Journal of Cell Science

Author queries: JCS261544

Please indicate your corrections using comments/annotations as shown in the corrected proof example (please do not use the 'sticky notes' tool or edit the text directly).

Please check the **entire proof** thoroughly, paying particular attention to any text highlighted in red.
If you require a colour-blind-accessible proof, please contact the Journal Editorial Office at jcsprodeds@biologists.com.
Check carefully that the authors' names, affiliations and the corresponding author's e-mail address are correct.
Please ensure that all tables, figures and equations are present and in the correct order.

IMPORTANT: If you submit revised figures, please let us know what has been changed in the figures so that we can check that the files have been substituted in the final proof.

Funding: The funding data linked to your article are summarised in a table at the end of the proof. **Please check that all funders and institutions supporting your work and relevant grant numbers are included.** Funder names may have been edited to match the Crossref Open Funder Registry. Note that this table will not be included in your published paper.

PubMed Central deposition/Self-archiving: We offer a free PMC deposition service to authors supported by funders that mandate deposition in US/NLM PMC. If you require deposition and this is not indicated in the Funding section of your proof (Deposited in PMC for release…), please let us know immediately. For deposition in other publicly available repositories, see Open Access rights and permissions.

Gold Open Access – CC-BY: If you have paid for Gold Open Access publication, the CC-BY licence text will be displayed on page 1 of your proof, below the author affiliations. Open access papers will be deposited in US/NLM PMC for immediate release. Note that all other papers will be published under our Green Open Access model free of charge, and made freely available 6 months after publication. For further details, see Open Access rights and permissions.

Supplementary information: If you have submitted supp. data, please check that citations are included in the text. Please note there are no proofs for supp. data as the files are not edited. If you wish to make any changes, please provide replacement file(s) and let us know what has been changed.

Please answer the hyperlinked queries below and indicate any necessary changes on the proof.

© 2023. Published by The Company of Biologists Ltd | Journal of Cell Science (2023) 136, jcs261544. doi:10.1242/jcs.261544

CELL SCIENTISTS TO WATCH

Cell scientist to watch – Anjali Kusumbe

Anjali Kusumbe is the head of the Tissue and Tumour Microenvironments Group at the MRC Human Immunology Unit and MRC Weatherall Institute of Molecular Medicine and Director of the Wolfson Imaging Centre in Oxford, UK. She completed her PhD with a fellowship from the Council of Scientific and Industrial Research in India, before moving to the Max Planck Institute for Molecular Biomedicine in Germany for her postdoc, where she worked on endothelial heterogeneity in bone. She established her group in Oxford in 2017 and was recently awarded the 2023 BSCB Women in Cell Biology Early Career Medal. We caught up with Anjali over Zoom to ask about the award, her career path and her advice for new group leaders.

Anjali Kusumbe

Congratulations on winning the BSCB Women in Cell Biology (WICB) Early Career Medal; what does winning this award mean to you?

My sincere gratitude extends to the BSCB for recognising my contributions with the WICB award. This recognition holds tremendous significance, not only for me as an early career group leader but also for the collective efforts and unwavering dedication of my lab members. I am truly overjoyed to have reached this milestone, particularly in the face of the challenges brought forth by the pandemic. I firmly believe that this accomplishment would not have been attainable without the exceptional contributions of my lab. Once again, thank you to the BSCB for bestowing this esteemed award upon me. I am determined to continue striving for excellence and making impactful contributions to the world of cell biology and fostering a collaborative and innovative environment.

What first inspired you to become a scientist and what was your career path?

The roots of my passion for science can be traced back to my early childhood, where biology emerged as my favourite subject. A significant influence came from my father and maternal uncle, both botanists. Although my father later went into banking, I used to love reading his books; I vividly remember eagerly absorbing the intricate details of plants, from their captivating images to the intriguing descriptions and names. Moreover, observing my uncle's role as a Group Leader at The Indian Agricultural Research Institute, where he embarked on inspiring journeys to international institutes and conferences, filled me with awe and excitement. The prospect of such exhilarating ventures abroad was enticing, although my introverted nature presented doubts. After completing my PhD, I embraced a new chapter in my scientific journey by venturing to Germany for my postdoctoral work. Undeniably, the transition posed challenges, testing my adaptability. However, I gradually acclimatized to the new country and environment. Initially, I was not sure whether I would become a principal investigator (PI) and my route to becoming a PI was gradual, but it worked out.

