

Lactation hormone cues birds to be good parents

February 6 2018, by Susan Kelley

Toppling a widespread assumption that a "lactation" hormone only cues animals to produce food for their babies, Cornell researchers have shown the hormone also prompts zebra finches to be good parents.

Lowering the [hormone prolactin](#) in zebra finches reduces the time and attention both males and females spend taking care of their chicks, the study found. The research was published Jan. 3 in *Hormones and Behavior*.

"This work changes the notion that prolactin is just a lactation hormone. It's a hormone that has a more basic function of feeding in general," said lead author Kristina Smiley, Ph.D. '17.

Smiley, now a postdoctoral researcher at University of Otago, New Zealand, co-wrote the paper while at Cornell with Elizabeth Adkins-Regan, professor of psychology and of neurobiology and behavior.

The work sheds light on how the role of prolactin has evolved over time to include lactation, Smiley said.

It has long been thought in the field that prolactin not only prompts mammals to produce milk, but also cues birds to take care of their young. That's because previous studies had shown prolactin cues a few specialized birds and fish to produce regurgitated "crop" milk and milky secretions to feed their offspring.

But no studies had shown how prolactin works in birds that do not produce food from an internal source.

This research confirms that the hormone does prompt parents to feed their offspring – even in a species that does not internally produce food for its young, Smiley said.

And that has implications for our understanding of how prolactin evolved from a hormone that prompts animals to feed their offspring into one that makes an animal produce the food themselves, Smiley said.

"Since birds and fish are older evolutionarily than mammals, prolactin's larger role beyond just feeding offspring tells us prolactin has evolved to become more specialized for lactation behaviors in mammals," she said.

The researchers chose to use zebra finches for the study because both males and females parent their chicks. In the study, the team fed 25 male-female pairs a drug that suppresses prolactin dissolved in peanut oil and 25 male-females peanut oil only as a control. The birds were fed the drug for several days just before and just after their chicks hatched. The researchers also measured the temperature of the nests – a proxy for how frequently the parents were in the nest and keeping the chicks warm. They also monitored how much time the parents spent regurgitating food into the chicks' mouths.

They found that lowering prolactin either eliminated or drastically reduced both brooding and feeding the chicks for both male and female [zebra finches](#). And the pairs were far less synchronized when they did feed [chicks](#), compared to a control group. "During those two hours when that hormone was suppressed, they were providing basically no care," Smiley said. "It was very obvious."

That indicates prolactin is important for prompting parental care.

"And [parental care](#) is such an important behavior for species," Smiley said. "That's how they're going to pass on their genetic material; they have to reproduce and they have to raise their young to adults."

Smiley points out studying prolactin in [birds](#) and fish, rather than in mammals such as mice, sheds light onto how the hormone evolved. "I'm really interested in how hormones and behavior evolved," she said, "and really the only way to study that is to look across the spectrum of species that share this hormone to see what are the similarities and differences in what it does."

More information: Kristina O. Smiley et al. Lowering prolactin reduces post-hatch parental care in male and female zebra finches (*Taeniopygia guttata*), *Hormones and Behavior* (2018). DOI: 10.1016/j.yhbeh.2017.12.011

Provided by Cornell University

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