



MICROBIOLOGY
SOCIETY

**Safeguarding the future
of the microbiology research
and innovation workforce**

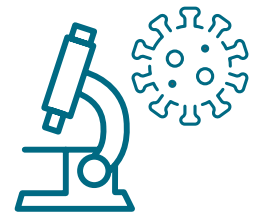


Executive Summary

Being at the forefront of the COVID-19 pandemic response has led to unprecedented challenges for the microbiology research and innovation workforce, with many early career researchers (ECRs) disproportionately affected. In order to protect the future of this workforce and enable it to tackle immediate and long-term societal challenges, the Microbiology Society calls for employers, funders and governments to prioritise and better support early career microbiologists (ECMs).

We recommend that employers, funders and governments should take the following actions:

Mitigate the impact of COVID-19 on ECMs' careers



Continue to enable flexible working patterns in laboratories

Universities and research organisations should develop and implement tailored policies, allowing flexibility over working hours and access to laboratories.

Facilitate greater networking and collaboration opportunities

Universities, research organisations and conference organisers must keep up with the changing landscape and design new types of hybrid events to enable relationship-building.

Adjust research output requirements and expectations of ECMs

Employers and funders can play a role in adjusting research output requirements, particularly when reviewing researchers' curricula vitae (CV). Implementation of the principles in the 'Concordat to Support the Career Development of Researchers' and the inclusion of a personal statement section in grant, fellowship and job applications provides a starting point for ensuring better equality.

Re-assess funding allocation

Employers and funders should put ECMs at the heart of their recovery plans and re-assess how the available funding is allocated in order to mitigate against further financial hardship caused by the pandemic. Funding should encompass the breadth of microbiological research and not be limited to one area of microbiology, as neglecting others will lead to dramatic consequences on nature, health and societies.

Support ECMs' wellbeing and mental health



Create safe spaces for open and honest discussions

University departments and group leaders should create safe spaces, such as peer-to-peer support groups or mentoring schemes, that foster open and honest discussions.

Embed mental health support and training within universities and research organisations

Universities and research organisations should ensure that mental health support and training are meaningful and accessible for all students and staff.

Prioritise communication and transparency around funding, policies and procedures

Funders must prioritise communication and transparency around funding, policies and procedures to help alleviate some of the uncertainty and frustration that ECMs have been experiencing.

Develop and embed a new research culture that values ECMs and other researchers



Recognise and reward non-traditional skills and activities

Metrics of success should include novel ways of assessing researchers, valuing their potential and impact outside of research productivity and include leadership, knowledge exchange and science communication skills.

Design and implement policies on equal opportunities, diversity and inclusion that lead to positive change

Implementing policies to improve diversity in grant panels and ensuring that the criteria for allocating resources are fair could enable more researchers to build their contributions and help mitigate the disproportionate impact of the pandemic on marginalised groups.

Give a voice to ECMs at the heart of the decision-making process

Being at the heart of decision-making enables ECMs to gain practical experience and develop the transferable skills necessary in upholding the talent pipeline. Decision-making agencies, funding bodies and universities should enable ECRs to interact and advise stakeholders on research policy and funding decisions.

Introduction

Since the emergence of SARS-CoV-2, the cause of COVID-19, scientists across the world have rallied together to contribute to the efforts to combat the impact of the virus [1]. Microbiologists, including ECRs have been at the heart of this collaboration, driving testing efforts, vaccine development and unveiling SARS-CoV-2's evolution and its associated disease mechanisms. During the COVID-19 pandemic, many microbiologists became spokespeople for the field of microbiology and took on new roles as science ambassadors [2].

