

STAT

Biohackers are about open-access to science, not DIY pandemics. Stop misrepresenting us

By Daniel Grushkin June 4, 2018



A class at Genspace, a community lab in Brooklyn. *Courtesy David Chuchuca*

Some people call me a biohacker. My colleagues like the term because it sounds cool, and journalists like it because it gets clicks. I prefer being called a community

biologist, do-it-yourself biologist, or even a citizen scientist, terms that are all interchangeable with biohacker.

The New York Times recently [published a story](#)² warning the public about biohackers who are [using CRISPR](#)³, a bioengineering tool that lets researchers make tiny and specific edits to DNA. The article assembled a number of news items — which included a biotech executive pricking himself with a homemade herpes treatment, scientists at University of Alberta in Edmonton synthesizing cowpox, and work at my community lab in Brooklyn — to paint a picture of biohackers working underground to create the next global apocalypse. As the author publicized on Twitter:

That celebrity biohacker who straps a GoPro camera to his forehead and streams experiments on himself from his garage? Yeah, even he's concerned. Here's my latest for [@nytimes](#)⁴ on the path to a D.I.Y. pandemic: <https://t.co/lKnM0N3efR>⁵

— Emily Baumgaertner (@EmilyJBaum) [May 14, 2018](#)⁶

Yet the truth is that community labs like ours have more to do with science outreach and education than the scary-sounding research mentioned in the article. These labs, also known as biohacker spaces, are community hubs where people from diverse backgrounds and a range of ages meet to learn about biotechnology, work on projects, and share know-how and equipment.

This isn't the first time the newspaper of record has published a story about so-called sinister biohackers. In 2012, during a controversy around a scientific journal that [published a study](#)⁷ conducted by university scientists that could be used to make a more virulent strain of influenza, the Times published, "[Amateur Biologists Are New Fear in Making a Mutant Flu Virus](#)⁸." Of note, six years later, no biohacker has released the next pandemic. To my knowledge, none have even attempted to work with flu.

Todd Kuiken, a researcher at North Carolina State University, and I combatted these myths in "Seven Myths and Realities about Do-It-Yourself Biology," [a report](#)¹¹ that was published by the Woodrow Wilson Center.

The formula for these types of stories is all too easy. Take a new technology that creates public unease. Pair it with apocryphal stories of amateurs using it outside of academic or industrial labs. Sprinkle in a few quotes from concerned biosecurity experts. And let social media take it from there.

The problem with these articles is that they sacrifice the social good that community labs offer — educational, economic, scientific, and otherwise — at the altar of biosecurity. Good reporting should balance risks with benefits. It should recognize that there may be more malevolent risks that can come from restricting scientific knowledge to sanctioned scientists, or "licensed" practitioners as Harvard researcher George Church suggests in the recent New York Times article. Restricting access not only hinders innovation, it also stifles informed civil discourse about how best to use

new biotechnologies.

Community biology started largely because the tools for learning biotechnology were locked behind the doors of academia, where the price for admittance is upwards of \$40,000 per year or five to seven years of indentured servitude as a doctoral or post-doctoral student in an academic lab. These are steep prices to pay to explore one's interest in science, and they exclude those who can't afford to pay it.

The origin of [Genspace](#)¹², the community lab where I work, got its start nine years ago when a group of people met in my Park Slope living room to learn more about bioengineering by inserting a gene into bacteria that caused it to glow green. The lesson wasn't groundbreaking — it was high school AP biology level science. The *real* discovery was the number of people willing to sit around a table in a stranger's apartment to explore biology.

Today, Genspace is a full-scale teaching lab in Sunset Park, Brooklyn. More than 100 groups and facilities around the world have emulated this model.

Far from representing biosecurity threats, labs like ours are reaching into neighborhoods and educating people with hands-on science at a depth most schools and museums cannot provide. Students from under-resourced high schools come to Genspace four days a week over the summer to learn the fundamentals of molecular biology and lab techniques. By the end of August, they'll have learned how to collaborate on their own research projects and have a bridge to the

burgeoning [\\$370 billion bioeconomy](#)¹³.

Genspace offers a similar bridge for adults who take classes or pay monthly membership fees. On any given day at our lab, you might encounter a former NASA electrical engineer bioengineering bacterium to act as photographic film; an artist building electronics powered by moss; a pair of Ph.D. scientists who have turned their graduate work into a company; a barista who has become an expert mycologist; or dozens of hobbyists simply exploring the natural world through DNA.

A few individuals associated with biohacking [have experimented on themselves](#)¹⁵. For the most part, the citizen science community recognizes these as publicity stunts. Community labs have been extremely conscientious about safety — from the very start of the movement, they adopted a [code of ethics](#)¹⁶, established a system to provide [access to professional biosafety officers](#)¹⁷, and have working relationships with the FBI.

Despite all the positives the biohacking community provides, should we ignore their benefits because someone shouts bioterrorism? No. Rather than portraying community biology as a threat, it's time for the media — and the public — to see it as a public resource.

A biohacker I once met shared his vision for the future of community biology, and it struck me how well it fit with the scientific community's own hopes for public engagement. He imagined a community lab in every neighborhood where people could come together to learn about the latest discoveries, appreciate the value

of the scientific method, and use the tools of biotech to explore the beauty and complexity of the natural world.

At a time when scientists feel the need to [march in the defense of science](#)¹⁸, this sounds like a vision worth pursuing. I'd hate to see it marred by misplaced fear.

Daniel Grushkin is co-founder and executive director of Genspace, and founder of the [Biodesign Challenge](#)¹⁹.

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Links

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