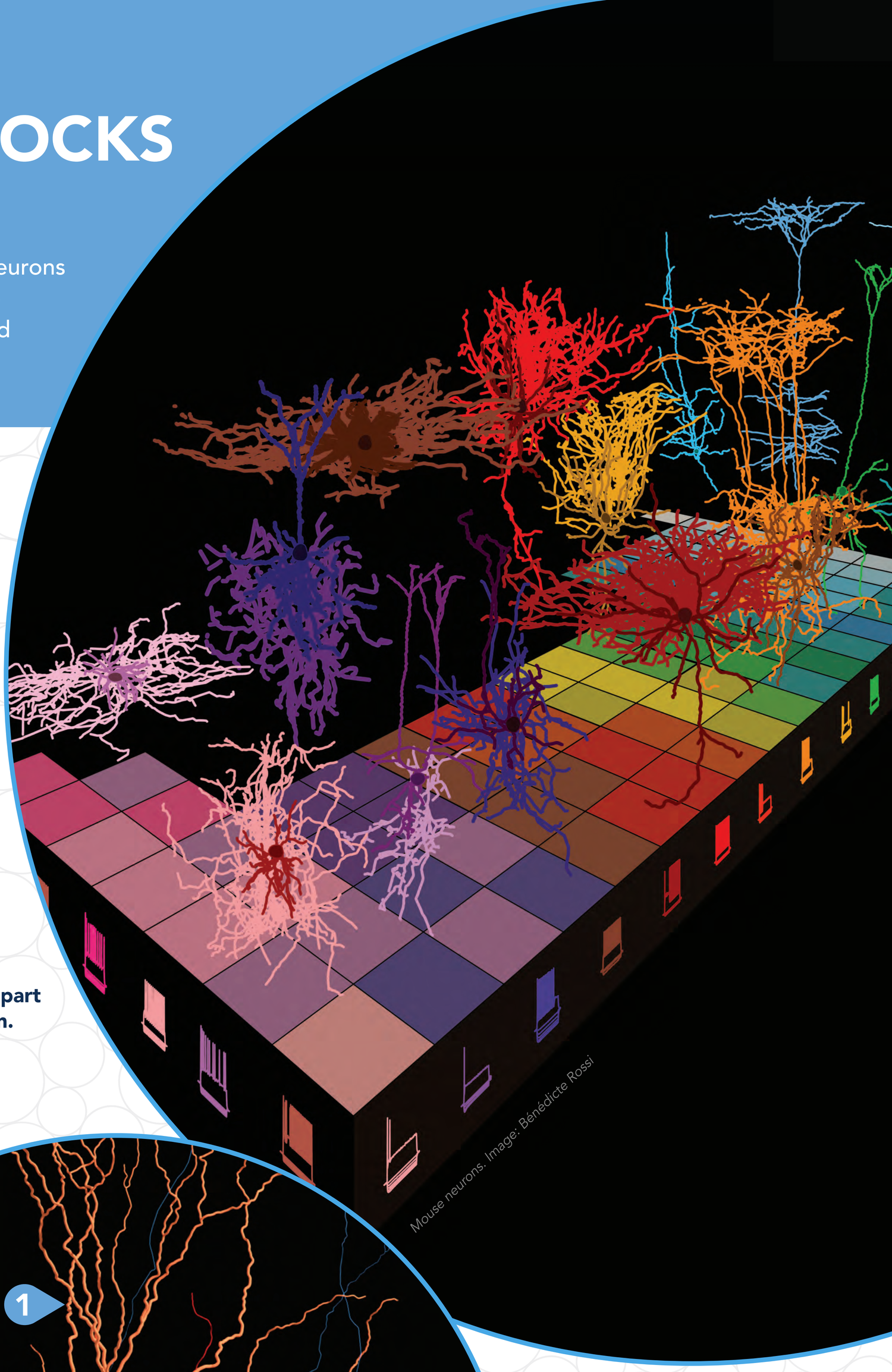
THE BUILDING BLOCKS OF YOUR BRAIN

Adult human brains have between **86-100 billion** neurons and every single one is unique. The structure of the neuron helps it communicate with its neighbors, and together they let you move, feel, think and more.



Mouse neurons. Image: Bénédicte Rossi

CLASSIFYING BILLIONS OF NEURONS:

