper wrapping, tip racks and packaging. Tip boxes are also recyclable, though many suppliers offer a collection scheme. Make a friendly poster that clearly shows what can and cannot be recycled to make sure lab recycling bins don't get contaminated. It's a good idea to add recycling to lab inductions.
- What equipment can be switched off? Label equipment with different-coloured spots to reflect these rules.

- Use of electronic lab notebooks instead of paper with free software such as OneNote. This not only replaces paper notebooks and the space needed to store them, but also improves data management.
- How can you make your institute's events more sustainable? Encourage staff and students to use reusable coffee cups and bottles rather than single-use cups. Ask catering to use crockery only. Don't print programmes or provide handouts; electronic versions are best.
- How can you reduce single-use plastics in the lab? Use glass where possible – make reagents in glass. Buy essential plastics from suppliers who use less packaging. Can you reuse ice packs and polystyrene boxes or set up a scheme to return them? Many companies have recycling schemes.
- Do you share chemicals with other labs in your building? Chemicals are often supplied in kg and litres resulting in a large amount of waste. It's estimated that chemicals alone make up 80% of unused reagents in labs.[4]
- Can you increase the temperature of your –80°C freezer to –70°C? Doing this will save the energy equivalent of £300/year per freezer and reduce the cooling demands of the building's air conditioning units. Defrosting your freezer regularly will also save on energy consumption.

Small steps, big difference

A good first step is to find out how much energy your lab actually uses so you can set economic targets. Lots of universities have sustainable programmes to conduct these audits. Audits involve assessing different aspects of the lab such as cold storage, waste systems, chemical storage and making sure there are systems in place when buying reagents and equipment to choose the most sustainable option.

Nature has a useful quiz for assessing your lab's footprint[5] and be sure to read the Laboratory Efficiency Assessment Framework (LEAF).[6]

These small changes can make a big difference when adopted properly; however, there is only so much that can be improved without opposing health and safety guidelines, and other departmental/university policies. Our eco group was interested in finding ways to recycle more of our lab waste. This became very challenging because most of the waste is contaminated and therefore needs to be autoclaved and subsequently sent to deep landfill (which is safer that regular landfill) or incinerated (for higher risk waste). We came up with the idea of recycling plastics after they've been autoclaved. Unfortunately, we couldn't go ahead with this because the risks of putting potentially hazardous waste through the recycling chain was too high. Contamination issues prevent uptake of many other schemes including TerraCycle®'s glove recycling programme.[7] Because of these issues, it's definitely best to reduce, replace and reuse, with recycling being the last option. Ideally, funding bodies should be promoting sustainability by including green lab practice as a necessity for grant applications.

ECOgroup for the University of Glasgow, Institute of Infection, Immunity & Inflammation. (L-R) Julie Martin, Caitlin Duncan, Kym Bain, Gavin Meehan, Madeleine Cunningham, Colin Crawford, Rhona McGonigal, Danielle Smyth.

Greener conferences

It's worth mentioning that green research practices should extend outside of the lab. As scientists, we are travelling all the time. Travel to conferences contributes to a large proportion of the carbon associated with the life sciences sector, which can be reduced by taking trains, rather than flying, where possible. At the University of Glasgow, we estimate that 20% of the university's carbon footprint is associated with business travel. It's worth considering whether you can conference call rather than attend a meeting to reduce travel. The conferences themselves generate a lot of waste through printouts, food and drinks packaging and electricity usage. At the recent BSI Congress, the BSI decided to ditch plastic holders for name badges and encourage delegates to bring reusable water bottles and coffee cups. This is a brilliant step in the right direction, and hopefully BSI Congress 2020 will make even better green improvements.

Doing our bit

It's clear that many scientists care about the environment, but we could certainly do a better job at raising awareness of the large part we play in global carbon emissions, and therefore why we need to be taking these issues more seriously. The best advice I can give is to get as many of your colleagues involved as possible; more people equals more recycling and less waste. If the environmental angle doesn't work, try to highlight that reducing energy usage directly reduces costs and saves money. Running a fume hood 24/7 costs ~£1650 per year, and the University of Dundee estimates that turning off unnecessary equipment for two weeks would save £40,000. Even using a reusable coffee cup can save you money! Follow us on Twitter **@ECOgroup_III** to learn more, and to find other groups who are setting examples of fantastic green lab practice.

Kym Bain
Institute of Infection, Immunity and Inflammation, University of Glasgow
Twitter: **@ECOgroup_III**

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1. Woolliams *et al.* 2005 *Emerald Insight* 1467–6370
2. Mills & Sartor 2005 *Energy* **30** 1859–1864
3. Urbina *et al.* 2015 *Nature* **528** 479 doi:10.1038/528479c
4. Dolgin 2018 *Nature* **554** 265–267
5. Ramirez-Aguilar 2019 *Nature* doi: 10.1038/d41586-019-02830-y
6. University College London LEAF – The Laboratory Efficiency Assessment Framework **https://bit.ly/2umlKPm**
7. TerraCycle® Nitrile Glove Recycling program **https://bit.ly/2RBZQzB**

Clinical & Experimental Immunology:

Introducing the new aims and scope

Our official journal, *Clinical & Experimental Immunology*, is pleased to share with you their updated vision and scope for the journal, focusing on sections within the journal that are relevant to our readers and contributors.

Clinical & Experimental Immunology (*CEI*) is an international, authoritative, and timely journal publishing high-quality and impactful papers in the field of translational immunology. In the past year, we have updated our vision and scope and created new sections around key subject areas. We aim to better serve the community by making sure our scope and editorial team reflect the research interests of our audience.

Our dedicated Section Editors are experts in their field and will be able to make decisions based on what will be of interest to their specialist community. As reflected by the breadth in expertise of our members and the wide variety of Affinity Groups within the Society, we know that our members appreciate access to subject-specific networks and up-to-date research relevant to them.

Leonie Taams, *CEI* Editor-in-Chief:
"*CEI*'s updated aims and scope reflect the increasing opportunities to study the immunological basis of human disease, driven by both technological and clinical advances. The journal now has a stronger emphasis on translational immunology studies that include a mechanistic component. We also welcome studies that inform clinical practice.

"The journal has moved towards dedicated Section Editors, and each will have a supporting editorial board in the following areas: autoimmunity, immune-mediated inflammatory diseases, cancer immunity, infectious diseases and vaccines, neuroimmunology, and allergy & respiratory diseases. Translational immunology articles that fall outside these areas will be evaluated by the Editor-in-Chief and our general editorial board. In this way, all articles will receive expert evaluation in a timely fashion."

If you are interested in finding out more about the sections or wish to submit to the journal, please visit our website (**bit.ly/CEIscope**). The revenue derived from our journals provides major financial support for all the BSI's activities so, by submitting your work, you're supporting your Society.

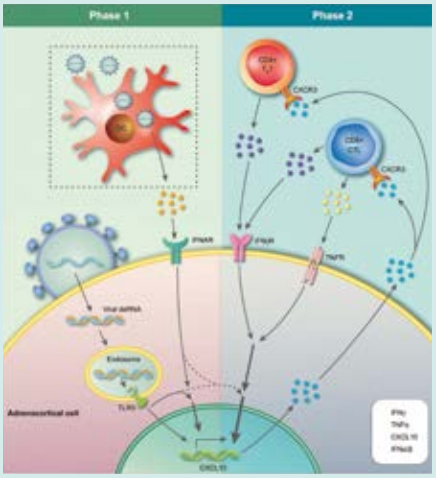
SECTIONS

AUTOIMMUNITY

The autoimmunity section is interested in articles that provide mechanistic insights into the establishment and maintenance of autoimmune responses and the molecular basis for the different molecular and clinical correlates of autoimmunity. The articles in this section cover a variety of rheumatological and immunological diseases, including diabetes, rheumatoid arthritis, Hashimoto's thyroiditis, systemic lupus erythematosus and many more.

