

Brilliant Violet 421™ anti-human CD279 (PD-1) Antibody

Catalog# / Size	329919 / 25 tests 329920 / 100 tests
Clone	EH12.2H7
Regulatory Status	RUO
Other Names	PD-1
Isotype	Mouse IgG1, κ
Description	Programmed cell death 1 (PD-1), also known as CD279, is a 55 kD member of the immunoglobulin superfamily. CD279 contains the immunoreceptor tyrosine-based inhibitory motif (ITIM) in the cytoplasmic region and plays a key role in peripheral tolerance and autoimmune disease. CD279 is expressed predominantly on activated T cells, B cells, and myeloid cells. PD-L1 (B7-H1) and PD-L2 (B7-DC) are ligands of CD279 (PD-1) and are members of the B7 gene family. Evidence suggests overlapping functions for these two PD-1 ligands and their constitutive expression on some normal tissues and upregulation on activated antigen-presenting cells. Interaction of CD279 ligands results in inhibition of T cell proliferation and cytokine secretion.

Product Details

Verified Reactivity	Human
Reported Reactivity	African Green, Baboon, Chimpanzee, Common Marmoset, Cynomolgus, Rhesus, Squirrel Monkey
Antibody Type	Monoclonal
Host Species	Mouse
Formulation	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide and BSA (origin USA).
Preparation	The antibody was purified by affinity chromatography and conjugated with Brilliant Violet 421™ under optimal conditions.
Concentration	Lot-specific (to obtain lot-specific concentration, please enter the lot number in our Concentration and Expiration Lookup or Certificate of Analysis online tools.)
Storage & Handling	The antibody solution should be stored undiluted between 2°C and 8°C, and protected from prolonged exposure to light. Do not freeze.
Application	FC - Quality tested
Recommended Usage	Each lot of this antibody is quality control tested by immunofluorescent staining with flow cytometric analysis . For flow cytometric staining, the suggested use of this reagent is 5 μ l per million cells in 100 μ l staining volume or 5 μ l per 100 μ l of whole blood.

Brilliant Violet 421™ excites at 405 nm and emits at 421 nm. The standard bandpass filter 450/50 nm is recommended for detection. Brilliant Violet 421™ is a trademark of Sirigen Group Ltd.

[Learn more about Brilliant Violet™.](#)

This product is subject to proprietary rights of Sirigen Inc. and is made and sold under license from Sirigen Inc. The purchase of this product conveys to the buyer a non-transferable right to use the purchased product for research purposes only. This product may not be resold or incorporated in any manner into another product for resale. Any use for therapeutics or diagnostics is strictly prohibited. This product is covered by U.S. Patent(s), pending patent applications and foreign equivalents.

Excitation Laser	Violet Laser (405 nm)
-------------------------	-----------------------

Application Notes	Additional reported applications (for the relevant formats) include: blocking of ligand binding ¹⁻³ , immunohistochemical staining of paraformaldehyde fixed frozen sections ¹³ , and spatial biology (IBEX) ^{15,16} . The LEAF™ purified antibody (Endotoxin <0.1 EU/ μ g, Azide-Free, 0.2 μ m filtered) is recommended for functional assays (Cat. No. 329911 and 329912). For highly sensitive assays, we
--------------------------	---

recommend Ultra-LEAF™ purified antibody (Cat. No. 329926) with a lower endotoxin limit than standard LEAF™ purified antibodies (Endotoxin <0.01 EU/µg).

