

Your Next Outfit Could Be Made From Spider Silk

Over the last few decades, several research groups have been producing and testing materials inspired by spider webs. One of the ways to do this is by creating replicas of spider silk based on spidroins, the proteins that make up spider silk and are the central building blocks of spider webs. Spiders can produce spidroins, but it's not exactly feasible to employ a factory full of spiders and have them create spidroins on demand. People have certainly thought about it, but it's very time-consuming and according to a recent review, another issue is that spiders show "cannibalistic behavior". They'd eat each other if they were bred to scale up spider silk production!

So how else can you make spidroins? Like other proteins, spidroins are encoded by genes, so if you know the genetic code, it's possible to produce recombinant spidroins in other organisms. That has been the main method that researchers have been using to produce spider silk without spiders. It also makes it possible to change the spidroin so that it has the desired properties of being able to form strong fibers, but adjust it for purposes other than "making a spider web".

One way that scientists have achieved this in the past is by expressing the protein in goat milk. Now defunct company Nexia produced a fiber called BioSteel in this way, but wasn't able to scale it up to commercial proportions. Still, BioSteel itself was functional, and in 2012 artist Sruli Recht used it to [create a shirt](#), which demonstrates how recombinant spider silk could be used in textiles.



Another way to produce spider silk without spiders is by expressing the spidroin proteins in micro-organisms such as bacteria. Several research groups and companies have been going down this route. It's also the production process used by Japanese biotech company Spiber, which produces Brewed Protein, a proprietary fiber that they've used to create replacements for different types of fabrics. Their materials have been showcased on the runway at Paris Fashion Week 2020 in a collection by Yuima Nakazato



There's a lot of potential for spiderwebs beyond Halloween decorations!

Eva Amsen, Forbes, Oct 30, 2022