The autoimmunity section is led by Angelo Manfredi of Università Vita-Salute San Raffaele, Milan.

Example article: de Bont *et al.* 2020 Neutrophil proteases degrade autoepitopes of NET-associated proteins *Clinical & Experimental Immunology* **199** 1–8 **https://bit.ly/2tDdOJI**



CANCER IMMUNITY

We welcome articles reporting on translational studies in animal models or *in vitro* human model systems with relevance for innovative immunotherapy strategies, as well as articles reporting on immune profiling of clinical samples and immune monitoring of clinical trials. Articles should provide novel mechanistic insights into the molecular and cellular processes governing natural tumour immunity, immune escape, or therapy efficacy. Emphasis should be on clinical or near-clinical applications for either solid tumours or haematological malignancies.

The cancer immunology section is led by Tanja de Gruijl, of VUmc, Amsterdam.

Example article: Lu *et al.* 2019 TNF-derived peptides inhibit tumour growth and metastasis through cytolytic effects on tumour lymphatics *Clinical & Experimental Immunology* **198** 198–211 **https://bit.ly/37fktrZ**

IMMUNE-MEDIATED INFLAMMATORY DISEASES

This section welcomes high-quality, primary research articles that report on the mechanistic investigation of inflammation in humans. Studies can encompass a wide range of pathologies, transplant rejection or sterile inflammation. While the main focus should be on the immunological basis of inflammation, papers that additionally describe genetic, metabolic or neurogenic aspects of inflammation, are welcomed.

The immune-mediated inflammatory diseases section is led by Leonie Taams of King's College London.

Example article: Steen-Louws *et al.* 2019 IL4-10 fusion protein: a novel immunoregulatory drug combining activities of interleukin 4 and interleukin 10 *Clinical & Experimental Immunology* **195** 1–9 **https://bit.ly/2va4Y6E**

ALLERGY AND RESPIRATORY DISEASE

This section is particularly interested in translational or clinical studies that report on the immunological basis of allergies as well as studies that provide immunological insight into the development, treatment or diagnosis of respiratory disease. Articles focusing on technologies or models that advance the immunological understanding of allergy or respiratory disease are also welcome.

We are currently seeking to recruit a Section Editor for allergy and respiratory disease. If you are interested in joining our Editorial Team in this position, please get in touch at **imm@immunology.org**.

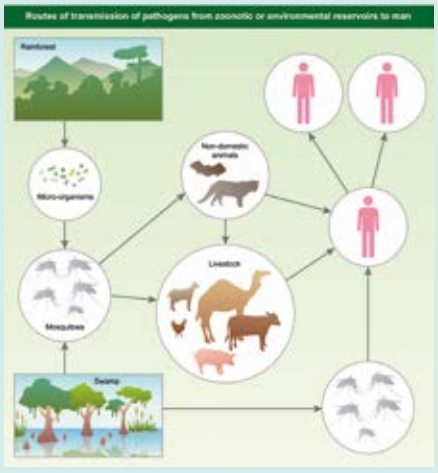
Example article: Arakawa *et al.* 2019 Secretory immunoglobulin A induces human lung fibroblasts to produce inflammatory cytokines and undergo activation *Clinical & Experimental Immunology* **195** 287–301 **https://bit.ly/36eRNxS**

INFECTIOUS DISEASES AND VACCINES

In this section, we welcome articles focusing on both established as well as emerging infectious diseases, their treatment, and the development of prophylactic and therapeutic vaccines. We are especially interested in these topics as they apply to resource limited settings. Vaccine articles should not simply be descriptions of the production or formulation of a vaccine but should include a clinical or pre-clinical component that attests to the vaccine's efficacy or immunogenicity. We are also interested in all aspects of the microbiome and its interaction with and influence on the immune system.

The infectious diseases and vaccines section is led by Danny Douek (National Institute of Allergy and Infectious Diseases/National Institutes of Health/DHHS, USA) and Xiao-Ning Xu (Imperial College London).

Example article: Zhong *et al.* 2019 The impact of timing of maternal influenza immunization on infant antibody levels at birth *Clinical & Experimental Immunology* **195** 139–152 **https://bit.ly/2TIRI33**

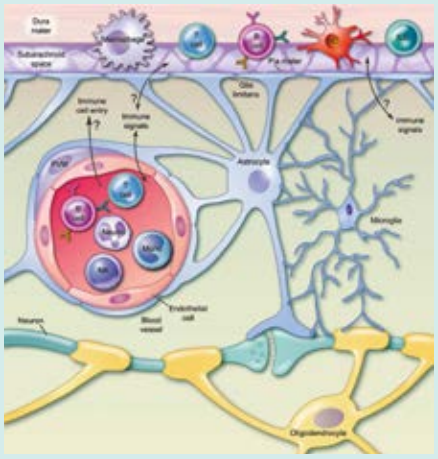


NEURO-IMMUNOLOGY

Although neuroimmunologists originally focused on the classical neuroinflammatory disorders including multiple sclerosis and infections of the nervous systems, the immune response also plays a major role in many other diseases including genetic white matter disorders, epilepsy, neurodegenerative diseases, neuropsychiatric disorders, diseases of the peripheral nervous system and neuro-oncology. This section welcomes research papers on technological advances, animal and human studies, and outcomes from clinical trials regarding the contribution of the immune system to these diseases, as well as its role in brain development, ageing, and regeneration and repair.

The neuroimmunology section is led by Sandra Amor, of VUmc, Amsterdam.

Example article: Xue *et al.* 2019 Transcriptomes in rat sciatic nerves at different stages of experimental autoimmune neuritis determined by RNA sequencing *Clinical & Experimental Immunology* **198** 184–197 **https://bit.ly/2ReZH6r**



Robyn Taylor
BSI Journals Manager
Email: r.taylor@immunology.org

Find out more

Find out more about the new aims and scope: **bit.ly/CEIscope**
Submit to the journal: **mc.manuscriptcentral.com/cei**
Follow us on twitter: **twitter.com/CEIjournal**

BSI policy work update

It's been a time of upheaval for British politics. Our Policy and Public Affairs Manager, Matthew Gibbard, reviews the current political situation and the last few months of policy work, including how the BSI established a new engagement plan for the new Parliament.

Following the December 2019 general election and its delivery of a decisive result that gave the Conservative Party an 80-seat majority in the House of Commons, this should be the last *Immunology News* article for a while that begins by recounting all the change and upheaval in Westminster since the last issue. While Parliament was dissolved, the BSI continued its policy and public affairs work behind the scenes preparing for the likely outcome, establishing a new engagement plan for the new Parliament, and continuing to work with our contacts in the civil service.

Post-election summary

Because of the general election, the Government was unable to make major policy announcements due to purdah – the governing party is unable to use the machinery of government and taxpayers' money to its electoral and political advantage and to maintain the neutrality of the civil service. This meant that several important documents that we were expecting, including the new Vaccine Strategy, or the Department of Business, Energy and Industrial Strategy (BEIS)/ UK Research and Innovation roadmaps to achieving the target of a combined public-private spend of 2.4% GDP on UK R&D, were not published. The Conservative Party included in its manifesto a commitment to publish the Vaccine Strategy within 30 days of being re-elected into Government.

Immediately after the election, the BSI wrote to the Prime Minister reminding him of this commitment, and the need to make the future funding framework clear. We will watch progress on these issues closely.