Application References

1. Dorfman DM, *et al.* 2006 *Am. J. Surg. Pathol.* 30:802. (FA)
2. Radziejwicz H, *et al.* 2007. *J. Virol.* 81:2545. (FA)
3. Velu V, *et al.* 2007. *J. Virol.* 81:5819. (FA)
4. Zahn RC, *et al.* 2008. *J. Virol.* 82:11577. [PubMed](#)
5. Chang WS, *et al.* 2008. *J. Immunol.* 181:6707. (FC) [PubMed](#)
6. Nakamoto N, *et al.* 2009. *PLoS Pathog.* 5:e1000313. (FA)
7. Jones RB, *et al.* 2009. *J. Virol.* 83:8722. (FC) [PubMed](#)
8. Vojnov L, *et al.* 2010. *J. Virol.* 84:753. (FC) [PubMed](#)
9. Radziejwicz H, *et al.* 2010. *J. Immunol.* 184:2410. (FC) [PubMed](#)
10. Montero P, *et al.* 2011. *J. Immunol.* 186:4618. [PubMed](#)
11. Conrad J, *et al.* 2011. *J. Immunol.* 186:6871. [PubMed](#)
12. Salisch NC, *et al.* 2010. *J. Immunol.* 184:476. (Rhesus reactivity)
13. Li H and Pauza CD. 2015. *Eur. J. Immunol.* 45:298. (IHC)
14. Peterson VM, *et al.* 2017. *Nat. Biotechnol.* 35:936. (PG)
15. Radtke AJ, *et al.* 2020. *Proc Natl Acad Sci USA.* 117:33455-33465. (SB) [PubMed](#)
16. Radtke AJ, *et al.* 2022. *Nat Protoc.* 17:378-401. (SB) [PubMed](#)

