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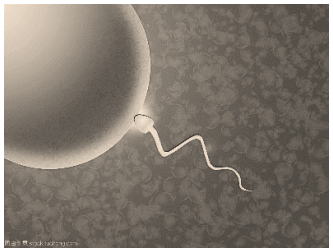
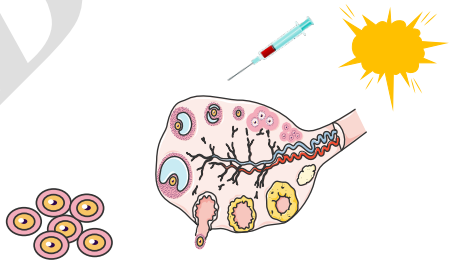
High-dose estrogen impairs demethylation of H3K27me3 by decreasing Kdm6b expression during ovarian hyperstimulation in mice

Key words: Ovarian stimulation; Histone methylation; Assisted reproductive technology (ART)

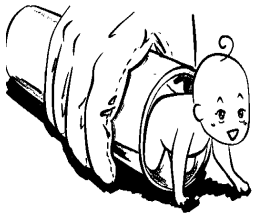
Research Summary

This article revealed that hyperstimulation-induced high-dose estrogen could impair the demethylation of H3K27me3 by reducing Kdm6b expression, and explored the key pathway in the following aspects:





- **Different ovarian stimulation mouse models**
- **Gene transcription sequencing of oocytes**
- **Estrogen treated mouse embryonic stem cells (mESCs)**
- **Kdm6b gene knockdown in mESCs**



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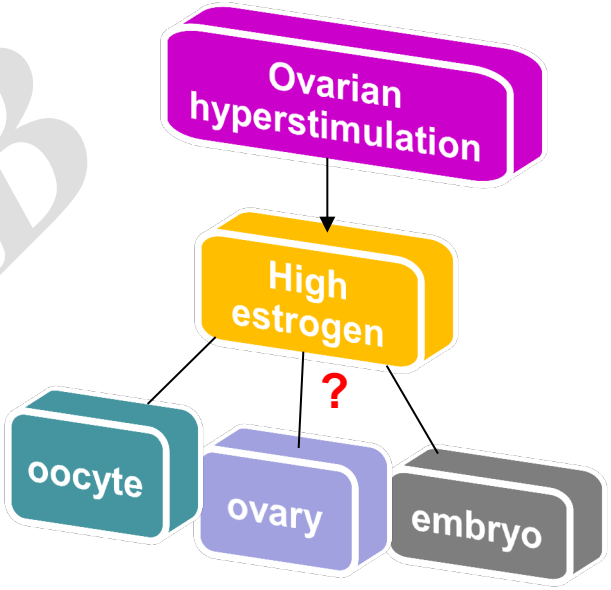
Innovation points

- **Introduction** of the hyperstimulation resulted in high serum estrogen levels, enlarged ovaries, an increased number of aberrant oocytes, and decreased embryo formation.

- **Exploration** of the Kdm6b expression was downregulated in ovarian hyperstimulation oocytes and in mESCs treated with high-dose estrogen.

- **Hypothesis** of the Kdm6b may be a key factor indicating hyperstimulation-induced aberrant oocytes and embryos.



