Tohoku Univ. Technology

Immune checkpoint inhibitor

Drug discovery toward immune checkpoint LILRB4

Overview

Conventional immune checkpoint (CP) inhibitors (e.g. PD-1 and CTLA-4 inhibitors) have revolutionized cancer immunotherapy, but are ineffective in approximately 40-80% of patients and have side effects such as autoimmune inflammation. The myeloid CP molecule LILRB4 (B4) has the unique property of being involved in immune evasion of cancer while also being involved in the exacerbation of autoimmune diseases, and is expected to be a new drug target, but its ligand was unknown. The present invention identifies fibronectin (FN) as the only physiological ligand for B4 and finds that immune control is possible by inhibiting the binding of B4 to FN, and relates to a novel CP inhibitor based on this finding.

Following patterns can be considered for immunoregulation by blocking the binding between B4 and its ligand FN :

(1) FN analog (competitively binds to B4-FN)

(2) Anti-B4 antibody (acts on B4 and inhibits B4-FN binding)

*Company X possesses data up to Phase 1b of the anti-B4 antibody for cancer immunotherapy, and is able to provide it under conditions to be negotiated.

(3) Anti-FN antibody (acts on FN and inhibits B4-FN binding)

Further, B4 as a biomarker for lung cancer patients' prognosis prediction was verified by our original B4 monoclonal antibody that inhibits B4-FN binding (data not shown).

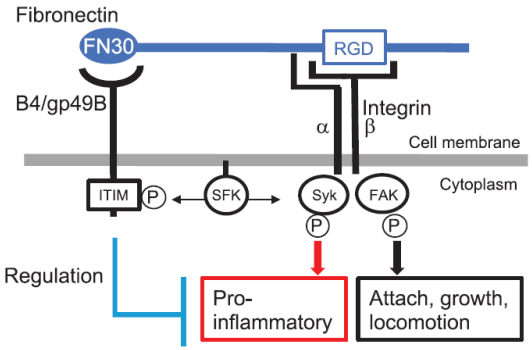
Possible applications

- Drugs for treating autoimmune, cancer, inflammatory or allergic diseases associated with B4
- Diagnostic agent that predicts the effectiveness of cancer immunotherapy

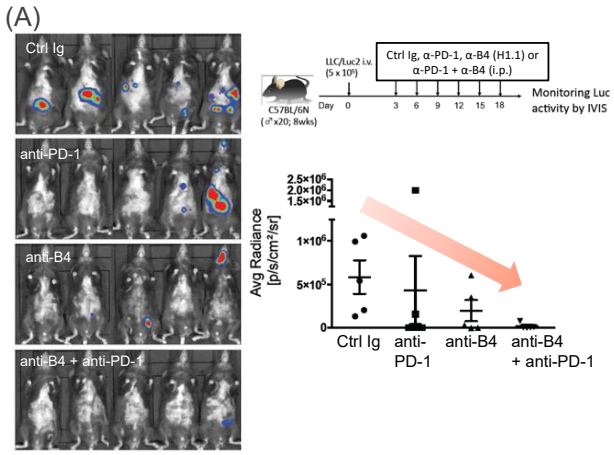
IP Data

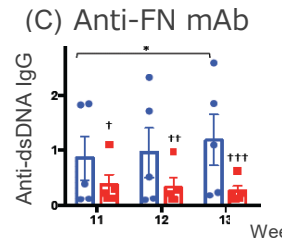
IP No.	:	WO2021/029318
Inventor	:	TAKAI Toshiyuki, SU Mei Tzu, *et al*.
Admin No.	:	T18-289

Mechanism[2]



Features・Outstandings





・Fig. A: Administration of anti-B4 Ab alone or in combination with anti-PD-1 Ab suppresses cancer cell metastasis in cancer-bearing mice

・Fig. B and C: Administration of FN analog (Fig. B) and anti-FN Ab (Fig. C) to SLE mice suppresses the generation of autoantibodies (dsDNA IgG)

Related Works

[1] International Immunology, 2021; 33(8), pp. 447–458.

[2] International Immunology, 2022; 34(8), pp. 435–444.

Contact

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Please visit CONTACT here