Other post-election work for the BSI included writing to all 140 MPs who entered Parliament for the first time and the 15 MPs who returned to Parliament following an electorate-imposed break, to inform them of the impending crisis in vaccination uptake, the circumstances surrounding this, and to offer a meeting. We also urged them to contact the Health Secretary to ask him to publish the Vaccine Strategy as soon as possible. MPs have a bigger voice than us as a single organisation and it is important that the Health Secretary is reminded that vaccination is an issue that is important to his colleagues in Parliament. The BSI also met with the Parliamentary Private Secretary to the Health Ministerial Team, Steve Double MP, in January to advocate for a comprehensive vaccine strategy that tackles the real causes of undervaccination in England.

> 'MPs have a bigger voice than us as a single organisation and it is important that the Health Secretary is reminded that vaccination is an issue that is important to his colleagues in Parliament.'

'Getting Brexit done'

By the time this article is published, the UK will have left the European Union on 31 January. I feel fairly confident in writing that sentence, given that the Prime Minister now has a large working majority and a popular mandate, and we have seen the electoral defeat of all the Tory MPs who defected or lost the whip over Brexit. This will mean a much smoother and faster process than we have grown used to with two years of minority government. Any opposition in the Remain-heavy House of Lords will be token; the Salisbury Doctrine is the constitutional convention by which the House of Lords does not oppose the second or third reading of any Government legislation that the governing party promised in its election manifesto, and the Parliament Acts of 1911 and 1949 severely limit the ability of the Lords to delay or block legislation in any case.

After the UK leaves the European Union, it will enter a transition period until December 2020 during which the Government can negotiate a future relationship with Brussels, while also entering talks with

'The discussions surrounding the future relationship with the EU will range far more broadly than just trade, and the agenda will include myriad other items including access to Horizon Europe.'

countries around the globe. The Government plans to legislate the December 2020 date into law but can obviously change that at will (see above on large majority). On 31 January, 20 continuity deals covering 50 countries will have come into force; these represent approximately three-quarters of the EU's current trade agreements and cover 8% of UK trade. 'Mutual recognition agreements' have been signed with the USA, Australia, and New Zealand; the Antipodean agreements replicate all relevant aspects of the current EU agreements. The discussions surrounding the future relationship with the EU will range far more broadly than just trade, and the agenda will include myriad other items including access to Horizon Europe (the Government's ambition is to continue the close collaboration currently enjoyed, as stated in the Conservative manifesto).

'Getting Brexit done' has allowed the Prime Minister to use his own personal mandate to decide the Cabinet that he wants. The biggest, and most unexpected, change was the departure of Chancellor Sajid Javid, who leaves 11 Downing Street with the undesirable distinction of being the first Chancellor in modern history not to deliver a Budget. Saj is replaced by his former deputy, Rishi Sunak, who has accepted the Prime Minister's demands for a joint Number 10–Treasury team of advisers, which is meant to stop the briefings and counter-briefings to the press and ensure both teams are on the same page.

The other big change is the departure of the Science and Universities Minister, Chris Skidmore, and, what appears to be the first split of the science and universities ministerial roles since the pre-Cameron era, when both briefs were based in the same department (currently science is the responsibility of BEIS and universities are the responsibility of the Department for Education). The downgrading of the science post from the level of Minister of State with Cabinet attendance privileges to a junior ministerial Parliamentary Under Secretary of State role could mean that the science sector loses some influence – alternatively it could mean that Dominic Cummings, the PM's senior adviser, sees himself as a voice for science at the centre of government and someone else would be superfluous. Time will tell.

Labour leadership race

While the Conservatives are getting to grips with the freedom to govern, the Labour Party are licking their wounds and engaging in some party introspection. Candidates for the Labour leadership are currently laying out their stalls to the membership

The two favourites at the moment are Sir Keir Starmer QC MP (Lab, Holborn and St Pancras) and Rebecca Long Bailey MP (Lab, Salford and Eccles). Sir Keir, a barrister by trade and former Director of Public Prosecutions, is a confident parliamentary performer and has served as Shadow Brexit Secretary without ever fully signing up to the Corbyn agenda. He has suggested that the time for a second referendum has ended and that Labour must focus on ensuring a relationship with Europe in the coming years that's 'going to work for jobs and the economy', while partly blaming Labour's worst defeat since 1935 on an 'overloaded' manifesto. For those who think the next Labour Leader should be a woman and from the North, Sir Keir falls somewhat short; instead Manchester born and bred, Rebecca Long Bailey, might be more to their taste. Long Bailey who has shared a London flat with Ashton-under-Lyne MP Angela Rayner since being elected in 2015 has agreed with her flatmate that Long Bailey should stand for Labour Leader while Rayner stands for the Deputy Leadership. This has led to, not completely unfair, claims that not only is Long Bailey not the best leadership candidate in the Labour Party, but that she's not even the best candidate in her own flat. First elected in 2015 and having been lifted from the backbenches to Shadow Secretary of State in less than two years, it is widely known that she is John McDonnel's protégée and for this reason many see her as 'Continuity Corbyn' and the Labour Left are pushing hard, in part by fixing the rules for the contest. The Labour leadership result will be declared on 4 April while much of the country are watching the Grand National.

Matthew Gibbard
BSI Policy & Public Affairs Manager
Email: **m.gibbard@immunology.org**

Congratulations

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

Bright Sparks shine through

The BSI Congress saw the return of our very popular 'Bright Sparks' sessions, highlighting exceptional work from PhD students and postdocs. The judges praised the incredibly high standard of presentations across both sessions.

Emilie J Cosway (University of Birmingham) won the postdoc category for her talk entitled 'Eosinophils: essential regulators of thymus regeneration'. Runners-up in this session were **Joshua Casulli** (The University of Manchester) and **William Branchett** (Imperial College London).

Meanwhile, the PhD category was won by **Nathalie Schmidt** (University College London) for her presentation 'Rescuing hepatitis B virus- and tumour-specific T cell responses by modulating cholesterol metabolism'. Runners-up were **Ondrej Suchanek** (University of Cambridge) and **Alicia Galdon** (The University of Manchester). Our congratulations to all the finalists.

Bright Sparks winners

Communicating Immunology Grants

The BSI is delighted to fund the following projects.

James Harker and colleagues from Imperial College London have been awarded funding for their 'Origami Outbreak' project.

We have also funded **Charlotte Bell** and colleagues from the University of Manchester for their project titled 'Infiltrate the tumour'.

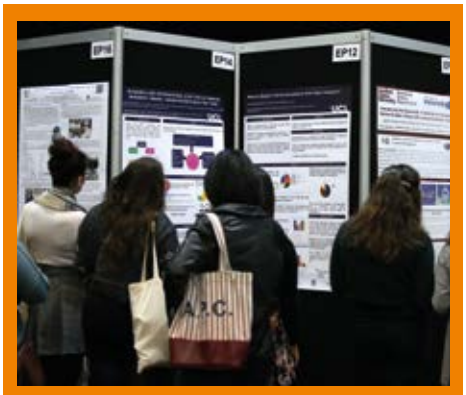
James Penney from The London School of Hygiene & Tropical Medicine has been awarded funding for his 'Madagascar Medical Expedition 2020' project.

The giant nose will be attending the Cambridge Science Festival 2020 through funding for Maryam Arasteh and colleagues at the **BSI Cambridge Immunology Group**.

George Finney and **Cecile Benezech** have been funded to run their 'Vaccines are for everyone' project at GENIE.

Héctor José Pérez Hernández from the Medical Sciences University of Santiago de Cuba has been funded to deliver his project titled 'Interactive communication in immunology'.

