# SciNews

**Event:** Evidence Found for Skin Color in Ancient Snake Fossil

**Important Dates and Numbers:**

5 microns: Size of a chromatophore; or 1/20 the thickness of a human hair!
10 million years: Age of snake fossil
65 million years: Age of the youngest dinosaur fossils

*April 2015, Issue 28*

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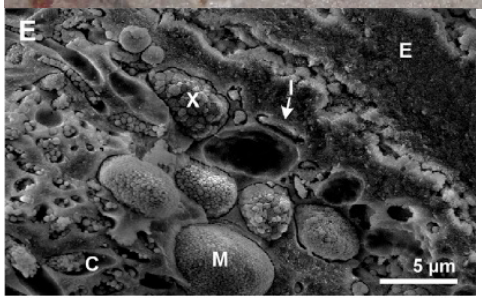
## Event Description

When you are at a museum, ever wonder how scientists know the color of an animal that lived a long time ago? Well, scientist are working hard to figure this out so they don't have to guess! Some animals, including fish and reptiles, have groups of cells called chromatophores that give skin its color. For the first time ever, scientists found chromatophores in the fossil of a snake that lived 10 million years ago. By comparing the shapes of chromatophores found in fossilized snake to those of snakes living today, scientists were able to figure out what colors the ancient snake was! Different combinations of 3 types of chromatophores - iridophores (iridescent and white), xanthophores (yellow), and melanophores (dark brown/black) - produce many colors. The scientists found that the ancient snake had different shades of green on top and its underbelly was probably a light yellow. These colors, and their pattern, are interesting because they suggest the snake had evolved to have good camouflage. This research leads the way for determining skin pigment of other animals such as dinosaurs!


Above: The snake fossil; lighter areas are snakeskin, darker lines are bones.




Left: Xanthophores (X), melanophores (M) and iridophores (I) in the snakeskin have been replaced by minerals, but their original shapes are well-preserved.

*Read about the fossil discovery - links on the SciNews website! All figures are from the research paper: McNamara et al. (2016)*

## Lesson Descriptions

*Based on the evidence this study provides, students will predict the chromatophore cells they would expect to see in a garter snake; and discuss the reasons certain colors or patterns of colors might be favored to evolve.*

The authors of the paper made a sketch of what the fossilized snake may have looked like based on the chromatophores they found (McNamara et al., 2016). Use this as an example of how to "mix" colors with different amounts of the various chromatophores. Have students sketch the chromatophores in the skin for the 3 colors in the garter snake cartoon. Have them reflect on what their color choices could represent – camouflage, mating preferences, etc.

**Lesson Materials** - *download from the SciNews website*

**(1) Snakeskin Fossil Reconstruction (to project; .pdf)**
**(2) Sketching Snakeskin (.docx):** Students will use the example from the new study to hypothesize the arrangement of chromatophores in a garter snake.
**(3) Discussion Q's and Vocab (.docx):** Scientific significance of the discovery and how color sheds light on animal adaptation.

**Next Generation Science Standards**
*MS-LS1-2: Develop a model to describe the function of a cell as a whole. (Also see MS-LS1-3.)*

**Alternative Lesson Plans** *(links on the SciNews website!)*

Design your own snake! Pick three colors and sketch the combinations of chromatophores that make them.

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**PSU/NASA Space Grant**
*Funded by PSU/NASA Space Grant Consortium*
*http://pa.spacegrant.org*

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