Interleukin-9 triggers strong antitumor immune response thus inhibiting lung cancer growth

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Background

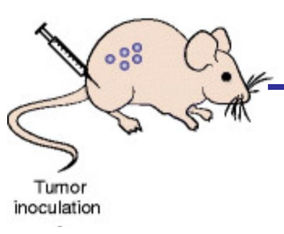
- Lung cancer is still the leading cause of cancer-related death. Mounting evidence indicated that IL-9 was linked to cancer.
- However, its role in lung cancer is still controversial.
- In this study, we aimed to explore the therapeutic role of IL-9 in lung cancer and to elucidate its mechanism.

Methodology

1. IL-9 receptor detection

   WB was used to detect IL-9 receptor expression in CMT167 and LLC cell lines

2. Lung cancer mouse model establishment



Group	n	Treatment	Doses
Control	8	PBS	
IL-9	8	IL-9	50 ng, each other day

3. Flow cytometry analysis

   Immune cells: CD45, CD3, CD4,CD8, Dendritic cells.

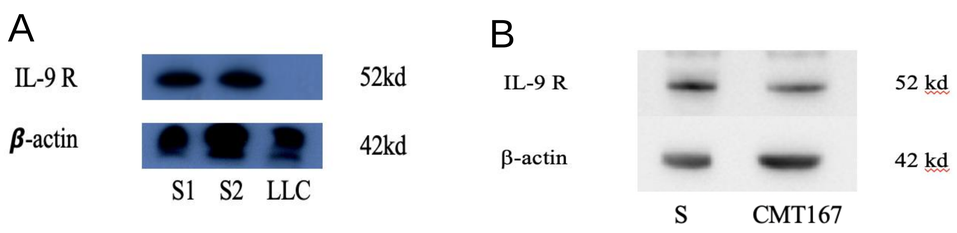
   Markers: PD-1, PD-L1, CD25

4. qPCR

   B2m, Ccl5, Ccl20 mRNA level expression in tumor

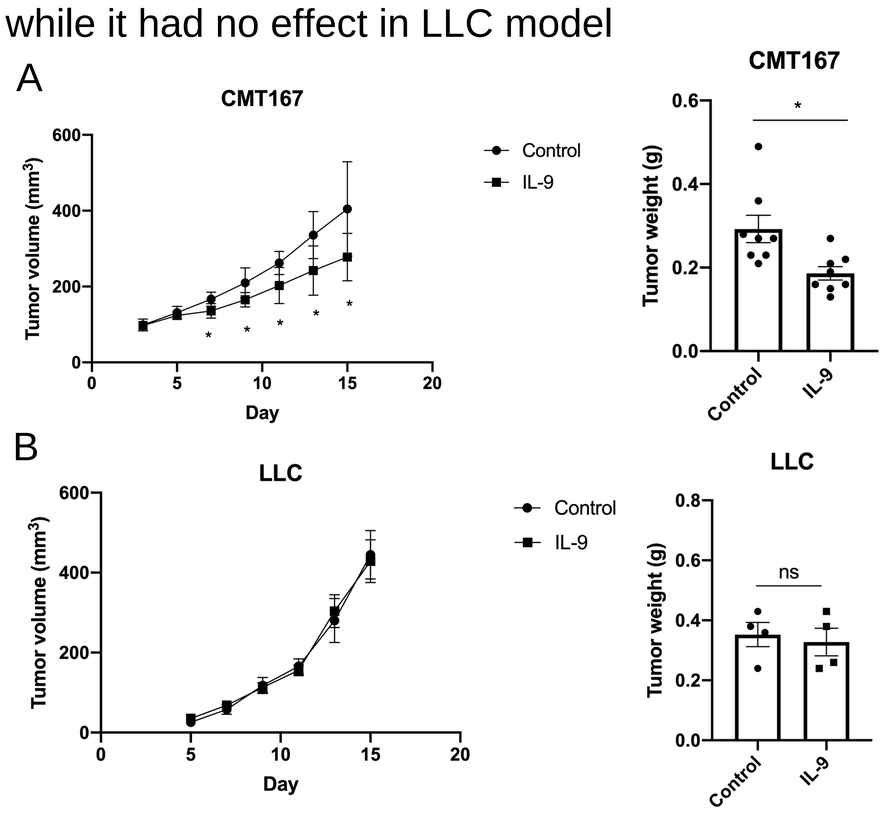
Results

Fig.1 IL-9 receptor is expressed in CMT167 cells, not in LLC cells



S: splenocytes, positive control

Fig.2 IL-9 inhibits tumor growth in CMT167 mouse model, while it had no effect in LLC model



