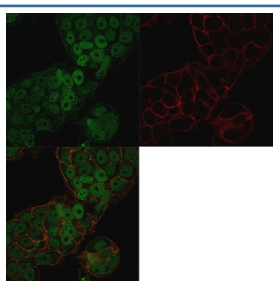
CHD4 Antibody / Chromodomain helicase DNA binding protein 4 [clone 3F2/4] (V7676)

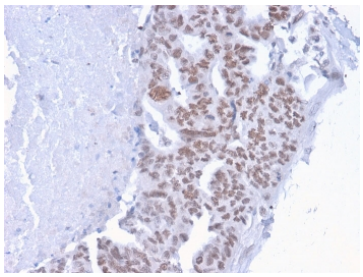
Catalog No.	Formulation	Size
V7676-100UG	0.2 mg/ml in 1X PBS with 0.1 mg/ml BSA (US sourced) and 0.05% sodium azide	100 ug
V7676-20UG	0.2 mg/ml in 1X PBS with 0.1 mg/ml BSA (US sourced) and 0.05% sodium azide	20 ug
V7676SAF-100UG	1 mg/ml in 1X PBS; BSA free, sodium azide free	100 ug

Bulk quote request

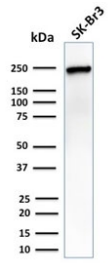
Availability	1-3 business days
Species Reactivity	Human, Mouse
Format	Purified
Clonality	Monoclonal (mouse origin)
Isotype	Mouse IgG2a, kappa
Clone Name	3F2/4
Purity	Protein G affinity chromatography
UniProt	Q14839
Localization	Cytoplasmic, nuclear
Applications	ELISA (order BSA-free Format For Coating) : Western Blot : 1-2ug/ml Immunofluorescence : 1-2ug/ml Immunohistochemistry (FFPE) : 1-2ug/ml
Limitations	This CHD4 antibody is available for research use only.



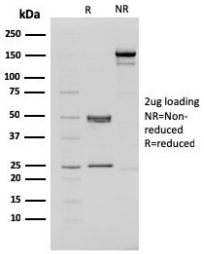
Immunofluorescent staining of permeabilized human MCF7 cells with CHD4 antibody (clone 3F2/4, green) and Phalloidin (red).



IHC staining of FFPE human breast carcinoma with CHD4 antibody (clone 3F2/4). HIER: boil tissue sections in pH 9 10mM Tris with 1mM EDTA for 10-20 min and allow to cool before testing.



Western blot testing of human SK-BR-3 cells with CHD4 antibody. Predicted molecular weight ~218 kDa, commonly observed at 240-260 kDa.



SDS-PAGE analysis of purified, BSA-free CHD4 antibody (clone 3F2/4) as confirmation of integrity and purity.

Description

The CHD4 antibody / Chromodomain helicase DNA binding protein 4 antibody (clone 3F2/4) detects the chromatin remodeling factor CHD4, a core ATP-dependent helicase within the Nucleosome Remodeling and Deacetylase complex, commonly referred to as the NuRD complex. The UniProt recommended name is Chromodomain-helicase-DNA-binding protein 4, encoded by the CHD4 gene on chromosome 12p13.31. CHD4 belongs to the chromodomain helicase DNA binding (CHD) family, a group of ATP-dependent chromatin remodelers that regulate nucleosome positioning, DNA accessibility, transcription, and chromatin organization. CHD4 is primarily localized to the nucleus, where it associates with chromatin and participates in large multi-protein complexes essential for maintaining transcriptional homeostasis.

CHD4 contains hallmark structural regions including tandem chromodomains, a SNF2-like ATPase helicase domain, PHD finger domains, and regions that facilitate interaction with additional NuRD components such as HDAC1, HDAC2, MTA proteins, GATAD2A/B, MBD2/MBD3, and RBBP4/RBBP7. These domains coordinate ATP hydrolysis with nucleosome repositioning to regulate gene expression. CHD4 modulates chromatin compaction, nucleosome sliding, and access of transcriptional regulators to DNA, making it a key factor in gene repression pathways. Through its helicase domain, CHD4 engages ATP-driven remodeling events that reorganize chromatin architecture to support transcriptional silence, lineage specification, or developmental timing.

