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Tuesday, March 3, 2009

## [The Art and Science of Wiring Up Brains](#)

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### ARCHIVES

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This should be a good introduction to the new field of brain hacking.

From *Wired*:

### The Art and Science of Wiring Up Bra...



Boyden directs MIT's Neuroengineering and Neuromedia Lab, part of the MIT Media Lab. He explains the mission of neuroengineering this way: "If we take seriously the idea that our minds are implemented in the circuits of our brains, then it becomes a top priority to understand how to engineer brains for the better."

Here, neuroscience is not merely studied, it is applied. Which is why we're off again, to see the molecular engineer's microscope, the viral growing area, and the machine where they cut micron-thin slices of mouse brains in order to evaluate what changes they've made using the rest of the equipment.

Human beings worked out a few thousand years ago that the brain is where the action is. Since then we've been trying to get it to do what we want it to.

Like a computer, the power of the brain arises out of how the many parts constantly and quickly talk to each other. But unlike the electrical circuits in a computer, brain cells aren't physically connected to one another. Neurons communicate across tiny empty spaces, called synapses, that lie between the tendrils of neuronal cell bodies. This almost-but-not-quite touching is what gives them such flexibility as those connections form and fade throughout our lives.

Most of what we think of as our ability to learn and change comes from the pattern of those synapses. In a way, history is the story of trying to manipulate those patterns through learning, faith, love, drugs, food, exercise — in short, anything and everything. We have spent thousands of years working out indirect ways of changing the contours of our brains to change the shape of our minds.

Neuroengineers, on the other hand, take a pragmatic and direct approach. They are trying to change brains by going in and just changing them.

More from *Wired*: [Rewiring the Brain: Inside the New Science of Neuroengineering](#), [Dial H for Happiness: How Neuroengineering May Change Your Brain](#)



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