

Episode: *Author Interview: “Which Concepts Are Key to Transitioning From Nonhuman Animal Models to Engineered Microphysiological Systems in Biomedical Research?”*

Guest: Erin Sharoni, MBE

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Transcript: Cheryl Green

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[bright theme music]

[00:00:03] TIM HOFF: Welcome to another episode of the Author Interview series from the *American Medical Association Journal of Ethics*. I’m your host, Tim Hoff. This series provides an alternative way to access the interesting and important work being done by Journal contributors each month. Joining me on this episode is Erin Sharoni, teaching fellow at Harvard Medical School Center for Bioethics, visiting postgraduate research fellow in Global Health and Social Medicine at Harvard Medical School, and associate fellow at the Oxford Centre for Animal Ethics at the University of Oxford. She’s here to discuss her article, “*Which Concepts Are Key to Transitioning From Nonhuman Animal Models to Engineered Microphysiological Systems in Biomedical Research?*,” in the September 2024 issue of the Journal, [Nonhuman Animal Research](#). Erin, thank you so much for being on the podcast.

ERIN SHARONI: Thanks so much for having me. I’m excited to chat with you. [music fades]

[00:00:56] HOFF: So, what is the main ethics point of your article?

SHARONI: So, [in] my article actually, I propose an ethical framework that underscores the need, both empirical and normative, to transition to animal-free testing technologies, specifically, as you mentioned in the introduction, something called engineered microphysiological systems within mainstream biomedical research for the purposes of improving the benefits of medical science to humanity. So, I know that sounds like a lot, [laughs] so let me break it down. In the article specifically, I actually recommend five key concepts that I believe could help address the barriers to adoption of these new technologies. Those barriers are really big, and I discuss them at length in the article. But they’re scalability, standardization, public opinion, and regulatory acceptance. And so, while those five key concepts are not ethical concepts in and of themselves, they’re actually—I’ll list them, it’s awareness, access, education, application, and rewards—I view each one of those through an ethics lens in the context of the discussion to explain how addressing each one can support the advancement and adoption of animal-free testing technologies.

[00:02:14] HOFF: And so, what do you see as the most important thing for health professions students and trainees to take from your article?

SHARONI: Well, we have a significant problem in translational science in the field of biomedical research. The estimates are between 90 to 95 percent of interventions that are proven safe and effective in animal models actually fail to translate to humans in clinical trials. Big problem. So, the current system that we have in place is harming both humans and animals. It's depriving humans of potentially life-saving treatments, and one can argue then that it's needlessly utilizing animals in experiments that then fail to produce real, meaningful results. And the failures of animal model systems in translational science are actually widely recognized by academia and industry, but I don't think most students are aware of this fact. I know that when I was a student, I was not aware of that fact simply because animal research is the status quo, and those failure rates are accepted as sort of embedded within that status quo. But many people, including on the Senate floor in the United States Capitol, have noted that we have to evolve away from the methods that we used 100 years ago. They may have been sufficient for what we were capable of then, but that is certainly not the case today.

And so, I really argue that students and trainees can help promote ethical responsibility in biomedical research by working to adopt and advance those animal-free research methodologies and technologies. And I know I mentioned it before, but engineered microphysiological systems are in vitro platforms that mimic aspects of human and animal physiology using either tissue or organ-specific cells. So, people might've heard of things like organs on chips and mini organoids. They're very interesting. I encourage people to check them out. I touch on them a bit in the article, but that's what I'm referring to.

[00:04:16] HOFF: And finally, if you could add a point to your article that you didn't have the time or space to fully explore, what would that be?

SHARONI: Hmm. Well, I think I would emphasize what I've written in the past about, which is the importance of this principle of reflexivity in research ethics. Reflexivity is an ethical principle that really directs us to engage in, one could say, critical self-reflection on our positions relative to research subjects—our positions of power relative to research subjects—whether they be animals or other humans, so that we can make our work more adaptable to challenges and do better science. And what's interesting about reflexivity that I think maybe touches a nerve sometimes, but that's why it's important in ethics that we discuss it, is it really rejects this sort of traditional scientific demand for objective neutrality in research because it's recognizing the contribution of each participant's unique position in that entire narrative. And the reason that's important is because it allows us to consider emotion.

And I know that in medical science, often we're not considering emotion. And certainly, when we're thinking about a critical emergent situation, for example, in an emergency room when somebody comes in with a gunshot wound, you're not sitting there considering the emotional feelings that you may have about the state of gun control, right, or something like that. But it is really important in research, and it's important specifically when we're talking about transitioning away from using animal models, which, as I just explained, often fail in translational research anyway, because I think we shouldn't be suppressing our emotions as scientists in research. It actually doesn't

make for the best research and the best scientific outcomes. So, I know maybe it's a little bit of a controversial statement, but it's certainly relevant here.

And if microphysiological systems can advance medical science, and they can reduce unnecessary animal suffering and unlock new avenues in drug development and disease understanding, then it becomes really an ethical imperative for us to pursue it. And it's essential for the future of both ethical and effective biomedical research. And so, I guess that was a long-winded way of saying that I think we can include other, maybe softer principles within the context of biomedical research to make changes like the one that I'm proposing. [theme music returns]

[00:06:56] HOFF: Erin, thank you so much for your time on the podcast today, and thanks for your contribution to the Journal this month.

SHARONI: Thank you so much.

HOFF: To read the full article, as well as the rest of this month's issue for free, visit our site, journalofethics.org. We'll be back soon with more *Ethics Talk* from the *American Medical Association Journal of Ethics*.