

## APC Annexin V

<b>Catalog# / Size</b>	640919 / 25 tests 640920 / 100 tests 640941 / 300 tests
<b>Regulatory Status</b>	RUO
<b>Other Names</b>	Annexin A5
<b>Description</b>	Annexin V (or Annexin A5) is a member of the annexin family of intracellular proteins that binds to phosphatidylserine (PS) in a calcium-dependent manner. PS is normally only found on the intracellular leaflet of the plasma membrane in healthy cells, but during early apoptosis, membrane asymmetry is lost and PS translocates to the external leaflet. Fluorochrome-labeled Annexin V can then be used to specifically target and identify apoptotic cells. Annexin V Binding Buffer (Cat. No. 422201) is recommended for use with Annexin V staining. Annexin V binding alone cannot differentiate between apoptotic cells and necrotic. Therefore, we recommend using our Helix NP™ Blue (Cat No. 425305), Helix NP™ Green (Cat No. 425303) or Helix NP™ NIR (Cat. No. 425301). Early apoptotic cells will exclude 7-AAD and PI, while late stage apoptotic cells and necrotic cells will stain positively, due to the passage of these dyes into the nucleus where they bind to DNA.

### Product Details

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<b>Verified Reactivity</b>	All mammalian species
<b>Formulation</b>	Phosphate-buffered solution, pH 7.2, containing 0.09% sodium azide and BSA (origin USA)
<b>Preparation</b>	The purified protein was conjugated with APC under optimal conditions.
<b>Concentration</b>	Lot-specific (to obtain lot-specific concentration, please enter the lot number in our <a href="#">Concentration and Expiration Lookup</a> or <a href="#">Certificate of Analysis</a> online tools.)
<b>Storage &amp; Handling</b>	The Annexin V solution should be stored undiluted between 2°C and 8°C, and protected from prolonged exposure to light. <b>Do not freeze.</b>
<b>Application</b>	<a href="#">FC - Quality tested</a>
<b>Recommended Usage</b>	Each lot of this product 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 100,000 - million cells in a 100 µl volume of Annexin V Binding Buffer (Cat No. 422201). It is recommended that the reagent be titrated for optimal performance for each application.
<b>Excitation Laser</b>	Red Laser (633 nm)
<b>Application Notes</b>	<p><b>Annexin V Staining</b></p> <ol style="list-style-type: none"> <li>1. Wash cells twice with cold BioLegend Cell Staining Buffer (Cat. No. 420201) and then resuspend cells in Annexin V Binding Buffer (Cat. No. 422201) at a concentration of 1x10<sup>6</sup> cells/ml.</li> <li>2. Transfer 100 µl of cell suspension in 5 ml test tube.</li> <li>3. Add 5 µl of APC Annexin V.</li> <li>4. Add 10 µl of PI solution (Cat. No. 421301) or 7-AAD (Cat. No. 420403/420404).</li> <li>5. Gently vortex the cells, and incubate for 15 min at room temperature (25°C), in the dark.</li> <li>6. Add 400 µl of Annexin V Binding Buffer (Cat. No. 422201) to each tube. Analyze by flow cytometry.</li> </ol> <p><b>For a better experience detecting apoptosis, we now recommend <a href="#">Apotracker™</a>. Cell staining with Apotracker™ is Calcium independent. Thus, no special buffers are required, and the protocol can be shortened for single-step co-staining with other reagents</b></p>
<b>Application References</b>	<ol style="list-style-type: none"> <li>1. Koopman G, et al. 1994. <i>Blood</i> 84:1415.</li> <li>2. Vermes I, et al. 1995. <i>J. Immunol. Methods</i> 184:39.</li> <li>3. Dachary-Prigent J, et al. 1993. <i>Blood</i> 81:2554.</li> <li>4. Sekine C, et al. 2009. <i>Int Immunol.</i> <a href="#">PubMed</a></li> <li>5. Grujic M, et al. 2010. <i>J. Immunol.</i> 185:1730. <a href="#">PubMed</a></li> <li>6. Hussain MS, et al. 2013. <i>Hum Mol Genet.</i> 22:5199. <a href="#">PubMed</a></li> <li>7. Feng Q, et al. 2014. <i>PLoS One.</i> 9:95927. <a href="#">PubMed</a></li> </ol>
<b>(PubMed link indicates BioLegend citation)</b>	