Product Citations

1. Rutishauser L, *et al.* 2017. *AIDS Res Hum Retroviruses* . 10.1089/AID.2016.0324. [PubMed](#)
2. Cao J, *et al.* 2018. *Nat Commun.* 9:77. [PubMed](#)
3. Sayin I, *et al.* 2018. *J Exp Med.* 7:40286. [PubMed](#)
4. Lee SWL, *et al.* 2018. *Front Immunol.* 8:1064. [PubMed](#)
5. Ferrando-Martinez S, *et al.* 2018. *J Clin Invest.* 128:2089. [PubMed](#)
6. Sade-Feldman M, *et al.* 2018. *Cell.* 175:998. [PubMed](#)
7. Bengsch B *et al.* 2018. *Immunity.* 48(5):1029-1045 . [PubMed](#)
8. Minagawa A, *et al.* 2018. *Cell Stem Cell.* 1.548611111. [PubMed](#)
9. Levin MJ, *et al.* 2018. *J Clin Invest.* 128:4429. [PubMed](#)
10. Baxter AE, *et al.* 2017. *Nat Protoc.* 12:2029. [PubMed](#)
11. Whitney JB, *et al.* 2018. *Nat Commun.* 9:5429. [PubMed](#)
12. André P *et al.* 2018. *Cell.* 175(7):1731-1743 . [PubMed](#)
13. Celis-Gutierrez J *et al.* 2019. *Cell Rep.* 27(11):3315-3330 . [PubMed](#)
14. Ollé Hurtado M, *et al.* 2019. *PLoS One.* 14:e0216373. [PubMed](#)
15. Herrera FG, *et al.* 2019. *Int J Radiat Oncol Biol Phys.* 103:320. [PubMed](#)
16. Collinson-Pautz MR, *et al.* 2019. *Leukemia.* 33:2195. [PubMed](#)
17. Leng T, *et al.* 2019. *Cell Rep.* 28:3077. [PubMed](#)
18. Nissim L *et al.* 2017. *Cell.* 171(5):1138-1150 . [PubMed](#)
19. Pilkinton MA, *et al.* 2017. *Vaccine.* 35:329. [PubMed](#)
20. Cui J, *et al.* 2020. *Cancers (Basel).* 0.596527778. [PubMed](#)
21. Mastelic-Gavillet B, *et al.* 2019. *J Immunother Cancer.* 7:257. [PubMed](#)
22. Bradley T, *et al.* 2020. *Nat Commun.* 11:948. [PubMed](#)
23. Han Q, *et al.* 2020. *Cell Rep.* 30:1553. [PubMed](#)
24. Claiborne DT, *et al.* 2019. *PLoS Pathog.* 15:e1007981. [PubMed](#)
25. Kim N, *et al.* 2020. *Nat Commun.* 2.045138889. [PubMed](#)
26. Hagan T, *et al.* 2020. *Cell.* 178(6):1313-1328.e13.. [PubMed](#)
27. Li C, *et al.* 2020. *Immunity.* 52(1):201-202. [PubMed](#)
28. Karlsson J, *et al.* 2020. *Nat Commun.* 1.773611111. [PubMed](#)
29. Parackova Z, *et al.* 2020. *Sci Rep.* 0.759027778. [PubMed](#)
30. Pacheco Y, *et al.* 2013. *J Immunol.* 191:2072. [PubMed](#)
31. Buggert M, *et al.* 2014. *J Immunol.* 192:2099. [PubMed](#)
32. Buggert M, *et al.* 2014. *J Immunol.* 192:4685. [PubMed](#)
33. Mylvaganam G, *et al.* 2014. *J Immunol.* 193:4527. [PubMed](#)
34. Claiborne D, *et al.* 2015. *Proc Natl Acad Sci U S A.* 112:1480. [PubMed](#)
35. Eberhardt K, *et al.* 2015. *Clin Infect Dis.* 61: 1615 - 1623. [PubMed](#)
36. Lee J, *et al.* 2015. *Clin Immunol.* 159: 37-46. [PubMed](#)
37. Paris R, *et al.* 2015. *PLoS One.* 10: 0144767. [PubMed](#)
38. Nicholas K, *et al.* 2015. *Cytometry A.* 10.1002/cyto.a.22799. [PubMed](#)
39. Calascibetta F, *et al.* 2016. *J Virol.* 90: 7541 - 7551. [PubMed](#)
40. RY H, *et al.* 2016. *Oncoimmunology.* 6:e1249561. [PubMed](#)
41. AC Belkina, JE Snyder-Cappione 2017. *Cytometry A.* 91:175-179. [PubMed](#)
42. Tauriainen J, *et al.* 2017. *Sci Rep.* 7:40354. [PubMed](#)
43. Geetha H. Mylvaganam, Daniel Rios 2017. *Proc Natl Acad Sci U S A.* 114(8):1976-1981. [PubMed](#)
44. Sam J, *et al.* 2020. *Front Oncol.* 10:575737. [PubMed](#)
45. Gibellini L, *et al.* 2020. *EMBO Mol Med.* 12:e13001. [PubMed](#)
46. Juno JA, *et al.* 2020. *Nat Med.* 26:1428. [PubMed](#)
47. Lindesmith LC, *et al.* 2020. *Cell Mol Gastroenterol Hepatol.* 0.586805556. [PubMed](#)
48. Bhattacharya P, *et al.* 2020. *Elife.* 9:00. [PubMed](#)
49. Riberdy JM, *et al.* 2020. *Mol Ther Methods Clin Dev.* 1.146527778. [PubMed](#)
50. Wu VH, *et al.* 2020. *JCI Insight.* 5:00. [PubMed](#)
51. de Jonge K, *et al.* 2021. *Oncolmmunology.* 10(1):1873585. [PubMed](#)
52. Mineo M, *et al.* 2020. *Molecular Cell.* 78(6):1207-1223.e8. [PubMed](#)
53. Gannon PO, *et al.* 2020. *Cytotherapy.* 22(12):780-791. [PubMed](#)
54. Buggert M, *et al.* 2020. *Cell.* 183(7):1946-1961.e15. [PubMed](#)
55. Nielsen CM, *et al.* 2021. *Cell Reports Medicine.* 2(3):100207. [PubMed](#)
56. Routhu NK, *et al.* 2021. *Immunity.* 54(3):542-556.e9. [PubMed](#)
57. Bergamaschi L, *et al.* 2021. *Immunity.* 54(6):1257-1275.e8. [PubMed](#)
58. Kreutmair S, *et al.* 2021. *Immunity.* . [PubMed](#)

RRID

AB_10900818 (BioLegend Cat. No. 329919)
AB_10960742 (BioLegend Cat. No. 329920)

