Synthetic Genomics unveils digital-to-biological converter using digital DNA to print biologics

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A team of researchers at Synthetic Genomics (SG) has unveiled a machine they call a digital-to-biological converter—it sends digitized information describing DNA, RNA or a protein to a device that prints out synthesized versions of the original material. The team has published

a paper describing their creation in the journal *Nature Biotechnology*.

What if you could launch a machine aboard a rocket to Mars and then transmit information describing a life form, which the machine then "prints?" That is what the team at SG envisions. Or more practically, they envision sending the digitized DNA of a deadly virus from a remote outbreak zone to a research lab that uses the information to develop a vaccine. Once created, the same converter machine could then be used to print the material for creating the vaccine locally.

The device is actually a hodgepodge of smaller devices that contribute to the whole. One of the main pieces is the BioXP 3200—a synthetic DNA printer that is already marketed around the world to researchers who use it to easily create synthetic DNA samples. The rest of the pieces receive information and process it and deal with the printed materials—the head of the project at SG, for example, can send a message from his office to the machine and then walk over and collect a virus it has created. This is not a means for creating life, the researchers note, because viruses are not considered forms of life. Instead, it is described as a "digital to biological converter for on-demand production of biologics."

Researchers at SG have used the device to remotely synthesize viruses and claim they are on the cusp of doing the same with a so-called minimal cell, a major step toward remotely printing material for creating living organisms. But first, they have to fix what they describe as an unacceptable rate of mutations.

In their paper and announcement, the company highlights the positive uses for the machine, but notably avoid mentioning the negative—the ability to use the machine to produce a virus at a given location that could be released as a biological weapon.

More information: Kent S Boles et al. Digital-to-biological converter

for on-demand production of biologics, *Nature Biotechnology* (2017). DOI: 10.1038/nbt.3859