8. Isobe T, *et al.* 2014. *eLife*. 3:1977. [PubMed](#)

## Product Citations

1. Preda MB, *et al.* 2021. *Cell Death Dis.* 12:566. [PubMed](#)
2. Chugh RM, *et al.* 2021. *Stem Cell Res Ther.* 12:388. [PubMed](#)
3. Inclan-Rico JM, *et al.* 2020. *Nat Immunol.* 21:1181. [PubMed](#)
4. McCartin C, *et al.* 2022. *Cancers (Basel).* 14:. [PubMed](#)
5. Tang Z, *et al.* 2017. *Cell Death Differ.* 24:2127. [PubMed](#)
6. Patel RP, *et al.* 2020. *Transl Oncol.* 14:100917. [PubMed](#)
7. Isobe T, *et al.* 2014. *Elife.* 3:1977. [PubMed](#)
8. Schick M, *et al.* 2022. *Nat Commun.* 13:281. [PubMed](#)
9. Wu N, *et al.* 2020. *Cell Rep.* 30:1129. [PubMed](#)
10. Wiley CD, *et al.* 2019. *Cell Rep.* 28:3329. [PubMed](#)
11. Kuljanin M, *et al.* 2018. *Cell Rep.* 25:2524. [PubMed](#)
12. Wu SJ, *et al.* 2017. *Cell Rep.* 2:628472222. [PubMed](#)
13. Xu B, *et al.* 2017. *Oncogenesis.* 6:e295. [PubMed](#)
14. Cannons JL, *et al.* 2021. *Cell Rep.* 37:109804. [PubMed](#)
15. Dai X, *et al.* 2017. *J Cell Mol Med.* 10.1111/jcmm.13296. [PubMed](#)
16. Donado CA, *et al.* 2020. *Cell Reports.* 31(1):107466. [PubMed](#)
17. Xiao C, *et al.* 2022. *iScience.* 25:103934. [PubMed](#)
18. McNeal AS, *et al.* 2021. *Elife.* 10:. [PubMed](#)
19. Zhang S, *et al.* 2019. *Front Pediatr.* 0.485416667. [PubMed](#)
20. Vig S, *et al.* 2019. *Cell Death Dis.* 0.63125. [PubMed](#)
21. Zeriuoh W, *et al.* 2017. *PLoS One.* 12(2):e0170823. [PubMed](#)
22. Weiser J, *et al.* 2015. *J Infect Dis.* 212: 1677 - 1682. [PubMed](#)
23. Figueroa-Valdés AI, *et al.* 2021. *Front Bioeng Biotechnol.* 9:619930. [PubMed](#)
24. Fujino T, *et al.* 2021. *Nat Commun.* 12:1826. [PubMed](#)
25. Patel RP, *et al.* 2021. *Invest Ophthalmol Vis Sci.* 62:16. [PubMed](#)
26. Dregalla RC, *et al.* 2021. *Stem Cell Res Ther.* 12:547. [PubMed](#)
27. Linnerbauer M, *et al.* 2022. *Front Immunol.* 12:800128. [PubMed](#)
28. Cao J, *et al.* 2019. *Theranostics.* 0.938194444. [PubMed](#)
29. Moose DL, *et al.* 2020. *Cell Rep.* 30:3864. [PubMed](#)
30. Wang J, *et al.* 2016. *Nat Cell Biol.* 18: 480-490. [PubMed](#)
31. Sumitomo Y, *et al.* 2016. *Blood.* 128: 1614 - 1624. [PubMed](#)
32. Li L, *et al.* 2016. *Cell Death Dis.* 7:e2439. [PubMed](#)
33. Wohlhieter CA, *et al.* 2020. *Cell Rep.* 33:108444. [PubMed](#)
34. Pease NA, *et al.* 2021. *Cell Reports.* 34(12):108888. [PubMed](#)
35. Deng J, *et al.* 2021. *Cell Death Dis.* 12:978. [PubMed](#)
36. Zeng H, *et al.* 2018. *Cancer Cell.* 34:56:00. [PubMed](#)
37. Lei W, *et al.* 2020. *Sci Rep.* 10:7004. [PubMed](#)
