

Training the Next Generation of Journal Contributors: A Case Study at *Environmental Health Perspectives*

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Many scientific societies sponsor programs that help early career researchers (ECRs) establish themselves in their fields. Journals, too, are involving ECRs in both ad hoc and routine operations, to provide members of the next generation of scientists with working knowledge of how scientific manuscripts traverse the gauntlet from editorial evaluation through peer review and publication. With this article, *Science Editor* launches a new series focusing on ECRs in scientific publishing. The series begins with a case study of the ECR Initiative¹ at *Environmental Health Perspectives* (*EHP*), a leading journal in the fields of environmental health sciences including toxicology, environmental epidemiology, and exposure science. The *EHP* editorial team hopes that sharing their experience will benefit other journals, publishers, and organizations implementing or exploring similar programs. The team also hopes to encourage open conversations about challenges faced, participant experiences, and best practices for recruiting and engaging participants.

EHP, which is published with the support of the National Institute of Environmental Health Sciences (NIEHS; part of the National Institutes of Health), launched its ECR Initiative mid-pandemic, in the spring of 2021. To build a team dedicated to developing, maintaining, and leading ECR-focused activities, as one of its first steps, *EHP* engaged an advisory panel of ECRs in the environmental health sciences. *EHP* defines ECRs as graduate students or researchers having fewer than 3–5 years of professional experience since their terminal degree or postdoctoral training. This definition allows individuals with a variety of career paths to self-identify as ECRs. Candidates for the advisory panel

are chosen for their active participation in the environmental health research community, leadership potential, and scholarly achievements.

EHP Senior Science Editor Windy Boyd was instrumental in fostering the initiative, which gained momentum after the journal's strategic planning summit in January 2021. "One of the journal's goals is to foster development of an innovative, diverse, international community of contributors in the environmental health sciences. One way we can do that is to offer learning opportunities and experience in all stages of scholarly publishing, from authorship to peer review and manuscript editing," Boyd said. "During the planning summit, some participants brainstormed goals and activities, which helped shape the initiative's early form."

EHP Associate Science Editor Kristin Inman, a member of *Science Editor's* board, serves as a day-to-day lead on the project. "We're learning as we go," she said, "so we want to share our experiences with other journals and publishers interested in launching similar programs."

As this article goes to press, the ECR Initiative advisory panel is entering its second year. Most of the inaugural members have chosen to continue their service, as early projects come to fruition and new ones take shape. "The work of the panel continues to become more visible," Inman said.

Boyd is optimistic about the future of both the panel and the overarching initiative. "So far, there has been no shortage of interest from ECRs," she observed. "For the first round of the advisory panel, our deputy editors reached out to scientific societies including the Society of Toxicology, the International Society of Environmental Epidemiology, and the International Society of Exposure Science, who identified leaders in their disciplines as potential candidates. We also reached out to ECRs in our pool of reviewers." Moving forward, *EHP* wants to reach beyond those in its immediate network. "Our goal is to widely advertise the program and accept self-nominations to the panel," Boyd said.

Inman elaborated on efforts to diversify participation in the ECR Initiative. "We want to make sure we are reaching

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those who may not have access to similar programs or resources," she said, "to level the playing field for all scientists, researchers, and communicators." Doing so will also bring a diversity of experiences, ideas, and problem-solving strategies, she noted.

Benefits Extend Beyond ECRs

In an environment where active researchers are also authors, reviewers, and teachers, projects designed with ECRs in mind may have a payoff for others, including the journal itself. A case in point is *EHP*'s peer reviewer resource center,² launched in late 2021. The center offers guidelines for reviewing each section of a manuscript, accompanied by a convenient checklist, recommendations for writing constructive feedback, and journal policies on peer review, confidentiality, and conflict of interest. Initially conceived as support for ECRs stepping into the reviewer role at *EHP*, the resources help develop the expertise of any peer reviewer. By extension, benefits accrue to associate editors (AEs) and other editors at *EHP*.

The resource center's impact has already extended beyond peer reviewers. Advisory panel member Donghai Liang invited his lab members—about a dozen trainees ranging from undergraduate to postdocs—to check out the resource center, as well as the journal's author guidelines.³ "My trainees have told me that they found these materials super helpful, including useful information for drafting, revising, and reviewing manuscripts," he said.

To involve more ECRs in peer review, journal staff established a database of ECR reviewers that can be searched by AEs seeking experts to review manuscripts. The database and resource center are complemented by opportunities for mentored peer reviews, which *EHP* encourages its more senior reviewers to take on. This activity was especially attractive to advisory panel member Mimi Huang, PhD, a toxicologist who conducted her postdoctoral research in the NIEHS Division of Translational Toxicology. Huang is part of a team of *EHP* editors and advisory panel members who collaborated to propose a manuscript review seminar for the 2023 Society of Toxicology meeting. "I am excited about teaching others how to do [peer] review," she said. "I was fortunate enough to have good mentors for conducting manuscript reviews; not everybody has that." Huang offered a preview of the seminar. "We will go through what happens on the journal side, what reviewers should look for, common mistakes, and so on," Huang explained, noting that the opportunity to help lead an *EHP*-sponsored conference presentation is just one benefit of joining the advisory panel.

