Expression of the luteinizing hormone receptor (LHR) gene in ovine non-gonadal tissues during estrous cycle

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ABSTRACT. Luteinizing hormone (LH) is an important glycoprotein hormone that regulates gonadal function in mammals and in turn regulates physiological status changes during the estrous cycle. The function of LH is mediated by luteinizing hormone receptor (LHR). In order to examine the expression patterns of the LHR gene in non-gonadal tissues during the 4 phases of the ovine estrous cycle, tissues from healthy non-pregnant adult Hu sheep were examined according to the estrous cycle for normal ovaries using real-time fluorescence quantitative PCR and ELISA methods with GAPDH as the reference gene. LHR mRNA expression levels were significantly correlated with protein concentrations and the LHR gene was abundantly expressed in olfactory bulb, hypothalamus, rumen, small intestine, kidney, and uterine tissues. When comparing the expression levels of LHR during the 4 estrous phases in particular tissues, the results showed that LHR expression levels were significantly different and relatively lower at the estrous stage in a number of non-gonadal tissues. The trends of change in LHR expression levels were highly significantly correlated between hypothalamus and rectum, hypophysis and oviduct, ileum and...
uterus, and among jejunum, olfactory bulb, and kidney (P < 0.01), and there was also significant correlation between duodenum and oviduct, hypothalamus and medulla oblongata, jejunum and uterus, omasum and abomasum, and reticulum and colon (P < 0.05). These results indicate that the ovine \textit{LHR} gene (or \textit{LH}) might control important mechanisms in non-gonadal tissues and that the level of \textit{LH} activity in some tissues may be influenced by hormonal status during the estrous cycle.

\textbf{Key words:} Luteinizing hormone receptor (LHR); ELISA; qRT-PCR; Non-gonadal tissues