PD-1/PD-L1

PD-1/Programmed death-ligand 1

Programmed death-1 (PD-1) is a cell surface receptor that functions as a T cell checkpoint and plays a central role in regulating T cell exhaustion. PD-1 is activated by the engagement of its ligands PDL-1 or PDL-2. PD-1 receptor delivers inhibitory checkpoint signals to activated T cells upon binding to its ligands PD-L1 and PD-L2 expressed on antigen-presenting cells and cancer cells, resulting in suppression of T-cell effector function and tumor immune evasion. Inhibiting the programmed cell death-1 (PD-1)/programmed cell death-ligand 1 (PD-L1) pathway is an attractive strategy for tumor immunotherapy.

PD-1 is expressed on activated T cells, B cells, monocytes, dendritic cells (DCs), regulatory T cells (Tregs), and natural killer T cells (NKT). It is a member of a family of immunoglobulin domain (Ig) co-receptors that modify the outcome of activation of the T cell receptor by an antigen-presenting cell (APC) or infected target cell. PD-L1 is widely and constitutively expressed on both hematopoietic and nonhematopoietic cells; e.g., naive T and B cells, vascular endothelial cells, and pancreatic islet cells, whereas PD-L2 is exclusively and inducibly expressed on professional APCs.

PD-1/PD-L1 Inhibitors & Antagonists

Atezolizumab
(MPDL3280A) **Cat. No.:** HY-P9904

Atezolizumab (MPDL3280A) is a selective humanized monoclonal IgG1 antibody against programmed death ligand 1 (**PD-L1**), used for cancer research.

Atezolizumab

Purity: 98.98%
Clinical Data: Launched
Size: 1 mg, 5 mg, 25 mg, 50 mg

AUNP-12
(NP-12) **Cat. No.:** HY-P1812

AUNP-12 (NP-12) is a peptide antagonist of the **PD-1 signaling pathway**, displays equipotent antagonism toward PD-L1 and PD-L2 in rescue of lymphocyte proliferation and effector functions.

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

AUNP-12 TFA
(NP-12 TFA) **Cat. No.:** HY-P1812A

AUNP-12 TFA (NP-12 TFA) is a peptide antagonist of the **PD-1 signaling pathway**, displays equipotent antagonism toward PD-L1 and PD-L2 in rescue of lymphocyte proliferation and effector functions.

Purity: ≥96.0%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg, 10 mg

Avelumab (Anti-Human PD-L1, Human Antibody; MSB 0010718C; MSB0010718C)
Cat. No.: HY-108730

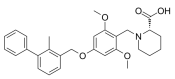
Avelumab is a fully human IgG1 anti-**PD-L1** monoclonal antibody with potential antibody-dependent cell-mediated cytotoxicity.

Avelumab

Purity: >98%
Clinical Data: Launched
Size: 1 mg, 5 mg, 10 mg

BMS-1
(PD-1/PD-L1 inhibitor 1) **Cat. No.:** HY-19991

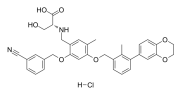
BMS-1 is an inhibitor of the **PD-1/PD-L1** protein/protein interaction (IC_{50} between 6 and 100 nM).



Purity: 99.56%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

BMS-1001 hydrochloride
Cat. No.: HY-120635

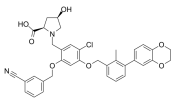
BMS-1001 hydrochloride is an orally active human **PD-L1/PD-1** immune checkpoint inhibitor. BMS-1001 hydrochloride exhibits low-toxicity in cells.



Purity: 98.46%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

BMS-1166
Cat. No.: HY-102011

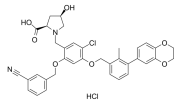
BMS-1166 is a potent **PD-1/PD-L1** immune checkpoint inhibitor. BMS-1166 induces dimerization of PD-L1 and blocks its interaction with PD-1, with an **IC_{50}** of 1.4 nM. BMS-1166 antagonizes the inhibitory effect of PD-1/PD-L1 immune checkpoint on T cell activation.



Purity: 99.86%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

BMS-1166 hydrochloride
Cat. No.: HY-102011A

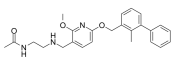
BMS-1166 hydrochloride is a potent **PD-1/PD-L1** immune checkpoint inhibitor. BMS-1166 hydrochloride induces dimerization of PD-L1 and blocks its interaction with PD-1, with an **IC_{50}** of 1.4 nM.



Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

BMS-202
Cat. No.: HY-19745

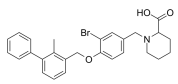
BMS-202 is a potent and nonpeptidic **PD-1/PD-L1 complex** inhibitor with an **IC_{50}** of 18 nM and a **K_D** of 8 μM. BMS-202 binds to PD-L1 and blocks human PD-1/PD-L1 interaction. BMS-202 has antitumor activity.



