PE anti-human CD279 (PD-1) Antibody

Catalog# / Size	329905 / 25 tests 329906 / 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 PE 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 CD279 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 SB - Reported in the literature, not verified in house
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 µl per million cells in 100 µl staining volume or 5 µl per 100 µl of whole blood.
Excitation Laser	Blue Laser (488 nm) Green Laser (532 nm)/Yellow-Green Laser (561 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/µg, Azide-Free, 0.2 µm 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).
Additional Product Notes	Iterative Bleaching Extended multi-pleXity (IBEX) is a fluorescent imaging technique capable of highly-multiplexed spatial analysis. The method relies on cyclical bleaching of panels of fluorescent antibodies in order to image and analyze many markers over multiple cycles of staining, imaging, and, bleaching. It is a community-developed open-access method developed by the Center for Advanced Tissue Imaging (CAT-I) in the National Institute of Allergy and Infectious Diseases (NIAID, NIH).

Application References

(PubMed link indicates BioLegend citation)

1. Dorfman DM, *et al.* 2006 *Am. J. Surg. Pathol.* 30:802. (FA)
2. Radziewicz 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. Radziewicz H, *et al.* 2010. *J. Immunol.* 184:2410. (FC) PubMed
10. Monteriro 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. Shaw BI, *et al.* 2021. J Immunol. 206:1668. PubMed
2. Li M, *et al.* 2021. J Clin Invest. 131:. PubMed
3. Tocheva AS, *et al.* 2020. Curr Protoc Immunol. 130:e103. PubMed
4. Fujita T, *et al.* 2014. J Immunol. 193:5576. PubMed
5. Chang W, *et al.* 2008. J Immunol. 181:6707. PubMed
6. Wang F, *et al.* 2018. Oncogenesis. 7:41. PubMed
7. Jung MY, *et al.* 2022. Neurooncol Adv. 4:vdac017. PubMed
8. Wang W, *et al.* 2022. World J Gastrointest Oncol. 14:1124. PubMed
9. Rha MS, *et al.* 2021. Immunity. 54:44. PubMed
10. Li H, *et al.* 2016. J Immunol. 196: 4064 - 4074. PubMed
11. Diao B, *et al.* 2020. Front Immunol. 1.032638889. PubMed
12. Huang L, *et al.* 2018. Mol Med Rep. 18:77. PubMed
13. Kim CJ, *et al.* 2018. Immunity. 49:1034. PubMed
14. Swadling L, *et al.* 2020. Cell Rep. 30:687. PubMed
15. Zhou R, *et al.* 2020. Immunity. S1074-7613(20)30333-2.. PubMed
16. Rosskopf S, *et al.* 2016. Sci Rep. 6:31580. PubMed
17. Karlsson H, *et al.* 2015. PLoS One. 10: 0144787. PubMed
18. Lucas C, *et al.* 2020. Nature. 584:463. PubMed
19. Chen M, *et al.* 2021. Cancers (Basel). 13:. PubMed
20. Gao Y, *et al.* 2021. Oncogenesis. 10:62. PubMed
21. Minns D, *et al.* 2021. Front Immunol. 12:633486. PubMed
22. Zhu C, *et al.* 2012. J Clin Endocrinol Metab. 97:943. PubMed
23. Findlay EG, *et al.* 2019. Oncoimmunology. 8:1608106. PubMed
24. Nduom E, *et al.* 2016. Neuro Oncology. 18: 195 - 205. PubMed
25. Lin JR *et al.* 2018. eLife. 7 pii: e31657. PubMed
26. Ma X *et al.* 2019. Cell Metab. 30(1):143-156 . PubMed
27. Edwards CJ, *et al.* 2021. Br J Cancer. . PubMed
28. Jutz S, *et al.* 2016. J Immunol Methods. 430:10-20. PubMed
29. Ping Y, *et al.* 2020. Front Cell Dev Biol. 0.890972222. PubMed
30. Pauthner M *et al.* 2017. Immunity. 46(6):1073-1088 . PubMed
31. Suzuki M, *et al.* 2012. J Immunol. 189:2118. PubMed
32. Bonifacius A, *et al.* 2021. Immunity. 54(2):340-354.e6. PubMed
33. Wang Y, *et al.* 2021. Front Immunol. 12:654463. PubMed
34. Raghuraman S, *et al.* 2012. J Infect Dis. 205:763. PubMed
35. Wu L, *et al.* 2018. Oncol Lett. 15:9507. PubMed
36. Alishah K, *et al.* 2021. J Transl Med. 19:482. PubMed
37. Smith CM, *et al.* 2021. Biochem J. 478:3331. PubMed
38. Buggert M, *et al.* 2020. Cell. 183(7):1946-1961.e15. PubMed
39. Shen C, *et al.* 2021. Front Immunol. 12:680055. PubMed
40. Song TZ, *et al.* 2021. Front Endocrinol (Lausanne). 12:745984. PubMed
41. Chen W, *et al.* 2021. MAbs. 13:1914359. PubMed
42. Vikkurthi R, *et al.* 2022. Nat Microbiol. 7:974. PubMed
43. OConnor RA, *et al.* 2021. OncoImmunology. 10(1):1940675. PubMed
44. Colineau L, *et al.* 2015. PLoS One. 10: e0140978. PubMed
45. Wang C, *et al.* 2020. Oncologist. 25:382. PubMed
46. Chen Y, *et al.* 2022. Bioact Mater. 9:251. PubMed
47. Huang RS, *et al.* 2021. Curr Protoc. 1:e246. PubMed
48. Krishnan S, *et al.* 2021. Clin Exp Immunol. 203:458. PubMed
49. Xu H, *et al.* 2013. J Leukoc Biol. 93:943. PubMed
50. Li N, *et al.* 2020. Oncoimmunology. 9:1824643. PubMed
51. Kamiya T, *et al.* 2018. Blood Adv. 2:517. PubMed
52. Good Z, *et al.* 2019. Nat Biotechnol. 37:259. PubMed
53. Ling X, *et al.* 2022. STAR Protoc. 3:101321. PubMed
54. Capuano C, *et al.* 2018. Front Immunol. 9:1031. PubMed
55. Pombo C, *et al.* 2015. J Infect Dis. 12: 1376-1386. PubMed
56. Shuwa HA, *et al.* 2021. Med. 2(6):720-735.e4. PubMed
57. Radziewicz H, *et al.* 2010. J Immunol. 184:2410. PubMed
58. Wei J, *et al.* 2019. J Immunother Cancer. 7:209. PubMed
59. Saber MM, *et al.* 2022. Antibodies (Basel). 11:. PubMed
60. Toor SM, *et al.* 2021. Vaccines (Basel). 9:. PubMed
61. Xu Y, *et al.* 2013. J Virol. 87:3760. PubMed

