Hen oocyte quality and fertility

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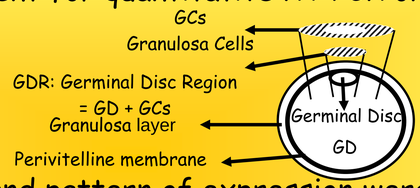
Introduction

The reproductive physiology of the hen shows numerous specificities that include oviparity and telolecithe oocyte. Moreover, the intensive selection on conformation parameters leads to a dramatic decrease in reproductive ability. This leads to investigate the regulation of the expression and function of genes involved in the maturation of the oocyte, with consequences on the development of the early embryo. This last point is very important in hen because of the late embryonic genome reactivation. The aim of the present study was to explore the expression of two genes of the TGF-β family suggested to be implicated in fertility, gdf9 and bmp15. Biological effects of BMP15 were also investigated.

Materials and Methods

mRNA was extracted from Granulosa Cells, Germinal Disc Region and embryo with tri-reagent for quantitative RT PCR on candidate genes.



Tissular specificity and pattern of expression were explored during follicular maturation and early embryo development.

In situ hybridization was performed on hen ovary to localize these genes.

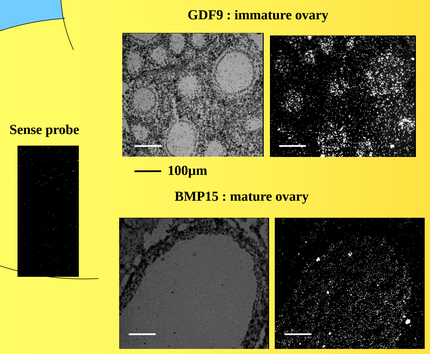
Effects of one of these genes, BMP15, were investigated on granulosa cells of F3/4, F2 and F1 follicles

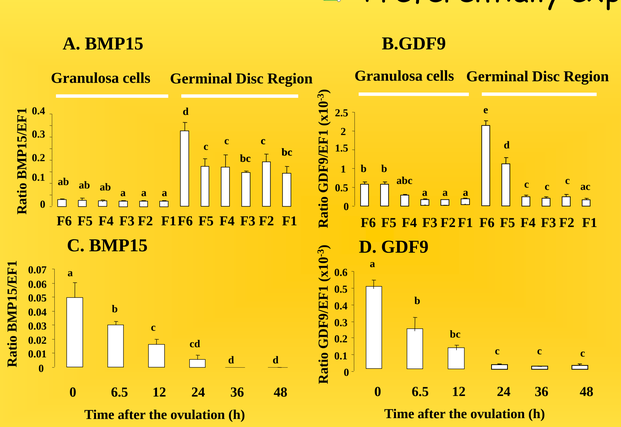
Results

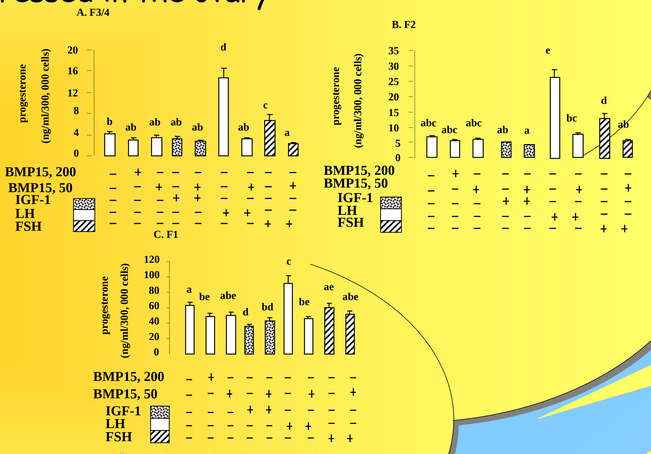
757 bp

727 bp

Preferentially expressed in the ovary







mRNA localised in the oocyte

Both of these genes are expressed in the oocyte, and their expression decrease after the ovulation

BMP15 inhibits progesterone LH- or FSH-induced secretion

bmp15 and gdf9 are expressed in the hen oocyte

Their expression decreased after the ovulation, even after the embryonic genome activation. They should be used during the follicular maturation or early embryo development

BMP15 inhibits progesterone induced secretion

BMP15 may have a key role in the female fertility in birds