abcam

Product datasheet

Anti-SMC1A antibody [C2M] ab16147

★★★★★ 1 Abreviews 1 References

Overview

Product name	Anti-SMC1A antibody [C2M]
Description	Mouse monoclonal [C2M] to SMC1A
Host species	Mouse
Tested applications	**Suitable for:** ICC/IF, WB
Species reactivity	**Reacts with:** Human
Immunogen	Recombinant fragment corresponding to Human SMC1A aa 402-894. Database link: **Q14683**
Positive control	WB: HeLa cells.
General notes	Structural Maintenance of Chromosomes (SMC) family proteins play critical roles in various nuclear events that require structural changes of chromosomes, including mitotic chromosome organization, DNA recombination and repair and global transcriptional repression. The chromosome proteins are conserved in eukaryotes lead to mitotic chromosome segregation defects, suggesting a critical function of SMC family proteins in mitotic chromosome dynamics. SMC1 and SMC3 form a heterodimeric complex required for metaphase progression in mitotic cells. Specifically this SMC1/SMC3 complex is responsible for sister chromatid cohesion during metaphase. A number of cellular factors interact with hSMC1/hSMC3 during cell cycle. The major population of hSMC1/hSMC3 is in a compex with hRAD21 forming the human cohesion complex. Human cohesion associates with chromosomes which peaks at S phase and dissociates from chromosomes during G2/M transition. In addition, a subpopulation of hSMC1/hSMC3 associates tightly with nuclear matrix and centrosomes during interphase. A subset of hSMC1/hSMC3 is localized to spindle poles, spindles and kinetochores during mitosis when cohesin is in the cytoplasm. hSMC1/hSMC3 is required for spindle aster formation in vitro and reacts with nuclear mitotic apparatus (2) protein in vivo. The Life Science industry has been in the grips of a reproducibility crisis for a number of years. Abcam is leading the way in addressing this with our range of recombinant monoclonal antibodies and knockout edited cell lines for gold-standard validation. Please check that this product meets your needs before purchasing. If you have any questions, special requirements or concerns, please send us an inquiry and/or contact our Support team ahead of purchase. Recommended alternatives for this product can be found below, along with publications, customer reviews and Q&As

Properties

Form	Liquid
Storage instructions	Shipped at 4°C. Upon delivery aliquot and store at -20°C. Avoid freeze / thaw cycles.
Storage buffer	Preservative: 0.08% Sodium azide Constituent: PBS
Purity	Protein A/G purified
Clonality	Monoclonal
Clone number	C2M
Isotype	IgG

Applications

The Abpromise guarantee Our **Abpromise guarantee** covers the use of ab16147 in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

Application	Abreviews	Notes
ICC/IF		Use at an assay dependent concentration.
WB	★★★★★ (1)	Use at an assay dependent concentration.

Target

Function Involved in chromosome cohesion during cell cycle and in DNA repair. Central component of cohesin complex. The cohesin complex is required for the cohesion of sister chromatids after DNA replication. The cohesin complex apparently forms a large proteinaceous ring within which sister chromatids can be trapped. At anaphase, the complex is cleaved and dissociates from chromatin, allowing sister chromatids to segregate. The cohesin complex may also play a role in spindle pole assembly during mitosis. Involved in DNA repair via its interaction with BRCA1 and its related phosphorylation by ATM, or via its phosphorylation by ATR. Works as a downstream effector both in the ATM/NBS1 branch and in the ATR/MSH2 branch of S-phase checkpoint.

Involvement in disease Defects in SMC1A are the cause of Cornelia de Lange syndrome type 2 (CDLS2) [MIM:300590]; also known as Cornelia de Lange syndrome X-linked. CDLS is a clinically heterogeneous developmental disorder associated with malformations affecting multiple systems. CDLS is characterized by facial dysmorphisms, abnormal hands and feet, growth delay, cognitive retardation and various other malformations including gastroesophageal dysfunction and cardiac, ophthalmologic and genitourinary anomalies.

Sequence similarities Belongs to the SMC family. SMC1 subfamily.

Domain The flexible hinge domain, which separates the large intramolecular coiled coil regions, allows the heterotypic interaction with the corresponding domain of SMC3, forming a V-shaped heterodimer. The two heads of the heterodimer are then connected by different ends of the cleavable RAD21 protein, forming a ring structure.

Post-translational modifications Phosphorylated by ATM upon ionizing radiation in a NBS1-dependent manner. Phosphorylated by ATR upon DNA methylation in a MSH2/MSH6-dependent manner. Phosphorylation of Ser-957 and Ser-966 activates it and is required for S-phase checkpoint activation.

Cellular localization Nucleus. Chromosome. Chromosome > centromere > kinetochore. Associates with chromatin.

Before prophase it is scattered along chromosome arms. During prophase, most of cohesin complexes dissociate from chromatin probably because of phosphorylation by PLK, except at centromeres, where cohesin complexes remain. At anaphase, the RAD21 subunit of the cohesin complex is cleaved, leading to the dissociation of the complex from chromosomes, allowing chromosome separation. In germ cells, cohesin complex dissociates from chromatin at prophase I, and may be replaced by a meiosis-specific cohesin complex. The phosphorylated form on Ser-957 and Ser-966 associates with chromatin during G1/S/G2 phases but not during M phase, suggesting that phosphorylation does not regulate cohesin function. Integral component of the functional centromere-kinetochore complex at the kinetochore region during mitosis.

Our Abpromise to you: Quality guaranteed and expert technical support

- Replacement or refund for products not performing as stated on the datasheet
- Valid for 12 months from date of delivery
- Response to your inquiry within 24 hours
- We provide support in Chinese, English, French, German, Japanese and Spanish
- Extensive multi-media technical resources to help you
- We investigate all quality concerns to ensure our products perform to the highest standards

If the product does not perform as described on this datasheet, we will offer a refund or replacement. For full details of the Abpromise, please visit **https://www.abcam.com/abpromise** or contact our technical team.

Terms and conditions

- Guarantee only valid for products bought direct from Abcam or one of our authorized distributors