38. Ning X, *et al.* 2019. *Mol Cell.* 74:19. [PubMed](#)
39. Vongpipatana T, *et al.* 2020. *J Immunol.* 2156:204. [PubMed](#)
40. O'Neill K, *et al.* 2016. *Genes Dev.* 30: 973-988. [PubMed](#)
41. Hussain M, *et al.* 2013. *Hum Mol Genet.* 22:5199. [PubMed](#)
42. Fleischmann M, *et al.* 2021. *Cells.* 10:. [PubMed](#)
43. Rausch M, *et al.* 2021. *Cancers (Basel).* 13:. [PubMed](#)
44. Lee M, *et al.* 2022. *Nat Commun.* 13:1157. [PubMed](#)
45. Sheng Y, *et al.* 2019. *Cell Prolif.* 52:e12611. [PubMed](#)
46. Tang Z, *et al.* 2019. *Cell Rep.* 28:1744. [PubMed](#)
47. Liu L, *et al.* 2019. *Cell Prolif.* :e12718. [PubMed](#)
48. Hickman O, *et al.* 2016. *Br J Cancer.* 10.1038/bjc.2016.91. [PubMed](#)
49. Laughney AM, *et al.* 2020. *Nat Med.* 26:259. [PubMed](#)
50. Hagan AS, *et al.* 2020. *Development.* 147:00:00. [PubMed](#)
51. Lee Y, *et al.* 2022. *Sci Adv.* 8:eabm7688. [PubMed](#)
52. Qiu C, *et al.* 2022. *Front Immunol.* 12:764949. [PubMed](#)
53. Aslam MA, *et al.* 2021. *EMBO Rep.* 22:e51184. [PubMed](#)
54. Saint Fleur-Lominy S, *et al.* 2018. *Cell Rep.* 24:3045. [PubMed](#)
55. Kanda K, *et al.* 2018. *JCI Insight.* 3:e91316. [PubMed](#)
56. Zhou X, *et al.* 2019. *Cell Rep.* 27:1176. [PubMed](#)
57. Høgh RI, *et al.* 2020. *J Immunol.* 1746:204. [PubMed](#)
58. Zhang S, *et al.* 2020. *Front Immunol.* 1.757638889. [PubMed](#)
59. Celus W, *et al.* 2021. *Cancer Immunol Res.* Online ahead of print. [PubMed](#)
60. Brasacchio D, *et al.* 2018. *Cell Death Dis.* 0.681944444. [PubMed](#)
61. Cao W, *et al.* 2016. *Nat Commun.* 7:11687. [PubMed](#)
62. Perny M, *et al.* 2016. *Cell Death Dis.* 7:e2447. [PubMed](#)
63. Liu L, *et al.* 2020. *Cancer Res.* 80:2564. [PubMed](#)
64. Ren Y, *et al.* 2022. *J Immunother Cancer.* 10:. [PubMed](#)
65. Warmuth S, *et al.* 2022. *Oncoimmunology.* 10:2004661. [PubMed](#)
66. Jung E, *et al.* 2017. *J Neurosci.* 37:6837. [PubMed](#)
67. Cai J, *et al.* 2021. *eLife.* 10:00. [PubMed](#)
68. Cheng CC, *et al.* 2020. *Elife.* 9:00. [PubMed](#)
69. Feng Q, *et al.* 2014. *PLoS One.* 9:95927. [PubMed](#)
70. Hills LB, *et al.* 2021. *J Immunol.* 206:89. [PubMed](#)
71. Dou R, *et al.* 2021. *Cell Death Dis.* 12:206. [PubMed](#)
72. Burclaff J, *et al.* 2022. *Cell Mol Gastroenterol Hepatol.* 13:1554. [PubMed](#)
73. Pediconi F, *et al.* 2022. *Sci Signal.* 15:eabl7989. [PubMed](#)
74. Li R, *et al.* 2022. *Exp Hematol Oncol.* 11:77. [PubMed](#)
75. He C, *et al.* 2022. *BMC Cancer.* 22:1100. [PubMed](#)
76. Lasrado N, *et al.* 2022. *iScience.* 25:103865. [PubMed](#)

