Docket #: S19-137

Blocking metastasis in liver cancer with cytokine inhibition

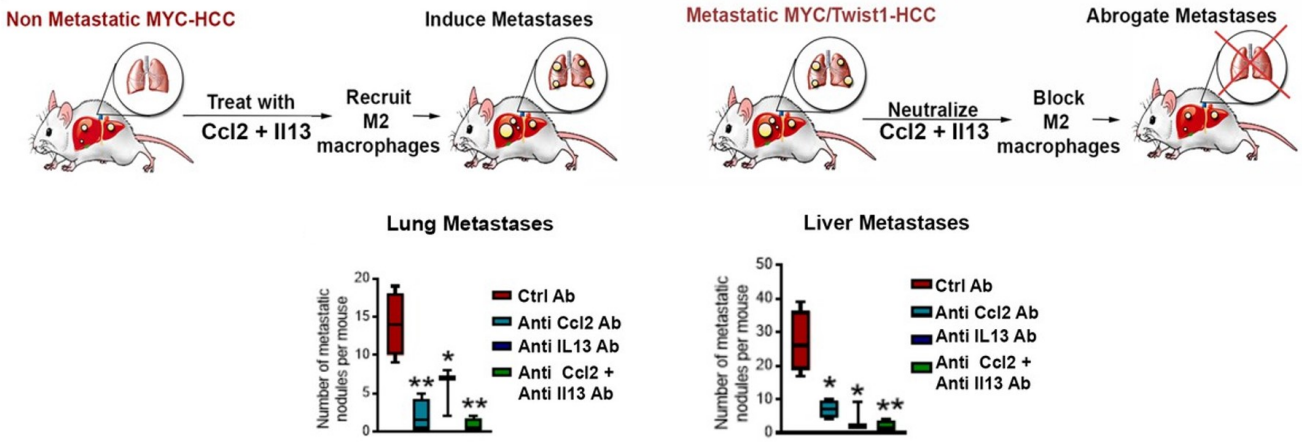
Background

The ultimate cause of fatality for most cancers is metastasis, where cancer cells spread to distant tissue sites. However, there are no assays or biomarkers to definitively predict metastatic activity, nor any therapeutic options to specifically block the mobility of tumor cells or promote immune targeting of spreading cancer cells.

Technology

Researchers at Stanford have identified a cytokine profile associated with metastasis in liver cancer, with potential applications across a range of tumor types. Using a transgenic mouse model, inventors characterized a specific mutation profile- MYC and Twist1- that drives the reprogramming of macrophages into a tumor- permissive state. By blocking the cytokines CCL2, CCL5, CCL7, CXCL1, or IL13 with neutralizing antibodies, the inventors were able to block macrophage reprogramming and subsequent metastasis in a mouse model of liver cancer.

Beyond mouse models, the inventors found that the genetic signature associated with macrophage reprogramming also predicted invasive disease in 33 different human cancers.



Reduction in tumor growth on remote cancer sites following treatment with neutralizing antibodies against CCL2 and IL13.

Applications

- Liver cancer
- Lung cancer
- Metastatic disease
- Modulation of immune surveillance
- Preliminary validation in 33 human cancers

Advantages

- Uniquely enables immune targeting of metastatic disease
- Defined targets to systemically modulate macrophage activity
- Potential use of biomarker-driven patient selection, driven by expression of specific genetic profile or its associated cytokines

Publications

- MYC and Twist1 cooperate to drive metastasis by eliciting crosstalk between cancer and innate immunity Dhanasekaran R,, et al., Elife. 2020 Jan 14;9:e50731.

Patents

- Published Application: WO2021194610
- Published Application: 20230109697

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