The next application deadline is 1 April 2020. For more details, visit **www.immunology.org/grants-and-prizes/communicating-immunology.**



BSI Congress poster prizes

Our congratulations to the following winners of the BSI Congress poster prizes.

Gesa Albers (Imperial College London), **Cameron Burnett** (University of Birmingham), **Scott Davies** (University of Birmingham), **Isaac Dean** (University of Birmingham), **Chloe Pyle** (Imperial College London) and **Kathryn Steel** (King's College London). **Shona Moore** (University of Liverpool) won a poster prize in our new category 'Education and public engagement'.

You can read the abstracts for all posters presented at BSI Congress 2019 on the Congress website.

Travel grant success

The following members were recently awarded BSI travel grants: **Nursabah Atli, Louise Bennett, Mariarca Bailo, Dominic Boardman, Susanne Dechantsreiter, Matthew Dickinson, Christopher Dowson, Stephanie Hanna, Katie Hudson, Sarah Inglesfield, Kieran James, Hanna Johnsson, Danai Koftori, Beth Lucas, Kathryn McCall, Jessica Powell, Daniel Puleston, Alex Spencer, Makris Spiros, Rachel Tanner, Danijela Tatovic, Eleanor Ward** and **Caroline Weight.** Congratulations to the 156 members who were awarded a travel grant to attend BSI Congress 2019!

The next application deadline is midday, 1 May 2020. More information at **www.immunology.org/grants-and-prizes/travel-awards.**

Skills Development Awards

The BSI is delighted to fund the following applications.

Annie Ingerslev (University of Southampton) received an award to support her placement with the pharmaceutical company H. Lundbeck A/S in Denmark. She will use an APP/PS1 transgenic mouse model with accelerated amyloid pathology for evaluation of mutated, amyloid-beta specific antibodies.

Cristina Bizzotto (University of Pavia) was given support through the award for a placement at Yale University in the US. Her project will investigate the role of TIM-3 in Macrophages. The next application deadline is 1 June 2020. For more details, visit **www.immunology.org/grants-and-prizes/skills-development-award.**

AMS Foulkes Foundation Medal

Congratulations to BSI member, **Muzlifah Haniffa** from Newcastle University and the Wellcome Sanger Institute, who won the Academy of Medical Sciences 2019 Foulkes Foundation Medal. This is awarded to a rising star within biomedical research for their significant contributions to the field.

We would love to hear from you about your achievements. Have you or a colleague recently received grant funding, passed your PhD viva or accepted a new appointment? If so, let us know by emailing **media@immunology.org** or tagging **@britsocimm** on Twitter.

FUTURE FOCUS

BiteSized Immunology

BiteSized Immunology is an online education resource from the British Society for Immunology (BSI) which is designed to form a comprehensive guide to the immune system, approaching the topic via punchy, easy-to-digest entries that outline major learning points.

The BiteSized audience

Our resource is aimed primarily at life sciences undergraduate students studying immunology content or for MSc students undertaking an immunology degree but it is also useful for advanced A-level students or anyone new to the subject wishing to learn about key topics.
We decided to develop this resource as a way of educating an ever-wider audience about immunology. This is especially important at undergraduate level as immunology is seldom a standalone BSc degree and the majority of students at this level study the subject as part of another degree, such as biomedical sciences, microbiology or biochemistry.

Digestible and accessible

Content ranges from the cells, organs and systems which form the basis of the immune system through to pathogens, disease and dysfunction and onto vaccines, therapeutics and experimental techniques. Each article is written by expert immunologists who work on that topic as part of their research and/or clinical practice. These are then further reviewed by other experts on the topic ensuring that the final article is fully accurate. All articles are reviewed regularly to ensure they are up-to-date with the latest thinking and knowledge. The articles contain succinctly written yet easy to understand prose along with graphical and photographic images that further explain the topic being covered. In addition, each article has a downloadable PDF version which is ideal for further offline study, use on mobile platforms or where Wi-Fi access is limited.

This online resource is also highly accessible and easy to use. You can search by keyword, and access/download the content in a variety of formats – as well as via graphical interface, or flexible menu system.
In addition to its ease-of-use, BiteSized Immunology is made further accessible by now being available in Spanish too! Working closely with our colleagues at the Spanish Society for Immunology (SEI), and in particular their community manager and translator Jesús Gil, the articles have all been expertly translated (including the graphics). To access these simply use the drop-down option on any BiteSized page and select 'Español'. You can return via the same method and choose English. The BSI again wishes to extend our thanks to Jesús and his colleagues at SEI for translating these articles so diligently and expertly.

Popular highlights

Thus far BiteSized Immunology has been a hugely success educational resource. Its popularity with both BSI members and non-members continues to grow from strength to strength. It is consistently the most popular content on the website with some of the top articles being NK cells, immune response to viruses, complement, ELISA, T cell activation and CD8+ T cells. If you are unfamiliar with the site, let's take a closer look at some of the most popular articles.

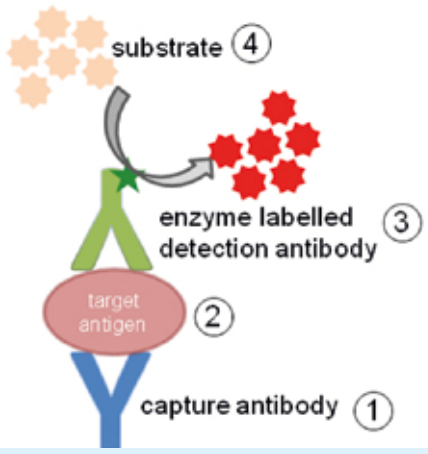
Find out more

You can explore BiteSized Immunology at: **www.immunology.org/bitesized-immunology.**

ELISA (ENZYME LINKED IMMUNOSORBENT ASSAY)

In this article you will learn about a key test used in immunology to antibodies, antigens, proteins and glycoproteins. The multi-step test identifies the concentration of antigens in the sample.

"The enzyme-linked immunosorbent assay (ELISA) is an immunological assay commonly used to measure antibodies, antigens, proteins and glycoproteins in biological samples. Some examples include: diagnosis of HIV infection, pregnancy tests, and measurement of cytokines or soluble receptors in cell supernatant or serum. ELISA assays are generally carried out in 96 well plates, allowing multiple samples to be measured in a single experiment. These plates need to be special absorbent plates (e.g. NUNC Immuno plates) to ensure the antibody or antigen sticks to the surface. Each



ELISA measures a specific antigen, and kits for a variety of antigens are widely available."

Authored by: Claire Horlock, Imperial College London, UK

Find out more: http://bit.ly/37yd7Qx.

COMPLEMENT SYSTEM

In this article you will learn about the critical role the complement system plays in killing bacteria. You will learn its role in attracting immune cells and the various pathways it uses, as well as its role in inflammation.

"Complement was discovered by Jules Bordet as a heat-labile component of normal plasma that causes the opsonisation and killing of bacteria. The complement system refers to a series of >20 proteins, circulating in the blood and tissue fluids. Most of the proteins are normally inactive, but in response to the recognition of molecular components of microorganisms they become sequentially activated in an enzyme cascade – the activation of one protein enzymatically cleaves and activates the next protein in the cascade."

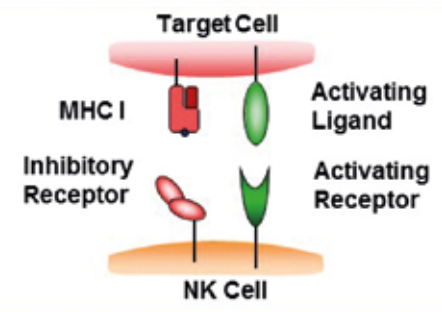
Authored by: Zaahira Gani, Cambridge, UK

Find out more: http://bit.ly/30Y6fJE.

