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Bringing Balance to the (Brain's) Force

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

We know very little about how the brain works and how it develops. Our goal is by understanding in much more detail how the brain develops and how these connections are established, we hope that this information will provide the blueprint in order to repair a lot of these disorders.

How does your research affect conditions like epilepsy?

There are many hypotheses as to why epilepsy arises, but we're particularly interested in understanding how it happens in the brain. What are the root causes of it? And one idea that we're suggesting is that in the developing brain, there are not enough of the inhibitory cells that develop properly. So sometimes there's too much excitation, and what happens is that the neural circuits form a short circuit, and then it gives rise to epilepsy.

Some of the future possibilities is that we'll be able to put back more of these inhibitory nerve cells in development. In work from others and work that we're pursuing in our lab, we see that nerve cells are very plastic. That means that these cells can be taken from one scenario and placed, or maybe in the dish and then placed into a brain. And so then by providing these inhibitory nerve cells that we think are lost in diseases like epilepsy and autism, by restoring them, then this will help bring back the balance into neural circuits, and bring back healthy function of the brain.