SANTA CRUZ BIOTECHNOLOGY, INC.

# Mat1 (6): sc-135981

SANTA CRUZ BIOTECHNOLOGY

*The Power to Question*

## BACKGROUND

Progression through the cell cycle requires activation of a series of enzymes designated cyclin dependent kinases (Cdks). The monomeric catalytic subunit, Cdk2, a critical enzyme for initiation of cell cycle progression, is completely inactive. Partial activation is achieved by the binding of regulatory cyclins such as cyclin D1, while full activation requires phosphorylation at Thr 160. The enzyme responsible for phosphorylation of Thr 160 in Cdk2 and also Thr 161 in Cdc2 p34, designated Cdk-activating kinase (CAK), has been partially purified and shown to be comprised of a catalytic subunit, a regulatory subunit and a subunit of unknown function. The regulatory subunit is a novel cyclin (cyclin H) and is required for activation of Cdk7. This previously undescribed protein, now termed Mat1, has been cloned as a protein that associates with the cyclin H-Cdk7 nuclear complex at all stages of the cell cycle. Cyclin H-Cdk7-Mat1 complexes display kinase activity towards Cdk activation domains, and the carboxy terminus of RNA polymerase II. Mat1 appears to constitute the first example of an assembly factor, essential for the formation of an active Cdk-cyclin complex.

## REFERENCES


1. Nurse, P. 1994. Ordering S phase and M phase in the cell cycle. Cell 79: 547-550.
2. Sherr, C.J. 1994. $G_1$ phase progression: cycling on cue. Cell 79: 551-555.
3. Hunter, T., et al. 1994. Cyclins and cancer II: cyclin D and Cdk inhibitors come of age. Cell 79: 573-582.
4. Kato, J.Y., et al. 1994. Regulation of cyclin D-dependent kinase 4 (Cdk4) by Cdk4-activating kinase. Mol. Cell. Biol. 14: 2713-2721.
5. Matsuoka, M., et al. 1994. Activation of cyclin-dependent kinase 4 (Cdk4) by mouse MO15-associated kinase. Mol. Cell. Biol. 14: 7265-7275.
6. Fisher, R.P., et al. 1995. Alternative mechanisms of CAK assembly require an assembly factor or an activating kinase. Cell 83: 47-57.
7. Yee, A., et al. 1995. Molecular cloning of Cdk7-associated human Mat1, a cyclin-dependent kinase-activating kinase (CAK) assembly factor. Cancer Res. 55: 6058-6062.
8. Tassan, J.P., et al. 1995. *In vitro* assembly of a functional human Cdk7-cyclin H complex requires Mat1, a novel 36 kDa RING finger protein. EMBO J. 14: 5608-5617.
9. Kang, B.G., et al. 2007. Co-repressor MMTR/DMAP1 is involved in both HDAC1 and TFIIH-mediated transcriptional repression. Mol. Cell. Biol. 27: 3578-3588.


## CHROMOSOMAL LOCATION

Genetic locus: MNAT1 (human) mapping to 14q23.1; Mnat1 (mouse) mapping to 12 C3.

## SOURCE

Mat1 (6) is a mouse monoclonal antibody raised against amino acids 54-221 of Mat1 of mouse origin.

## PRODUCT

Each vial contains 50 µg $IgG_1$ in 0.5 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

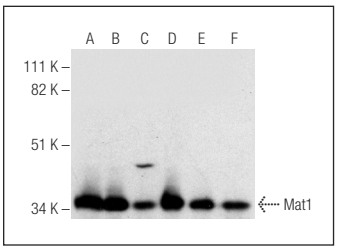
Mat1 (6) is recommended for detection of Mat1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)] and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for Mat1 siRNA (h): sc-35861, Mat1 siRNA (m): sc-35862, Mat1 shRNA Plasmid (h): sc-35861-SH, Mat1 shRNA Plasmid (m): sc-35862-SH, Mat1 shRNA (h) Lentiviral Particles: sc-35861-V and Mat1 shRNA (m) Lentiviral Particles: sc-35862-V.

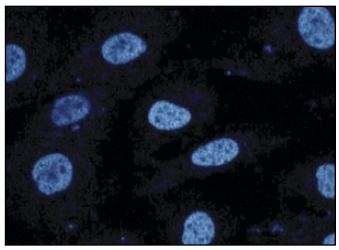
Molecular Weight of Mat1: 36 kDa.

Positive Controls: A-673 nuclear extract: sc-2128, A-431 nuclear extract: sc-2122 or NIH/3T3 nuclear extract: sc-2138.

## DATA




Mat1 (6): sc-135981. Western blot analysis of Mat1 expression in NIH/3T3 (**A**), A-431 (**B**), A-673 (**C**), RAW 264.7 (**D**), HeLa (**E**) and Hep G2 (**F**) nuclear extracts.



Mat1 (6): sc-135981. Immunofluorescence staining of rat fibroblast cells showing nuclear localization.

## SELECT PRODUCT CITATIONS


1. Perry, M.C., et al. 2014. ERBB2 deficiency alters an E2F-1-dependent adaptive stress response and leads to cardiac dysfunction. Mol. Cell. Biol. 34: 4232-4243.
2. Patel, H., et al. 2016. Expression of Cdk7, cyclin H, and Mat1 is elevated in breast cancer and is prognostic in estrogen receptor-positive breast cancer. Clin. Cancer Res. 22: 5929-5938.
3. Patel, H., et al. 2018. ICEC0942, an orally bioavailable selective inhibitor of Cdk7 for cancer treatment. Mol. Cancer Ther. 17: 1156-1166.


## STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

For research use only, not for use in diagnostic procedures. Not for resale.