

# **Implications of incubation temperature modulation on Type X collagen expression in embryonic duck skeletal development**

**Author:** Amanda Prickett

**Major:** Veterinary Medicine

**Project Advisor:** Michael Lilburn and Macdonald Wick

Optimal temperature regulation is an important component of avian incubation and the process of embryonic development can be accelerated by even small increases in incubation temperature. In the current study as well as previous studies in our lab, it was shown that an increase in temperature from 99.5° to 100.5° during early incubation (0 to 10 d) increased embryonic body weight during mid-incubation (approximately 10 to 18 d) in duck embryos. The aim of this project was to specifically study the effects of increased incubation temperature on skeletal development in duck embryos. The femur and tibiotarsus of White Pekin ducks were collected at various stages of embryonic development. RNA was isolated from these tissues and used to make corresponding complimentary DNA. This cDNA was then used for a polymerase chain reaction (PCR) with a primer for Type X collagen found in the literature and the amplicon produced was consistent with the 220 base pair fragments reported in the literature. Type X collagen is a marker specific to hypertrophic chondrocytes which are associated with the terminal maturation of cartilage prior to the onset of mineralization. It was observed that Type X collagen was expressed in embryos collected from both temperature treatments as early as day 4 of incubation. These preliminary results suggest that raising the incubation temperature early in embryogenesis was not specific to cartilage maturation as determined by Type X collagen expression.