Purity: 98.45%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

BMS-8
Cat. No.: HY-116274

BMS-8 inhibits the **PD-1/PD-L1** interaction with **IC_{50}** of 7.2 μM. BMS-8, binds directly to PD-L1 and induces formation of PD-L1 homodimers, which in turn prevents the interaction with PD-1.

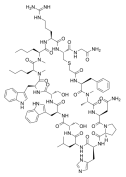


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

BMSpep-57

Cat. No.: HY-P3143

BMSpep-57 is a potent and competitive macrocyclic peptide inhibitor of **PD-1/PD-L1 interaction** with an IC_{50} of 7.68nM. BMSpep-57 binds to PD-L1 with K_ds of 19 nM and 19.88 nM in MST and SPR assays, respectively.

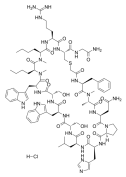


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

BMSpep-57 hydrochloride

Cat. No.: HY-P3143A

BMSpep-57 hydrochloride is a potent and competitive macrocyclic peptide inhibitor of **PD-1/PD-L1 interaction** with an IC_{50} of 7.68nM. BMSpep-57 hydrochloride binds to PD-L1 with K_ds of 19 nM and 19.88 nM in MST and SPR assays, respectively.



Purity: 99.79%
Clinical Data: No Development Reported
Size: 1 mg

Camrelizumab

(SHR-1210)

Cat. No.: HY-P9971

Camrelizumab (SHR-1210) is a potent humanied high-affinity IgG4-κ monoclonal antibody (mAb) to **PD-1**. Camrelizumab binds PD-1 at a high affinity of 3 nM and inhibits the binding interaction of PD-1 and PD-L1 with an IC_{50} of 0.70 nM.

Camrelizumab

Purity: 97.70%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Durvalumab

(MEDI 4736)

Cat. No.: HY-P9919

Durvalumab (MEDI 4736) is an humanized anti-**PD-L1** monoclonal antibody. Durvalumab (MEDI4736) completely blocks the binding of **PD-L1** to both **PD-1** and **CD80**, with IC_{50}s of 0.1 and 0.04 nM, respectively.

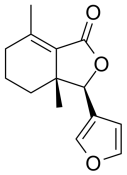
Durvalumab

Purity: 99.60%
Clinical Data: Launched
Size: 1 mg, 5 mg, 25 mg, 50 mg

Fraxinellone

Cat. No.: HY-N0242

Fraxinellone is isolated from the root bark of the Rutaceae plant, Dictamnus dasycarpus. Fraxinellone is a **PD-L1** inhibitor and inhibits **HIF-1α** protein synthesis without affecting HIF-1α protein degradation.



Purity: 99.99%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 20 mg

Human PD-L1 inhibitor II

Cat. No.: HY-P2470

Human PD-L1 inhibitor II is a potent **PD-L1** inhibitor with anti-cancer activity.

FNWDYSLEELREKAKYK

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Human PD-L1 inhibitor III

Cat. No.: HY-P2564

Human PD-L1 inhibitor III is a human PD-L1 inhibitor.

TEKDYRHGNIRMKLAYDL

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Human PD-L1 inhibitor IV

Cat. No.: HY-P2477

Human PD-L1 inhibitor IV, a polypeptide, is a competitive **human PD-1 protein** inhibitor with a K_d value of 1.38 μM. Human PD-L1 inhibitor IV inhibits the interaction of hPD-1/hPD-L1.

GNWDYNSQRAQLYNQ

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Human PD-L1 inhibitor V

Cat. No.: HY-P2478

Human PD-L1 inhibitor V, a **human PD-1 protein** binding peptide with a K_d value of 3.32 μM. Human PD-L1 inhibitor V inhibit the interaction of hPD-1/hPD-L1.

LDYVNRRKMYQ

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Human PD-L1 inhibitor V TFA

Cat. No.: HY-P2478A

Human PD-L1 inhibitor V TFA, a **human PD-1 protein** binding peptide with a K_d value of 3.32 μM. Human PD-L1 inhibitor V TFA inhibit the interaction of hPD-1/hPD-L1.

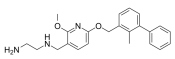
LDYVNRRKMYQ (TFA salt)

Purity: 96.63%
Clinical Data: No Development Reported
Size: 10 mg

N-deacetylated BMS-202

Cat. No.: HY-19745A

N-deacetylated BMS-202 is the deacetylated of BMS-202. BMS-202 is an inhibitor of the **PD-l/PD-Ll** interaction, mainly used for cancer treatment.