NATURAL KILLER CELLS

In this article you will learn how these cells of the innate immune system are classified and how they develop. There is also a detailed explanation of how these cells function and how they target cancer cells or infected cells.

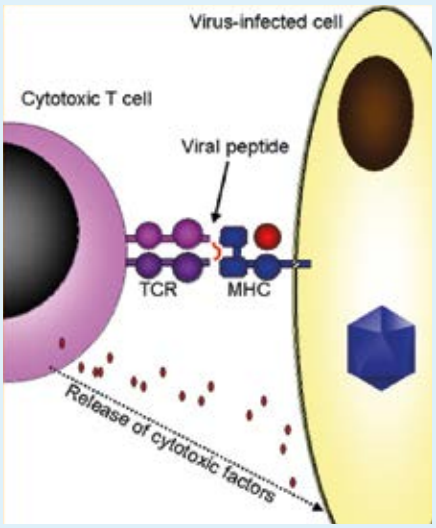
"Natural Killer (NK) Cells are lymphocytes in the same family as T and B cells, coming from a common progenitor. However, as cells of the innate immune system, NK cells are classified as group I Innate Lymphocytes (ILCs) and respond quickly to a wide variety of pathological challenges. NK cells are best known for killing virally infected cells and detecting and controlling early signs of cancer.



As well as protecting against disease, specialised NK cells are also found in the placenta and may play an important role in pregnancy."

Authored by: Philipp Eissmann, Imperial College, London, UK

Find out more: http://bit.ly/36t2cpR.



IMMUNE RESPONSES TO VIRUSES

This article informs the reader about what happens to a host when it is infected with a virus. It highlights the role of T cells and other related cells in fighting viral infections along with the role of antibodies.

'When a virus infects a person (host), it invades the cells of its host in order to survive and replicate. Once inside, the cells of the immune system cannot 'see' the virus and therefore do not know that the host cell is infected. To overcome this, cells employ a system that allows them to show other cells what is inside them – they use molecules called class I major histocompatibility complex proteins (or MHC class I, for short) to display pieces of protein from inside the cell upon the cell surface. If the cell is infected with a virus, these pieces of peptide will include fragments of proteins made by the virus."

Authored by: Kerry Laing, Fred Hutchinson Cancer Research Centre, Seattle, USA

Find out more: http://bit.ly/30Vi17O.

'The articles contain succinctly written yet easy to understand prose along with graphical and photographic images that further explain the topic being covered.'

Do you want to contribute?

BiteSized Immunology is an ever-evolving educational tool that has proved hugely popular on our website. As big and wide-ranging as this resource is, we're always keen to expand it ever further. This includes adding many more topics and articles to the list we already have. This can include anything from basic systems and cells to more translational topics such as therapies and experimental techniques. Specific topics that we are currently seeking include:

- Ebola
- Inflammation
- Immunity in the brain
- Animal research

If you think you would like to contribute to this exciting project or know someone who would please don't hesitate to contact me to talk further about your idea or proposal.

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

Vincenzo (Enzo) Cerundolo FRS

1964–2020

The BSI was saddened to learn about the recent death of our Member, Professor Vincenzo Cerundolo FRS. Enzo has been part of the BSI for three decades, greatly contributing to the field as an active member since 1990, being involved with the BSI Oxford Immunology Group and speaking at numerous events.


©Dr Paolo Polzella

Enzo was born in Italy, in Lecce, in the region known as the heel of the country. As many others, after completing the Liceo Scientifico De Giorgi in Lecce, he moved to northern Italy, to study medicine in Padova, where he also did his PhD in immunology and clinical training in medical oncology, under the supervision of Dino Collavo and Paola Zanovello. He then moved to the UK in 1988 with an EMBO fellowship to work with Professor Alain Townsend. His wife Lucia, and their daughter Giulia, followed in 1989.

With Alain, Enzo made seminal discoveries in the field of peptide antigen presentation and defined the role of TAP transporters. His training in oncology influenced his interest in tumour immunology and when he transitioned to independence, he applied his knowledge to the understanding of how tumour antigens are presented and the role of cross-presentation in anti-tumour responses. Having characterised TAP-dependent antigen presentation with Alain, with his first postdoctoral fellows and PhD students he then described families of patients with TAP deficiency and peculiar necrotising granulomatous skin lesions. This clinical syndrome also sparked his interest in unconventional T cell biology, where after successfully refolding CD1d molecules and generating lipid antigen loaded tetramers, his lab made several contributions towards the characterisation of molecular mechanisms of lipid antigen presentation.

They then identified iNKT cell agonists with different stimulatory capacity, and with Prof Yvonne Jones determined the crystal structure of the dominant iNKT cell antigen, α-GalCer, bound to human CD1d. Serendipitously, the crystal contained units of unloaded CD1d molecules and Enzo put forward an interesting hypothesis for the existence of chaperone lipids assisting in the folding of CD1 molecules, later verified experimentally. He was so thrilled to see the crystal images, on his return from the CD1 symposium in September 2004, in Heron Island, Australia.

Enzo's lab rapidly grew in the WIMM (Weatherall Institute of Molecular Medicine), from a few members in the top corner of the institute, to larger labs strategically positioned between CRUK facilities (he was funded by CRUK for over 20 years, moving from small projects to ambitious programme grants) and the MRC Human Immunology Unit. In addition, he had satellite labs in the main John Radcliffe Hospital in Oxford, including a GMP (Good Manufacturing Practices) suite for immune-monitoring of clinical trials. All these activities, and more, came together when he was appointed Director of the MRC Oxford University Human Immunology Unit in 2010, a position he held until his death.

Enzo's family also grew, with the birth of his son Marco, in 2001. Enzo was very close to both his family in Oxford and his roots in Puglia, where he spent the summer holidays most years, together with visits to the Dolomites with his close friends from Padova, Fabio and Marina. He always returned tanned and recharged, full of ideas for new experiments and collaborations.

Enzo's infectious enthusiasm for science and his intellectual breadth drove interesting collaborations, which led him to explore a variety of immunological questions, including autoimmunity in Addison's patients. Whenever possible, Enzo was keen to link basic research findings with clinical observations, to ultimately improve patients' therapies. Indeed, he contributed as a founding member to the set-up of iOX Therapeutics, a spin off company stemming from his studies on α-GalCer analogues, with the aim of using different formulations of iNKT cell agonists to enhance antigen-specific immune responses in cancer patients. He characterised the famous NY-ESO-1 specific, HLA-A2 restricted TCR, 1G4, which has now been genetically engineered elsewhere and is used in adoptive T cell therapy. As a consequence


©Prof Stephan Gadola

> 'Enzo's infectious enthusiasm for science and his intellectual breadth drove interesting collaborations, which led him to explore a variety of immunological questions, including autoimmunity in Addison's patients.'

of his broad interests, he designed studies on the tumour microenvironment, in an attempt to understand why tumour cells manage to survive a metabolic altered milieu, but this impairs T cell recognition.

Enzo's enthusiasm for research was transferred to the many students, postdocs and research assistants he mentored over his long career. Whenever possible, he tried to have weekly meetings with each of his junior members to discuss the direction of travel. He had great intuition and always suggested the right avenue forward. Once director of the Human Immunology Unit (HIU), he had an excellent understanding of the strengths of human immunology and through facilitating collaborations promoted a dynamic, stimulating work environment, which attracted basic scientists as well as several clinician scientists. He continued the tradition of annual meetings to share scientific results within the Unit groups and took great pride in showcasing the Unit's achievements to the Advisory board. HIU days were always a success, leading to new collaborations, new ideas. Under his leadership the Unit went from strength to strength.

