

## FIPRONIL CAUSES APOPTOSIS DURING MEIOTIC MATURATION IN PORCINE OOCYTES

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### Introduction

Fipronil is a widely used and highly effective phenylpyrazole pesticide, which can kill pests through blocking GABA ( $\gamma$ -aminobutyric acid) gated chloride channels. However, it is found that fipronil and its metabolites have detrimental effects on mammalian blood cells, nerve cells and spermatogonia causing increased level of ROS and DNA damage. On the contrary, studies on the effect of fipronil on the female mammalian reproductive system have hardly reported, especially on oocytes.

### Materials and Methods

In this study porcine oocytes were chosen as a target. And Immunofluorescence, qPCR, Time-lapse and etc. were used to observe the changes in mitochondria function and cell cycle.

### Results and Discussion

The results showed that the first polar body extrusion rate significantly decreased and oocytes arrested at GV stage when treated with 100  $\mu$ M fipronil ( $p < 0.05$ ). Besides, the apoptosis and autophagy activities were enhanced in 100  $\mu$ M fipronil treatment group oocytes ( $p < 0.05$ ). Meanwhile, the fipronil caused a significant increased ROS level and more severe DNA damage inside the oocytes ( $p < 0.05$ ). In the 100  $\mu$ M fipronil group, the mitochondrial membrane potential and expression of Bcl-xL dropped and the cytochrome c was released from the mitochondria ( $p < 0.05$ ). Furthermore, the result showed a delayed increase of MPF activity during GVBD in the treatment group, which was also consistent with the lag in cyclin b1 degradation. In conclusion, the fipronil causes apoptosis and cell cycle arrest in the porcine oocyte during maturation because of the increased ROS level and DNA damage.