You've also been recognised with the 2022 Award for Life Sciences from the Royal Microscopy Society, what drew you to using microscopy in your research?

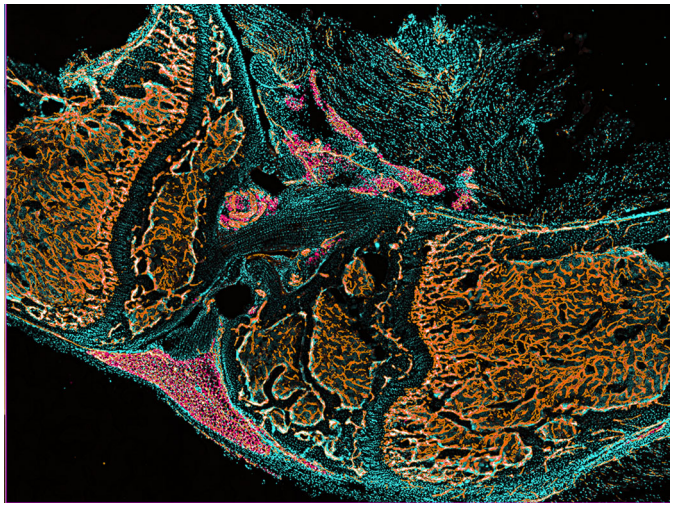
I would like to share my journey that began during my postdoctoral research, where microscopy played a pivotal role in my investigations. My focus was on exploring the vasculature in bones, which required imaging as an essential component. Previously, researchers had been examining bone using thin paraffin sections in 2D, which unfortunately limited their understanding of the intricate 3D organization of blood vessels. In response to this challenge, I dedicated my efforts to developing innovative methods utilizing thick sections of bone, enabling us to achieve high-resolution imaging. Moreover, my laboratory has been committed to advancing research methodologies and tools tailored for investigating vessel–tissue interactions in bones and soft organs. Most recently, my lab has developed a method that enables ultrafast immunostaining and light-sheet imaging of intact bones, leading to the exciting discovery of lymphatic vessels and their function in bones.

What are the main research questions that your lab addresses?

My lab's research questions are laser-focused on unravelling the mysteries of vascular and tissue ageing. We delve into understanding age-dependent changes in both blood and lymphatic vessels, while also investigating how ageing influences immune cells, cancer and tissue

Tissue and Tumor Microenvironments Group, MRC Human Immunology Unit, MRC Weatherall Institute of Molecular Medicine, Medical Sciences Division, University of Oxford, Oxford, OX3 9DS, UK.
E-mail: anjali.kusumbe@rdm.ox.ac.uk

Journal of Cell Science (2023) 136, jcs261544. doi:10.1242/jcs.261544



3D image showing immunostaining for vascular and perivascular cells in a murine bone and knee joint.

regeneration. Cancer exhibits a strong age-related component, with cancer cells lying dormant in the bones for decades before metastasizing. This enigma drives our pursuit to comprehend the effects of ageing vascular microenvironments on disseminated tumour cells. As we age, we are aware of the profound impact on the immune system's response, as also evidenced during COVID-19. Our primary objective is to illuminate the intricate ways in which the ageing vasculature affects immune cell production and migration. By uncovering these critical insights, we strive to unlock potential avenues for tackling age-related health challenges and empowering healthier ageing.

You mentioned COVID-19, did your research focus change because of the pandemic?

Our research, although not directly centred on COVID-19, does indeed highlight the profound interplay between ageing and the immune system, making the pandemic a relevant and topical example. The core research questions pursued in my lab have remained steadfast, delving into the fascinating realm of understanding how blood vessels undergo changes as we age and how these changes reverberate across various biological processes, including immune cells, stem cells, tissue and cancer dynamics.