Enzo's smile, sense of humour and extensive knowledge facilitated his interactions with several members of the WIMM, not least Sir Peter Radcliffe, who at the time of Enzo's transition to independence, was performing the experiments for which he was awarded the Nobel Prize last year. They even shared a lab at some point. Enzo also collaborated with the wider Oxford immunology community, and several UK labs. He was internationally recognised in the cancer immunology field, through his affiliation with the Ludwig Institute, in the antigen presentation field and in the CD1 field. As a testimony for his many scientific contributions, he received several recognitions, including Fellowships of the Academy of Medical Sciences, the Royal College of Pathology, and of the Israel Academy of Medical Sciences. In 2018 he was elected a Fellow of the Royal Society. He was also a Fellow of Merton College in Oxford. He co-organised a Keystone Meeting on myeloid cells and two international CD1/MR1 conferences.

In one of the saddest ironies of life, Enzo was diagnosed in 2017 with lung cancer and without any doubts he applied his scientific rigour to his treatment. A grim tumour for a non-smoker, as it does not carry as many mutations to awaken the immune system, Enzo was nevertheless willing to try every experimental treatment available, to harness the immune system he had studied in so much detail. With the guidance of international colleagues expert in the field, he went through rounds of chemotherapy, checkpoint inhibitors, vaccines and radiotherapy.

Throughout this battle, his strength and his positive energy were remarkable, "business as usual", he would say. Lab meetings were held over Skype and long emails were used when he needed to stay away from crowds at the nadir of his haematological values. Enzo was always scientifically present, even more, as he delegated some of the administrative work. Every success was an occasion to celebrate – papers, graduations of DPhil students, the well-deserved election as Fellow of the Royal Society in the Spring of 2018 and recently, the CD1/MR1 symposium, held in Oxford in September 2019.

His sudden departure at the beginning of the year, a few weeks after his 60th birthday, took us all by surprise. We fondly remember the last HIU day in mid-December 2019 and the plans for the next grants and the next MRC quinquennial review. Enzo leaves a gaping hole in all our lives and his friendly, encouraging smile is sorely missed, but we are carrying on his scientific legacy, as he would have liked us to do.

Mariolina Salio
Clinical Research Fellow
MRC Human Immunology Unit
University of Oxford

Leslie Baruch Brent

1925–2019

The BSI is saddened to learn about the recent death of our Honorary Member, Professor Leslie Baruch Brent. Leslie had been a member of the British Society for Immunology for over 60 years, making significant contributions to the field over decades.

Leslie (Lothar) Baruch Brent MBE {5 July 1925 (Köslin) – 21 December 2019 (London)} was co-author of 'probably the most important paper in the history of transplantation' published in *Nature* in 1953. Later the extended 1956 report, published in the *Philosophical Transactions of the Royal Society*, was regarded as one of the 17 most influential papers that had appeared during the journal's 350-year history.

Brent's key experiment, performed while a PhD student in the Department of Zoology at University College London (UCL), used white and brown inbred mice. Cells from one inbred (donor) strain were injected directly into immunologically immature late foetuses of a different (recipient) strain. Later skin grafts from mice of different strains were performed. Many grafts were accepted, but only if they were from the donor strain; grafts from mice of other strains were rejected. The resulting images were dramatic: white mice had patches of brown fur and brown mice had patches of white fur.

The story of this famous Billingham–Brent–Medawar work is renowned. How the charismatic polymath leader Medawar, together with his postdoctoral fellow Billingham (who had already begun his own distinguished independent immunological career) and a young Kindertransport refugee, created between them a remarkable intellectual environment in Zoology at UCL. They were termed the 'Holy Trinity', with Brent presumably the Son. They established a set of key facts which challenged and changed the way we recognise ourselves – and others. Medawar's public recognition of his team immediately after the 1960 Nobel announcement, and much later the reflections that arose after release of the Nobel Committee's related letters, highlighted this common effort. Notably the author order in the two main publications is alphabetical, but his colleagues arranged that Brent would give the first oral presentation. The UCL team acknowledged the contribution made previously by Ray Owen that fraternal calf twins show chimerism, which he postulated was caused by prenatal exposure to red cell precursors. They recognised and brought to the fore the concept of 'tolerance' and deduced that loss of tolerance could explain what was later termed autoimmunity.

Brent's subsequent career took him to Southampton, as Professor of Zoology, and then to St Mary's Hospital Medical School in Paddington, where he was Professor of Immunology for 21 years. He showed that tolerance can be induced in adults, studied graft versus host disease, and explored the immunoregulatory role of T lymphocytes. The concept that we can 'tolerise' using powerful immunosuppressive tools was an indirect product of his work. He developed a clinical service and led a Master's programme in clinical immunology. He

Leslie Brent at the 60th anniversary celebrations of the British Society for Immunology in 2016.

fostered research by his colleague Tony Pinching on HIV and AIDS. He championed the role of women in the medical school, despite the fact that St Mary's was known for rugby as well as science. He was the first General Secretary of the British Transplantation Society, with Medawar as President. His *History of Transplantation* provides unique in-depth critical insight into the scientific background of the 1953 publication. It also acts as a personal memoir and shows eloquently his underlying honesty and fair play.

Under normal circumstances this could suffice as a fitting tribute to one of the UK's leading immunologists. However, there is another narrative, which is reflected in a different book, *Sunday's Child? A Memoir*. This narrative is about an 11-year-old, forced to leave homes and school, living in an orphanage in Berlin. His combination of intellect and leadership must have played a role in the decision that he would cope with being one of the first Kindertransport children. He was placed first in Dovercourt. Later, at the progressive school, Bunce Court, he was inspired by the headmistress, Anna Essinger, not only academically but also by the help he (and others) received in learning how to form loving and caring relationships. His rapid mastery of English led to his becoming the public face of his peers, interviewed to promote their image and hence recruit more foster families. At 16 the charity sponsoring him ran out of money, and he started work as a chemistry laboratory assistant in Birmingham. He volunteered for the Royal Warwickshire Regiment and ended up in the British Army of the Rhine. On his return to the UK he studied Zoology, and his Professor, Peter Medawar, invited him to continue as a PhD student.

Meantime letters from his parents, Arthur and Charlotte, and his sister Eva, had ceased in 1942, and on a post-war visit to Berlin he was unable to trace them, apart from the fact that they had been 'sent east'. Later he learned that in 1942 they had been transported to Riga in packed cattle trucks, taken into the woods and shot. He had 'Stolpersteine' – small brass plaques – set in the pavement outside their former Berlin home to commemorate them. He was active in the Association of Jewish Refugees, and a recent personal chance re-encounter with him in that context highlighted both his kindness and his meticulous intellect. In November 2018 he delivered his testimony and spoke from the pulpit at Westminster Abbey at a service to mark the 80th anniversary of Kristallnacht.

Today, meta-analysis, systems biology and biostatistics are seen as complementary to, if not replacements for, the imagination of open-minded, creative scientists and clinicians. However, as Elizabeth Simpson wrote in her review of the Medawar group, the latter often receive the clues that provide the vital insight(s) about novel approaches: Billingham, Brent and Medawar, and their closely associated colleagues, attest to this – they had a 'hands-on' approach, and were ever open to the challenge of the next experiment.

Although Brent was a secular Jew, he was aware that 'baruch' means blessed. Perhaps it is not too far off the mark to say that humanity has been blessed by his life's work, and by his generosity of spirit; that his family were blessed by his insight and affection; and that he set a blessed example in turning away from unspeakable intolerance and personal loss, focusing instead upon the study of tolerance.

