

Theanne Schiros Textile Scientist

Words by Rita Nakouzi
Photography by Matin Zad

Dr. Theanne Schiros is nursing an emotional hangover. Her Fashion Institute of Technology students were honored at the global Biodesign challenge for their project Werewool. Schiros and a small group of students worked on making a fiber using proteins from human cells. Yet, they didn't get the votes for the event's top award, and she was feeling their disappointment after three months of hard work, but the extraordinary discovery had buoyed them—they created a universal platform for producing fibers using any cellular protein, human or otherwise. Awards aside, the team has a chance to change the world, and their fiber discovery kit can help everyone explore with it. "We want to open-source it because we want to be part of the solution," Schiros says. "We made a platform to explore together."

Schiros is passionate about science—talking to her about her work feels like talking to a kid who's excited to share a new toy with you—yet she's still down-to-earth, even two decades into her career. After college, she worked in a contemporary art gallery, then decided she wanted to work on sustainability; she spent the next ten years getting a PhD in physics at Stanford and doing post-doctoral work at Columbia. She has worked with Engineers Without Borders in Haiti installing a three-kilowatt solar panel system that allowed a school to blossom from 12 kids under a mango tree to 1,600 children using computers. She's also worked with the United Nations and the Economic Community of West African States on a renewable energy engineering program. Those experiences empowered her but she didn't want to stay solely in research—she wanted to teach and help people make breakthroughs. Being a professor is what satisfies her most. "It's really luxurious to be an educator," Schiros says, "because you get to spend time with young people and really consider things and ideas. Education is a right but also a luxury."

She started teaching at FIT in 2014, answering a call for a professor of Physics and Chemistry with a focus on sustainability. Teaching science at a fashion college pulled her out of her own silo and allowed her to make a real-world impact. "If I had gone to

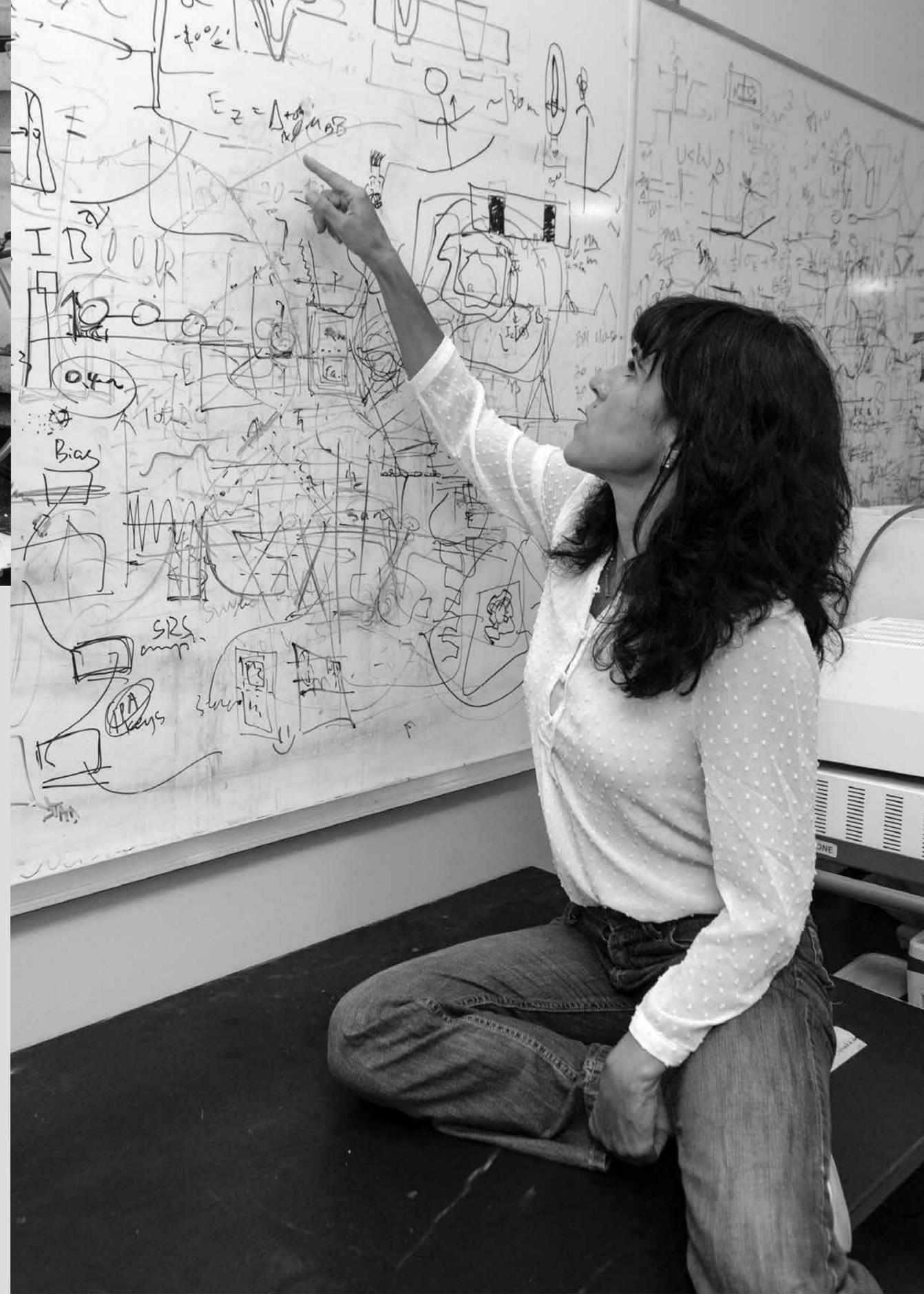
a tier-one research school, I would not have been able to provide something very different from everyone else," she says.

