

# Little understood cell helps mice see color

December 14 2017

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Researchers at the University of Colorado Anschutz Medical Campus have discovered that color vision in mice is far more complex than originally thought, opening the door to experiments that could potentially lead to new treatments for humans.

The study was published this week in the journal *Neuron*.

The scientists, led by Maureen Stabio, PhD, assistant professor of anatomy and neurobiology at the University of Colorado School of Medicine, discovered a new property of a little understood cell called the M5.

They knew that mice possessed light-sensitive proteins called opsins that allowed them to detect a limited range of colors. But as they investigated the role M5 cells played in this, Stabio discovered that the mice also had neurons that could compare signals from the different opsins and then send those color signals to the brain for interpretation.

"We are the first to discover this particular [color vision](#) circuit in mice," Stabio said. "We knew they had opsins but we didn't know they possessed the other two requirements for color [vision](#)."

Stabio's work focuses primarily on the cells and [circuits](#) of the retina, including a group called intrinsically photosensitive [retinal ganglion cells](#) or ipRGCs which includes the M5. These cells are primarily involved in a kind of vision known as non-image forming vision.

IpRGCs typically don't process contrast, color, faces or art. Instead, they react to ambient light levels and send that information to the brain's internal clock to put the body in synch with the rising and setting of the sun (aka the circadian rhythms).

Stabio and her colleagues found that the M5 cell, the least understood of the group, might play a role in both image and non-image forming vision.

"This adds to growing evidence that image forming and non-image forming pigments, cell types, and circuits are not as distinct as once

imagined," she said. "The two appear to be intersecting."

But the biggest surprise was discovering that the M5 [cells](#) also process color information in [mice](#). Mice are nocturnal and generally have poor vision. They navigate chiefly by using their nose and whiskers.

"What exactly they are doing with this [color](#) information remains to be discovered, but we know now there is a circuit for it and it's getting to the mouse's brain," Stabio said.

Provided by CU Anschutz Medical Campus

Citation: Little understood cell helps mice see color (2017, December 14) retrieved 18 April 2024 from <https://medicalxpress.com/news/2017-12-understood-cell-mice.html>

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