In the spring of 2021, the Microbiology Society invited members of its Early Career Microbiologists' (ECM) Forum [3] and other ECRs to participate in a survey, completed by 205 respondents¹ and organised a follow-up series of focus groups to discuss the impact of the pandemic on ECMs. These engagement activities have shown that while some ECMs have been involved in the COVID-19 response, others have faced multiple challenges including closed laboratories, travel bans, suspended professional development opportunities and funding uncertainties. ECMs on the path to establishing research independence have been unable to produce the research outputs currently essential in demonstrating a track record of success. The impact of the pandemic on this cohort of researchers will be felt over time, with challenges encountered during the height of the pandemic having significant and long-lasting consequences on (ECMs) career progression.

Crucially, our engagement activities have revealed that the pandemic has acted as a magnifying glass on issues that have been present in academia for years, such as gender inequality, ableism for people with disabilities and a sense of isolation and loneliness at work [4,5,6]. In that way, the pandemic has dramatically highlighted the need for a systemic and fundamental change in the way ECMs are being valued and supported in pursuing successful research careers. At a time when the importance of microbiology has never been more prominent, ECMs appear to be facing an uncertain future and some are considering leaving academia. We recognise that many universities and funders have continued to support researchers during these times, while facing their own set of challenges and uncertainties. However, we call attention to the fact that, without further action, we risk losing an entire generation of researchers that are able to rise to global challenges [7].

1. The largest proportion (42%) of respondents were PhD students or postgraduate students, followed by postdoctoral researchers (37%) and the remainder was comprised of researchers, lecturers/research group leaders and clinical scientists (21%). Most respondents (81%) reported that before the pandemic they primarily worked in a wet laboratory.



Recommendations

Following our engagement with ECMs, we recommend that employers, funders and governments should take the following actions:

Mitigate the impact of COVID-19 on ECMs' careers



Continue to enable flexible working patterns in laboratories

At the time of the survey, 96% of ECMs (n=196)² reported that the pandemic had affected their research activities. Out of those, 74% (n=146) mentioned having issues collecting data. Research productivity was also impacted by ECMs' personal circumstances, including increased caring responsibilities and declining mental health. Respondents described that even once lockdown restrictions lifted, disruption when conducting research continued. Blanket policies implemented by universities and research facilities to follow social distancing guidelines precluded the running of microbiological experiments as normal.

The impact of the pandemic on productivity will subsequently lead to reduced traditional research outputs such as publications in peer-reviewed journals. Because these outputs are currently considered key metrics of success [8], the pandemic will compromise (ECMs') career progression in the long-term. Therefore, this cohort of researchers urgently need solutions to make up for lost time and opportunities. To begin addressing this, we recommend that universities and research organisations develop and implement tailored policies allowing flexibility over working hours and access to laboratories, while safeguarding their staff and students from out of hours, work-related incidents.

Facilitate greater networking and collaboration opportunities

For 87% of ECMs asked (n=173)³, the pandemic has also made opportunities for networking and collaboration scarce. The loss of in-person conferences and meetings and the inability to travel has led to ECMs being unable to build connections with their peers and showcase their research to the broader scientific community.

Networking and collaboration are particularly important for ECMs. Hiring, promotion and funding decisions often require evidence of relationship-building. Work opportunities can be found at networking events and conferences, and the inability to attend these as normal has been a significant barrier to job hunting. For ECMs to foster work connections, universities and research organisations must urgently facilitate networking and collaboration opportunities. Senior colleagues and conference organisers need to keep up with the changing landscape and design new types of hybrid events to enable relationship-building. For example, one respondent highlighted the University of Southampton Biological Sciences Postgraduate Society's career event, in which speakers from academia, industry, management and medical writing backgrounds gave presentations online followed by an in-person meet-and-greet [9].