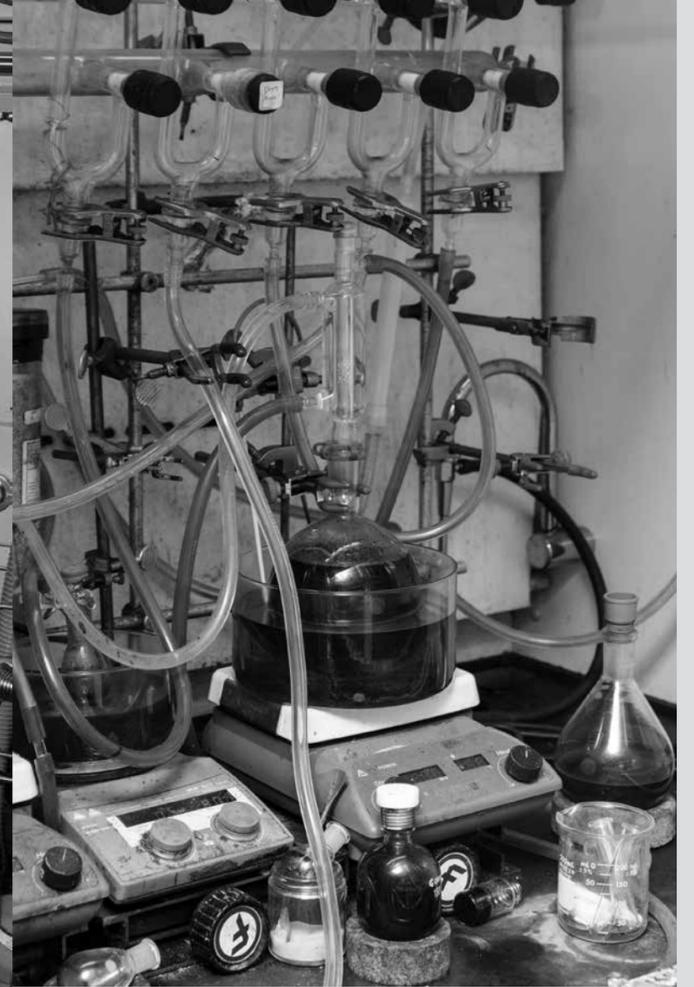
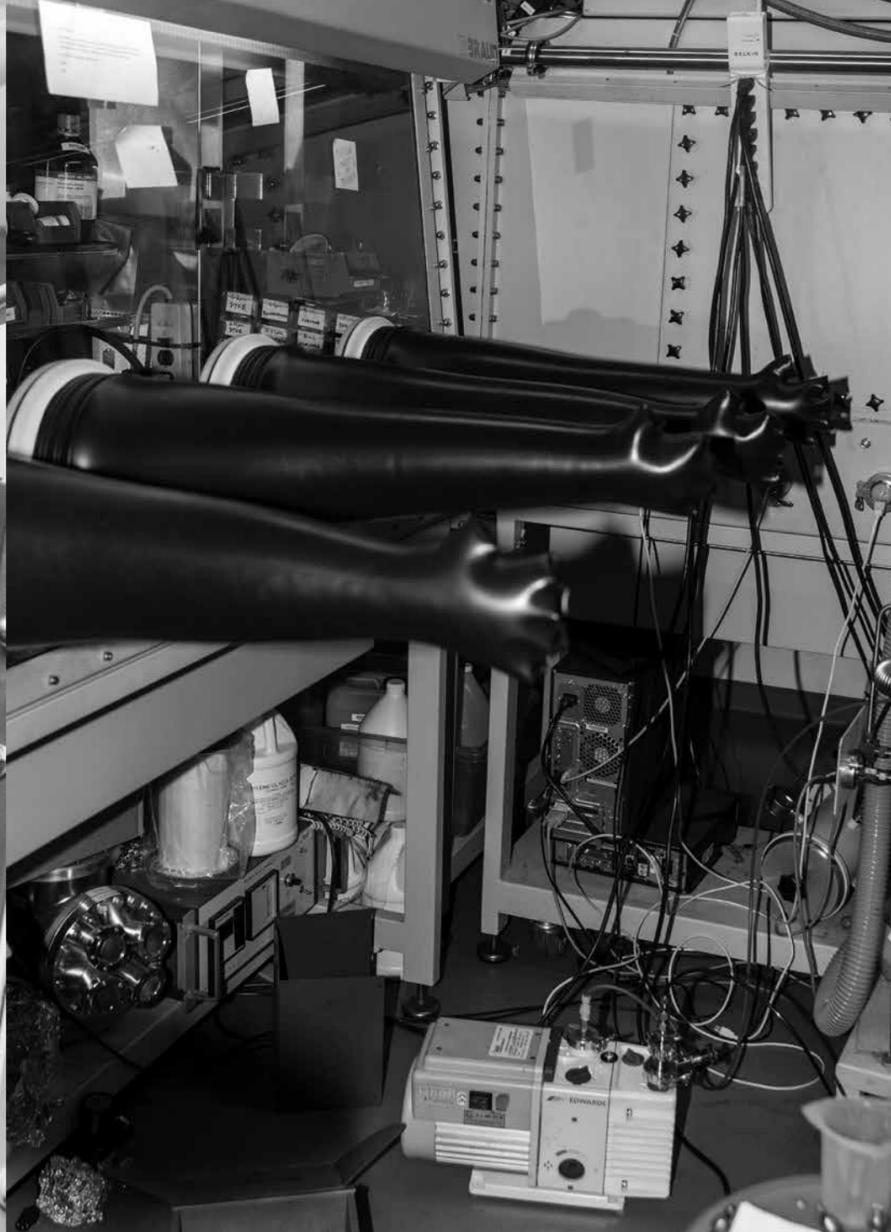
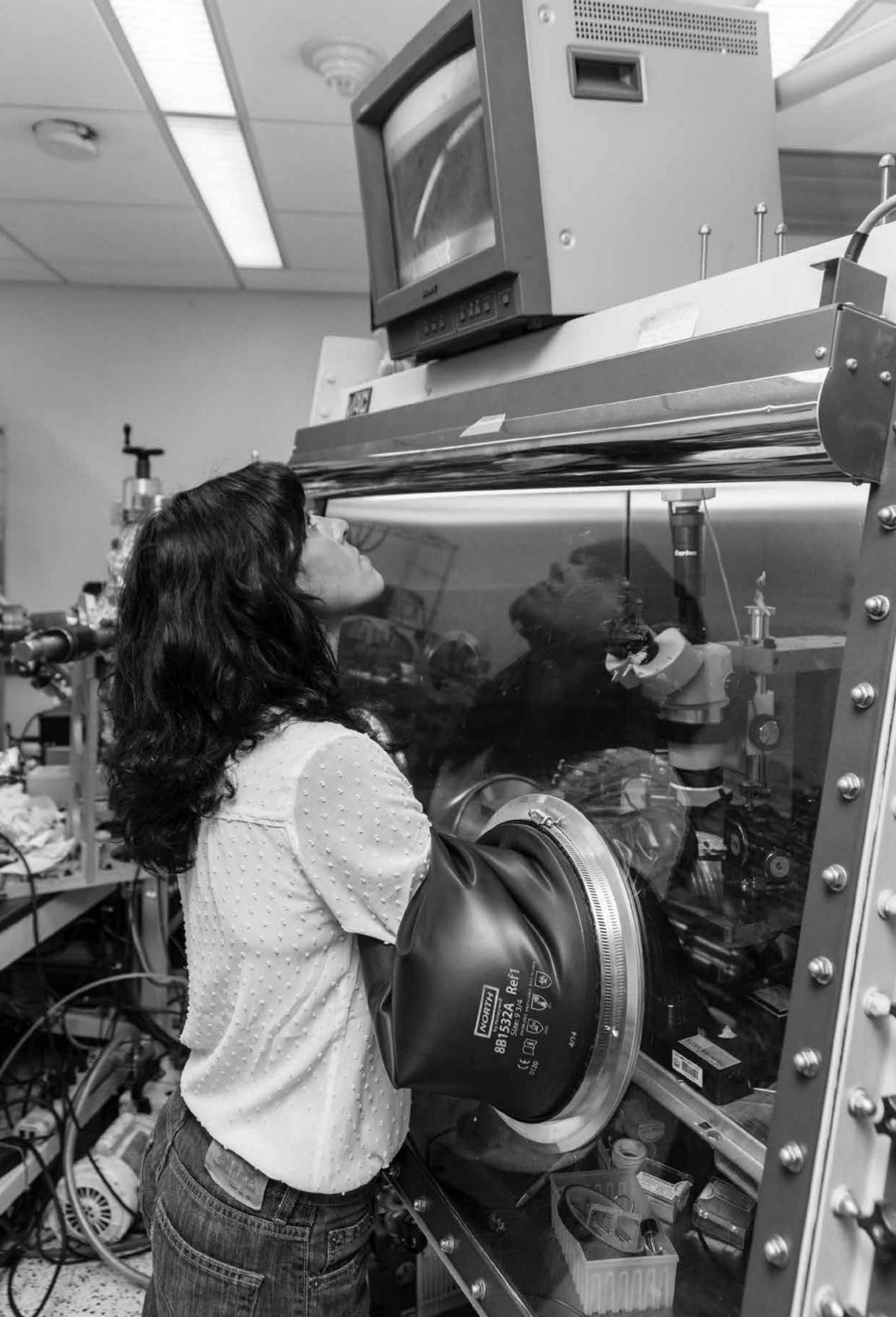
At FIT, Schiros is dismantling perceived barriers between design and science. Knowing global problems increasingly demand interdisciplinary solutions, she gives students an opportunity to explore through project-based learning. She teaches science not by walking students through what others have done in the past but by allowing them to become part of a greater solution for the future.

