



Origins of Déjà Vu

The brain cranks out memories near its center, in a looped wishbone of tissue called the hippocampus. But a new study suggests only a small chunk of it, called the dentate gyrus, is responsible for "episodic" memories—information that allows us to tell similar places and situations apart.

The finding helps explain where déjà vu originates in the brain, and why it happens more frequently with increasing age and with brain-disease patients, said MIT neuroscientist Susumu Tonegawa. The study is detailed today in the online version of the journal *Science*.

Like a computer logging its programs' activities, the dentate gyrus notes a situation's pattern—it's visual, audio, smell, time and other cues for the body's future reference. So what happens when its abilities are jammed?

When Tonegawa and his team bred mice without a fully-functional dentate gyrus, the rodents struggled to tell the difference between two similar but different situations.

"These animals normally have a distinct ability to distinguish between situations," Tonegawa said, like humans. "But without the dentate gyrus they were very mixed up."

Déjà vu is a memory problem, Tonegawa explained, occurring when our brains struggle to tell the difference between two extremely similar situations. As people age, Tonegawa said déjà-vu-like confusion happens more often—and it also happens in people suffering from brain diseases like Alzheimer's. "It's not surprising," he said, "when you consider the fact that there's a loss of or damage to cells in the dentate gyrus."

As an aging neuroscientist, Tonegawa admitted it's a typical phenomenon with him. "I do a lot of traveling so I show up in brand new airports, and my brain tells me it's been here before," he said. "But the rest of my brain knows better."