A PERIODIC TABLE FOR THE BRAIN

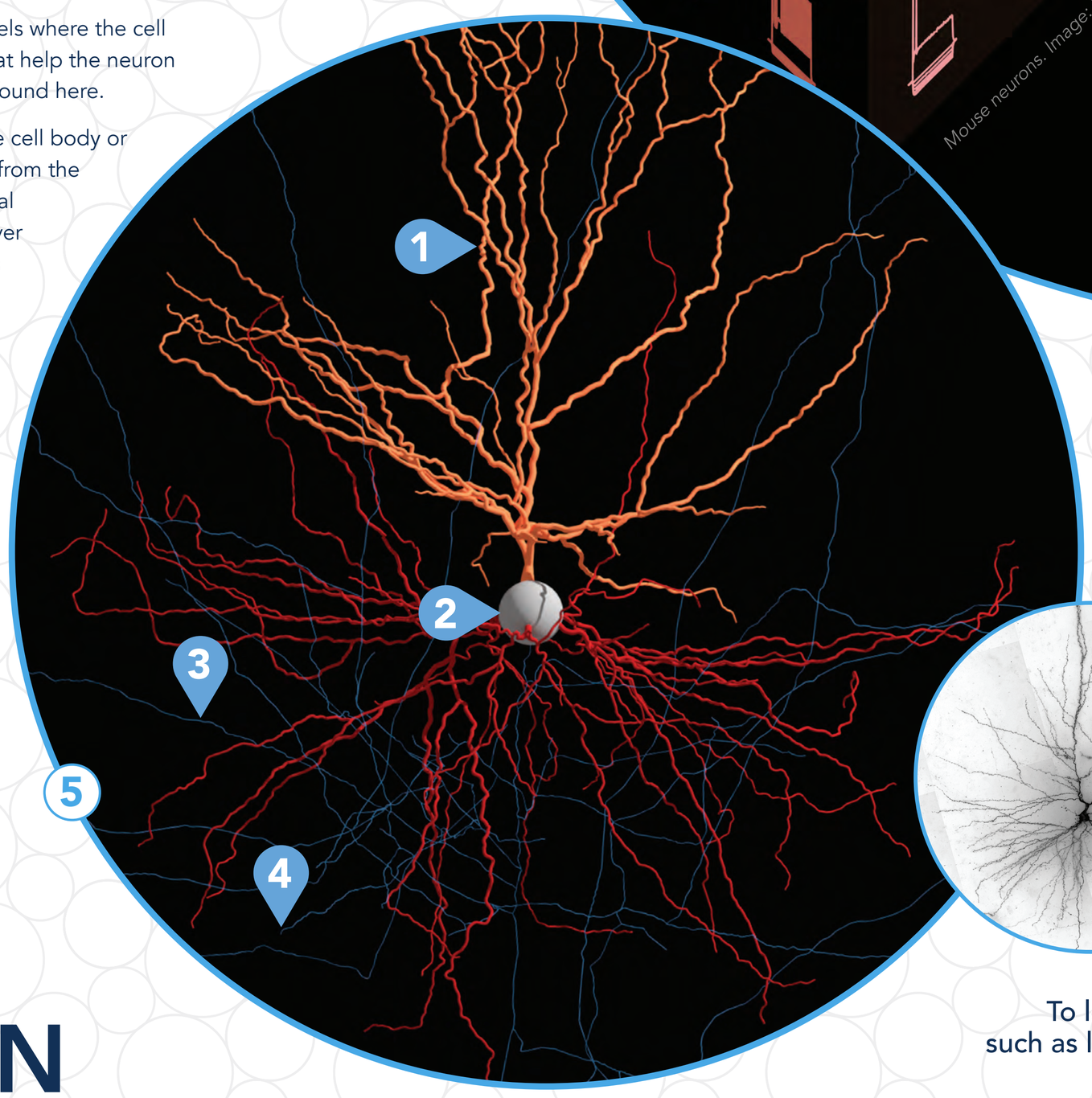
In chemistry, a periodic table categorizes atoms into elements. Scientists at the Allen Institute are working towards a classification system—a periodic table of sorts—for neurons. They're using machine learning algorithms to sort neurons based on their shape, connections, gene expression, and electrical properties.

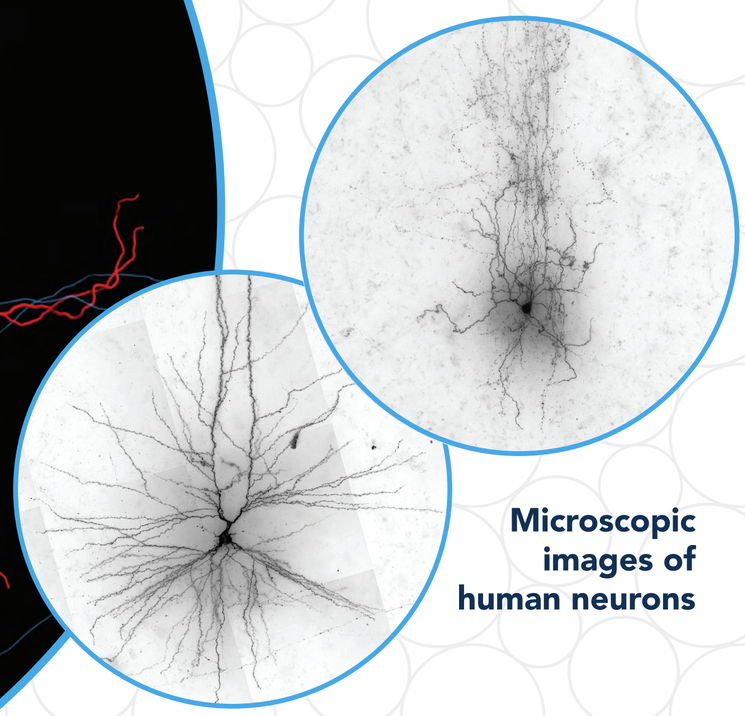
Many neurological diseases only affect certain types of neurons, so categorization is helpful in developing treatments that target affected cell types.

THE PARTS OF A NEURON

This neuron comes from the cortex – the most complex part of the brain. It is a model tracing of a real human neuron.

1. **DENDRITES:** They receive chemical signals, called neurotransmitters, that are released by other neurons. Each neuron may have only a few or many dendrites.
2. **CELL BODY:** This sphere models where the cell body is located. Organelles that help the neuron function, like the nucleus, are found here.
3. **AXONS:** They extend from the cell body or dendrite and carry signals out from the cell. In some neurons, the signal travels slowly, and in others, over 120 meters per second – that's about 250mph!
4. **AXON TERMINAL:** This neuron releases its own neurotransmitters from the axon terminal onto other neurons. The amount and type of neurotransmitters a neuron releases sends a signal to the next neuron to become more or less active.
5. **CELL MEMBRANE:** It's a layer that surrounds the neuron, just like any other cell in your body. Its properties mean the cell can be measured and influenced with electricity as well as with chemical neurotransmitters.





Microscopic images of human neurons

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