In 2016, a Biodesign challenge offered art and design students at universities around the world the chance to envision future applications of how cells, microbes, and other living things can remake products and processes. FIT decided to participate, and Schiros became the faculty advisor. The timing was right; her students had been studying sustainability and thinking about closed-loop circular economies. Now, they had an opportunity to think beyond the conventional wisdom of whether we should use organic cotton or bamboo. They could consider the vast potential of nature to solve problems.

"The Biodesign challenge becomes a platform for students to explore these areas without any pressure," she says. "There's no grades. You explore ideas with a faculty volunteer and other students who are working on their own time." This was an elective, as well as an intellectual journey, that a small group embarked on with her lead. "The fact that three textile development students, a physicist, and a biohacker went from cellular protein to fiber in less than three months shows the power of citizen science and what we can do when we work together," Schiros says of the Biodesign challenge.

This year, the Werewool team started by exploring how we interact with our planet and extract raw materials. The reality is that all textiles have a big environmental footprint. So long as textiles are made using fossil fuels, livestock, and agriculture, true sustainability is unreachable. But Schiros' team began thinking about how to extract proteins from the human body in order to create a fiber. If the protein from your body can be transformed





into a fiber, then you could make clothes from a swab of the inside of your cheek.

With the help of Sebastian Cocioba of Binomica Labs, the group built a fiber using a human DNA sequence and a cell extracted from the bleached side of a red fluorescent coral, proving one could, indeed, make clothes from a swab of the inside of the human cheek.

This isn't the first time Schiros forged a game changing initiative—in the past two years, she's worked with a team of students to create a knit fiber using kelp. Algiknit, as the initiative is known, is now working on creating a shoe as well.

Besides her work with students at FIT, she's using mycelium to create yoga blocks, serving platters, and large planters. She's also working on a microbial cellulose flash tent for firefighters and non-toxic, flame-retardant, biodegradable displays with modular and reusable lighting for trade shows. In the health sector, she's working on a cancer-detection garment with flexible electronics for home monitoring.

All said and done, Schiros describes herself as a "delusional optimist," a humbler way of saying she believes anything is possible. Asked if the damage we've caused the planet is too much for us to rectify, her reply is this: Earth is 4.6 billion years old, and in

the past 50 years, humans have changed it more than any natural geological disaster in the last 4 billion years. We are responsible for getting ourselves into this in just half a century, and we can still get ourselves out of it. In other words: "It's not hopeless."

If that's her delusional optimism talking, fine, but as long as she's continuing to teach and lead young people who want to build the future, then there's still a science-based reason to hope. Schiros is a woman who's studied at Stanford and Columbia and studied indigenous tribes around the world searching for ways to incorporate their wisdom. She's also a mother. "Families think a lot about their children's futures," she says, "but it's not connected to the things that will support a healthy planet with healthy people and children. There's a lack of understanding that the huge increase of autoimmune disease is directly linked to the plastics and chemicals streaming through our products. Almost every indigenous culture has a saying that we don't inherit the earth from our ancestors but we borrow it from our grandchildren. We have a responsibility for all the children of the world to leave them a healthy planet."

Lucky for us, we've got her on our side.