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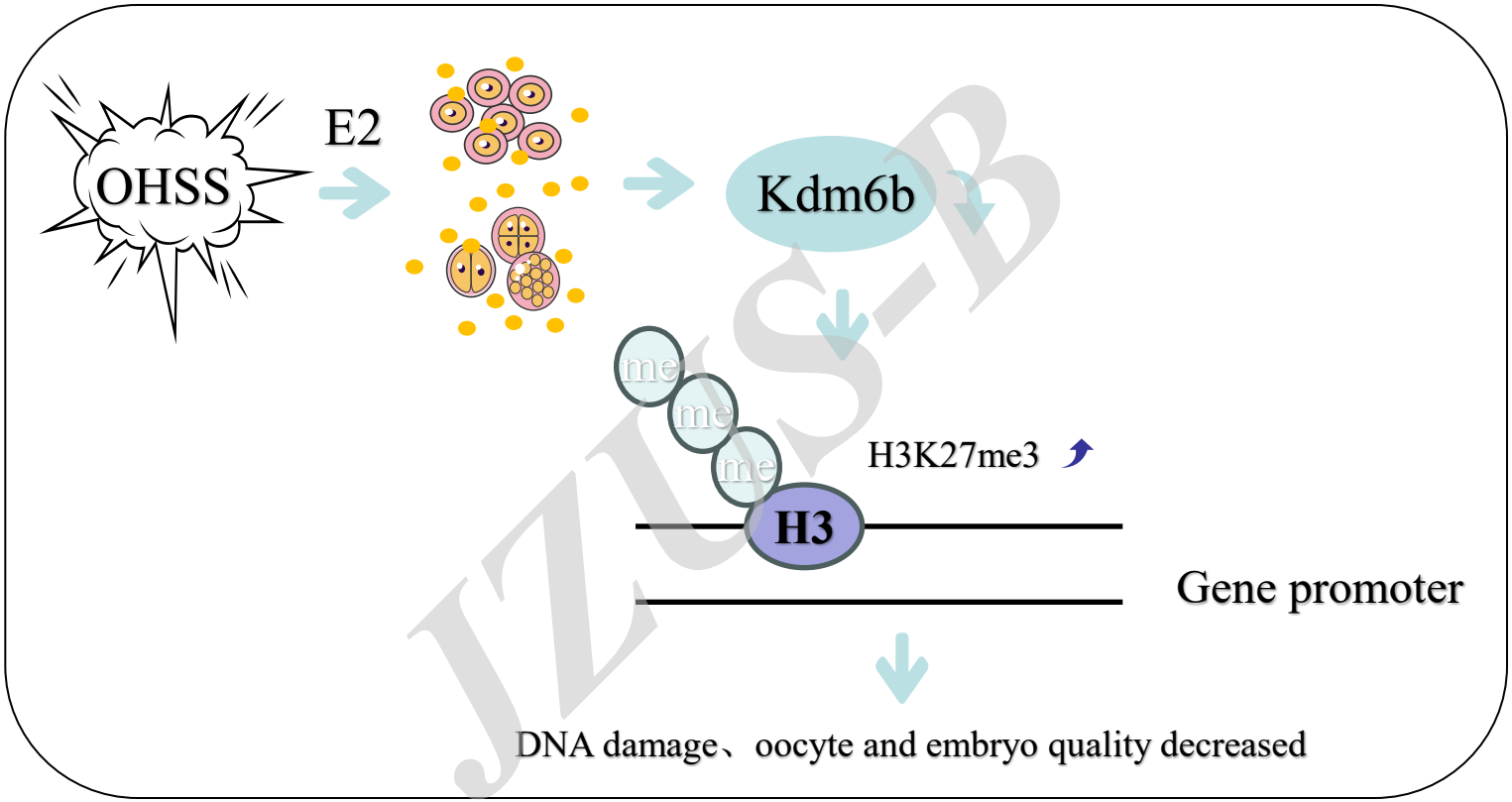
Innovation points



Innovation points

A series of comprehensive figures and tables were generated to elucidate the pathway.

figure 1 | Effects of ovarian stimulation on ovary morphology.

figure 2 | Effects of ovarian stimulation on oocytes.

figure 3 | Analysis of differentially expressed genes of oocytes obtained from different ovarian stimulation treatments.

figure 4 | Expression of Kdm6b at early embryo stages and H3K27 methylation levels.

figure 5 | High estrogen concentrations affect growth and histone methylation levels of mESCs.

figure 6 | Inhibition of Kdm6b alters histone methylation levels and γ-H2AX expression.

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Innovation points

A series of comprehensive figures and tables were generated to elucidate the pathway.

table S1 | Primer sequences.

table S2 | Antibodies.

table S3 | The ovarian weight of each mouse.

table S4 | Average numbers of retrieved oocytes, 2-cell embryos, and blastocysts from the four groups.

table S5 | Differentially expressed genes associated with gene stability.

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