Ginkgo Bioworks is hoping to spread nothing but excitement about its line of genetically engineered (GE) materials that are good for the planet. “As a society, we’re not talking about the full breadth of what GMOs are capable of doing,” says Christina Agapakis, Creative Director at Ginkgo. “Among so many industrial applications, genetic engineering is being used today to make transformative medicines—engineering a patient’s own immune cells to fight cancer—and to help make plants grow. We’re very passionate about what biology can do.”

In the case of Ginkgo Bioworks, genetic engineering is being used to produce a wide range of enzymes and specialty chemical products, including fragrances. While many natural scents are sourced from flowers and other extracts, this can lead to overharvesting and shortages. By cultivating these fragrances in GE yeasts, the maker can disconnect from the unstable supply chain.

Engineers at Ginkgo synthesize DNA chemically - so instead of cutting and pasting genes from one organism to another, the scientists can build large libraries of DNA sequences and are able to test many versions simultaneously. Ginkgo is also bringing synthetic biology tools to agriculture through a new joint venture with Bayer—Joyn Bio. Joyn is focused on engineering plant probiotics—microbes that can help plants grow, including bacteria that can reduce the amount of nitrogen fertilizer. Certain crops like soybeans are able to work with bacteria in their roots to get their own nitrogen from the air and self-fertilize. Joyn Bio is emulating this process and using it for a variety of crops.

Ginkgo Bioworks designs more DNA than anyone on earth, totaling more than 250 million base pairs last year. Ginkgo Bioworks recently announced it raised $275 million in Series D funding to build out its Bioworks3 production facility.

The company credits early SBIR grants from NSF, DARPA and NIH as the propelling force that got them off the ground. Today, Ginkgo employs about 175 individuals at its Boston headquarters.

Ginkgo’s organisms are powering innovation in flavors & fragrance, food & nutrition, agriculture, health, and even consumer electronics.

**The term “GMO”** comes with a wide variety of preconceived notions, but Ginkgo Bioworks is hoping to spread nothing but excitement about its line of genetically engineered (GE) materials that are good for the planet. “As a society, we’re not talking about the full breadth of what GMOs are capable of doing,” says Christina Agapakis, Creative Director at Ginkgo. “Among so many industrial applications, genetic engineering is being used today to make transformative medicines—engineering a patient’s own immune cells to fight cancer—and to help make plants grow. We’re very passionate about what biology can do.”

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