How did the pandemic impact your lab?

The pandemic brought about a mix of challenges and opportunities for my research endeavours. Embracing the positive side, the imposed restrictions and halted travel allowed me to spend quality time with my family, particularly my daughter who is now 6 years old. Previously, my schedule was heavily lab-centric, but the pandemic compelled me to take a step back, granting me valuable moments for reflection and completing research papers. An unexpected silver lining was my 2-month trip to India to be with my family, and I managed to continue my work remotely. However, the closure of the Institute did have significant implications for our bench work, particularly mouse experiments, which had to be terminated prematurely. As a lab that thrives on hands-on experimentation, this undoubtedly had a substantial impact.

Developing imaging techniques seems to be a cornerstone of your work, is this something that you enjoy?

Absolutely, I find tremendous enjoyment in the process of developing imaging methods, albeit my primary motivation lies in using these techniques to answer pressing research questions. During my postdoctoral work, I had the exhilarating opportunity to delve into 3D imaging, which led to several ground-breaking discoveries. The spatial information obtained through imaging plays a pivotal role in my work, as it allows us to gain valuable insights into the intricacies of age-associated diseases. The ultimate goal of our efforts is to advance these imaging technologies to study and potentially treat age-related illnesses. I envision that the novel imaging tools we develop not only aid our own research pursuits but will also serve as valuable resources for other scientists grappling with their own research questions. Moreover, I aspire for these technologies to find practical applications in clinical settings.

The ultimate goal of our efforts is to advance these imaging technologies to study and potentially treat age-related illnesses.

Which new methods are you most excited about in microscopy?

At present, we are deeply invested in the realm of microscopy, exploring exciting avenues that push the boundaries of imaging possibilities. One particularly captivating technique that we have been delving into is light-sheet microscopy. This methodology provides us with the remarkable advantage of fast imaging without compromising sample integrity. In particular, our interest lies in harnessing lattice light-sheet microscopy, a technique that promises to elevate our imaging capabilities to super-resolution levels. Undoubtedly, lattice light-sheet microscopy presents its own set of challenges. Previously, the technique required meticulous instrument maintenance and specific sample holders, rendering it difficult to use. However, we are thrilled to embrace the wave of progress as commercial instruments have emerged, offering user-friendly solutions.

Did you face any challenges when you started your lab that you didn't expect?

Absolutely, I faced several unforeseen hurdles during the initial stages of setting up my lab. One significant challenge revolved around the recruitment of students. In the UK, students are typically affiliated with specific institute and departmental PhD programmes, and not funded through research grants. Unfortunately, I was unaware of this, and I didn't secure a PhD student for several years. This was undoubtedly the most disheartening setback I experienced. I would strongly advise anyone embarking on establishing their own group in the UK to proactively delve into the student recruitment process to avoid such delays. As a researcher transitioning from a different system in Germany, I also encountered distinct differences in running a group and navigating the recruitment process in the UK. Adapting to these new dynamics required time and effort, and it reinforced the importance of thoroughly understanding the operational intricacies within the scientific community. Undeniably, one of the most challenging aspects for new PIs is the process of hiring the right personnel. Hiring the perfect fit for a lab's research vision and dynamic can be a complex task, particularly when new PIs themselves are yet to establish their names in the field.

Is there any other advice you would give to someone starting their lab?

Prioritize finding a supportive and nurturing environment that wholeheartedly invests in your professional growth. Seek out an environment where your voice is heard, your ideas are encouraged,

Journal of Cell Science (2023) 136, jcs261544. doi:10.1242/jcs.261544

and your growth is nurtured. While funding and resources are undoubtedly essential, the value of career development support from senior staff cannot be overstated in shaping your trajectory as a successful research leader. This advice holds particular significance for women and ethnic minorities in academia. These groups face unique challenges in the scientific community. Therefore, seeking an institution that offers a supportive community should take precedence over other considerations. A culture that fosters inclusion, diversity, and equitable opportunities will empower you to thrive and succeed. As you embark on this journey, surround yourself with people who believe in your potential and genuinely care about your professional growth. By prioritizing this, you will pave the way for a rewarding and impactful career, making a lasting difference in your field and beyond.