77. Forsberg MH, *et al.* 2021. Stem Cell Res Ther. 12:459. [PubMed](#)
78. Okita R, *et al.* 2021. Thorac Cancer. 12:775. [PubMed](#)
79. Qiu Z, *et al.* 2019. Theranostics. 3.650694444. [PubMed](#)
80. Reyes-Uribe P, *et al.* 2018. Oncogene. 37:4058. [PubMed](#)
81. Lima S, *et al.* 2018. Autophagy. 1.2375. [PubMed](#)
82. Oh J, *et al.* 2017. PLoS Biol. 15:e2003352. [PubMed](#)
83. Li C, *et al.* 2021. Cell Metabolism. 33(8):1610-1623.e5. [PubMed](#)
84. Kostadinova E, *et al.* 2016. Sci Rep. 6:30943. [PubMed](#)
85. Millington-Burgess SL, *et al.* 2021. Sci Rep. 11:17678. [PubMed](#)
86. Sahoo SS, *et al.* 2021. Nat Med. 27:1806. [PubMed](#)
87. Sun J *et al.* 2018. Cell stem cell. 23(3):355-369. [PubMed](#)
88. Sharma P, *et al.* 2018. Data Brief. 1.975694444. [PubMed](#)
89. Li B, *et al.* 2019. Oncol Rep. 41:608. [PubMed](#)
90. Fernández D, *et al.* 2016. PLoS One. 11: 0157889. [PubMed](#)
91. Muthalagu N, *et al.* 2020. Cancer Discov. 1.022222222. [PubMed](#)
92. Pothlichet J, *et al.* 2020. J Clin Invest. 130:2872. [PubMed](#)
93. Wei Z, *et al.* 2021. Nat Commun. 0.805555556. [PubMed](#)
94. Rodriguez-Perdigon M, *et al.* 2022. Macromol Biosci. 22:e2200168. [PubMed](#)
95. Xu Y, *et al.* 2021. IUBMB Life. 73:1432. [PubMed](#)
96. Ho JY, *et al.* 2021. Mol Ther Methods Clin Dev. 21:237. [PubMed](#)
97. Burgener SS, *et al.* 2019. Cell Rep. 27:3646. [PubMed](#)
98. Hasselluhn MC, *et al.* 2019. Cell Death Dis. 0.726388889. [PubMed](#)
99. Zhang S, *et al.* 2018. Sci Rep. 8:17066. [PubMed](#)
100. Shinde R, *et al.* 2018. Nat Immunol. 1.188194444. [PubMed](#)
101. Hirata SI, *et al.* 2020. Allergy. 75:1939. [PubMed](#)
102. Vickman R, *et al.* 2016. Mol Cancer Res. 14: 776 - 786. [PubMed](#)
103. Cabet E, *et al.* 2015. PLoS One. 10: 0137009. [PubMed](#)
104. Tulasi DY, *et al.* 2021. Cell Mol Gastroenterol Hepatol. 11:1437. [PubMed](#)
105. Alamillo E, *et al.* 2017. Fish Shellfish Immunol. 10.1016/j.fsi.2017.08.036. [PubMed](#)
106. Voss OH, *et al.* 2018. Curr Protoc Immunol. 120:14.44.1. [PubMed](#)
107. Dower CM, *et al.* 2018. Mol Cancer Ther. 2.350694444. [PubMed](#)
108. Barve A, *et al.* 2019. Cells. 1.251388889. [PubMed](#)
109. Yamamoto H, *et al.* 2016. Sci Rep. 6:19204. [PubMed](#)
110. Dong G, *et al.* 2020. Haematologica. [PubMed](#)
111. Parsa S, *et al.* 2021. Nat Cancer. 1:653. [PubMed](#)
112. Li S, *et al.* 2021. Front Pharmacol. 12:634115. [PubMed](#)
113. Grossman L, *et al.* 2017. mSphere. 2:e00305. [PubMed](#)
114. Habtetsion T *et al.* 2018. Cell metabolism. 28(2):228-242. [PubMed](#)
115. Woolf N, *et al.* 2017. Oncogenesis. 10.1038/oncsis.2017.77. [PubMed](#)
116. Satcher R, *et al.* 2015. J Cell Sci. 128: 4629 - 4641. [PubMed](#)
117. Cordo' V, *et al.* 2022. Nat Commun. 13:1048. [PubMed](#)
118. Mykhailova O, *et al.* 2021. Transfusion. 61:1247. [PubMed](#)
119. Walle T, *et al.* 2022. Sci Adv. 8:eabh4050. [PubMed](#)
120. Höhne K, *et al.* 2016. Open Bio. 6: 160046. [PubMed](#)
121. Festag J, *et al.* 2020. Mol Ther Nucleic Acids. 1.330555556. [PubMed](#)
122. Wallace JG, *et al.* 2020. Clin Immunol. 210:108311. [PubMed](#)
123. Yang X, *et al.* 2020. Immunity. 51(6):983-996.e6. [PubMed](#)
124. Chen Y, *et al.* 2020. Front Oncol. 10:767. [PubMed](#)
125. Lu Y, *et al.* 2018. Cancer Cell. 33:1048. [PubMed](#)
126. Loo Yau H, *et al.* 2021. Molecular Cell. 81(7):1469-1483.e8. [PubMed](#)
127. Viviane Ponath, Bernd Kaina 2017. PLoS One. 10.1371/journal.pone.0170347. [PubMed](#)
128. Song S, *et al.* 2021. Mar Drugs. 19: [PubMed](#)
129. Schäfer AL, *et al.* 2021. Front Immunol. 12:696810. [PubMed](#)
130. Anderson CJ, *et al.* 2021. Nature. 596:262. [PubMed](#)
131. Agarwal P, *et al.* 2021. Cell Reports. 36(2):109386. [PubMed](#)
132. Chen Y, *et al.* 2022. Cell Death Dis. 13:822. [PubMed](#)
133. Amend A, *et al.* 2021. Int J Mol Sci. 22: [PubMed](#)
134. Trigg RM, *et al.* 2019. Nat Commun. 4.186111111. [PubMed](#)
135. Young MM, *et al.* 2019. Cell Death Dis. 1.004861111. [PubMed](#)