Mentoring extends to more general science communication, as well. *EHP* recently completed the trial run of a mentored writing opportunity, not unlike the one offered by *Science Editor*. Among the products of the *EHP*

News team, led by Susan Booker Woolard, are Science Selections. These brief articles summarize the findings of recent *EHP* publications and include critical comment from outside experts on the work's implications. The first mentee, Oyelola Adegboye, is a public health biostatistician interested in exposure science and population studies. He sought to strengthen his skills communicating research to those beyond academia. "Communicating science as news articles requires different sets of storytelling skills to make sense of findings in a research article," he said.

Once the right paper came along, the News team coached Adegboye on how to approach the task, structure the story, find subject matter experts, and other finer points. After completing two now-published Science Selections, he admits that the work took longer than expected. However, he also said researching new studies generated ideas to explore in his own work, and he especially appreciated being able to develop a writing style suited to communicating results in a good story for nonacademic outlets. "The first news article took about 3–4 iterations, with excellent and constructive feedback each time," said Adegboye. "By the time I was ready for the second news article, I only submitted two drafts before it was accepted." He added that he would definitely take on the opportunity again.

On the shorter side of writing, advisory panel members provide *EHP*'s weekly #TuesdayTip tweets, with pointers on manuscript preparation, graphics, writing, publishing, publicizing, and more. As ECRs themselves, panel members have the needed insight into topics of interest to other ECRs. Liang pointed to a tip tweeted in May:

Stressing about sending your #uglyfirstdraft to your mentor or collaborator? Remember that every beautiful paper starts with an ugly draft, and editing is usually a part of every author's contribution to the paper.

He shared the succinct advice with his students. "This is so well said, it encourages them to keep practicing writing, so the draft will eventually become a beautiful article, with the support and help from the entire writing team," he said.

More to Come

An ECR program must grow along with its participants. *EHP*'s ECR Initiative is still taking shape, according to Inman. "We have a number of big items cooking right now that we're really excited about," she said.

Editor-in-Training

To serve ECRs seeking to join editorial review boards, or interested in careers in publishing, the journal is developing an editor-in-training (EIT) opportunity. Applicants selected for this unpaid position will receive hands-on training to support participation in the editorial process. For *EHP*, it

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promises to be a win-win, with potential to increase the pool of qualified reviewers and editors, and thereby help diversify its editorial boards with respect to career stage. As currently envisioned, an EIT would be paired with an AE and staff science editor, sit in on editorial meetings, and participate in several manuscript reviews, including taking the lead to shepherd one paper through the full peer-review process.

Learning Modules

The advisory panel and journal staff are developing free learning modules on publication ethics, reviewing manuscripts, promoting one's own research, science communication resources, and related topics. Formats—still on the drawing board—may range from webinar recordings to fact sheets, resource lists, and infographics. The modules will be revised and expanded as users gain experience with them.

Panel members have contributed other ideas that are under consideration, including opportunities for ECRs to author front matter content and formation of a review club.

Building on Lessons Learned

Regular reviews of any initiative allow building on successes and learning from challenges. *EHP* has certainly faced challenges and expects new ones to arise as its initiative reaches into new territory. For example, one membership goal is geographic diversity. Accordingly, current panel membership stretches across time zones from Nigeria to North Carolina and on to Australia. Yet this complicates scheduling meetings. Throw in the different platforms available at different institutions—Zoom, Microsoft Teams, GoogleMeet—and logistics can become a formidable challenge. Still, the benefits of this geographic diversity have exceeded expectations, according to panel members. Huang, for one, values working on a global team. "It's gotten me thinking more globally—both about the needs of ECRs in other countries with different education systems, and about environmental health issues different from what U.S. researchers and funders focus on," she said.

Huang is also looking forward to moving from advising into more concrete action. Inman explained that as the advisory panel moves into its second year, its members are

taking lead roles in envisioning and launching new program elements. "There is room for experimentation," she said. "We hope this will grow organically from the interests, skills, and specialties of the panel." The strengths each member brings to the panel have contributed not only to the shape of the initiative, but also to the group's collegiality. "Working with the other ECRs was a great experience, and I hope to maintain those connections in the coming years," Huang said.

Liang echoed the sentiment. "Being able to communicate and work with my excellent advisory panel colleagues helps me learn what ECR careers feel like across different institutions and sectors (academia, government, industry, etc.)," he said. "I really enjoy brainstorming with these colleagues and the *EHP* editorial team on ways to engage early career researchers in the fields of exposure science, environmental epidemiology, and toxicology."

Measuring success remains a challenge. Anecdotal evidence to date is encouraging, but as the program develops, the journal's editorial team seeks clearer evidence of what is working—or not—and why. For instance, with respect to mentored reviews, when an AE selects an ECR reviewer, should the editor be surveyed afterwards? If so, would having to complete such a survey be a disincentive to participating? Or is it sufficient to track whether an ECR receives a second invitation to review? Should an ECR who does not receive an invitation consider that a reflection on their qualifications, or would the journal need to specifically encourage the AEs in each ECR specialty to take on mentorship? These questions are not unanswerable; they simply reflect the early stages of this new and exciting program.

EHP is interested in hearing from journals and editors who have questions about the initiative or experience doing something similar. Please email Inman at Kristin.Inman@nih.gov.

References and Links

1. <https://ehp.niehs.nih.gov/doi/10.5555/ac14b6cd-5417-4bc5-aa13-43f0a5929b10/full/>
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