Results

Fig.3 IL-9 enhances anti-tumor immunity in CMT167 mouse model

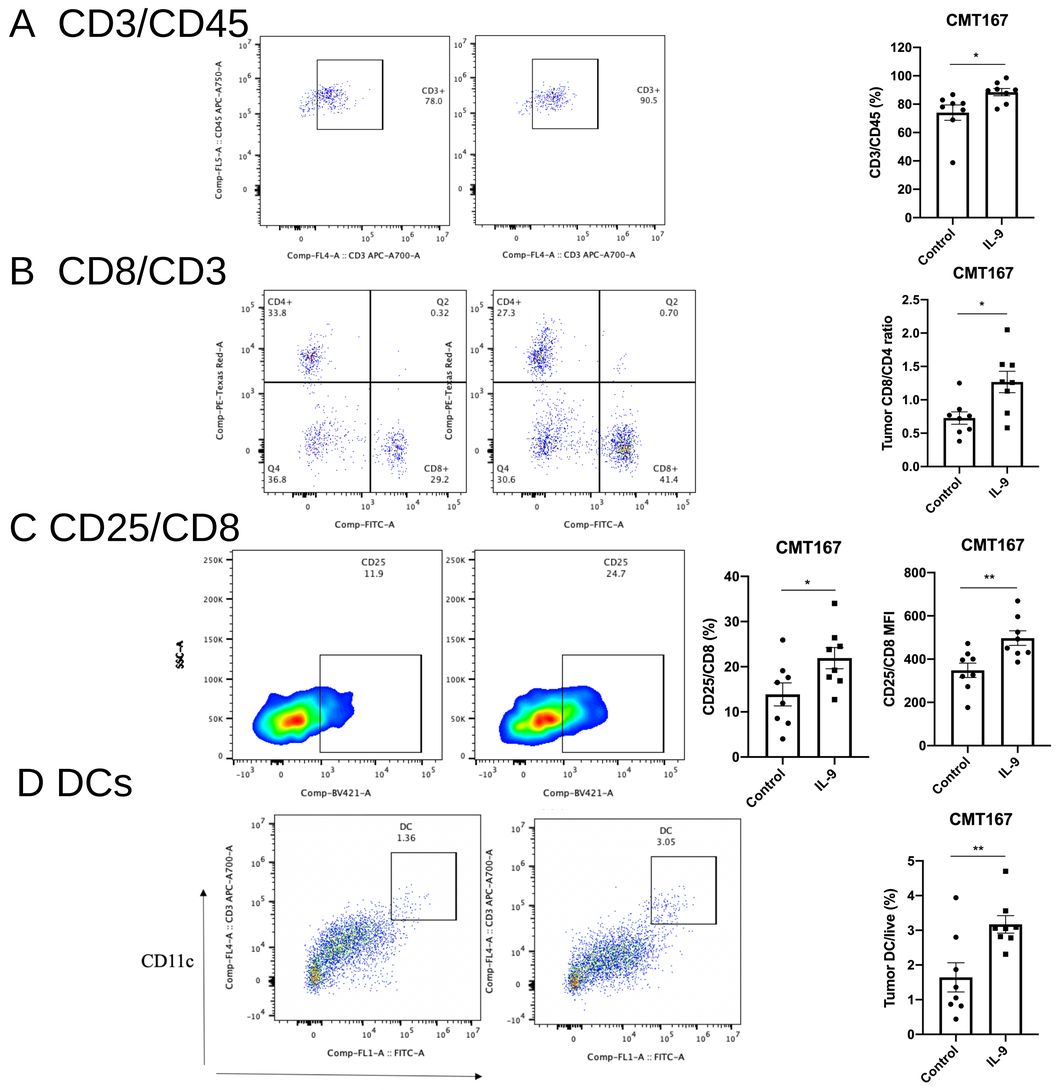


Fig.4 MHC-I upregulation may account for the enhanced anti-tumor immunity induced by IL-9