CHD4 plays a substantial role in DNA damage responses. It is rapidly recruited to sites of DNA double-strand breaks through interactions with poly-ADP-ribose, gamma-H2AX-associated factors, and repair scaffolds. In these contexts, CHD4 regulates chromatin relaxation and facilitates repair factor recruitment. Its participation in the DNA damage response helps coordinate repair fidelity and genome stability. CHD4 also interacts with replication-associated proteins and contributes to replication fork progression and chromatin maturation during S-phase. These functions emphasize its central role in maintaining genomic integrity.

During embryonic development, CHD4 is essential for early lineage commitment. It regulates transcriptional programs governing differentiation of neural tissues, hematopoietic lineages, cardiac structures, muscle development, and epithelial

patterning. CHD4 helps establish gene expression boundaries required for determining cell identity, controlling enhancer accessibility, and stabilizing chromatin domains that permit precise developmental progression. In immune cells, CHD4 helps regulate cytokine gene repression, lymphocyte differentiation, and chromatin remodeling during activation cycles.

Dysregulation of CHD4 is implicated in several diseases. Altered CHD4 expression contributes to malignancies including breast cancer, colorectal carcinoma, endometrial cancer, melanoma, glioma, hepatocellular carcinoma, and hematologic disorders. Somatic mutations in CHD4 are associated with cancer predisposition, transcriptional instability, and aberrant DNA repair. Germline mutations in CHD4 cause Sifrim-Hitz-Weiss syndrome, characterized by neurodevelopmental defects, congenital anomalies, and impaired chromatin regulation. CHD4 overexpression or functional imbalance can influence tumor progression, epithelial plasticity, metastasis, and therapy resistance through downstream effects on chromatin accessibility and transcriptional control.

At the pathway level, CHD4 influences multiple regulatory circuits including Notch signaling, p53-mediated transcription, interferon-associated gene silencing, hormone receptor-associated expression programs, and cell cycle checkpoint pathways. It acts as a central coordinator for integrating chromatin structure with transcriptional output, affecting gene silencing through histone deacetylation and nucleosome remodeling. CHD4 also interacts with histone-binding proteins, scaffold factors, and transcriptional repressors, modulating enhancer landscapes and chromatin boundaries in dividing and differentiated cells.

CHD4 protein expression is detected in dividing progenitor cells, differentiated tissues, and actively remodeling epithelial and stromal populations. Its nuclear localization and association with chromatin allow it to function as a marker of chromatin remodeling activity and epigenetic regulation. Isoforms of CHD4 originate from alternative splicing events that affect sequence length and may influence chromatin association or complex assembly. These isoforms contribute additional functional diversity in cell-type-specific chromatin environments.

The CHD4 antibody / Chromodomain helicase DNA binding protein 4 antibody (clone 3F2/4) can be used in immunohistochemistry, western blot, or other research assays to examine CHD4 expression, nuclear distribution, chromatin-associated regulation, or transcriptional repression mechanisms. These general applications support studies involving epigenetic control, nuclear organization, lineage specification, DNA damage signaling, and chromatin remodeling-dependent transcriptional programs. NSJ Bioreagents provides the CHD4 antibody / Chromodomain helicase DNA binding protein 4 antibody (clone 3F2/4) formulated for use in relevant research applications requiring accurate detection of this chromatin remodeling factor.

Application Notes

Optimal dilution of the CHD4 antibody should be determined by the researcher.

Immunogen

Amino acids ASGLGSPSPCSAGSEEEDM and CSRLANRAPEPPPQQVAQQQ were used as the immunogen for the CHD4 antibody.

Storage

Store the CHD4 antibody at 2-8oC (with azide) or aliquot and store at -20oC or colder (without azide).