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# What COVID-19 looks like as a stunning work of art

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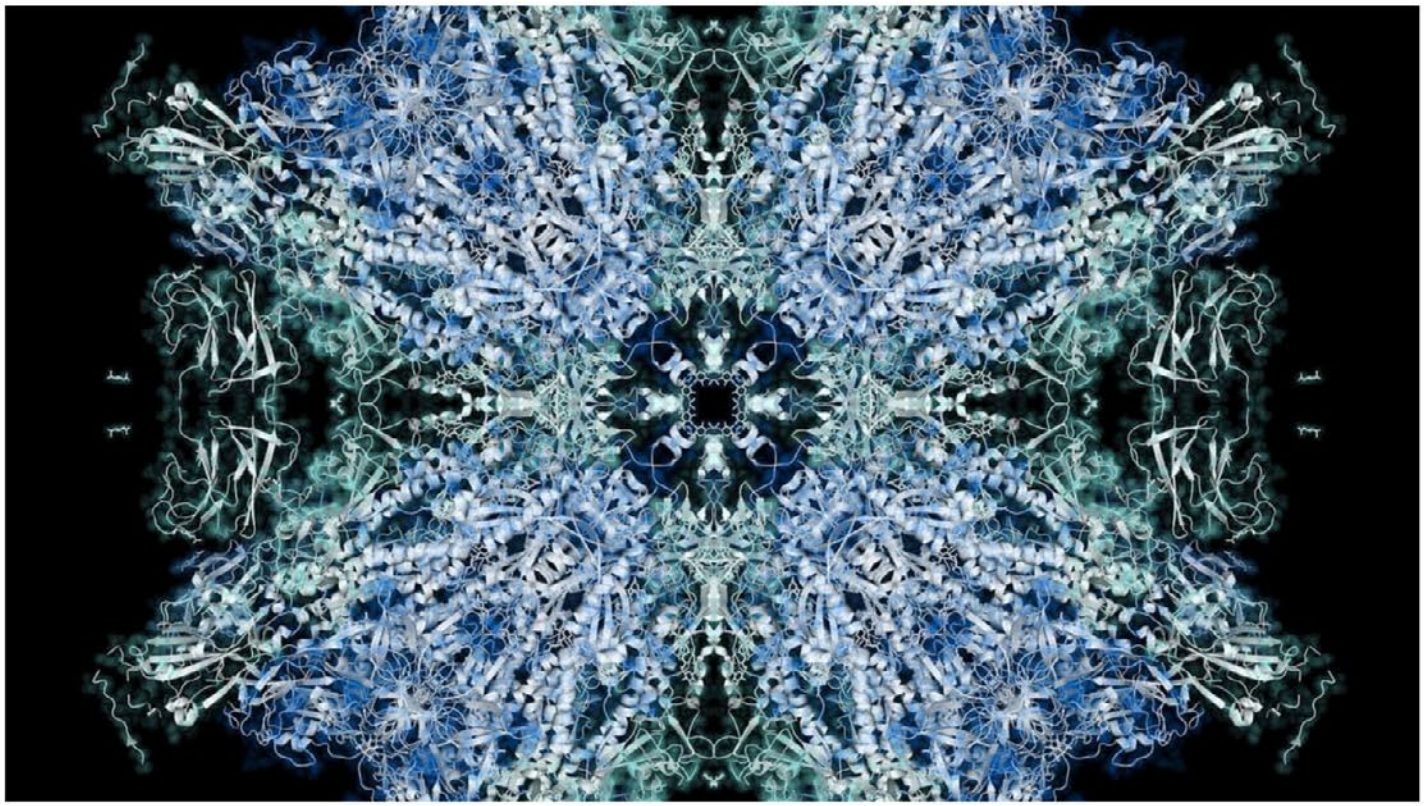

***"...If the virus responsible for causing COVID-19, became a piece of art, what would it look like? That's the exact question that Laura Splan asked herself..."***