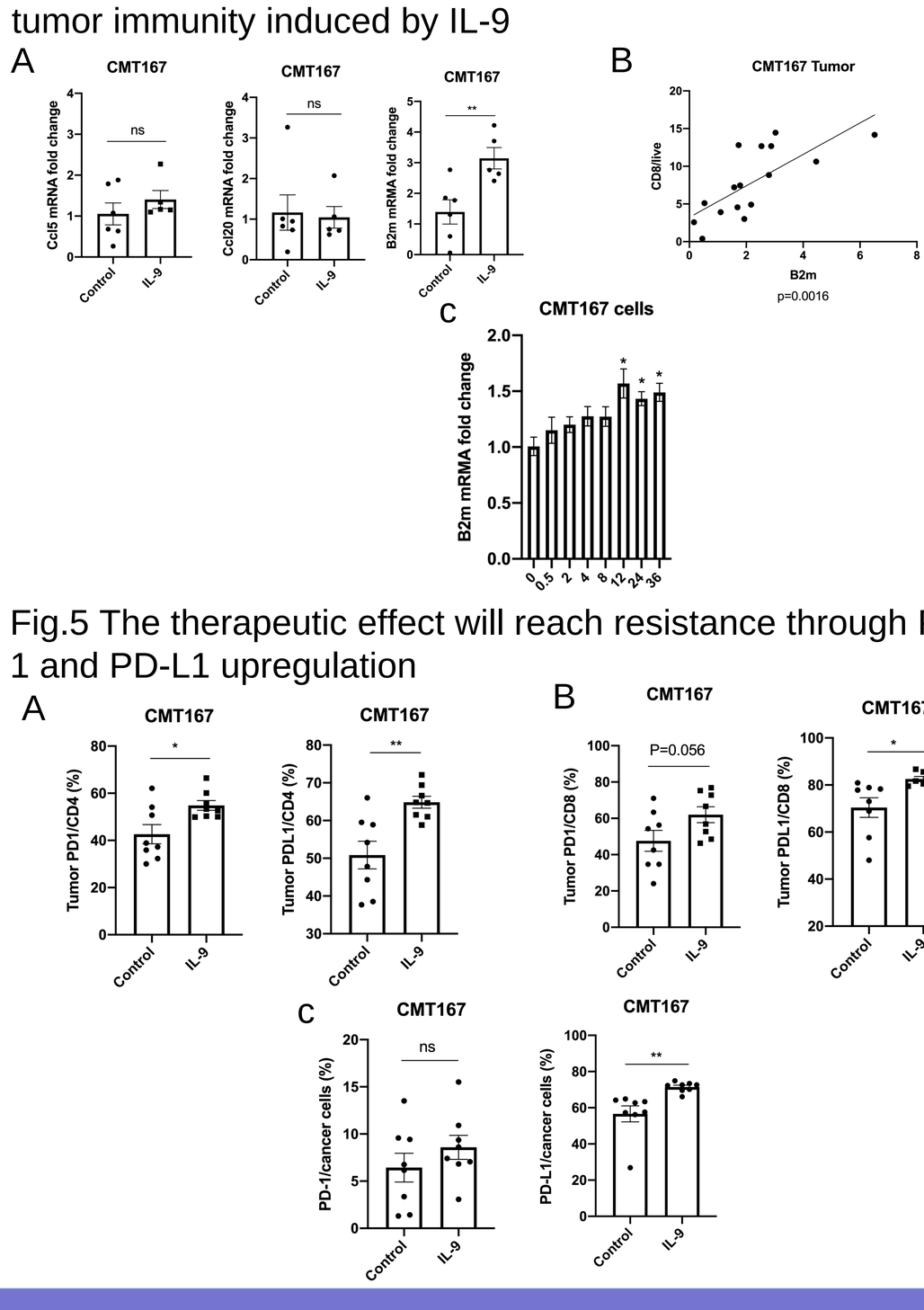


Fig.5 The therapeutic effect will reach resistance through PD-1 and PD-L1 upregulation

Conclusion

- IL-9 could inhibit tumor growth in CMT167 mouse model via enhancing antitumor immune responses in tumor microenvironment, especially through CD8+ T cells recruitment and activation.
- The B2m upregulation and DC recruitment induced by IL-9 may account for the antitumor activity of CD8+ T cells.
- However, the therapeutic effect will reach resistance through PD-1 and PD-L1 upregulation.