CONVERSATION

JEB@100: an interview with Monitoring Editor Monica Daley

Journal of Experimental Biology is celebrating 100 years of discovery in 2023 and, as part of our reflections, we are inviting Journal Editors to tell us their thoughts about the journal and to look to the future. In this Conversation, Monitoring Editor Monica Daley tells us why she thinks that understanding integration across systems and organizational scales is one of the big questions facing the field and why it is important to recognize failure as an opportunity.

What’s your area of scientific expertise and how did that introduce you to Journal of Experimental Biology?

My area of research is in muscle–tendon function and the biomechanics of locomotion. In particular, I focus on unsteady movements: when animals move over uneven terrain, turn or accelerate. I started my work during my PhD with Andy Biewener in the Concord Field Station at Harvard University, USA, studying muscle–tendon function and level and incline locomotion. At the time, Andy was an Editor of JEB, so when it became time to publish, there wasn’t much of a discussion about where to try. We submitted it to JEB and I had a great experience, because the review process was thorough and when it was accepted, my article was featured in Inside JEB, so I got to give an interview about the work. As an early-career scientist, that was very nice. During my career, I have faced pressure to publish in higher impact journals and, temporarily, played with moving away from JEB. But I’ve always come back and the reason is that JEB supports scientific excellence, fosters a sense of community and the review and publication process is of the highest standard. Many of my most cited papers are in JEB, so it seems that chasing the high impact journals was a bit of a waste of energy and slowed down the publication process for my trainees. So, when my own students are thinking about where to publish, I basically say ‘Go to JEB’, just like my PhD supervisor did.

What do you think is the secret of JEB’s longevity and success?

I love that JEB is run by a not-for-profit company, by scientists for scientists, focusing on curiosity-driven research and fostering scientific excellence while supporting the community. There have been so many changes in the publication landscape over the past couple of decades and, when the Open Science movement started out, I really thought, ‘Oh, this is the future’. But then so many for-profit Open Access journals started popping up, cluttering the publication landscape. Now, there’s so much more noise and completely rubbish science being published, because it’s not undergoing a rigorous review process overseen properly by scientific editors. Some Open Access journals are predatory and have made scientific publishing worse. At JEB, we care about our community, we care about supporting the authors and maintaining the integrity of the scientific process. Of course, we do need change in scientific publishing, but if you have not-for-profit journals run by the scientific community for the community, they will evolve their publication process in a way that meets the needs of the scientific community.

They’re not going to be chasing the next fad for profit, like some of the newer journals. I’ve published articles in some of the big Open Access journals and I’ve also observed how those journals have evolved over time, to the point where they have automated internal systems and become a ‘paper farm’. At some of these journals, the Editor doesn’t select reviewers, because it’s all automated by AI; it’s even hard for an Editor to intervene in the article handling process to remove an offensive review or to reject a paper because of a fundamental scientific flaw. The system automatically assigns new reviewers until two reviewers accept an article for publication. Now, I refuse to interact with such journals. I will not review for them or submit papers, because I realize just how far they have taken the profit motive. The way forward is to support not-for-profit journals run by the scientific community for the community.

At JEB, we care about our community, we care about supporting the authors and maintaining the integrity of the scientific process.

What are the current big outstanding questions in your field?

Currently, we understand elements of the function of individual organs and systems, but one of the biggest challenges is understanding the integration across systems and organizational scales: linking laboratory-based studies of form, function and biomechanics to how animals behave in much more complex real-world environments. For example, how does muscle–tendon stiffness determine economy of movement, which then determines...
how an animal evaluates risks and rewards in its environment and then decides to navigate that environment. We have a big gap in our understanding at the organism/environment scale. There are people who study animal behaviour in their environment and the environmental factors that influence behaviour, but we don’t have many approaches that directly link, in a mechanistic way, how the physiological systems in the body and the biomechanics of those systems influence the capacity to move in the environment and how animals choose to move depending on their own individual capacity. I think there’s a rich opportunity to integrate between comparative biomechanics and animal behaviour, and between comparative biomechanics and wildlife ecology. New sensor and data logging technologies are now allowing scientists to do this, but this integration remains in the early stages. We now have miniaturized accelerometers with relatively long battery lives that can track animal movements, but we need physiological measures as well – measurements of heart rate, heat production and other physiological variables as animals move. Data storage and battery life are often limiting factors. It’s really exciting to see how far the technology has come in the past 10 years, so I’m hopeful that we will get to the point where we have rich datasets from animals moving in natural environments that will inform our laboratory studies. We need to know what behaviours are most relevant to animals in the real world so we can investigate them in more mechanistic detail in the lab.