## Fast Company

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Article by Suzanne Labarre
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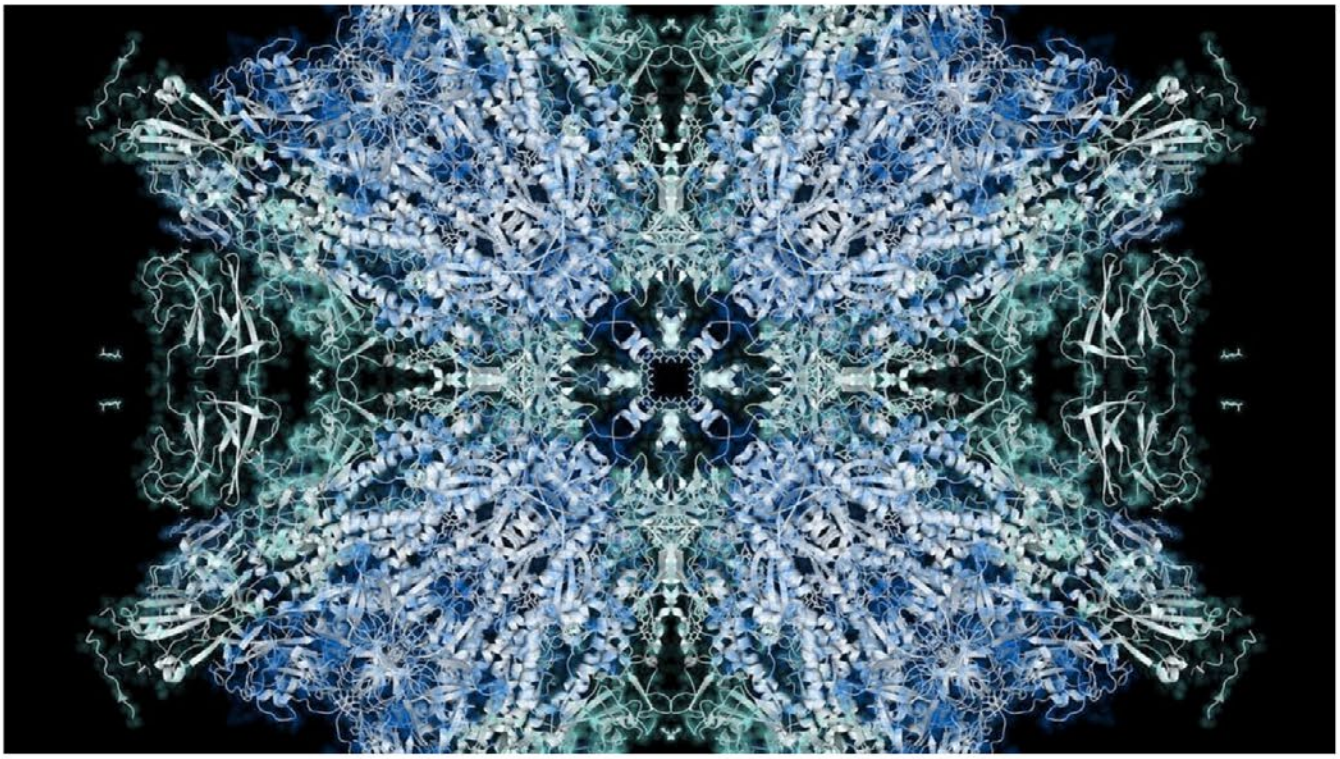


[Photo: Courtesy Laura Splan]

BY SUZANNE LABARRE 5 MINUTE READ

If SARS-CoV-2, the virus responsible for causing COVID-19, became a piece of art, what would it look like? That's the exact question that Laura Splan, a Brooklyn-based interdisciplinary artist, asked herself. It was early 2020 and Splan was in the midst of doing her second BioArt Residency with Integral Molecular, a biotechnological company based in Philadelphia, when the World Health Organization declared COVID-19 a global pandemic. As an artist whose work often meshes science and art, Splan was in the right place at the right time and already had been shadowing a team of biotech scientists studying membrane protein antibody discovery.


"I was learning about their research and watching them do everything from bench lab experiments to molecular visualization, and they were very generous about explaining to me what they were doing and what some of the materials they were dealing with were," she said. "This is how I started learning more about the use of llamas and alpacas in antibody production."

Membrane protein antibody discovery involves isolating and manipulating specific parts of a cell to study the markers of disease and immunity. In the lab, the scientists were using PyMOL, an open-source molecular visualization system that's commonly used by members of the science community. PyMOL maps the structure of viruses to develop potential treatments through the study of the antibodies of different species, such as llamas, alpacas, and chickens. During Splan's visits to the lab, the scientists introduced her to the software, which she began applying to her own studio work.

