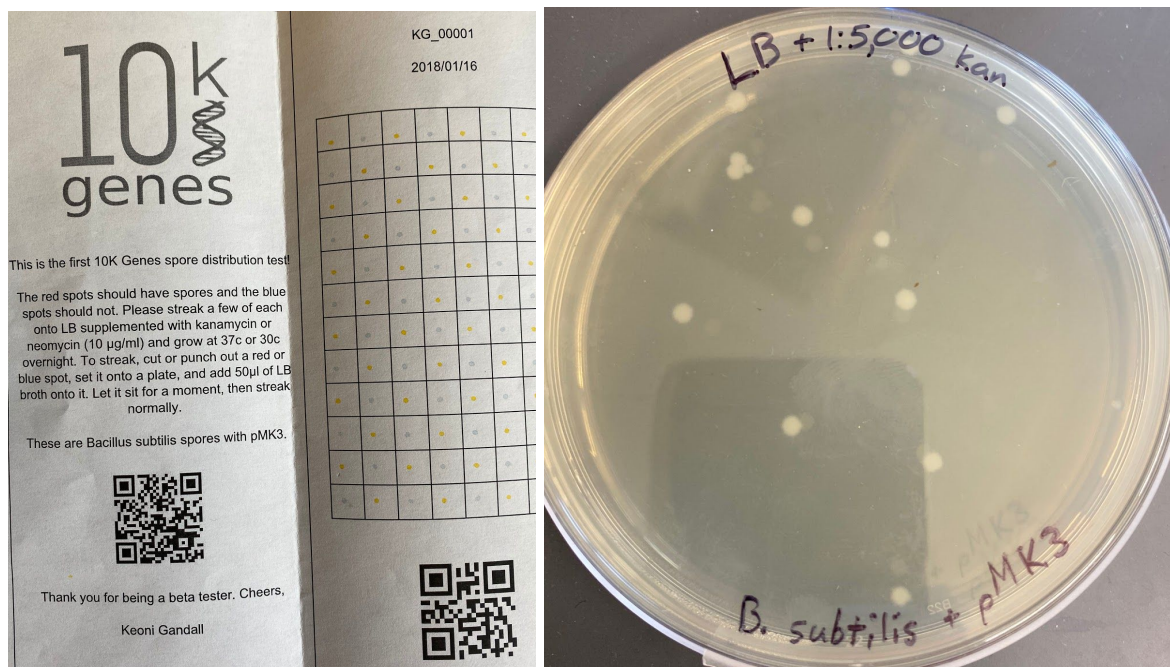


SporeNet #1

Universal access to basic tools in order to participate in the future bioeconomy is an important goal to achieve for biotechnology to benefit all people and the planet. However, current methods to distribute large quantities of DNA are costly, require additional transformation, or require expensive freezers.

A solution to those problems is the shipping of DNA in spores, in particular, *Bacillus subtilis* spores. These spores are able to survive for decades at room temperature on paper[1], and can be easily revived by putting the paper containing the spores in an environment where they can grow, such as into LB broth. If used, we can lower the cost of shipping and storage of DNA parts by many orders of magnitude.

I propose, in order to test if we can efficiently ship in spores, we create the **SporeNet #1** collection. This collection is intended to test the efficiency of storing and shipping *Bacillus subtilis* spores quickly with the least amount of work for the BioBricks team. In order to do this, we are going to directly synthesize a common *Bacillus subtilis* origin of replication and resistance marker along with each part that we wish to distribute so no further subcloning or vector uploading process needs to take place. We plan on synthesizing approximately ~10 DNA fragments this way with the origin and resistance marker from pMK3, a plasmid that we know we can transform into *Bacillus subtilis* in our lab and can be revived from spores years later from paper. In addition, we plan to synthesize a few more origin of replications and resistance marker pairs.



SporeNet #1 was initiated by Keoni Gandall (EndyLab, Stanford). Many people have expressed their interest in using spores for storage and distribution, so once verified in lab, we plan on testing production and distribution to a variety of labs, mostly community biology labs, who are willing to cooperate with us to make SporeNet better.

As far as we know, there are no patents on these materials, but a more comprehensive check will be done during the synthesis planning phase.

References

[1] Personal communication with Dr. Daniel R. Zeigler, the director of the Bacillus Genetic Stock Center (<http://www.bgsc.org/>)

ACCEPTED: 2019.12.10 -kg