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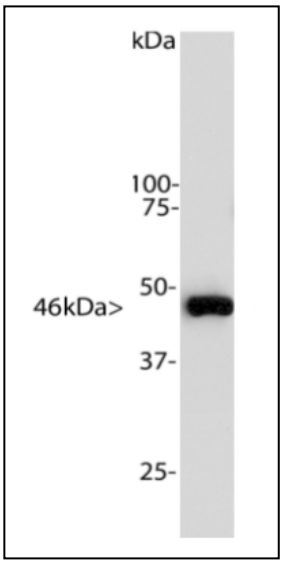
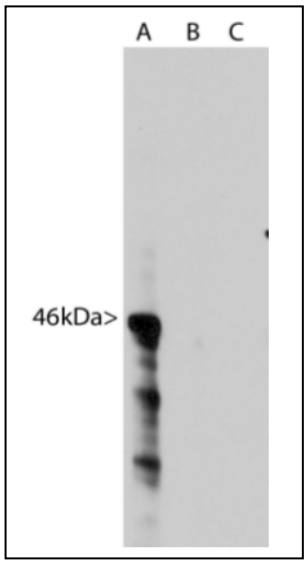
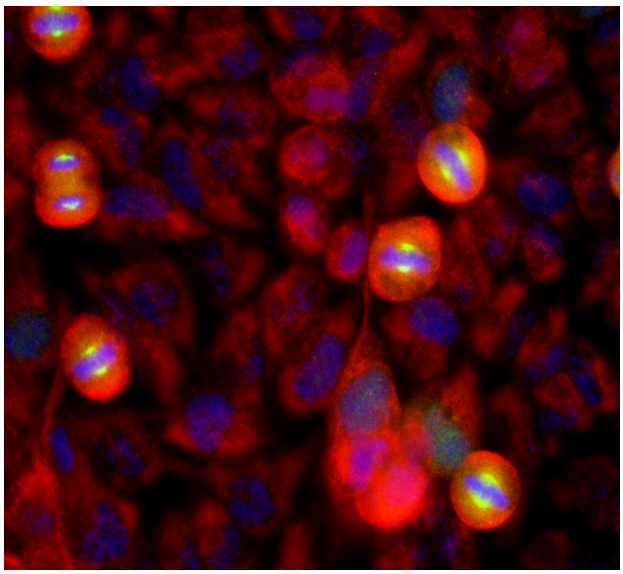
Catalogue# MCA-1A11: Mouse Monoclonal Antibody to Aurora A kinase

The Immunogen: Aurora-A is a member of the Aurora/Ipl1-related kinase family, a novel family of serine/threonine kinases crucial for cell cycle control. The first Aurora kinase was discovered in Drosophila (1). Because mutations of this kinase cause monopolar spindles, it was given the name "Aurora", reminiscent of the North Pole (1). Mammalians contain at least three aurora kinases: Aurora A, Aurora B, and Aurora C. In particular, aurora A is overexpressed in various types of cancer and considered to play critical roles in tumorigenesis (2,3). Overexpression of Aurora A overrides the cell cycle checkpoint, interferes with mitotic exit (4), and induces transformation in mammalian cells (2,3). In contrast, silencing of aurora A interrupts centrosome separation, spindle assembly and arrests G2-M transition in C. elegans and human cells (5,6). Moreover, aurora A plays an essential role for neuronal migration by modulation of microtubule organization and is required for normal axon formation (7,8). Aurora A is activated by phosphorylation at Thr-288 and activated aurora A phosphorylates numerous target proteins including p53, TPX2 and BRCA1. Expression of aurora A is cell-cycle regulated, low in G1/S, accumulates during G2/M, and decreases rapidly after. Aurora A localizes next to the centrosome late in the G1/S phase. As the cell cycle progresses, aurora A associates with the mitotic poles and the adjacent spindle microtubules. It remains associated with the spindles through telephase and relocalizes to the mid-zone of the spindle right before mitotic exit (9). As a result MCA-1A11 is an excellent reagent for studying centrosomes and mitotic poles in dividing cells. Monoclonal antibody MCA-1A11 was raised against full length recombinant human Aurora A expressed in and purified from *E. coli*. The antibody was tested for binding to recombinant human Aurora A, B, C and shown to react with only Aurora A and without cross-reaction with Aurora B and C (see Blot image). The HGNC name for this protein is AURKA.







