

Solving the mystery of the metallic sheen of fish

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The bright, metallic sheen of fish skin is due to a sophisticated system of crystals, Israeli scientists report. Courtesy of Florida Keys NMS; Photo by Bob Care

The bright, metallic sheen of fish skin — source of endless fascination for fishermen and aquarium owners — is due to a sophisticated system of crystals that enhance light reflection and may help fish hide from predators in the wild, scientists in Israel are reporting. Their study is scheduled for the current issue of ACS' *Crystal Growth & Design*.

In the new study, Lia Addadi and colleagues note that researchers have known for years that guanine crystals in the skin underneath the scales of fish reflect light to produce a mirror-like sheen.

This silvery reflectance acts as a form of camouflage that helps protect fish from predators as fish swim near the water's surface. However, the exact shape of these guanine crystals and how they work remained a mystery.

The researchers extracted guanine crystals from the skin of the Japanese Koi fish and analyzed the crystals using X-ray diffraction and an electron microscope. They compared the results to guanine crystals made in the laboratory.

The researchers found that the biogenic crystals develop in an unexpected direction that differs from the lab-made crystals and that their unique shape improves light reflectivity. The arrangement represents a “strategy evolved by fish to produce more efficient photonic crystals,” the article states.

Source: ACS

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