Development of IL13Rα2-Targeted Chimeric Antigen Receptor T Cells against Malignant Glioma

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Education

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Summary of Lecture

Malignant glioma (MG) is the most common and devastating primary brain tumor, leading to death in most cases. Current treatment regimen of maximal cytoreductive surgery followed by chemo-/radiotherapy, hardly achieved long-term survival in spite of short-term benefits. Thus, T cell immunotherapy is emerging as a powerful strategy to treat cancer and may improve outcomes for patients with MG.

Interleukin-13 receptor α2 (IL-13Rα2) is a promising target because of its abundant and specific expression in MG compare to low-grade glioma or normal brain. Moreover, patients expressing IL13Rα2 have clinically shown a significant correlation with low survival rates. A number of IL13Rα2-targeting therapies, including CAR-T-targeting IL13Rα2, IL13Rα2-targeted immunotoxins, IL13 expressing virus, anti-IL13Rα2 antibody therapy, and IL13Rα2-targeted tumor vaccine, have been given in clinical trial and have proven to be safe.

In this study, we tried to verify the efficacy of newly developed YYB-103, an IL13Rα2-targeted CAR-T, using modified IL13 as an antigen-binding domain, which lowered the binding affinity for IL13Rα1 expressed in normal cells in *in vitro* and *in vivo* model, and the possibility of intravenous administration of YYB-103.