Avelumab

Cat. No.:	HY-108730
CAS No.:	1537032-82-8
Target:	PD-1/PD-L1
Pathway:	Immunology/Inflammation
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.

BIOLOGICAL ACTIVITY

Description	Avelumab is a fully human IgG1 anti-PD-L1 monoclonal antibody with potential antibody-dependent cell-mediated cytotoxicity.
IC_{50} & Target	PD-1/PD-L1[1]
In Vitro	Avelumab is a fully human IgG1 anti-PD-L1 monoclonal antibody with potential antibody-dependent cell-mediated cytotoxicity property. Avelumab increases NK-cell lysis 3.1-fold (P=0.01) in JHC7 cells relative to isotype control. When the cells are treated with IFN-γ, Avelumab markedly enhances NK-cell lysis relative to isotype control in the following cell lines: JHC7 (7.56-fold; P=0.001), UM-Chor1 (7.34-fold; P<0.001), U-CH2 (2.6 fold; P=0.008), MUG-Chor1 (8.38-fold; P=0.0016). Avelumab effectively increases antibody-dependent cell-mediated cytotoxicity (ADCC) of both the non-cancer stem cell (CSC) and CSC subpopulations to the same degree[1]. Results also demonstrate that the addition of Avelumab increases the frequency of antigen-specific multifunctional $CD8^+$ T cells by more than fivefold, relative to the isotype control in CEFT-stimulated peripheral blood mononuclear cells (PBMCs)[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Measurement of individual tumors clearly shows a slowing of tumor growth in the Avelumab-treated mice. By day 36 post-tumor implantation, there is a significant (P<0.01) reduction in the average tumor volume of the Avelumab-treated mice. Reduction in MB49 tumor growth in the mice treated with Avelumab is durable and leads to a significant (P<0.05) improvement in percent survival. Avelumab treatment of 10 mice with bladder tumors results in complete tumor regression in 8 mice, confirmed by histopathology. However, in mice depleted of either CD4 or CD8 cells, Avelumab treatment is much less effective in controlling bladder tumor burden with tumor breakthrough occurring in a higher frequency in mice depleted of CD4 T cells[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [1]	To examine the relationship between a cancer stem cell (CSC) subpopulation and antibody-dependent cell-mediated cytotoxicity (ADCC) activity, UM-Chor1 cells are left untreated or treated with 50 ng/mL of IFN-γ for 24 h. Cells are then plated as targets at 50,000 cells/well in 6-well round-bottom culture plates and incubated with 2 μg/mL of Avelumab at room temperature for 30 min. NK cells are added at 2500,000 cells/well at an effector-to-target (E:T) ratio of 50:1. After 4 h, tumor cells are harvested and stained with antibodies for flow cytometry[1].

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Animal Administration [3]	Female C57BL/6 mice are used in this study. Subcutaneous tumor injections are carried out by inoculating C57BL/6 mice with 1×10^5 MB49 parental cells on the right shaved flank. Tumor growth is measured with calipers and 8 days post-inoculation mice are assigned to treatment groups. Tumor-bearing mice are treated with Avelumab (400 μg per 100 μL) and injected i.p. three times, 3 days apart. Since Avelumab is a human IgG1, three injections have to be compressed within a 7 to 9 day window (i.e., days 9, 12, and 15 post-tumor inoculation) to avoid the onset of neutralizing mouse anti-human Ig[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Signal Transduct Target Ther. 2023 Mar 15;8(1):107.
- Cancer Immunol Immunother. 2023 Jan 19.
- Clin Exp Immunol. 2021 Mar 18.
- Chemrxiv. 2021 Feb.
- Patent. US20200261591A1

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REFERENCES

[1]. Fujii R, et al. Enhanced killing of chordoma cells by antibody-dependent cell-mediated cytotoxicity employing the novel anti-PD-L1 antibody avelumab. Oncotarget. 2016 Jun 7;7(23):33498-511.

[2]. Grenga I, et al. A fully human IgG1 anti-PD-L1 MAb in an in vitro assay enhances antigen-specific T-cell responses. Clin Transl Immunology. 2016 May 20;5(5):e83.

[3]. Vandeveer AJ, et al. Systemic Immunotherapy of Non-Muscle Invasive Mouse Bladder Cancer with Avelumab, an Anti-PD-L1 Immune Checkpoint Inhibitor. Cancer Immunol Res. 2016 May;4(5):452-62.

Caution: Product has not been fully validated for medical applications. For research use only.

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