

Brain adds cells in puberty to navigate adult world

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The brain adds new cells during puberty to help navigate the complex social world of adulthood, two Michigan State University neuroscientists report in the current issue of the *Proceedings of the National Academy of Sciences*.

Scientists used to think the brain cells you're born with are all you get. After studies revealed the birth of new brain cells in adults, conventional wisdom held that such growth was limited to two [brain regions](#) associated with memory and smell.

But in the past few years, researchers in MSU's neuroscience program have shown that mammalian brains also add cells during puberty in the amygdala and interconnected regions where it was thought no new growth occurred. The amygdala plays an important role in helping the brain make sense of social cues. For hamsters, it picks up signals transmitted by smell through pheromones; in humans, the amygdala evaluates [facial expressions](#) and body language.

"These regions are important for social behaviors, particularly [mating behavior](#)," said lead author Maggie Mohr, a doctoral student in neuroscience. "So, we thought maybe cells that are added to those [parts of the brain](#) during puberty could be important for adult reproductive function."

To test that idea, Mohr and Cheryl Sisk, MSU professor of psychology, injected male hamsters with a [chemical marker](#) to show cell birth during

puberty. When the hamsters matured into adults, the researchers allowed them to interact and mate with females.

Examining the brains immediately after that rendezvous, the researchers found new cells born during puberty had been added to the amygdala and associated regions. Some of the new cells contained a protein that indicates cell activation, which told Mohr and Sisk those cells had become part of the neural networks involved in social and sexual behavior.

"Before this study it was unclear if cells born during puberty even survived into adulthood," Mohr said. "We've shown that they can mature to become part of the [brain circuitry](#) that underlies adult behavior."

Their results also showed that more of the new [brain cells](#) survived and became functional in males raised in an enriched environment – a larger cage with a running wheel, nesting materials and other features – than in those with a plain cage.

While people act in more complicated ways than rodents, the researchers said they hope their work ultimately sheds light on human behavior.

"We don't know if cells are added to the human amygdala during puberty," Sisk said, "but we know the amygdala plays a similar role in people as in hamsters. We hope to learn whether similar mechanisms are at play as people's brains undergo the metamorphosis that occurs during puberty."

Provided by Michigan State University

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