62. Richter M, *et al.* 2016. Mol Ther Methods Clin Dev. 5:16013. PubMed
63. Matsuyama H, *et al.* 2019. Sci Rep. 9:13181. PubMed
64. Eriksen LL, *et al.* 2021. PLoS One. 16:e0255574. PubMed
65. Zheng L, *et al.* 2020. Clin Cancer Res. 26:3694. PubMed
66. Beyer M, *et al.* 2016. Nat Immunol. 17:593-603. PubMed
67. Wang B, *et al.* 2018. Mol Ther Nucleic Acids. 0.548611111. PubMed
68. Ukita M, *et al.* 2022. JCI Insight. 7:. PubMed
69. Wadley AJ, *et al.* 2020. Brain Behav Immun Health. 3:100049. PubMed
70. Vojnov L, *et al.* 2010. J Virol. 84:753. PubMed
71. Shen C, *et al.* 2021. BMC Med. 19:283. PubMed
72. Zhang C, *et al.* 2020. Front Oncol. 0.944444444. PubMed
73. Schumann K, *et al.* 2015. Proc Natl Acad Sci U S A. 112: 10437-10442. PubMed
74. Li B, *et al.* 2019. Oncogenesis. 8:17. PubMed
75. Cortés–Rubio CN, *et al.* 2019. Clin Epigenetics. 11:134. PubMed
76. Gamradt S, *et al.* 2021. iScience. 24:103312. PubMed

RRID

AB_940481 (BioLegend Cat. No. 329905)
AB_940483 (BioLegend Cat. No. 329906)

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

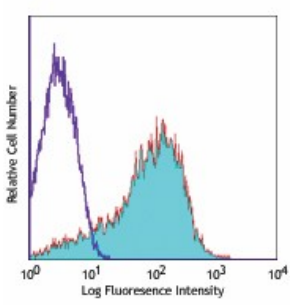
Related Protocols

Cell Surface Flow Cytometry Staining Protocol

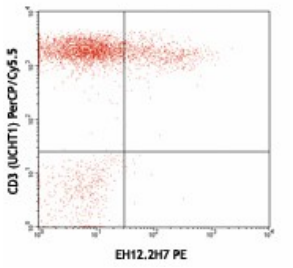
Other Formats

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)

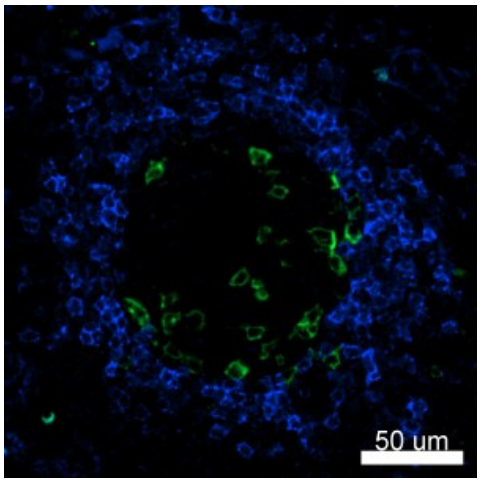
Product Data



PHA-stimulated (day-3) human peripheral blood lymphocytes were stained with CD279 (clone EH12.2H7) PE (filled histogram) or mouse IgG1, κ PE (open histogram).



Human peripheral blood lymphocytes were stained with CD279 (clone EH12.2H7) PE and CD3 (clone UCHT1) PerCP/Cy5.5.



Confocal image of human lymph node sample acquired using the IBEX method of highly multiplexed antibody-based imaging: IgD (blue) in Cycle 2, PD-1 (green) in Cycle 5. Tissues were prepared using ~1% (vol/vol) formaldehyde and a detergent. Following fixation, samples are immersed in 30% (wt/vol) sucrose for cryoprotection. Images are courtesy of Drs. Andrea J. Radtke and Ronald N. Germain of the Center for Advanced Tissue Imaging (CAT-I) in the National Institute of Allergy and Infectious Diseases (NIAID, NIH).

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