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## CD28 (CD28.2) Mouse mAb (PE-Cy7<sup>®</sup> Conjugate)

For Research Use Only. Not for Use in Diagnostic Procedures.

<b>Applications:</b> FC-L	<b>Reactivity:</b> H	<b>Sensitivity:</b> Endogenous	<b>Source/Isotype:</b> Mouse IgG1 kappa	<b>UniProt ID:</b> #P10747	<b>Entrez-Gene Id:</b> 940
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<b>Product Usage Information</b>	<b>Application</b> Flow Cytometry (Live)	<b>Dilution</b> 1:20
<b>Storage</b>	Supplied in 10 mM NaH <sub>2</sub> PO <sub>4</sub> , 150 mM NaCl, 0.09% NaN <sub>3</sub> , 0.1% gelatin, pH7.2. This product is stable for 6 months when stored at 4°C. Do not aliquot the antibody. Protect from light. Do not freeze.	
<b>Specificity/Sensitivity</b>	CD28 (CD28.2) Mouse mAb (PE-Cy7 <sup>®</sup> Conjugate) recognizes endogenous levels of total CD28 protein. This antibody detects an epitope within the extracellular domain.	
<b>Source / Purification</b>	This monoclonal antibody was purified from tissue culture supernatant via affinity chromatography. The purified antibody was conjugated under optimal conditions, with unreacted dye removed from the preparation.	
<b>Description</b>	This Cell Signaling Technology antibody is conjugated to PE-Cy7 <sup>®</sup> and tested in-house for direct flow cytometric analysis in human cells.	
<b>Background</b>	CD28 is a transmembrane glycoprotein expressed by T cells as well as some other hematopoietic cells (1, 2). T cell activation requires T cell receptor (TCR) recognition of antigen presented in the context of MHC molecules. CD28 acts as a T cell costimulatory receptor, and interaction of CD28 with its ligands CD80 or CD86 provides the second signal required for naïve T cell activation (3-5). Activation of naïve T cells in the absence of CD28 stimulation can result in a state of T cell anergy, or unresponsiveness (3). CD28 signals through cytoplasmic phospho-tyrosine motifs that bind several SH2 or SH3 domain-containing proteins involved in T cell activation (2). Recently, CD28 was demonstrated to be a preferred target of PD-1-mediated dephosphorylation. Consistently, CD28 expression was required for T cell proliferation following PD-1 blockade and CD28 stimulation was required for effective anti-PD-1 cancer immunotherapy in mice (6, 7). Several CD28 isoforms are produced by alternative splicing (8).	
<b>Background References</b>	<ol style="list-style-type: none"> <li>1. Aruffo, A. and Seed, B. (1987) <i>Proc Natl Acad Sci U S A</i> 84, 8573-7.</li> <li>2. Esensten, J.H. et al. (2016) <i>Immunity</i> 44, 973-88.</li> <li>3. Harding, F.A. et al. (1992) <i>Nature</i> 356, 607-9.</li> <li>4. Azuma, M. et al. (1993) <i>Nature</i> 366, 76-9.</li> <li>5. Linsley, P.S. et al. (1990) <i>Proc Natl Acad Sci U S A</i> 87, 5031-5.</li> <li>6. Hui, E. et al. (2017) <i>Science</i> 355, 1428-1433.</li> <li>7. Kamphorst, A.O. et al. (2017) <i>Science</i> 355, 1423-1427.</li> <li>8. Magistrelli, G. et al. (1999) <i>Biochem Biophys Res Commun</i> 259, 34-7.</li> </ol>	
<b>Species Reactivity</b>	Species reactivity is determined by testing in at least one approved application (e.g., western blot).	
<b>Applications Key</b>	<b>FC-L:</b> Flow Cytometry (Live)	
<b>Cross-Reactivity Key</b>	<b>H:</b> Human	
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