

New discovery finds missing hormone in birds

March 24 2014



University of Akron researchers discovered leptin in the mallard duck, peregrine falcon and zebra finch, marking the first time the hormone has been found in birds.

How does the Arctic tern (a sea bird) fly more than 80,000 miles in its roundtrip North Pole-to-South Pole migration? How does the Emperor penguin incubate eggs for months during the Antarctic winter without eating? How does the Rufous hummingbird, which weighs less than a nickel, migrate from British Columbia to Mexico? These physiological gymnastics would usually be influenced by [leptin](#), the hormone that regulates body fat storage, metabolism and appetite. However, leptin has

gone missing in [birds](#) - until now.

University of Akron researchers have discovered leptin in birds, In their "Discovery of the Elusive Leptin in Birds: Identification of Several 'Missing Links' in the Evolution of Leptin and its Receptor," published March 24, 2014 in the journal [PLOS ONE](#), UA researchers reveal their findings of leptin in the [peregrine falcon](#), [mallard duck](#) and [zebra finch](#).

UA Professor of Biology R. Joel Duff made the initial discovery by comparing ancient fish and reptile leptins to predict the bird sequence. Duff, along with undergraduate students Cameron Schmidt and Donald Gasper identified the sequence in multiple bird genomes and found that the genomic region where leptin was found is similar to that of other vertebrates. Jeremy Prokop, a former UA Integrated Bioscience doctoral student who initiated the project, then constructed computer models of the bird leptin's three-dimensional structure and performed bench experiments to show that the bird leptin can bind to a bird leptin receptor.

Richard Londravage, research team member and UA professor of biology, says that the search for leptin in birds has been a bit of a race among scientists.

"It has been a pretty big deal because people wanted to study leptin in birds for the poultry industry, for instance, to develop faster growing and tastier chicken," Londravage says, noting that, interestingly, leptin has yet to be discovered in chickens, perhaps because their gene structure varies from that of other birds.

Robert Dores, editor-in-chief of the journal *General and Comparative Endocrinology*, says the discovery represents a significant turning point in leptin study.

"This study now sets the stage for future studies on the evolution of leptin function ... and reinforces that studies on hormone sequences should be complemented by hormone receptor modeling studies," says Dores, a University of Denver professor of biological sciences. "The world of comparative endocrinology has entered the 21st century."

Provided by University of Akron

Citation: New discovery finds missing hormone in birds (2014, March 24) retrieved 23 April 2024 from <https://phys.org/news/2014-03-discovery-hormone-birds.html>

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