Adjust research output requirements and expectations of ECMs

Our engagement activities have uncovered many of the disruptions faced by ECMs in conducting their research and the negative impact these have had on traditional research outputs. If held to pre-pandemic standards, ECMs fear being unable to prove a track record of academic success. Focus group discussions have also revealed that researchers have felt an increased expectation to be productive post-lockdown,

2. A total of 204 out of 205 ECMs surveyed responded to this question.

3. A total of 199 out of 205 ECMs surveyed responded to this question.

despite continued barriers to conducting research. To best support ECMs moving forward, employers and funders should consider adjusting their requirements when reviewing the job and grant applications of those affected by the pandemic. Implementation of the principles in the 'Concordat to Support the Career Development of Researchers', particularly the recommendation that institutions must use "fair and inclusive selection and appointment practices", provides a starting point for ensuring equality moving forward [10].

Discussions have revealed a perceived lack of compassion and understanding from funders and employers regarding the impact of the pandemic on (ECMs) research productivity, fuelling a feeling of uncertainty about their academic future and a desire to leave research all together. We recognise that funders and employers are also facing challenging times, but to maintain the current and future talent pipeline, we ask that they embrace an open mindset when considering researchers' CV. Practical steps could include expanding the eligibility criteria and adding a personal statement section in grant, fellowship and job applications where candidates can detail how they have been impacted by the pandemic. However, empathy and sensitivity are crucial when designing impact statements that some may perceive as intrusive, particularly when having to disclose personal circumstances. Such statements may help to normalise being open and transparent about personal struggles and should therefore be implemented on a long-term basis, to reflect the long-term impact of the pandemic on career progression.

We welcome the Medical Research Council's updated guidance for applicants, which encourages them to describe how they have been affected by COVID-19, and updated guidance for peer reviewers, which reminds them to provide a balanced assessment in the context of individual circumstances described by applicants [11]. Although this information is publicly available, it should be made more visible to all those concerned.

Re-assess funding allocation

While ECMs have been facing job insecurity, short-term contracts and financial precarity for decades [12], funders and employers must endeavour to mitigate against further financial hardship caused by the pandemic. Out of the ECMs surveyed, 70% (n=121)⁴ reported that they have not had their funding extended and that they are now urged to conduct experiments before their funding runs out. While some non-funded extensions have been granted, these are often perceived as unfair – instead of supporting ECMs' careers, they help to maintain a culture in which researchers are not compensated for their contributions. Even though some ECMs may have benefited from the fast-tracking of their line of work due to their research shifting to SARS-CoV-2, others fear being left behind because their work is not virus- or health-related [13]. Microbiologists are involved in addressing challenges that vary from urgent problems demanding immediate solutions, such as the COVID-19 response, through to long-term issues such as antimicrobial resistance, food security and environmental sustainability [14]. We recommend that future funding decisions continue to encompass the breadth of microbiological research and not be limited to one area of microbiology, as neglecting others will lead to dramatic consequences on nature, health and societies.

Although we recognise the difficulties of the current economic situation, we call for funders and employers to put ECMs at the heart of their recovery plans. While public funding may be limited in the next few years, there is now an opportunity to re-assess how the available funding is allocated. Opportunities for change include increasing small pots of money for preliminary data to support ECMs' ideas and allow them to develop a track record of independence, enabling longer contracts for post-doctoral researchers and ensuring all extensions and positions are fully funded. For example, the University of Glasgow, supported by the Wellcome Institutional Strategic Support Fund, has provided ECRs with the opportunity to apply for up to £30,000 for their own projects, assisting them in gaining research independence [15].

