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Opening the 'Black Box' of the Human Brain

An Interview with **Freda Miller**, Neuroscientist, Hospital for Sick Children, Medicine by Design, University of Toronto

I really believe this is the golden age of biology and medicine. We live in a time when something as complex as the brain, you can actually imagine deciphering it. And you know what, 10 or 20 years ago, I mean, that was just a pipe dream. It was imagination.

The brain is put together from a thin sheet of parent cells called stem cells. And stem cells are miraculous in many ways. The problem is we don't really understand those cells right now. So our project is to really provide as complete a description of those cells as we possibly can, and to gather the information that will then allow us, in a rational and fast-moving way, to tweak them pharmacologically or in other ways, to actually help them to repair the brain following an injury.

Why do we need to understand the brain?

So the space between discovery and actual use of those discoveries has become shorter and shorter. And the reason for that is because you cannot fix something that you don't understand. So the brain has been like a black box for decades and decades. People have been fascinated with it and they've only been able to find little tiny things out about it. And honestly, coming up with a rational therapeutic has been a pipe dream, essentially.

But now, because we know so much more and because we've got so much more technology and because we're becoming increasingly collaborative, then you can move quickly. Even before a paper is published, if you have a great idea, especially with something like Medicine by Design, you can go to your colleagues immediately and start moving down the therapeutic road.