David R Katz
Emeritus Professor of Immunopathology
Division of Infection and Immunity
University College London

'He showed that tolerance can be induced in adults, studied graft versus host disease, and explored the immunoregulatory role of T lymphocytes. The concept that we can 'tolerise' using powerful immunosuppressive tools was an indirect product of his work.'

Immune Update

The BSI journals

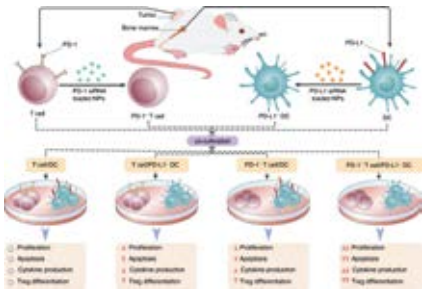
A round-up of new research published in the British Society for Immunology's official journals *Immunology* and *Clinical & Experimental Immunology*. Members can access these journals free of charge at **www.immunology.org/journals**.

Immunology

Blocking immune checkpoint molecules boosts dendritic cell vaccine efficacy

Dendritic cell (DC) vaccines are extensively used for the immunotherapy of several cancer types, but have variable efficacies, potentially due to the tumour microenvironment. Hassannia *et al.* silenced the expression of the immune-inhibitory checkpoint molecules programmed death (PD) ligand 1 (PD-L1) in DCs and PD protein 1 (PD-1) in T cells to evaluate the DC phenotypic and functional characteristics and T cell functions following tumour antigen recognition on DCs, *ex vivo*.

Blockage of these checkpoint molecules and/or their ligands could restore the anti-tumour effects of T cells in the tumour microenvironment. The results showed that synthesised nanoparticles (NPs) were associated with efficient cellular uptake and target gene silencing. Moreover, PD-L1 silencing was associated with stimulatory characteristics of DCs. These findings suggest the high potency of cancer immunotherapy by PD-L1-silenced DC vaccines in combination with PD-1 siRNA-loaded NPs.



Hassannia *et al.* 2020 *Immunology* **159** 75–87 **https://bit.ly/37f1YnF**

Sirtuin4 inhibits anti-neuroinflammatory role of infiltrating Tregs in spinal cord injury

Neuroinflammation following traumatic spinal cord injury (SCI) is a critical process that impacts both the injury and the recovery of spinal cord parenchyma. Infiltrating Treg cells are potent anti-inflammatory cells that restrain post-SCI neuroinflammation. Lin *et al.* used a mouse spinal cord compression injury model to analyse the role of Sirtuins (SIRTs) in the modulation of infiltrating Treg cell functions. Among their findings, they discovered that the expressions of SIRT4 and SIRT6 were upregulated in infiltrating Treg cells. Using lentivirus-mediated gene expression or RNA interference, they found that SIRT4 substantially inhibited the expression of Foxp3, interleukin-10 and TGF-β in Treg cells, whereas SIRT6 had little effect on Treg cells. This research unveils a new mechanism by which the post-SCI neuroinflammation is regulated.

Lin *et al.* 2019 *Immunology* **158** 362–374 **https://bit.ly/38q3LWZ**

Clinical & Experimental Immunology

Human labour is associated with maternal immune activation

During human pregnancy, regulatory T cell (Treg) function is enhanced and immune activation is repressed to prevent immune-mediated rejection of the fetus while still protecting the mother and baby from invading pathogens. Shah *et al.* investigated whether labour is associated with a reversal in these changes to the immune system. They found that Treg function declines with the onset of labour and these changes are associated with an increased activation of myometrial cells and cord blood mononuclear cells. The innate immune system showed increased activation, with altered monocyte and neutrophil cell phenotypes, possibly preparing to respond to microbial invasion after birth or to contribute to tissue remodelling.

These results highlight changes in the function of the adaptive and innate immune systems that may have important roles in the onset of human labour or contribute to an increased risk of excessive inflammatory responses.

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Shah *et al.* 2020 *Clinical & Experimental Immunology* **199** 182–200 **https://doi.org/10.1111/cei.13384**

Evidence for a role of autoinflammation in early-phase psoriasis

Psoriasis is a common, inflammatory immune-mediated skin disease mainly presenting with papules or pustular lesions. The pathogenesis is based on the central role of the interleukin (IL)-23/IL-17 axis; however, the mechanisms of early-phase psoriasis are not fully understood. Fanoni *et al.* investigated the role of autoinflammation by investigating expression of IL-1 and other cytokines in 10 psoriasis patients. IL-1 is the main driver in autoinflammation, generally caused by mutation of the genes regulating the innate immune response.

They found IL-1β was significantly over-expressed in psoriasis patients and was colocalised mainly with CD66b, suggesting neutrophils were the major source of this cytokine. IL-1β over-expression in combination with low expression of other cytokines involved in late-phase psoriasis supports the role of autoinflammation in early-phase disease, possibly paving the way to randomised trials with IL-1 antagonists.

Fanoni *et al.* 2019 *Clinical & Experimental Immunology* **198** 283–291 **https://bit.ly/2tCwERb**

Around the journals

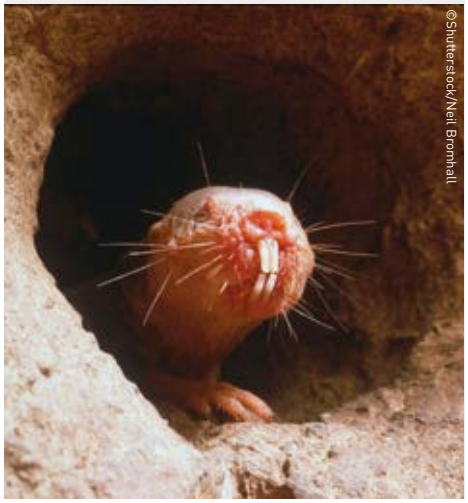
A summary of some of the latest papers from the world of immunology.

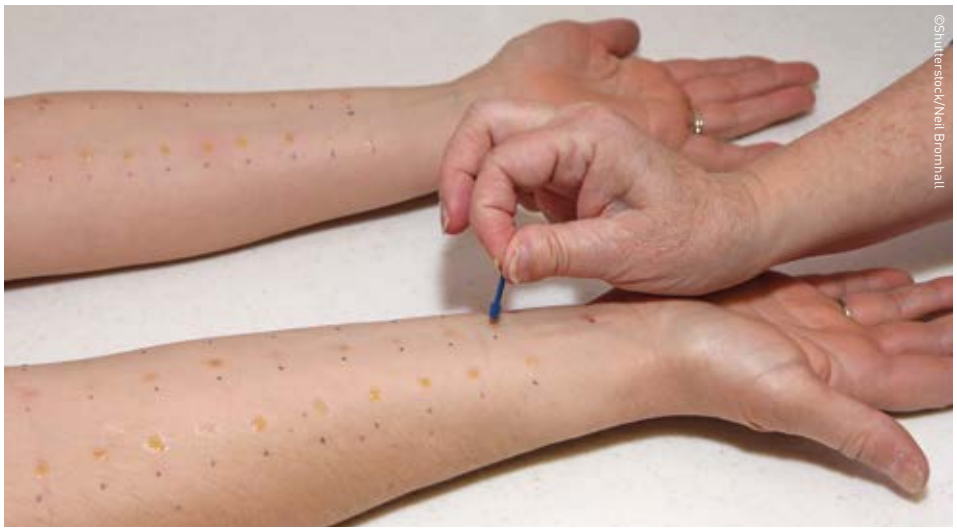
Written by Edd James, Louisa James, Donald Palmer and Mihil Patel.