4. A total of 174 out of 205 ECMs surveyed responded to this question.

Recommendations

Support ECMs wellbeing and mental health

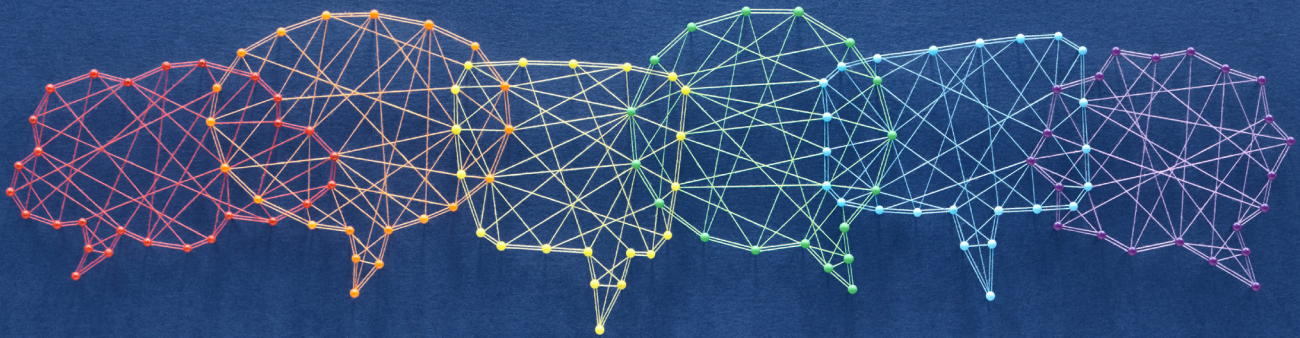
Create safe spaces for open and honest discussions



Our focus groups have revealed that ECMs' sense of isolation and loneliness at work has been exacerbated during the pandemic. The lack of in-person interactions have led to ECMs feeling disconnected from their peers, colleagues and group leaders. Over the last year, universities and funders have showcased stories of researchers who have benefited from new opportunities whether this is due to the ability to write and publish more research, or to participate in the SARS-CoV-2 research effort. This has painted an unrealistic picture of ECMs' experiences and has taken a toll on their mental health, as those who have faced challenges in progressing their careers did not feel acknowledged.

To alleviate the ongoing impact of the pandemic on ECMs wellbeing and mental health, we call for university departments and group leaders to create safe spaces that foster open and honest discussions. These could take the form of peer-to-peer support groups, where ECMs of a similar career-level would feel comfortable sharing issues and experiences, or mentoring schemes whereby ECMs could access mentors to support their career progression and personal development. For example, Queen Mary University of London received funding in 2018 to run a two-year project that included weekly support groups for PhD students, which showed that having access to these groups improves wellbeing significantly [16].





Embed mental health support and training within universities and research organisations

Out of the ECMs surveyed, 60.5% (115)⁵ reported that their mental health and wellbeing had not been supported throughout the pandemic. Poor mental health has been well documented in the ECR community [17] but these issues have been amplified by the pandemic, leading to an inability to focus and negatively impacting research outputs.

Universities and research organisations should ensure that mental health support and training are meaningful and accessible for all students and staff. Group leaders and senior academics are currently ill-equipped to deal with mental health issues and could benefit from training to support their pastoral roles. Wider mental health training could help microbiologists and indeed all researchers recognise mental health issues within research groups and provide support to those in need. In addition, promoting healthy working hours could help to avoid staff and student burnout.

Prioritise communication and transparency around funding, policies and procedures

Throughout our engagement activities, ECMs have highlighted issues around communication and transparency from funders and employers during the pandemic. The lack of information regarding funding, policies and procedures introduced a great deal of uncertainty, which considerably impacted on researchers' mental health and wellbeing. For example, discussions in our focus groups indicated that the process to apply for extensions was unclear, inconsistent and slow, with many applications being rejected without clear explanations. The current grant review process also appeared to be opaque to focus group attendees, who felt they provided little opportunity for feedback.

Prioritising communication and transparency around funding, policies, and procedures could help alleviate some of the uncertainty and frustration that ECMs have been dealing with. We welcome the UK Research and Innovation (UKRI) statement recognising that they need to “be more transparent about what we are doing before, during and after key decisions” [18] and encourage other organisations to focus on timely communication and transparency moving forward.

