

THE EFFECTS OF LEPTIN ON PLACENTAL DEVELOPMENT AND FUNCTION,
AND OFFSPRING BEHAVIOR IN MICE

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ABSTRACT

The nutritional and energy status of individuals is communicated throughout the body by means of leptin. This hormone also plays a role in implantation and placental development and function, as well as programming behavior via alteration of brain function. The current research provides insight into how leptin is involved in placental and fetal development. The goal of the first study was to determine the importance of the leptin receptors of the mouse conceptus in placental development and function. We utilized a leptin receptor knockout mouse model, and found significant alterations in gene expression in placentas lacking the receptor, suggesting that placental function may be altered. The goal of the second study was to determine the effect of maternal hyperleptinemia on offspring behavior. We compared wildtype offspring from two hyperleptinemic mouse models. Adult offspring from hyperleptinemic dams weighed less, and were more active than their controls. Female offspring from these dams consumed more food and had reduced preference for palatable food compared to their controls. Maternal hyperleptinemia during pregnancy protected offspring from weight gain by increasing activity. Overall, leptin affects placental gene expression, and possibly function, and offspring behaviors that influence energy homeostasis