What impact do you think current research will have in 50 years’ time?
With the current climate change crisis, understanding how animals will respond to climate change and how animals interact in the real world will become more relevant. Any information that we collect about how animals move in different environments will help us understand how extremes in weather and massive climate change might impact animal populations when they experience conditions that they’ve never encountered before. In 50 years’ time, we might be spending a lot of energy trying to understand how environmental change will impact migration patterns, breeding patterns and whether populations of animals will be able to survive. Questions like that are going to occupy more and more of our headspace.

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If you could time travel, what piece of future equipment would you like to bring back with you?
Well, I’m a Trekke, so sometimes I take inspiration from Star Trek, the TV show. I think that science fiction is great, because by imagining future possibilities, we can work towards creating that technology. When I was younger, I remember watching Star Trek and the ability to speak to somebody live on video wasn’t possible then, although it was on Star Trek. What strikes me when I watch the show is the doctor’s ability to directly manipulate tissues. They have sophisticated tissue engineering tools and I wonder how such tools might influence our scientific approach. For example, if you could cross-link the collagen in your tendons to make your tendons stiffer, would that improve your locomotor economy? This technology could allow us to directly manipulate musculoskeletal tissues and then measure how that influences function in real time.

If you had one piece of advice to give your younger self, what would it be?
The issue that I have struggled with most throughout my school years and career is fear of failure and perfectionism. Knowing that, I would tell my younger self to embrace mistakes and failure as much as possible, take them as an opportunity to learn and grow. Often, because I was afraid of being judged for my failures, I would not show my writing to mentors until I had worked at it for too long, which meant that I did not receive feedback when it would have been most useful. Also, I think fear of failure kept me from doing things because I thought I wasn’t good enough or smart enough and that held me back from doing the most exciting and challenging things. As I’ve progressed, I’ve learned to overcome that and realized that every failure is an opportunity. Overall, you will not be judged by one mistake or failure, you’ll be judged on your striving, your scientific curiosity, your efforts to overcome failure and how you learn from mistakes. However, I think that my fear of failure was not unfounded. I was in a male-dominated field which makes women hypervisible, so you feel as if your failures are in the spotlight and you might be judged more harshly than male peers. Underrepresented minorities face these challenges acutely. But sometimes change doesn’t happen until we make it ourselves. When I was in graduate school, I was the only female grad student in a small research group, so I found women colleagues, PhD students in other labs, who became my allies. We supported each other. I wouldn’t have gotten through graduate school otherwise. Building a network of women allies has been essential for my well-being throughout my career.

I think fear of failure kept me from doing things

What one thing could have helped you to develop your career better?
I didn’t have a woman mentor early in my career; there were women in biomechanics but, somehow, I wasn’t directly connected with them. I did have excellent and supportive male mentors, but they didn’t have my lived experience. There were certain things they just couldn’t understand about me. I think that having a direct female mentor, someone like myself, could have been really impactful. Women and underrepresented minorities need mentors who can relate to them, believe in them and support them. In fact, each person needs a team of mentors. As a mentor, I cannot be everything to one trainee, so it’s my job to help them identify people who might be able to provide them with a different perspective and different support than I can provide.

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If you had to sum up what JEB means to you, as an author and a researcher, what would you say?
JEB is a real scientific home, an organization that has fostered a sustained scientific community focused on physiology and biomechanics, curiosity-driven science and integrity of the research process. Comparative biomechanics is a relatively small field, and I think it’s great that we have a journal that really caters to our needs and supports us as a community.

Monica Daley was interviewed by Kathryn Knight. The interview has been edited and condensed with the interviewee’s approval.