



RESEARCH2REALITY

Shining a light on research & innovation.

Finding Missed Connections Among the 100 Billion

An interview with **Julie Lefebvre**, Neuroscientist
University of Toronto

I continue to study neuroscience because I want to understand how the brain works; to understand how all the different types of nerve cells that make up the nervous system, how they develop and how they make specific connections with one another. And it's those connections that then give rise to function: the ability to see, or the ability to move.

What is neural circuitry?

The neural circuitry is a term we use to describe how many, many different nerve cells form a wiring diagram. This is the coding that gives rise to an action, or for you to be able to interpret what you're seeing in front of you. And we think many of the neural circuits, if they had not assembled properly, can give rise to a number of neural disorders. What we want to know is how the wiring diagram of the neural circuit is organized, and what it regulates. What's its function? What particular task in the brain is it computing?

What is your lab focusing on right now?

We're particularly interested in studying neural circuits for vision. In the retina, this is the piece of nervous tissue in your eye, it's not just a screen. It does a lot more. In order to deal with the complexity of nervous information, it has decided to organize itself into different neural circuits that have different jobs. What it does is split the image into many, many different aspects, such as colour, such as motion.

TODAY'S RESEARCH. TOMORROW'S REALITY.



What the future promise of your research?

With someone who has blindness, it's the neural circuits in the retina, the first set of neural circuits that are unable to fire or respond to the stimulation in the visual world. So we're interested in understanding how we can improve or restore some of those bits that make up the neural circuits so that they can then regain some of that visual function.