

**Last updated 9/14/18**

## **Certificate of Analysis**

### **Recombinant Human PD-1 (Programmed cell death protein 1)**

<b>Catalog #</b>	<b>Concentration</b>
PT-OP-0002	0.5 mg/mL

Recombinant human PD-1, extracellular domain is produced in E. coli. The final protein sequence contains G22-V170 of human PD1 fused to a polyhistidine tag on the carboxyl terminus.

**Product Description:** PD-1 receptor is a single immunoglobulin variable like domain that inducibly expressed on the surface of natural killer cells, B cells, activated monocytes, CD4+ T cells and CD8+ T cells. PD-1 expression is induced by T cell receptor or B cell receptor. PD-1 interaction with its ligands, PD-L1 and PD-L2, regulate the threshold for T cell activation and cytokines production.

**Synonyms:** PD1, PDCD1

**Sequence:** MPGWFLDSPD RPWNPPTFSP ALLVVTEGDN ATFTCSFSNT  
SEFVLNHWYR MSPSNQTDKL AAFPEDRSQP GQDCRFRTQ LPNGRDFHMS  
VVRARRNDSG TYLCGAISLA PKAQIKESLR AELRVTERRA EVPTAHPSPS  
PRPAGQFQTL VGSHHHHHH

**Accession #:** [Q15116](#)

**Quality control:** Verified by disulfide mapping and Mass Spectrometry analyses.

**Purity:** >95% by SDS-PAGE gel

**Product Source:** PD1 was produced in E. coli cells transformed with human PD1 gene. This product is sterile and does not contain any components of animal origin.

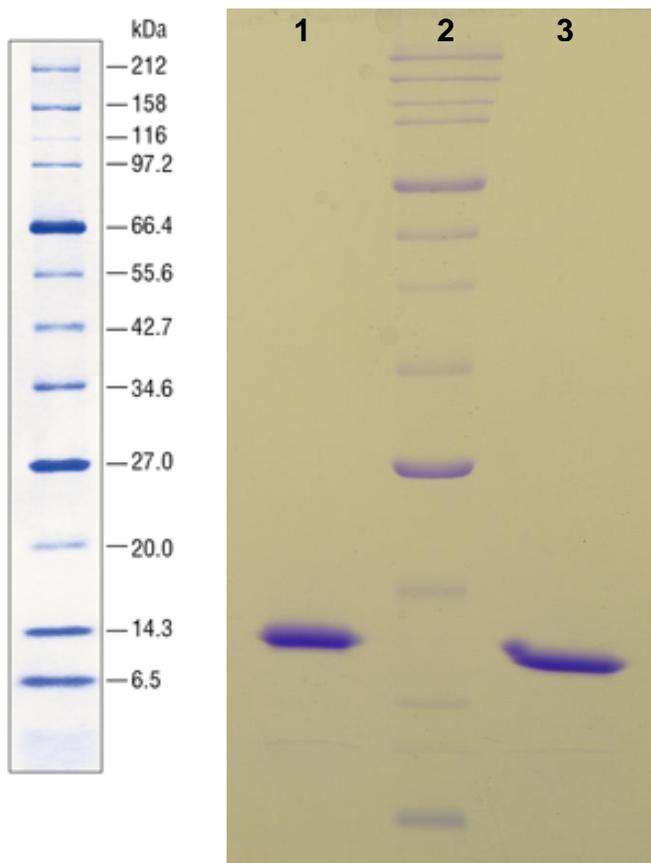
**Formulation:** Sterile filtered through a 0.2 micron filter in 50% glycerol, 10 mM MES buffer at pH 6.5

**Usage:** FOR LABORATORY RESEARCH USE ONLY.

**Storage/Stability:** Avoid repeated freeze-thaw cycles. 12 months at -20 C to -80 C. 1 month at 2 C to 8 C.

## References:

1. Sharpe, Arlene H., E. John Wherry, Rafi Ahmed, and Gordon J. Freeman. "The function of programmed cell death 1 and its ligands in regulating autoimmunity and infection." *Nature immunology* 8, no. 3 (2007): 239-245.
2. Brown, Julia A., David M. Dorfman, Feng-Rong Ma, Elizabeth L. Sullivan, Oliver Munoz, Clive R. Wood, Edward A. Greenfield, and Gordon J. Freeman. "Blockade of programmed death-1 ligands on dendritic cells enhances T cell activation and cytokine production." *The Journal of Immunology* 170, no. 3 (2003): 1257-1266.



**Figure 1. PD-1 SDS PAGE gel.** Lane 1, protein marker; lane 2, PD-1 with a mass of 17 kDa on SDS-PAGE under reducing environment; lane 3, PD-1 with a mass of 16 kDa on SDS-PAGE under oxidized environment.