The hypothalamus controls autonomic activities, specifically in the neuroendocrine system, monitoring both reproductive and metabolic needs. Neurons within the hypothalamus have been found to produce Kisspeptin, connecting with leptin and gnRH (Gonadotropin-releasing hormone) to create an interface between metabolism and reproduction (Gao & Horvath, 2008). Kisspeptin is the protein product of the gene Kiss1 and binds to GPR54 to regulate GnRH secretion and initiate gonadotropin secretion at puberty in adult mammals. Many different reproductive products have been found to be sexually dimorphic. Previous research in mice and rats has shown that Kisspeptin is sexually dimorphic in perinatal development (Kauffman, 2009). Studies earlier in embryonic development have not been done. The hypothesis of this current research is that Kisspeptin expression in the early development of the avian hypothalamus is sexually dimorphic. Kisspeptin expression in the hypothalamus at embryonic day 7(E7), 10, and 12 of each sex was measured with immunohistochemistry and cell counting techniques. Kisspeptin expression was sexually dimorphic at E7, but no difference was found later in development. Differentiation of the ovaries begins at E7, which may mean that Kisspeptin plays a role in this event. The possibility of a time delay in Kisspeptin expression in female hypothalamic neurons may also affect development of neuronal circuitry between the sexes. Embryonic day 7 may be a critical time in the development of sexually dimorphic traits.

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