Mapping of the naked mole-rat immune system reveals surprising features

The naked mole-rat (NM-R) is a burrowing rodent, which has a distinctive physiology including an extraordinary life span for its body size, resistance to physiological or molecular changes as it ages and cancer. Here, Hilton *et al.* use single-cell RNA sequencing to map the immune system of NM-Rs. In contrast to mice, which like humans are prone to cancer, the NM-R immune system consists mainly of myeloid cells with reduced numbers of lymphoid cells. Remarkably, NM-Rs lack canonical NK cells, do not express gene families that control NK cell function such as Ly49 and possess only three MHC class I genes compared to 22 protein-coding genes in mice. This selection of innate myeloid lineage cells is suggestive of a bias towards immunosurveillance of bacterial rather than viral pathogens and may contribute to its longevity.

Hilton *et al.* 2019 *Plos Biology* **17** e3000528 doi:10.1371/journal.pbio.3000528





Oily skin allergens hole up inside CD1a

CD1a presents non peptide molecules, such as lipids and drugs to CD1a-restricted T-cells. Balsam of Peru, a common contact allergen seen in medical practice, was found to activate a CD1a restricted clone. Using positive-mode nanoelectrospray ionisation MS, benzyl cinnamate and benzyl benzoate were identified as the compounds present in balsam of Peru presented by CD1a and responsible for T-cell activation. Screening of structurally related compounds revealed additional stimulants of CD1a-restricted T cells, including farnesol and coenzyme Q2. Farnesol itself was found to be buried deep within the CD1a cleft, where it displaces self-peptides. These studies put forward a connection between CD1a detecting T-cells and allergic reaction to common cosmetics.

Nicolai *et al.* 2020 *Science Immunology* **5** eaax5430 doi: 10.1126/sciimmunol.aax5430

Measles infection prunes back B cell memory

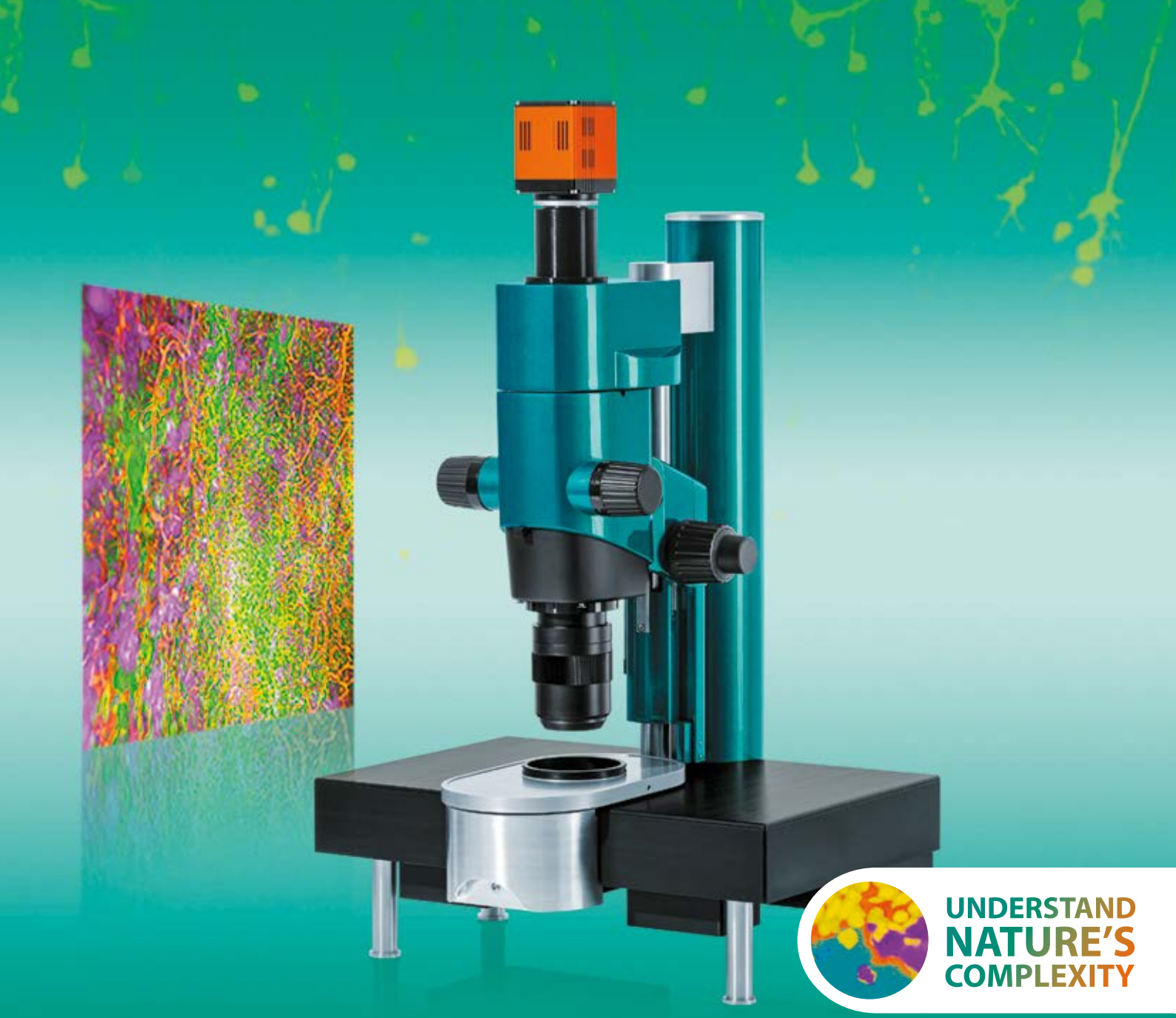
Despite the availability of a highly effective vaccine, measles remains a leading cause of mortality in children, largely due to public misinformation campaigns resulting in a significant reduction in vaccine uptake over recent decades. Measles infection is known to cause a prolonged period of generalised immunosuppression associated with secondary infections that further contribute to measles morbidity. To examine this further Petrova *et al.* sequenced the antibody genes of different B cell subsets isolated from unvaccinated children before and after measles infection. This revealed a skewing of the naïve B cell compartment, marked by a reduction in clonal diversity. In addition, the abundance of memory B cell clones was reduced following measles infection, corresponding to a loss of pre-existing immunity as measles-specific B cell clones expand. The combined effects of infection on the B cell repertoire confirm that measles causes a so called 'immune amnesia' and emphasises the importance of measles vaccination for preserving immune memory.

Petrova *et al.* 2019 *Science Immunology* **4** eaay6125 doi: 10.1126/sciimmunol.aay6125

Co-inhibitory role for FcγRIIB in regulating CD8⁺ T cell immunity

Immunoglobulin fragment crystallisable receptors (FcR) are expressed on a variety of immune cells and elicit both inhibitory and activation activity. However, it is believed that FcR are not expressed on T cells. In this study Morris *et al.* show that the inhibitory Fc receptor FcγRIIB is expressed on a subset of effector/effector-memory CD8⁺ T cells. Present in human and mice, they show, in transplantation studies, that *Fcgr2b-deficient* CD8⁺ T cells exhibit accelerated graft rejection in comparison to WT controls. Transcriptionally, these cells are distinct from FcγRIIB– CD8⁺ T cells and are potent cytokine producers. This intrinsic role of FcγRIIB inhibitory activity involves the induction of apoptosis and the activation of caspase-3/7. Moreover, the authors show that the inhibitory activity of this receptor can be induced with the immunosuppressive cytokine Fgl2. These observations highlight the potential for using FcγRIIB in immune modulation.

Morris *et al.* 2020 *Immunity* **52** 136–150. e6 doi: 10.1016/j.immuni.2019.12.006



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