A culture that fosters inclusion, diversity, and equitable opportunities will empower you to thrive and succeed.

Did you have any mentors that helped you in your career?

Indeed, throughout my journey, I had the invaluable support of mentors. However, I must admit that it wasn't easy for me to ask for help. Nevertheless, when I did, I was pleasantly surprised by the willingness of people to step up, support and help me. Over the course of my career, my mentors evolved and changed, each playing a vital role in distinct phases of my professional growth. Their diverse perspectives and experiences have been instrumental in moulding me into the researcher I am today. While some mentors were there during the early stages of my journey, others have stepped in to support me in more recent times.

What is your approach to mentorship with your lab members?

My approach to mentorship with my lab members revolves around fostering a supportive and environment that empowers each individual's growth as a scientist. When a new member joins my lab, I recognize the importance of investing significant time during the initial six months or so. This period allows me to understand their career aspirations, preferred working style, and areas where they require mentorship and guidance. By tailoring my approach to suit their needs, I ensure a more effective and personalized mentorship experience. Adapting to their preferred communication style is another crucial aspect of my mentorship approach. Open and transparent communication facilitates a strong mentor–mentee relationship. As time progresses, I encourage and empower my lab members to work independently as this helps their scientific growth. To promote a culture of collaboration, I place great emphasis on team building within the lab.

Your lab was awarded a LEAF sustainability Gold Award, can you tell us a bit about the scheme and why it was important for your lab to be involved?

The sustainability Gold Award has been immensely beneficial to our lab for two reasons. Firstly, it fosters an environment conducive to conducting high-quality research by addressing crucial aspects like lab organization, meticulous tracking of samples, lab management software implementation and sharing negative data. As a newer PI, I saw this as an opportunity to establish a strong foundation for my research endeavours. Participating in the sustainability Gold Award also reflects our commitment to responsible resource management. As an early-career PI, resources are often more limited, making it even more critical to optimize and streamline our operations. Secondly, the environmental aspect of the scheme resonated deeply with us. As we all know, lab-based research is highly resource and energy intensive, leading to significant carbon emissions. Being conscious of this impact, we were eager to participate in the scheme to actively contribute to reducing our carbon footprint. By embracing sustainable practices, we ensure that our lab operates efficiently, minimizing wastage and contributing to a greener future.

As an introvert, how do you get the most out of the meetings you attend?

I tend to be quite reserved when it comes to networking and find that I get exhausted when attending conferences. I have benefited from receiving invitations to give talks at meetings, which have had a huge impact in my career by enabling me to present our data and elevate our lab's visibility. For early career researchers, I highly recommend submitting abstracts for oral presentations whenever possible as this can be a transformative opportunity to showcase your work and expand your network. I have also benefited from organizing meetings myself; I organize the Oxford Imaging Symposium and the Oxford Vascular Biology Symposium. These events have allowed me to get to know people within the scientific community. Through short chats and interactions during conferences, I have gained valuable insights and identified potential collaborators. While I acknowledge that reaching out to people before meetings for one-on-one chats can be beneficial, I must admit that it has been a challenge for me as an introvert. Presenting my lab's work and organizing conferences have opened exciting possibilities contributing to the lab's success.

Finally, could you tell us an interesting fact about yourself that people wouldn't know by looking at your CV?

I am a passionate foodie! I have completed a Food Science course, delving into the intricacies of culinary arts. I've even participated in cooking competitions and been given awards for my culinary skills. I aspire to start my own restaurant one day, creating a space where I can share my culinary creations with the world. I find immense joy in both savouring and preparing delectable dishes. I like to attend food festivals and I especially love dark chocolate!

Anjali Kusumbe was interviewed by Helen Zenner, Online Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.