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Do Synthetic Biologists Play God?

by Arthur Caplan

If mankind creates a microbial life form are we playing God? And, if we are, is that wrong? There is a lot going on in the emerging field of synthetic biology that makes answering these questions very important.

Scientists have been talking a lot lately about their plans to create life. J. Craig Venter, the father of modern synthetic biology, is hard at work trying to build an artificial bacterium with the smallest number of genes necessary for a living bacteria to function. He has already built a simple bacteria-eating 'minimal' virus from scratch. Jack Szostak, a Harvard molecular biologist, is trying to build a brand new life form from fatty molecules that can trap bits of nucleic acids that contain the primitive DNA-like source code for replication. And other teams around the world are busy trying to synthesize new viruses or create never before seen modified versions of others.

There is plenty of room for arguing about what it would take in terms of biological creation to lay claim to the mantle of the scientist who creates the first successful novel life form. Some argue that viruses should not count because they are parasitical-- needing another creature's genome to reproduce. The prize probably will go to the first team to be able to create a creature capable of replicating under the power of its own genetic program. Still, however life is defined, there should be no doubt that someone is going to create a new critter in the not too distant future.

This prospect leaves a lot of people ethically jittery. The possibility that humans can create life, either from pre-existing organic parts or from inorganic materials, has been the subject of considerable cultural worry and commentary from Mary Shelley's Frankenstein to Gene Roddenberry's creation of the android Data in Star Trek. While no one will be making living people from scratch anytime soon, the idea that humans can create even primitive life forms seems to some to cross a moral line. Why?

One of the problems with the admonition not to play God is the notion of 'playing.' Playing brings to mind carefree, lighthearted activity -- not the sort of thing that lends credibility to having confidence in those making new life forms. Critics of synthetic biology who invoke the playing God concern are sometimes using the notion of play to suggest that scientists are at best cavalier and at worst just screwing around when it comes to making artificial or novel life forms.

That criticism seems unfair. Those involved in the creation of synthetic new life forms do so not as a game but in the hope that they can better understand how life works and further perhaps make microbes that can benefit us all. The playing element of creating life just is not much in evidence in the motivation or just as importantly the funding of this work.

Well then what about the challenge of being godlike in making new life? Some fear that when the creation of life at human hands happens this will knock down a key theological tenet that only God can create life from non-life. Others worry that in creating new forms of life we will create something that we can neither contain nor control. And others fear that the techniques for life creation in the wrong hands would spell horrific trouble for humanity.

It is hard to credit the view that God would give us the abilities to make new life forms and then argue that to do so crosses a line that God does not want crossed. If one takes a more secular view the fact that human beings can mimic random processes that allowed life to emerge is not especially threatening to faith in the divinity.

What about hubris? Our inability to control what we might make is a problem. Or worse, what if the techniques for making new living microbes falls into the hands of those who wish to cause harm?

It is not clear that we cannot control new life forms. But it surely is clear that we would be prudent to both create mechanisms for monitoring what is going on and then for controlling who has access to new living things as well as accountability as to where they are allowed to roam. In all candor, we have not done the best job controlling biologically engineered life to date as anyone struggling to control the spread of GMO pollen and seeds can attest. Nor have we been especially good at controlling unwanted living things from getting into places where they are not wanted and cause great damage such as kudzu, starlings, rabbits, Japanese beetles, northern pike and many other non-native species.

But the admonition not to play god is at best understood as a note to be very cautious and very careful about where novel life forms go, when to put them into the environment and who to allow to learn the techniques for creating nasty life forms. This advice is surely sound but it is not sufficient to bring work on synthetic life forms to a halt.

The time to start monitoring, regulating and controlling synthetic biology is now. There is no clear mandate as to which agencies around the world have such authority or what criteria and with level of transparency they should act. The good news is there is still time to solve these questions. The bad news is that if we don't, God help us because novel lifeforms will soon be with us.

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