Antigen Details

Structure	Immunoglobulin superfamily
Distribution	Transiently expressed on CD4 ⁺ CD8 ⁻ thymocytes; upregulated in thymocytes and splenic T and B lymphocytes; expressed on activated myeloid cells
Ligand/Receptor	B7-H1 (also known as PD-L1) and B7-DC (PD-L2)
Cell Type	B cells, Lymphocytes, T cells, Thymocytes, Tregs
Biology Area	Cancer Biomarkers, Immunology, Inhibitory Molecules
Molecular Family	CD Molecules, Immune Checkpoint Receptors
Gene ID	5133

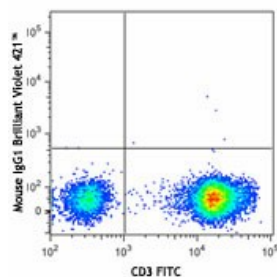
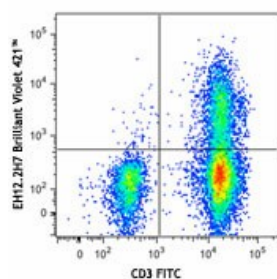
Related Protocols

[Cell Surface Flow Cytometry Staining Protocol](#)

Other Formats

Brilliant Violet 421™ anti-human CD279 (PD-1), Purified anti-human CD279 (PD-1), FITC anti-human CD279 (PD-1), PE anti-human CD279 (PD-1), APC anti-human CD279 (PD-1), Alexa Fluor® 647 anti-human CD279 (PD-1), PerCP/Cyanine5.5 anti-human CD279 (PD-1), APC/Cyanine7 anti-human CD279 (PD-1), Pacific Blue™ anti-human CD279 (PD-1), PE/Cyanine7 anti-human CD279 (PD-1), Purified anti-human CD279 (PD-1) (Maxpar® Ready), Brilliant Violet 605™ anti-human CD279 (PD-1), Ultra-LEAF™ Purified anti-human CD279 (PD-1), Brilliant Violet 711™ anti-human CD279 (PD-1), Brilliant Violet 785™ anti-human CD279 (PD-1), Brilliant Violet 510™ anti-human CD279 (PD-1), Biotin anti-human CD279 (PD-1), PE/Dazzle™ 594 anti-human CD279 (PD-1), Alexa Fluor® 488 anti-human CD279 (PD-1), PerCP anti-human CD279 (PD-1), GoInVivo™ Purified anti-human CD279 (PD-1), Brilliant Violet 650™ anti-human CD279 (PD-1), Alexa Fluor® 700 anti-human CD279 (PD-1), APC/Fire™ 750 anti-human CD279 (PD-1), TotalSeq™-A0088 anti-human CD279 (PD-1), TotalSeq™-B0088 anti-human CD279 (PD-1), TotalSeq™-C0088 anti-human CD279 (PD-1), Brilliant Violet 750™ anti-human CD279 (PD-1), TotalSeq™-D0088 anti-human CD279 (PD-1), PE/Fire™ 640 anti-human CD279 (PD-1), PE/Cyanine5 anti-human CD279 (PD-1)

Product Data



Human peripheral blood lymphocytes were stained with CD3 FITC and CD279 (clone EH12.2H7) Brilliant Violet 421™ (top) or mouse IgG1, κ Brilliant Violet 421™ isotype control (bottom).

For research use only. Not for diagnostic use. Not for resale. BioLegend will not be held responsible for patent infringement or other violations that may occur with the use of our products.

*These products may be covered by one or more Limited Use Label Licenses (see the BioLegend Catalog or our website, www.biolegend.com/ordering#license). BioLegend products may not be transferred to third parties, resold, modified for resale, or used to manufacture commercial products, reverse engineer functionally similar materials, or to provide a service to third parties without written approval of BioLegend. By use of these products you accept the terms and conditions of all applicable Limited Use Label Licenses. Unless otherwise indicated, these products are for research use only and are not intended for human or animal diagnostic, therapeutic or commercial use.

BioLegend Inc., 8999 BioLegend Way, San Diego, CA 92121 www.biolegend.com
Toll-Free Phone: 1-877-Bio-Legend (246-5343) Phone: (858) 768-5800 Fax: (877) 455-9587