Splan decided to target the antibodies of llamas and alpacas, two species that also happened to be the main focus of her previous artist residency with the lab in 2018. That time, she created several intricately woven sculptures in a series called "Conformations," made using 200 pounds of sheared wool acquired via donation from a laboratory that housed the animals at a Pennsylvania farm. (Those pieces were on display in fall 2019 as part of a solo exhibition at Esther Klein Gallery in Philadelphia.)

"I started by making sculptures out of the wool, which led to researching how [antibodies from llamas and alpacas] are being used to produce vaccines," she said. "I began making animations using PyMOL. Materially, the two projects felt like very different tangents, but conceptually they're both grounded in abstraction and interspecies entanglement.

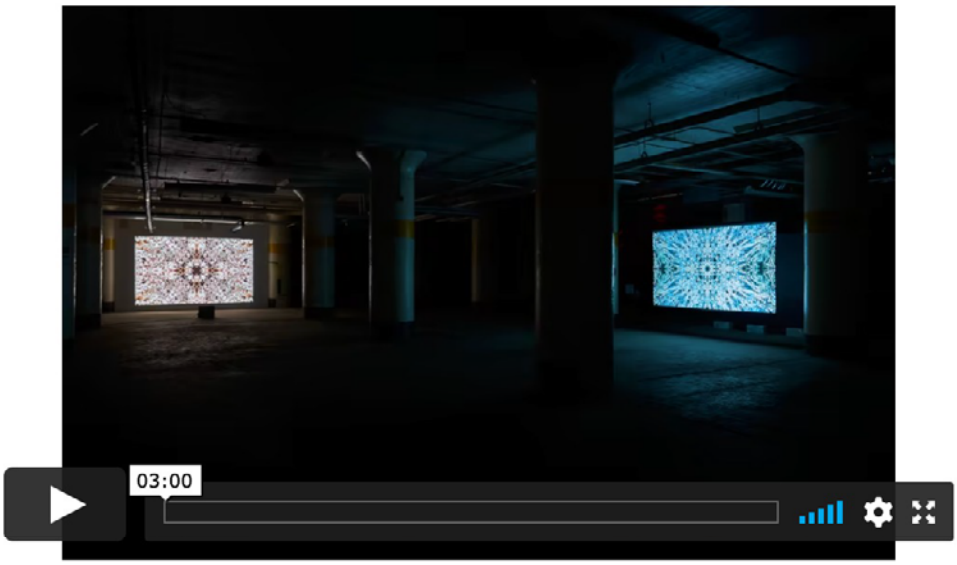
Right as Splan dove deeper into her project, COVID-19 was on the brink of becoming a global pandemic.

"It was a natural progression for me to start looking at models of SARS-CoV-2," she said. "The llamas whose wool I was working with were being used to produce antibodies for SARS-CoV-2 vaccine research, so I was using data and materials that were immediately relevant."

Splan relied on her experience studying biology as an undergrad at the University of California Irvine, along with her years of researching diseases, epidemics, pandemics, and public health, all themes that figure prominently into her vast portfolio of artwork. She extracted information from lab databases from around the world that she found using the Protein Data Bank, and researched models related to the virus, such as human cell receptors called ACE2 that SARS-CoV-2 spike proteins latch onto to infect the cells, alongside models of llama nanobodies.

"One of the things that really interested me about the PyMOL software is that it's an abstraction upon an abstraction upon an abstraction," she said. "The animations are made from models of the virus that are based on images that are aggregations of imaging of the virus. There are all these layers of abstraction in the ways that we're even able to relate to the virus itself. These layers of invisibility and layers of abstraction are what I began playing with."

She combined the models she downloaded from the database and using the software's sculpting tool, she could manipulate the forms of different proteins with a few clicks of her mouse, making generative animations that raveled and unraveled proteins using the software's morphing feature.



