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EDITORIAL

Advocating developmental biology

Aidan Maartens^{1,*}, Andreas Prokop², Katherine Brown³ and Olivier Pourquié⁴

Developmental biology is a discipline with a long and rich history, a vibrant and diverse present, and a future of tremendous potential. The field has had enormous impact beyond its own boundaries, for example providing many key concepts for medical research and laying the foundations for advances in the stem-cell and tissue-engineering fields. Technological advances are bringing new solutions to problems that have preoccupied the field for decades, including the potential to analyse our own (human) development. We stand poised on the brink of a deeper understanding not only of development, but increasingly also of regeneration and ageing.

However, while we and others (St Johnston, 2015; Gilbert, 2017) would argue that the field is in a strong position, there is also reason for concern. At conference poster sessions and coffee breaks, departmental happy hours and water coolers, conversations inevitably turn to questions of funding and the future – the next grant, the next position, the next budget. Young researchers look to an uncertain future, and reasonably consider their place in it. Some countries are hit harder than others, and some researchers are more worried than others, notably those conducting basic research without an immediate translational impact. Of course, developmental biologists are not unique in feeling these concerns, but this does not lessen the stark contrast between the promise of the discipline and the threats felt against it. It is therefore vital to consider what individuals and organisations can do to advocate for the continuing importance of developmental biology. This editorial discusses some of our efforts in this regard, and announces a new article series that we hope will provide a useful advocacy resource for the field.

Over the years, A.P. [Communications Officer of the British Society for Developmental Biology (BSDB, www.bsdb.org/)] has engaged in numerous long-term outreach and advocacy initiatives, and highlighted the importance of developmental biology (www.openaccessgovernment.org/developmental-biology-important/41386/). He argues that we should be ready to stand up for our field whenever there is an opportunity to engage with audiences, including the wider public, students, clinicians, journalists, funding agencies and policy makers. We need effective ways to do this, and our engagement will become more powerful if we collaborate and share our strategies and resources (see Illingworth and Prokop, 2017 and references therein). One concrete suggestion from A.P. is to prepare elevator pitches that convincingly explain the importance of your research; thenode.biologists.com/advocacy/outreach/ provides a concise rationale and selection of ideas for such pitches, as well as numerous references for individuals to further strengthen their

case. So, reader, do you know your elevator pitch, and are you ready to engage?

The BSDB's advocacy initiative is just one example of how organisations can help advocate developmental biology. The Society for Developmental Biology in the USA (www.sdbonline.org/) has undertaken numerous education and outreach activities, and with the BSDB and other societies is part of the global umbrella organisation the International Society for Developmental Biology (www.developmental-biology.org/). In the field of stem cell biology, the International Society for Stem Cell Research (www.isscr.org/about-isscr) provides a platform for advocacy, education about the latest stem cell advances. As well as facilitating science communication activities, such professional societies, along with funding bodies and academic institutions, can also do the essential (but perhaps less well documented) work of actively liaising with policy makers to achieve the necessary recognition of the importance of our discipline.

But what can journals do? Development has long prided itself as a community journal, and seeks to help researchers in many ways aside from publications, for instance through our travelling fellowships and meeting grants supported by our not-for-profit publisher The Company of Biologists. Through social media, we promote inspiring new research to specialists and non-specialists alike. We also host a community blog, the Node (thenode.biologists.com), which serves as a space for developmental biologists to share information and ideas, and could, in principle, provide a platform for individuals and societies to cooperate and coordinate their advocacy efforts. To help facilitate this, Sarah Morson (who joined us in 2017 for a three-month internship) updated the Node's Resources page (available at thenode.biologists.com/resources). This resource incorporates the collections of links previously managed by A.P. on the BSDB website, covering the areas of advocacy, outreach and education, as well as sections dedicated to audio-visual and research tools. We hope these pages will be a dynamically evolving resource and encourage suggestions from the community for useful additions.

With its wide readership, Development can act as a mouthpiece to advocate our discipline; that we should get more involved in such efforts was a strong theme running through the feedback we received during our recent community consultation. Following discussions among ourselves and with the journal's editorial group, we are now pleased to announce a series of articles that aim to advocate the wider importance of developmental biology.

The first set of articles will set out to answer the question 'What has developmental biology ever done for us?' with a series of case studies linking particular discoveries in developmental biology to their wider scientific and societal impact. Most obviously, this will involve examples of how basic knowledge gleaned from model organisms has led to medical applications, but we also want to emphasise how the field has advanced our general understanding of how life works, contributing to knowledge and education as social values in their own right (Rull, 2014). With this set of articles, we aim not only to celebrate the prestigious history of our field, but also

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to provide concrete examples showing why we need to continue to do basic developmental biology research.

To complement this historical angle, the second set of articles will look forward and ask ‘What are the big open questions in the field?’ We want to explore the fundamental unanswered questions in developmental biology and propose how we might start addressing them. The aim is not to wallow in the mystery of these questions, but rather to argue that, particularly with the breakneck speed of development of new tools, they are increasingly tangible. As well as providing signposts for the field’s future, we hope that these articles will convince prospective students that there has never been a more exciting time to get involved in developmental biology – and, perhaps, provide inspiration in choosing their particular field of research.

By providing a rationale for why we do developmental biology and where it is taking us, we hope that these articles will help to advocate our discipline, providing a useful resource for developmental biology educators and advocates, and also helping current researchers to develop their elevator pitches. Our first articles appear in this issue: Katrin Wiese, Roel Nusse and Renée van Amerongen survey the history of the Wnt pathway through

multiple model organisms to its influence on the cancer and stem cell fields (Wiese et al., 2018), while Miki Ebisuya and James Briscoe provide a perspective on the meaning of time development (Ebisuya and Briscoe, 2018). We hope you will enjoy this collection of articles, and we welcome suggestions for further commissions.

Developmental biology is a vital, fascinating and evolving discipline. As a global community, we can help to safeguard and support our field going forwards, and we encourage you all – through outreach and communication activities, discussions with funders and policy-makers – to get involved.

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