5. A total of 190 out of 205 ECMs surveyed responded to this question.

Recommendations

Develop and embed a new research culture that values ECMs and other researchers

Recognise and reward non-traditional skills and activities



Incentives present in the academic research culture and environment can create challenges and unintended consequences for ECRs' career prospects and wellbeing [19]. Our engagement with ECMs has highlighted that research culture issues have been heightened during the pandemic, revealing a systemic lack of empathy, transparency, flexibility and security, and restricting who can advance within this competitive ecosystem. To enable ECMs to work in a more supportive environment, metrics of success should include novel ways of assessing researchers, which value their potential and impact outside of research productivity and include leadership, knowledge exchange and science communication skills. In addition, career options should expand beyond career-tracks limited to teaching or becoming an independent Principal Investigator. For example, creating more permanent positions could enable post-doctoral researchers to have greater job security, while maintaining talent and expertise within a research group [20].

We support the government's new 'R&D People and Culture Strategy', particularly the drive to adopt the Royal Society's 'Résumé for Researchers' narrative CV [21,22]. This standardised CV template broadens the range of recognised experiences and accomplishments, by highlighting how an individual has contributed to knowledge generation, the development of individuals and the wider research community. However, we call for the government and funders to implement and evaluate the strategy as a priority, as a radical shift in how ECMs are assessed is urgently needed.

Design and implement policies on equal opportunities, diversity and inclusion that lead to positive change

Throughout our engagement activities, ECMs have reported that there seems to be an underlying assumption that they are young, able and willing to dedicate their life to their research, and that they can easily adapt to the new 'normal' created by the pandemic. However, this is not the reality for many individuals. Systemic disadvantages of marginalised groups and of those facing additional challenges (e.g., disabled or chronically ill researchers, parents and carers, people who have experienced bereavement, those who fell ill with COVID-19 or acquired long COVID) has been amplified by the pandemic. These challenges often intersect, compounding the effects on individuals operating within an often rigid system [23].

Funders and employers must continue to address existing biases and develop and implement policies on equal opportunities, diversity and inclusion that lead to positive change. Policies to improve diversity in grant panels and to ensure that the criteria for allocating resources are fair could enable more researchers to build their contributions and help to mitigate the disproportionate impact of the pandemic on marginalised groups. For example, to tackle gender disparity, the University of York's chemistry department introduced unconscious bias observers, which has helped to significantly increase the percentage of female researchers employed within the department [24].

Give a voice to ECMs at the heart of the decision-making process

Many ECMs have invested time and a lot of work to advance the field of microbiology. Their contribution should be recognised within the microbiology research and innovation ecosystem. Being at the heart of decision-making enables ECMs to gain practical experience and develop the transferable skills necessary in upholding the talent pipeline. For example, the Microbiology Society has provided ECMs with many professional development opportunities which help shape the Society's activities, including event co-chairing schemes, Editor and reviewer mentoring schemes and the ECM Forum Executive Committee, which gives early career members of the Society a way to influence our work. Researchers involved in the decision-making process have reported that it enabled them to expand their networks and develop valuable career skills, demonstrating that empowering ECMs can benefit both the microbiology community as a whole and individual careers [25].

We welcome UKRI's new pilot early career research forum, which aims to give ECRs a greater voice in policy and strategy [26]. However, it remains to be seen whether this initiative truly empowers this cohort of researchers to bring their perspective to decision-making groups. Additionally, more transparency around the structure and running of the scheme is needed in order to increase accountability moving forward. If successful, the model could be expanded across decision-making agencies, funding bodies and universities to enable ECRs to interact and advise stakeholders on research policy and funding decisions.



