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Roles of THEM4 in the Akt pathway: a double-edged sword

Key words: **Protein kinase B (Akt), Thioesterase superfamily member 4 (THEM4), Tumor proliferation, Tumor metastasis**

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Research Summary

This review mainly focused on THEM4 as an Akt-binding protein, and the regulatory relationship with Akt phosphorylation in various diseases, especially cancer.



Mainly through the following two points:

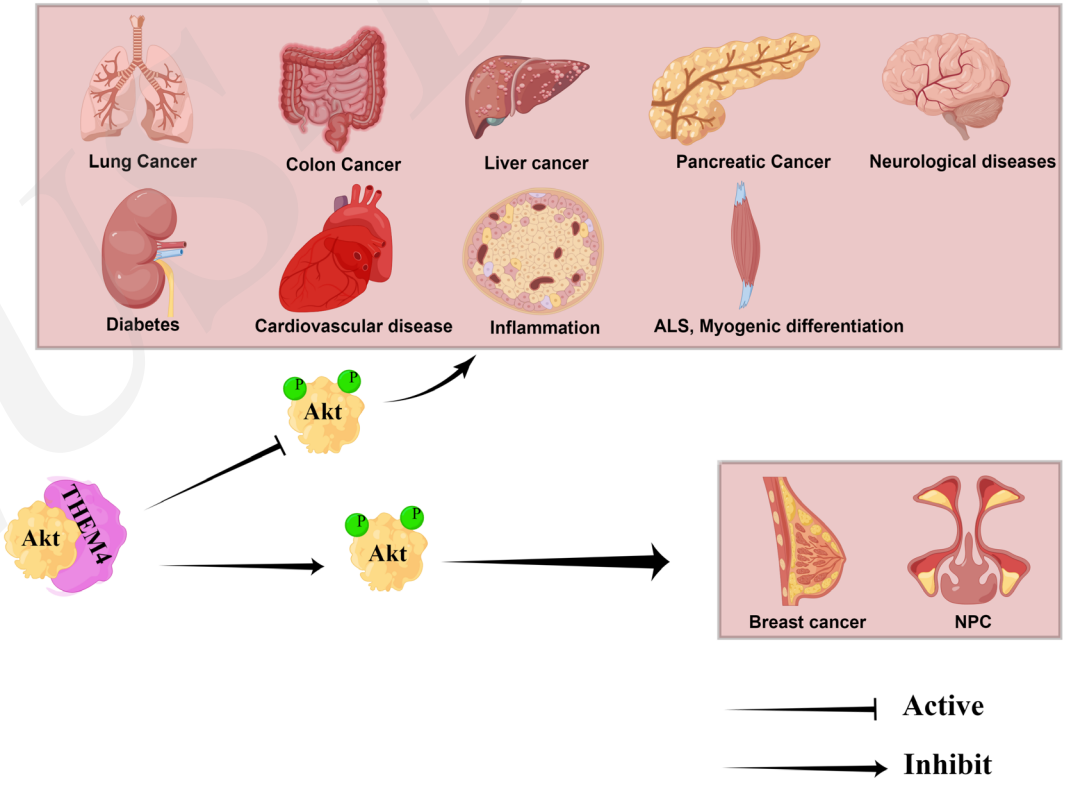
1. **THEM4 functions as a negative regulator of Akt.**
2. **THEM4 acts as a positive regulator of Akt.**

Innovation points

THEM4 positively/negatively regulates Akt phosphorylation in different cancers and diseases.

THEM4 inhibits Akt phosphorylation, interacts with Akt and functions as an endogenous inhibitor of Akt in a variety of tumors and diseases, including lung cancer, colorectal cancer, and pancreatic cancer, as well as diabetes, cardiovascular disease, and ALS.

However, in breast cancer and NPC studies, it was found that THEM4 did not negatively regulate Akt activity after binding to Akt, but promoted Akt phosphorylation, which was completely contrary to their reports.



Innovation points

Mechanism diagrams and tables were generated to describe and summarize the latest regulatory relationship between THEM4 and Akt.

Figure 2 | THEM4 regulates Akt phosphorylation in a positive/negative manner in various tumors.

Figure 3 | Examples illustrating the regulatory relationship between THEM4 and Akt in various diseases.

Table 1 | THEM4 regulates Akt phosphorylation in various cancers and diseases.

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