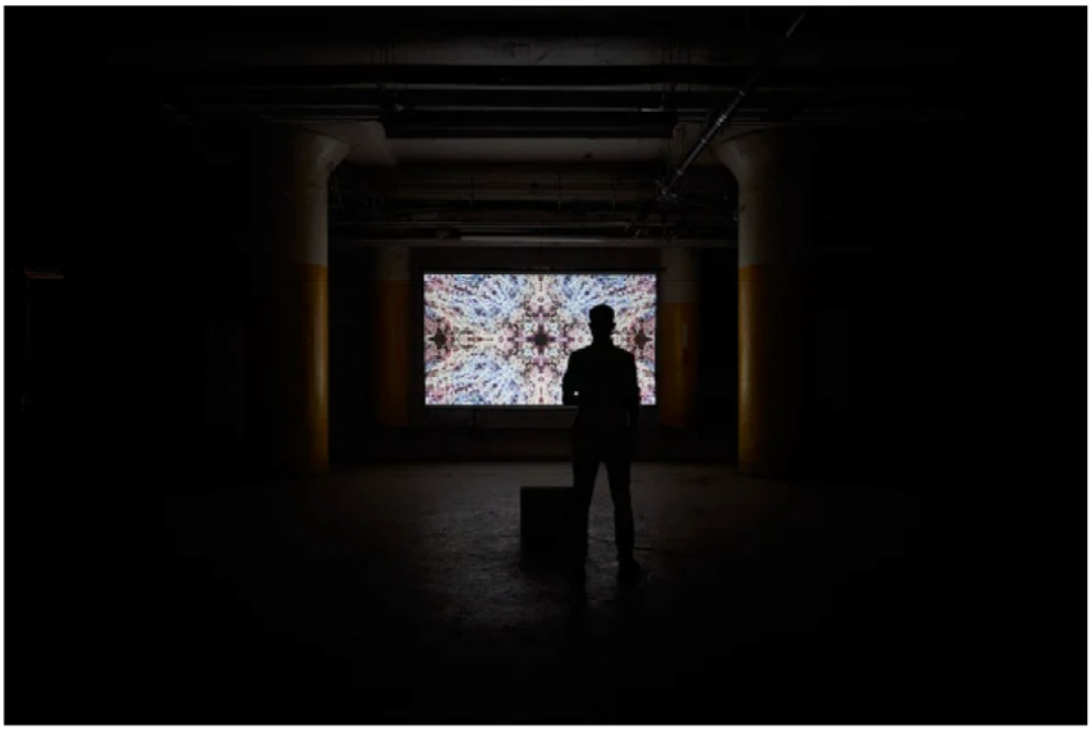

That discovery was what led to "Unraveling," Splan's recent series of kaleidoscopic animations that are both captivating and hypnotic. Because viruses are too small to have any color, Splan relied on PyMOL's broad palette of colors to add vibrancy and dimension to each of her animations, using colors pulled from nature such as sky blue, salmon, forest, and slate. For the animation series, she also used Adobe After Effects.

Splan exclusively used the spike protein found on the surface of the coronavirus, the part of the virus that attaches itself to human cells, which is represented in the software as alpha helices, (the ribbony spirals), and beta sheets (the arrows).

"Ultimately, these are amino-acid sequences, and because of the biochemistry of that sequence, the protein folds in a certain way through propulsion and attraction," Splan said. "When you're watching these animations, you can see these individual ribbon structures folding and unfolding and coming together and falling apart. That coming apart is what I did manually in the software. I unraveled the protein, and I animated it coming back together."

Splan was able to accomplish this using the software's sculpting tool, an application that scientists at the lab weren't aware of until she showed them, and they now use regularly in their own research.

"It was a matter of a lot of playful experimentation with these tools that are used for very serious research and seeing how far I could take that," she said. "In a way, the animations transcended the software itself."



[Photo: Courtesy Laura Splan]

Earlier this year, Splan invited the public to experience her animations in person by appointment only during a solo exhibition inside a cavernous 15,000-square-foot warehouse at BioBAT Art Space in Brooklyn. Inside, her work was projected onto large screens and paired with music recorded over Zoom by Frank Masciocchi, an instrumentation engineer at Integral Molecular, who played the A chord on his guitar 33 times. (The number 33 is significant since it's the same number of adenine nucleotides, or molecules, at the end of the mRNA termination sequence of SARS-CoV-2.)

"It was an interesting challenge because we're in a global health crisis that has become incredibly tragic and politicized," Splan said. "I wanted to approach my work with something immediate but also in a sensitive way. It was surprising how many people commented that the animations were soothing and meditative and relaxing, especially at a moment when most people were in a very different mindset because of the pandemic. I didn't set out to make something therapeutic, but that's the effect it's had on people who visited the show."

"Unraveling" is on display now through October 24 at Triennial Bruges in Belgium.

ABOUT THE AUTHOR

Suzanne LaBarre is the editor of Co.Design. Previously, she was the online content director of Popular Science and has written for the New York Times, the New York Observer, Newsday, I.D More