Left: Western analysis of MCA-1A11. Blot of HeLa cells treated with 100ng/ml nocodazole for 18 hours was probed with MCA-1A11. Nocodazole is a microtubule depolymerizing agent which induces cells to halt at G2/M phase and also induces Aurora A expression. The MCA-1A11 antibody binds strongly and cleanly to a band at about 46 kDa. **Middle**: Blot of recombinant full length human Aurora A, B and C proteins was probed with MCA-1A11. MCA-1A11 recognized only the Aurora A protein. **Right:** HeLa cell cultures stained with MCA-1A11 antibody (green). Aurora A localizes in spindle poles and mitotic spindles at late mitosis. Counterstained is our chicken polyclonal antibody against Vimentin, **CPCA-Vim** (red). Blue is a DNA stain.

Antibody characteristics: MCA-1A11 is a mouse IgG1 class antibody. MCA-1A11 recognizes aurora A kinase specifically both in western blots and in immunocytochemical experiments. On blots, MCA-1A11 reveals a prominent 46 kDa band, on cells in tissue cultures, MCA-1A11 reveals strong staining in centrosome.

Suggestions for use: The antibody is provided as an aliquot of concentrated tissue culture supernatant. Store at 4°C or -20°C. Avoid repeat freezing and thawing. The antibody solution can be used at dilutions of at least 1:100-1:500 in immunofluorescence experiments. In western blotting using chemiluminescence it can be used at dilutions of 1:100-1:500.

Storage Instructions: Shipped on ice. Please store at 4°C for regular uses. For long term storage, please leave frozen at -20°C and avoid freeze/thaw cycles.

Limitations: This product is for research use only and is not approved for use in humans or in clinical diagnosis.

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. Bischoff JR, Anderson L, Zhu Y, et al. A homologue of Drosophila aurora kinase is oncogenic and amplified in human colorectal cancers. EMBO J. 17:3052-65 (1998).

3. Zhou H, Kuang J, Zhong L, et al. Tumour amplified kinase STK15/BTAKinduces centrosome amplification, aneuploidy and transformation. Nat. Genet. 20:189-93 (1998).

4. Marumoto T, Hirota T, Morisaki T, Kunitoku N, Zhang D, Ichikawa Y, Sasayama T, Kuninaka S, Mimori T, Tamaki N, Kimura M, Okano, Roles of aurora-A kinase in mitotic entry and G2 checkpoint in mammalian cells. Genes Cells 7: 1173-1182 (2002).

5. Hannak E, Kirkham M, Hyman AA, Oegema K. Aurora-A kinase is required for centrosome maturation in Caenorhabditis elegans. J. Cell Biol. 155:1109-16 (2001).

6. Du J, Hannon GJ. Suppression of p160ROCK bypasses cell cycle arrest after Aurora-A/STK15 depletion. Proc Natl Acad Sci U S A 101:8975-80 (2004).

7. Mori D, Yamada M, Mimori-Kiyosue Y, Shirai Y, Suzuki A, Ohno S, Saya H, Wynshaw-Boris A, Hirotsune S. An essential role of the aPKC-Aurora A-NDEL1 pathway in neurite elongation by modulation of microtubule dynamics. Nat Cell Biol. 11(9):1057-68 (2009) Nat. Cell Biol.11(9):1057-68(2009).

8. Takitoh T, Kumamoto K,Toba S, Wynshaw-Boris A, Hiroutsune S. Activation of Aurora-A is essential for neuronal migration via modulation of microtubule organization. J. Neurosci. 32(32):11050-66 (2012).

9. Marumoto T, Honda S, Hara T, Nitta M, Hirota T, Kohmura E, Saya H. Aurora-A kinase maintains the fidelity of early and late mitotic events in HeLa cells. J. Biol. Chem. 278(51): 5178-95 (2003).

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