References

- [1] **World Health Organisation.** Impact of COVID-19 on people's livelihoods, their health and our food systems; 2020. <https://www.who.int/news/item/13-10-2020-impact-of-covid-19-on-people's-livelihoods-their-health-and-our-food-systems> [accessed 9 November 2021].
- [2] **American Society for Microbiology.** Emerging Roles of Microbiologists Post-COVID; 2021. <https://asm.org/Academy/Emerging-Roles-of-Microbiologists-Post-COVID> [accessed 9 November 2021].
- [3] **Microbiology Society.** Early Career Microbiologists' Forum; 2021. <https://microbiologysociety.org/why-microbiology-matters/early-career-microbiologists-forum.html> [accessed 9 November 2021].
- [4] **Wellcome Trust.** What researchers think about research culture; 2020. <https://wellcome.org/reports/what-researchers-think-about-research-culture> [accessed 9 November 2021].
- [5] **Nuffield Bioethics.** The culture of scientific research; 2014. <https://www.nuffieldbioethics.org/assets/pdfs/The-culture-of-scientific-research-report.pdf> [accessed 9 November 2021].
- [6] **Russell Group.** Realising our potential; 2021. <https://russellgroup.ac.uk/policy/publications/realising-our-potential-backing-talent-and-strengthening-uk-research-culture-and-environment/> [accessed 9 November 2021].
- [7] **Microbiology Society.** 75th Anniversary: A Sustainable Future; 2020. <https://microbiologysociety.org/our-work/75th-anniversary-a-sustainable-future.html> [accessed 9 November 2021].
- [8] **Rice DB, Raffoul H, Ioannidis JP, Moher D.** Academic criteria for promotion and tenure in biomedical sciences faculties: cross sectional analysis of international sample of universities. *Br Med J* 2020;369.
- [9] **University of Southampton.** Biological Sciences Postgraduate Society; 2021. <https://sotonbsps.wordpress.com/> [accessed 9 November 2021].
- [10] **Vitae.** The Concordat to Support the Career Development of Researchers; 2019. <https://www.vitae.ac.uk/policy/concordat> [accessed 9 November 2021].
- [11] **Medical Research Council.** MRC response to COVID-19; 2021. <https://mrc.ukri.org/funding/science-areas/coronavirus-updates/> [accessed 9 November 2021].
- [12] **Organisation for Economic Co-operation and Development.** Reducing the precarity of academic research careers; 2021. https://www.oecd-ilibrary.org/science-and-technology/reducing-the-precariety-of-academic-research-careers_0f8bd468-en [accessed 9 November 2021].
- [13] **UK Research and Innovation.** 2021/22 budget allocations for UK Research and Innovation; 2021. <https://www.ukri.org/wp-content/uploads/2021/05/UKRI-270521-UKRI-Allocation-Explainer-2021-22-FINAL-PDF.pdf> [accessed 9 November 2021].
- [14] **Microbiology Society.** 75th Anniversary: A Sustainable Future; 2020. <https://microbiologysociety.org/our-work/75th-anniversary-a-sustainable-future.html> [accessed 9 November 2021].
- [15] **University of Glasgow.** Catalyst Seed Funding; 2021. <https://www.gla.ac.uk/colleges/mvls/researchinnovationengagementsupport/issf/ecr/#catalyst-earlycareerresearcher> [accessed 9 November 2021].
- [16] **Queen Mary University of London.** Catalyst Fund Project; 2021. <https://www.qmul.ac.uk/queenmaryacademy/researcher-development/wellbeing/catalyst-fund-project/> [accessed 9 November 2021].
- [17] **Satinsky EN, Kimura T, Kiang MV, Abebe R, Cunningham S et al.** Systematic review and meta-analysis of depression, anxiety, and suicidal ideation among Ph.D. students. *Scientific Reports* 2021;11:14370.
- [18] **UK Research and Innovation.** Rules for PhD funding relaxed for those affected by the pandemic; 2021. <https://www.ukri.org/news/rules-for-phd-funding-relaxed-for-those-affected-by-the-pandemic/>
- [19] **Russell Group.** Realising our potential; 2021. <https://russellgroup.ac.uk/policy/publications/realising-our-potential-backing-talent-and-strengthening-uk-research-culture-and-environment/> [accessed 9 November 2021].
- [20] **Vitae.** The Concordat to Support the Career Development of Researchers; 2019. <https://www.vitae.ac.uk/policy/concordat> [accessed 9 November 2021].
- [21] **Department for Business, Energy, Industrial Strategy.** R&D People and Culture Strategy; 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004685/r_d-people-culture-strategy.pdf [accessed 9 November 2021].
- [22] **The Royal Society.** Résumé for Researchers; 2019. <https://royalsociety.org/topics-policy/projects/research-culture/tools-for-support/resume-for-researchers/> [accessed 9 November 2021].
- [23] **Pandemic PGRs.** Falling Short: Response to UKRI's Phase 1 and Phase 2 Support for PhD researchers during the COVID-19 Pandemic; 2021. <https://www.ucu.org.uk/article/11396/Falling-Short-report-Pandemic-PGRs> [accessed 9 November 2021].
- [24] **Athena Swan Department Application Gold award.** Department of Chemistry, University of York; 2018. <https://www.york.ac.uk/media/research/documents/athenaswan/York-Chemistry-Gold%202018%20for%20publication.pdf> [accessed 9 November 2021].
- [25] **Marshall H, Fernandes M.** Early-career researchers shaping publishing strategy. *Learned Publishing* 2021;34:675-678.

