Aurora kinase A/B Mouse Monoclonal Antibody

MCA-3H1

Ordering Information
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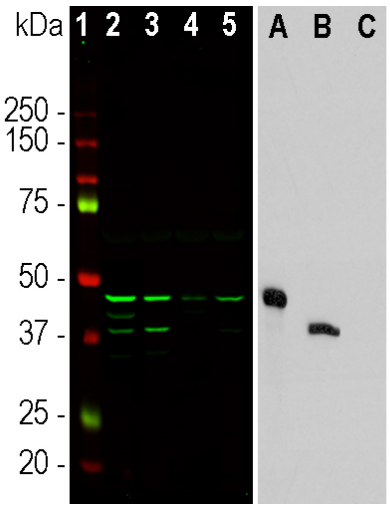
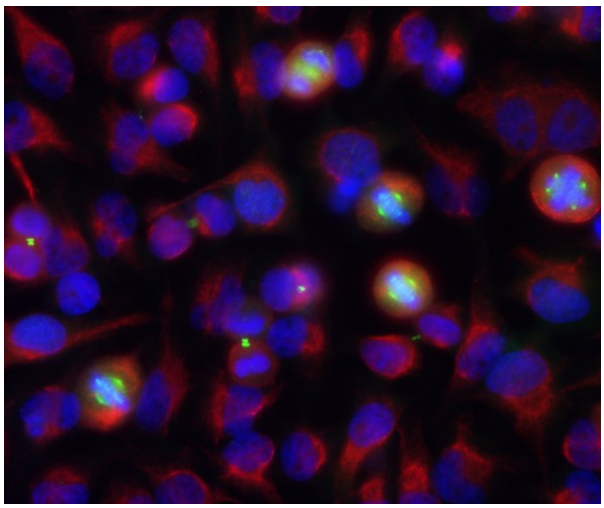
HGNC Name: *AURKA, AURKB*
UniProt: *O14965, Q96GD4*
RRID: *AB_2572230*
Immunogen: *Full length recombinant human Aurora A protein expressed in and purified from E. coli.*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Store at 4°C for short term, for longer term at -20°C*
Recommended dilutions:
WB: 1:1,000. IF/ICC or IHC: 1:500-1:1,000.

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Mouse	IgG1	46kDa, 38kDa	Hu, Rt, Ms



Western blot analysis of different cell lysates and recombinant protein solutions using mouse mAb to Aurora A/B, MCA-3H1. Left: cells were treated with 100 ng/mL of nicodazol for 6 hours:[1] protein standard, [2] HeLa, [3] A72, [4] NBL6, and [5] KR158 cells. Right: human recombinant protein Aurora (A, B, C as indicated) solutions. Bands at 46kDa and 38kDa correspond to Aurora A and Aurora B proteins respectively.



Immunofluorescent analysis of HeLa cell culture stained with mouse mAb to aurora A/B kinase, MCA-3H1, in green, and costained with chicken pAb to vimentin, CPCA-Vim, in red. The blue is DAPI staining of nuclear DNA. The MCA-5A12 antibody stains spindle poles and mitotic spindles at anaphase and concentrates on the midbody between the two daughter cells during telophase.

Background:

Aurora proteins are a family of serine/threonine protein kinases which play a key role in the regulation of cell division which were originally discovered in studies of *Drosophila* (1). Mammalian genomes encode 3 aurora kinases named aurora A, B and C, each containing a variable regulatory domain at the N terminus followed by a catalytic serine/threonine kinase domain which is almost identical between them, see here for sequence alignment. As a result it is possible to generate antibodies which react with only one aurora kinase or cross react with two or more other kinases. Aurora A and B are almost ubiquitous in distribution while C is normally only expressed in testis. Aurora A is required for centrosome duplication, entry into mitosis, formation of bipolar spindle and mitotic checkpoint (3). Aurora B is a chromosomal passenger protein and essential for chromosome condensation, kinetochore functions, spindle checkpoint activation and cytokinesis completion (4). Aurora C is normally involved in spermatogenesis, but may also be expressed in many transformed cell lines and tumors and has been less well studied to date (5). The aurora kinases are essential for the progression to cell division and as a result there has been much interest in the development of drugs aimed at inhibiting their activity for use as anticancer agents (6,7). We have made a panel of antibodies to the aurora kinases, concentrating originally on aurora A and B, and we made recombinant full length human aurora constructs of all three to document their potential cross reactivity.

The MCA-3H1 antibody was made against full length human aurora A protein and was shown to bind aurora A and B but not C. The antibody can be used to identify dividing or soon to be dividing cells and the antibody is also an excellent marker of midbodies both during and after cell division. We also supply other aurora specific antibodies, to aurora A MCA-1A11, another antibody to both aurora A and B, MCA-5A12 and aurora B specific, MCA-6G2, and MCA-3F11.

References:

1. Glover DM, Leibowitz MH, McLean DA, Parry H. Mutations in aurora prevent centrosome separation leading to the formation of monopolar spindles. Cell 81:95-105 (1995).
2. Hochegger H, Hegarat N, Pereira-Leal JB. Aurora at the pole and equator: overlapping functions of Aurora kinases in the mitotic spindle. Open Biol. 20:120185 (2013).
3. Barr AR, Gergely F. Aurora-A: the maker and breaker of spindle poles. J. Cell Sci. 120:2987-96 (2007).
4. Andrew PD, Knatko E, Moore WJ, Swedlow JR. Mitotic mechanics: the auroras come into view. Curr. Opin. Cell Biol. 15:672-83 (2003).
5. Tang CJ, Lin CY, Tang TK. Dynamic localization and functional implications of Aurora-C kinase during male mouse meiosis. Dev. Biol. 290:398-410 (2006).
6. Andrews PD. Aurora kinases: shining lights on the therapeutic horizon? Oncogene (2005) 24:5005–15 (2005).
7. Boris AC, Bhatt HG. A comprehensive review on Aurora kinase: Small molecule inhibitors and clinical trial studies. Eur. J. Med. Chem. 140:1-19 (2017).

A sequence alignment of the 3 human aurora molecules can be downloaded from http://encorbio.com/Alignments/Aurora_alignment.pdf.

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Abbreviation Key:

mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.