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THE *Current*

April 6, 2006

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War Between The Sexes Influences Evolution in Some Species, Say Scientists

Competition and conflict between males and females start inside the egg in some species, say scientists.

Birds, butterflies, and snakes have a genetic war between the sexes that influences the way they evolve, according to a new theory published in the April 7 issue of the journal *Science*.

"Genetic conflict is of great interest in evolutionary biology," explained first author Paige M. Miller. Miller is a postdoctoral fellow in the Department of Ecology, Evolution and Marine Biology (EEMB) at the University of California, Santa Barbara.

The recent publication of the chicken genome has sparked new interest in ZW species, explained William R. Rice, co-author and professor in the Department of EEMB at UC Santa Barbara.

Chickens serve as model organisms in many areas of research. Unlike mammals, the females are heterozygous; they have two different sex chromosomes, Z and W. In the human female, the sex chromosomes are XX; they are homozygous. Butterflies, birds and snakes are ZW species.

The authors explain that maternal-effect genes are those that are expressed in the mother, are packaged in the egg, and influence the development of offspring.

"We think that the maternal-effect genes are a new arena for conflict in ZW species," said Rice. "The mathematical models support this conclusion. 'Son killers' are predicted to accumulate on the W chromosome and 'daughter killers' to accumulate on the Z."

The scientists explain that the sexually antagonistic maternal-effect genes in ZW species lead to an evolutionary arms race. They state that maternal-effect conflict is increased in ZW species (compared with XY species) because the W, unlike the Y in humans, is expressed in both sexes through the maternal transmission to the egg.

A precedent for another type of sexual conflict is seen in the genetic battle that occurs in the placenta of most mammals and in the endosperm of plants.

Paige M. Miller is supported by a National Science Foundation Minority Postdoctoral Fellowship.

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