Purity: 98.38%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

Nivolumab

(BMS-936558; ONO-4538; MDX-1106)

Cat. No.: HY-P9903

Nivolumab is a programmed death receptor-1 (**PD-1**) blocking antibody to treat advanced (metastatic) non-small cell lung cancer.

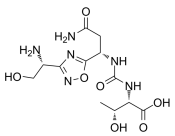
Nivolumab

Purity: 98.56%
Clinical Data: Launched
Size: 1 mg, 5 mg, 25 mg, 50 mg

PD-1-IN-1

Cat. No.: HY-101093

PD-1-IN-1 is an inhibitor of programmed cell dealth-1 (**PD-1**) extracted from patent WO2015033299A1, compound example 4. PD-1-IN-1 can be used as immune modulator.

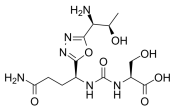


Purity: 99.63%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 1 mg, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

PD-1-IN-17

Cat. No.: HY-101097

PD-1-IN-17 is a programmed cell death-1 (**PD-1**) inhibitor extracted from patent WO2015033301A1, Compound 12, inhibits 92% splenocyte proliferation at 100 nM.

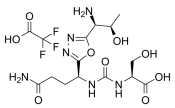


Purity: ≥95.0%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

PD-1-IN-17 TFA

Cat. No.: HY-101097A

PD-1-IN-17 TFA is a programmed cell death-1 (**PD-1**) inhibitor extracted from patent WO2015033301A1, Compound 12, inhibits 92% splenocyte proliferation at 100 nM.

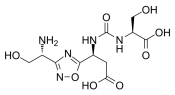


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1-IN-18

Cat. No.: HY-101098

PD-1-IN-18 is a **PD1** signaling pathway inhibitor, which acts as an immunomodulator.

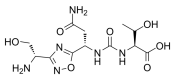


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1-IN-20

Cat. No.: HY-101093B

PD-1-IN-20 is the less active enantiomer of PD-1-IN-1. PD-1-IN-1 is an inhibitor of programmed cell dealth-1 (PD-1) extracted from patent WO 2015033299 A1, compound example 4.

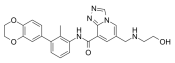


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1-IN-22

Cat. No.: HY-128605

PD-1-IN-22 is a potent programmed cell death-1 (PD-1)/programmed cell death-ligand 1 (PD-L1) interaction inhibitor with an IC_{50} of 92.3 nM.

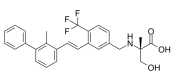


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1-IN-24

Cat. No.: HY-134886

PD-1-IN-24 (compound 1) is an orally active **PD-1** inhibitor.

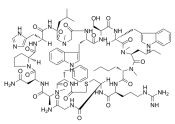


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1/PD-L1-IN 3

Cat. No.: HY-103048

PD-1/PD-L1-IN 3, a macrocyclic peptide, is a potent and selective inhibitor of the **PD-1/PD-L1** and **CD80/PD-L1** interactions extracted from patent WO2014151634A1, compound No.1.

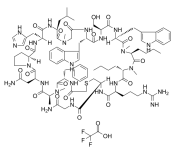


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1/PD-L1-IN 3 TFA

Cat. No.: HY-103048A

PD-1/PD-L1-IN 3 TFA, a macrocyclic peptide, is a potent and selective inhibitor of the **PD-1/PD-L1** and **CD80/PD-L1** interactions extracted from patent WO2014151634A1, compound No.1.

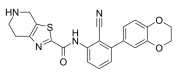


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1/PD-L1-IN 5

Cat. No.: HY-129172A

PD-1/PD-L1-IN 5 is a **PD-1/PD-L1** protein/protein interaction inhibitor extracted from patent WO2017222976A1, compound Example 1, has an IC_{50} of ≤100 nM.

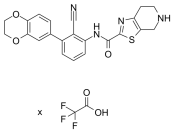


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1/PD-L1-IN 5 TFA

Cat. No.: HY-129172

PD-1/PD-L1-IN 5 TFA is a **PD-1/PD-L1** protein/protein interaction inhibitor extracted from patent WO2017222976A1, compound Example 1, has an IC_{50} of ≤100 nM.

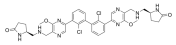


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

PD-1/PD-L1-IN 7

Cat. No.: HY-138407

PD-1/PD-L1-IN 7 is a **human PD-1/PD-L1 protein/protein interaction** inhibitor with an IC_{50} of 0.213 nM. PD-1/PD-L1-IN 7 has anticancer and antiviral functions.

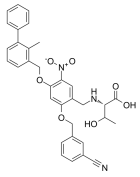


Purity: 98.48%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg

PD-1/PD-L1-IN-10

Cat. No.: HY-132202

PD-1/PD-L1-IN-10 (compound B2) is an orally active **PD-1/PD-L1** inhibitor (IC_{50} of 2.7 nM) with potent anticancer efficacy.

