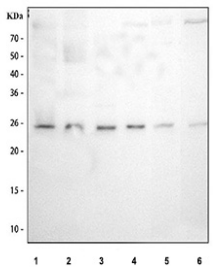
MAD2L1 Antibody / Mitotic arrest deficient 2-like protein 1 (R31695)

Catalog No.	Formulation	Size
R31695	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

Availability	1-3 business days
Species Reactivity	Human, Mouse, Rat
Format	Antigen affinity purified
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Antigen affinity
Buffer	Lyophilized from 1X PBS with 2% Trehalose
Gene ID	4085
Applications	Western Blot : 0.5-1ug/ml
Limitations	This MAD2L1 antibody is available for research use only.



Western blot testing of 1) human 293T, 2) human Raji, 3) human ThP-1, 4) human HeLa, 5) rat RH35 and 6) mouse NIH 3T3 cell lysate with MAD2L1 antibody. Predicted molecular weight ~24 kDa.

Description

MAD2L1 antibody detects Mitotic Arrest Deficient 2-Like Protein 1, a key spindle assembly checkpoint regulator that ensures accurate chromosome segregation during mitosis. The UniProt recommended name is Mitotic spindle assembly checkpoint protein MAD2A (MAD2L1). As a core component of the spindle checkpoint, MAD2L1 prevents premature anaphase onset by inhibiting the anaphase-promoting complex/cyclosome until all chromosomes have properly attached to the mitotic spindle. Through this regulatory role, MAD2L1 safeguards genome stability, prevents aneuploidy, and coordinates cell cycle progression with mitotic fidelity.

MAD2L1 is a dynamic protein that can adopt two major conformational states: open MAD2 (O-MAD2) and closed MAD2

(C-MAD2). These structural states allow MAD2L1 to interact with its primary target, CDC20, a co-activator of the anaphase-promoting complex. By forming the mitotic checkpoint complex together with BUBR1, BUB3, and CDC20, MAD2L1 blocks the ubiquitination and degradation of securin and cyclin B1, preventing chromatid separation until spindle attachment is complete. This mechanism is essential for maintaining chromosomal integrity across successive rounds of cell division.

The MAD2L1 gene is located on chromosome 4q27 and is expressed in proliferating tissues such as bone marrow, intestinal crypts, epithelial layers, embryonic tissues, and highly regenerative organs. MAD2L1 protein localizes primarily to kinetochores during early mitosis, then disperses throughout the cell as chromosomes achieve bipolar attachment. Its dynamic localization reflects rapid conformational cycling and complex assembly-disassembly events needed to generate a robust checkpoint signal. Because MAD2L1 activity is tightly linked to mitosis, its expression is frequently used as an indicator of proliferative state and checkpoint activation.

During development, MAD2L1 ensures orderly cell division across rapidly dividing tissues and supports maintenance of genomic fidelity during organogenesis. Insufficient checkpoint control can lead to mosaicism, chromosomal instability, or developmental abnormalities. Conversely, overactive checkpoint signaling can disrupt normal proliferation by delaying mitotic progression. Balanced regulation of MAD2L1 is therefore critical for proper tissue growth and differentiation.

In adult physiology, MAD2L1 continues to function as a guardian of chromosomal stability in regenerating tissues. MAD2L1 coordinates DNA replication timing with mitotic entry and helps prevent accumulation of aneuploid cells that may compromise tissue function. It also contributes to the cellular response to genotoxic stress, where checkpoint activation delays mitosis to allow resolution of replication or repair intermediates.

Pathologically, altered MAD2L1 expression or regulation has been linked to multiple diseases, most notably cancer. Many tumors exhibit elevated MAD2L1 levels, reflecting high proliferative rates and chronic spindle checkpoint activation. Excess MAD2L1 can promote chromosomal instability, a hallmark of tumor progression, while insufficient MAD2L1 activity may allow mis-segregation events that contribute to tumorigenesis. Abnormal MAD2L1 signaling has been implicated in colorectal, ovarian, breast, lung, and hematologic malignancies. In these contexts, MAD2L1 is studied as a potential marker of chromosomal instability, mitotic stress, and treatment response to spindle-targeting chemotherapies.

Beyond cancer, MAD2L1 has been explored in neurodegeneration, where mitotic checkpoint protein misregulation may influence neuronal genome maintenance. Although neurons are postmitotic, checkpoint proteins including MAD2L1 can become aberrantly re-expressed under pathological conditions, contributing to cell cycle re-entry and neuronal vulnerability.

MAD2L1 also participates in broader cell cycle networks, interacting with proteins involved in cohesion establishment, kinetochore function, and microtubule dynamics. These connections position MAD2L1 at the center of a signaling hub that integrates kinetochore tension, spindle attachment, and metaphase-to-anaphase transition outcomes.

MAD2L1 antibody supports research into mitotic regulation, chromosomal stability, spindle checkpoint control, and cancer biology. It is validated for use in relevant research applications aimed at detecting Mitotic Arrest Deficient 2-Like Protein 1 expression in cells and tissues. NSJ Bioreagents provides MAD2L1 antibody reagents suitable for studies of mitosis, checkpoint biology, genome maintenance, and proliferative signaling.

Application Notes

The stated application concentrations are suggested starting amounts. Titration of the MAD2L1 antibody may be required due to differences in protocols and secondary/substrate sensitivity.

Immunogen

Human partial recombinant protein (AA 2-205) was used as the immunogen for this MAD2L1 antibody.

Storage

After reconstitution, the MAD2L1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.