

May 3<sup>rd</sup>, 2021

Senator Claxton, Representative Meyer, and other honorable members of the Health and Human Services Committee:

My name is Dustin Updike. I am an Associate Professor at the Mount Desert Island Biological Laboratory in Bar Harbor, Maine, where I have run an NIH-funded research group these past nine years. I am writing today in support of LD1601.

As a scientist, my specialty is the development of the germline - the cells that become the egg and sperm. The basic biology and genetics of the development of our reproductive systems are conserved from the simplest animals to humans, so we conduct genetic research with a tiny nematode worm called *C. elegans*, which is widely used for biomedical research.

In 2015, when we started using CRISPR/Cas9 gene-editing technology, it transformed how we performed research and made things possible for us that we would have never considered a couple of years prior. Our experience with this technology prompted me to restructure a short course I run through the Maine INBRE ([IDeA Network of Biomedical Research Excellence](#)), a unique state-wide research training program. This course is attended by undergraduates from the University of Maine Farmington, Machias, Fort Kent, and Presque Isle campuses. During these weeklong courses, students learn how to design CRISPR reagents and then get the experience of performing the technique in *C. elegans* nematodes. Students in my course have used the process to delete genes. They have used the method to tag genes with fluorescent proteins. They walk away with the experience and ability to perform the technique, which most undergraduates across the country will never get the opportunity to try. I take a lot of pride knowing that my Fort Kent students will have this on their CVs, while their peers at institutions outside the state will not. We also delve into the ethics of using this technology, when it should and should not be used, and pull in timely media reports and research findings as part of the discussion. We discuss the implications of using the technology for CRISPR-based gene drives and the potential benefits and dangers of doing so. I try to bring in external speakers for my students – for example, last year, I brought someone from the MIT creative labs to talk about the need and their approach for creating safe and controlled gene drives to eliminate vector-borne diseases.

CRISPR gene-editing technology is beginning to impact the economics and efficiency of agriculture and medicine. It can be used to detect, treat, and cure disease. The effects of this technology are broad and will extend to all corners of our lives. As a scientist and educator, I feel a responsibility to expose undergraduate students to this technology. Whatever field they end up in, knowledge of CRISPR technology and what it is capable of will give them a leg up.

But I am here today because these discussions need to extend beyond the scientific community, and I feel that the establishment of the advisory panel proposed in LD1601 is one measure to accomplish this.

Thank you, and feel free to contact me if there are further questions.