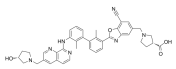


Purity: 99.29%
Clinical Data: No Development Reported
Size: 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

PD-1/PD-L1-IN-8

Cat. No.: HY-134884

PD-1/PD-L1-IN-8 (example 24) is a **PD-1/PD-L1** inhibitor, with an IC_{50} <= 10 nM.

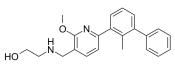


Purity: >98%
Clinical Data: No Development Reported
Size: 5 mg, 10 mg

PD-1/PD-L1-IN-9

Cat. No.: HY-132192

PD-1/PD-L1-IN-9 is a potent and orally active inhibitor of **PD-1/PD-L1** interaction, with an IC_{50} of 3.8 nM. PD-1/PD-L1-IN-9 can enhance the killing activity of tumor cells by immune cells. PD-1/PD-L1-IN-9 also exhibits significant in vivo antitumor activity in a CT26 mouse model.

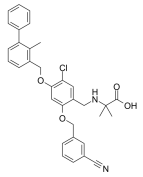


Purity: 98.01%
Clinical Data: No Development Reported
Size: 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

PD-1/PD-L1-IN-NP19

Cat. No.: HY-131347

PD-1/PD-L1-IN-NP19 is a **PD-1/PD-L1** inhibitor, with an IC_{50} of 12.5 nM for human PD-1/PD-L1 interaction. PD-1/PD-L1-IN-NP19 could activate the immune microenvironment in tumor, which may contribute to its antitumor effects.

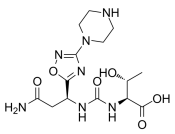


Purity: 98.05%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 5 mg, 10 mg, 25 mg, 50 mg, 100 mg

PD1-PDL1-IN 1

Cat. No.: HY-101058

PD1-PDL1-IN 1 is a potent **programmed cell death 1 (PD-1)** inhibitor. PD1-PDL1-IN 1 is useful as immune modulator.



Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Pembrolizumab

(MK-3475; Lambrolizumab)

Cat. No.: HY-P9902

Pembrolizumab is a humanized antibody inhibiting the programmed cell death 1 (**PD-1**) receptor, used in cancer immunotherapy.

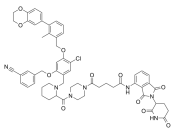
Pembrolizumab

Purity: 99.06%
Clinical Data: Launched
Size: 1 mg, 5 mg, 25 mg, 50 mg

PROTAC PD-1/PD-L1 degrader-1

Cat. No.: HY-131183

PROTAC PD-1/PD-L1 degrader-1, a **PD-1/PD-L1** degrader, inhibits PD-1/PD-L1 interaction with an IC_{50} of 39.2 nM. PROTAC PD-1/PD-L1 degrader-1 significantly restores the immunity repressed in a co-culture model of Hep3B/OS-8/hPD-L1 and CD3 T cells.

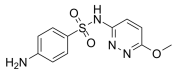


Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg

Sulfamethoxypyridazine

Cat. No.: HY-B1387

Sulfamethoxypyridazine is a long-acting sulfonamide antibiotic, for treatment of Dermatitis herpetiformis.



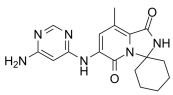
Purity: 99.67%
Clinical Data: No Development Reported
Size: 10 mM × 1 mL, 100 mg

Tomivosertib

(eFT508)

Cat. No.: HY-100022

Tomivosertib (eFT508) is a potent, highly selective, and orally active **MNK1** and **MNK2** inhibitor, with IC_{50}s of 1-2 nM against both isoforms.



Purity: 99.92%
Clinical Data: Phase 2
Size: 10 mM × 1 mL, 1 mg, 5 mg, 10 mg, 50 mg, 100 mg

TPP-1

Cat. No.: HY-P3139

TPP-1 is a potent inhibitor of the **PD-1/PD-L1 interaction**. TPP-1 binds specifically to PD-L1 with a high affinity (K_D=95 nM). TPP-1 inhibits human tumor growth in vivo via reactivating T-cell function.

Purity: 98.04%
Clinical Data: No Development Reported
Size: 25 mg

TPP-1 TFA

Cat. No.: HY-P3139A

TPP-1 TFA is a potent inhibitor of the **PD-1/PD-L1 interaction**. TPP-1 TFA binds specifically to PD-L1 with a high affinity (K_D=95 nM). TPP-1 TFA inhibits human tumor growth in vivo via reactivating T-cell function.

Purity: >98%
Clinical Data: No Development Reported
Size: 1 mg, 5 mg