RRID not an antibody (BioLegend Cat. No. 640919)  
 AB\_2561515 (BioLegend Cat. No. 640920)  
 AB\_2616657 (BioLegend Cat. No. 640941)

## Antigen Details

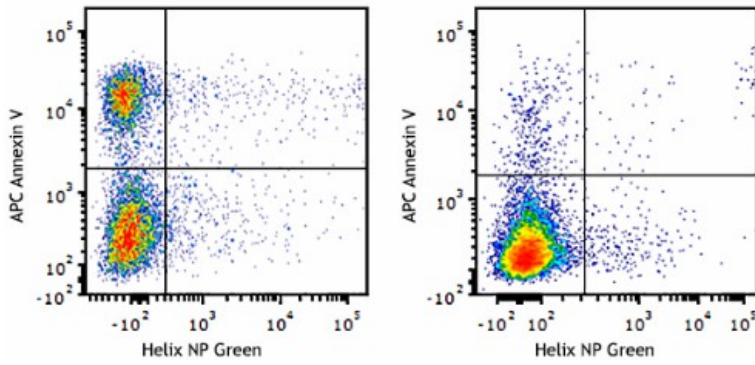
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**Biology Area** Apoptosis/Tumor Suppressors/Cell Death, Cell Biology, Neuroscience

**Gene ID** [308](#)

## Product Data

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Human T leukemia cell line Jurkat, treated (left) or non-treated (right) with BioLegend's anti-human CD95 (EOS9.1) mAb (Cat. No. 305704) for 4 hours, then stained with Annexin V- APC and Helix NP Green (Cat. No. 425303 at 5 nM) in Annexin V Binding buffer for 15 minutes at 25°C.

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