Misunderstandings on Synthetic Biology
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Synthetic biology is the culmination of biology and engineering. The products of this field is aimed to better society. Currently the field is still young and the research still basic. At the same time, there is misconceptions about synthetic biology. The general public often view sci-fi thrillers that instill false fears for DNA manipulation. However, synthetic biology is not about human cloning for organ harvesting, or creating genetically superior being. Instead, synthetic biology right now is about creating genetic circuits and reinventing existing circuits for the benefits of humanity.

One primary concern is the release of synthetically designed organisms. There is a fear for the unpredictable nature of these organisms if they were released from labs. This is a valid concern that synthetic biology labs take very seriously. In each of these labs there are multiple safety liaisons and coordinators that have the responsibility to manage and enforce lab safety regulations based on the bio-safety level of the labs. These regulations involve limiting the travel of organisms used in synthetic biology within the lab itself, often in designated rooms, hoods and or spaces. Additionally, many of the organisms synthetic biology labs work with utilize harmless bacteria such as *E. coli* or plant such as Arabidopsis. Projects involving these organisms are aimed to better understand how biochemical path way works and identify useful pathways and to modify these pathways that could benefit our society. Many of the aims of these projects involve generating bio-fuels as an alternative source of energy, or using plants and bacteria as detection for harmful substances. However one aspect of these projects that is still in development is the study on how these modified organisms interact with wild-types. There has not been enough studies done on the effects of cross breeding between a wild-type organism and a synthetically modified organism and the effects of the hybrids on local ecosystems. Perhaps the reason that these concerns have not been fully addressed is because many of these projects are not at the point where these synthetically modified organisms can be released for field studies. However when the time comes, there is little doubt that the scientific method will be used in the design of a controlled and quarantined system that will test the effect of these organisms in the wild.

Another concern that society has towards synthetic biology is the fear that knowledge will fall into the wrong hands. A new trend in our society is the increasing popularity of Do It Yourself (DIY) kits in all areas of interest. Starting with growing mineral crystals, DIY kits have permeated through all fields of biology. Kits come with increasing complexity and more easily available with websites selling DIY synthetic biology kits. As proof of concept for DIY science, college students have been able to build a set of homemade lab tools capable of performing experiments. Despite of the fact that knowledge is readily accessible on the internet, the costs and permits needed in obtaining the equipment and space to conduct experiments will put a damper on people with ulterior motives.

To dissolve the distrust society has towards synthetic biology there needs to be greater transparency. Scientists must try to communicate better with the general public. The public needs to make an effort to try to understand synthetic biology and science. Gaps between science and society can be bridged through better education in the public and private school systems, public science seminars and increased presence in society. Through education, everyone and anyone

who goes to school will learn the basics of synthetic biology, its risks and potentions. Seminars offered to the public helps to educate adults in what synthetic biology in an easy to understand way. Working with media outlets to make productions on synthetic biology can help increase the circulation of scientific terms and understanding .

At this point, synthetic biologist and the rest of the society are out of sync. The synbio community is trying but not hard enough to bring better understanding of synthetic biology to the public. We hope that the future of synthetic biology will be more integrated with society where there is a clear understanding on what the scientists do and what society expect.