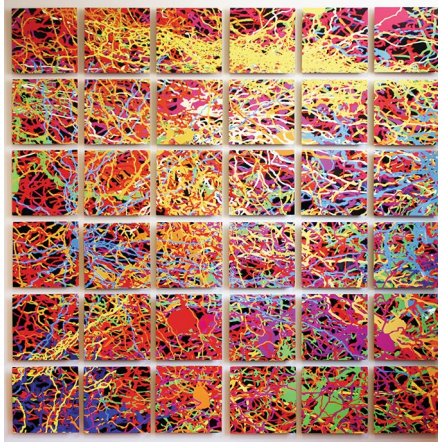


Brain wonders

Neuroscience as a form of abstract expressionism

As an artist, I am interested in one of the most complex puzzles that science has examined: the brain. From intracellular structures to the mechanisms of consciousness, my work spans the levels of biology, addressing the beliefs, theories and findings of neuroscience. Beginning with biological form or data, my work (www.juliabuntaine.com) departs into the world of aesthetics as I manipulate the idea through the use of scale, metaphor, material and form. Unlike articles and raw data, scientific ideas in the form of art inherently demand subjective judgement and interpretation, and my goal is to provide my viewer an alternative way to understand the wonders of biology within ourselves.

For Pollock, my largest two-dimensional work, is a visual celebration of the form of the neuron. It combines cutting-edge imagery in neuroscience with the style of abstract expressionism. To create this work, I sourced images of 3D computer-rendered neurons from EyeWire, a brain-mapping game born from the lab of neuroscientist Sebastian Seung at Princeton University. This citizen-science game allows hundreds of thousands of users all around the globe to participate in mapping the brain, slice by slice. The neurons that are digitally reconstructed through this process are stunning in their clarity and variety. Seeing



For Pollock.

these images inspired me to create my own work with them.

One of the most beautiful things about the brain, to me, is how messy it is — a jungle more than a computer; connections, branches and information flow that is happening every which way, intertwined in a web complex beyond our comprehension. I find this notion humbling, daunting and profoundly beautiful. This image of the brain is very different from what usually appears in textbooks or newspaper articles.

In many ways, the brain is a vast territory we have only begun to explore.

With the images from EyeWire, I wanted to elicit this feeling of jungle chaos. To do this, I manipulated the colour and arrangement of over 100 neurons, creating a web across the entire composition of 36 panels. I chose to make the piece into panels to play on the notion of modularity. Although the panels may appear to be interchangeable, moving one panel into the place of another would put the whole picture — the whole web of the brain — into disorder. As for the colours, I used a bright, high-contrast palette in order to excite as much of my viewers' visual cortex as possible. As they gaze at this 6 feet by 6 feet composition, I hope to provide an aesthetic view into the brain at human scale. Transforming the micro into macro, *For Pollock* allows a bodily interaction with forms too small for the eye to see, and with the biology that creates and comprises our experience of reality. □

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Field experiments

Art galleries are the right setting to promote the dialogue between scientists and the general public.

How should genetic engineering be applied in humans? What do we have to keep in mind when delegating decisions to artificial intelligence? It is in the realm of culture, where societal change is negotiated. Conversations like these cannot happen in scientific laboratories alone and need to engage a wider public.

STATE Studio (<https://state-studio.com>) is an art gallery in Berlin, Germany, that invites its visitors to explore cutting-edge science — and the important questions related to it — through the work of artists and designers. The artworks are tangible outcomes of the artist's own personal engagement during the process of creation and invite the public to look at a subject



Opening even of artwork *Living Canvas* by Fara Peluso and Solaga. Credit: Anne Freitag

matter from new angles and engage with topics and questions that may otherwise be hard to access.

Scientists can be closely involved in such a process: hosting artists in labs are a fruitful opportunity for them. Indeed, artist residencies at scientific institutions are on the rise worldwide. Commitment from both the participating artists and scientists is essential when engaging in such programmes. Friction is to be expected — and sought after. Artists look at the research from a different perspective and are not bound in their practice by the rules and principles of the scientific method. It helps to realize that the purpose of artworks need not be to express scientific facts or claim future applications. Much rather, they engage with different contexts of the scientific research and may serve as a bridge, raising questions about possible