

August 18, 2022

I would like to offer the following points to complement the presentations made during the Advisory Panel's work regarding the "Implications of genome-editing technology for the citizens of the State."

1. In Ms Waring Bateman's presentation on CRISPR she gave a brief overview of a number of elements. On one important point she did not fully portray the accuracy of CRISPR. There has been a significant literature showing a number of 'off target' effects of the technology (<https://www.nature.com/articles/s41467-022-28244-5>) and this is a major concern raised by people opposed to the technology. There are a number of new and ever evolving ways of making precise changes to DNA with CRISPR Cas-9 being only one and the Committee should be aware of the concerns and the rapidly evolving nature of the technology. Some of this came up in later presentations but only incidentally
2. Left undiscussed was the presence of community labs practicing DIY synthetic biology (<https://neo.life/2022/04/the-synthetic-biology-community-builder/>). There is a big push – including from institutions in Massachusetts – to democratize the technology. The Committee's deliberations should be informed by these efforts and consideration of ways of encouraging in Maine research in non-traditional university, research labs, and companies.
3. Related to this and treated only incidentally by the Committee in the first meeting is the rise of teaching of synthetic biology in public schools (<https://www.bu.edu/articles/2021/jump-starting-biotechnology-careers-for-boston-high-school-students/>). Not only are there serious curricula but there is also an international competition for high school to university students for the best application of synthetic biology to address real-world problems (<https://igem.org>). These and other initiatives might be worth consideration by the Committee to help position Maine in a more competitive position.
4. Ms Waring Bateman made only passing observations about synthetic biology applications for environmental outcomes and for treatment of diseases like malaria. Both of these topic have a rich literature and important lessons (e.g.: <https://www.iucn.org/news/secretariat/201905/rewriting-genes-could-have-broad-knock-effects-nature-iucn-report> and <https://targetmalaria.org>) for the Committee and I hope you will cover them in your next meeting.

Sincerely

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