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# **Bioactive constituents of animal-derived traditional Chinese medicinal materials for breast cancer: opportunities and challenges**

**Key words:** breast cancer; traditional Chinese medicinal materials (TCMM); bioactive constituents; anticancer effects

# ***Research Summary***

**This review systematically summarized and analyzed the animal-derived TCMMs along with their active components and anti-breast cancer effects that included the following aspects:**

- Regulation of cell cycle arrest**
- Cell proliferation**
- Cell apoptosis**
- Drug resistance**

# ***Innovation points***

- **Introduction** of main animal-derived traditional Chinese medicinal materials (TCMMs) along with their active components for breast cancer treatment
- **Summary** of the experimental evidence of the anti-breast cancer effects of animal-derived TCMMs in breast cancer.
- **Emphasis** of the issues remained in this area that require urgent consideration including the future direction, highlights of utilization of multi-omics technologies as well as drug delivery and transportation systems.

# ***Innovation points***

**Several figures were illustrated to summarize the action pathways involved in the anti-breast cancer effects of animal-derived TCMMs .**

**Figure 1 | Action pathways involved in the anti-breast cancer effects of bioactive components of *Ophiocordyceps sinensis*.**

**Figure 2 | Action pathways associated with the anti-breast cancer effects of NTCD**