Acknowledgments

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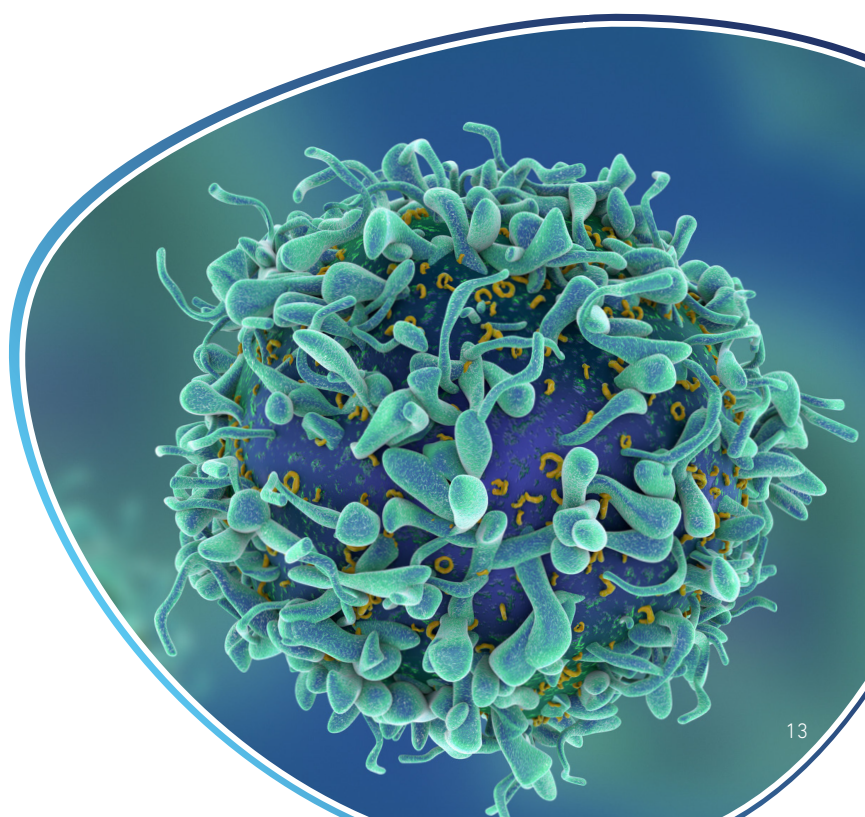
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The Microbiology Society is a membership charity for scientists interested in microbes, their effects and their practical uses. It is one of the largest microbiology societies in Europe with a worldwide membership based in universities, industry, hospitals, research institutes and schools.

Our members have a unique depth and breadth of knowledge about the discipline. The Society's role is to help unlock and harness the potential of that knowledge.