

Game Changer 2: Synthetic Biology

Transcript

Our second major transformation is Synthetic Biology, which you can think of as: biology as engineering. And this of course comes about because today we are decoding genomes. We've already decoded the human genome, and we continue to decode the genomes of other life in our world. What Synthetic Biology is able to do is approach this as cutting and pasting DNA. So as they decode the genome, they figure out what these snippets and pieces of DNA do, and it's like cutting and pasting these functions together to create an organism, or part of an organism, that functions in a way that you want it to function. And of course we're able to do this today because of advances in biotechnology and tools like CRISPR CAS9. We're able to actually not just edit genomes, but edit them in such a way that if that organism has offspring, it will pass on those traits and it becomes part of its DNA legacy; it becomes part of its genealogy.

You see some of this today. In places like China, which has a difference in ethics than we do, you see how they've already successfully modified a baby using these techniques. Looking forward at the massive future potential that Synthetic Biology promises, you're looking at incredibly individually tailored medicine—being able to use genomes and DNA to really, really target things, and you're looking at things like designer babies, and human modification. This is really looking at biology as a factory. So it's not just editing organisms and using it for medicine, but it's actually using life forms and biology to produce things—feedstocks, and fuels, and other things. On the flip side—the sort of negative potential of all this—there's the possibility for massive ecological disruption. Part of the downside of these things is that these tools are digital, and so the folks who are using them are not just scientists in very expensive labs; today using computers and equipment you can purchase, this stuff is being experimented with and perfected by students and youth. So Synthetic Biology—biology as engineering—is a huge potential strategic issue for everyone in the future.

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