

Product datasheet

Anti-HMGB1 antibody ab227168

[13 References](#) [11 Images](#)

Overview

Product name	Anti-HMGB1 antibody
Description	Rabbit polyclonal to HMGB1
Host species	Rabbit
Tested applications	Suitable for: IHC-P, WB, ICC/IF
Species reactivity	Reacts with: Mouse, Rat, Human Predicted to work with: Rabbit, Chicken, Cow, Dog, Pig, Xenopus laevis, Rhesus monkey



Immunogen Recombinant fragment within Human HMGB1 (internal sequence). The exact sequence is proprietary.

Database link: [P09429](#)

Positive control WB: HEK-293T, A431, A-375, HeLa, HepG2, NIH/3T3, JC, BCL-1, C2C12, RAW 264.7 and PC-12 whole cell lysates/extracts. IHC-P: Mouse esophagus and colon tissues; Rat brain stem tissue. ICC/IF: SK-N-SH, HeLa and NIH/3T3 cells.

General notes 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. Store at +4°C short term (1-2 weeks). Upon delivery aliquot. Store at -20°C long term. Avoid freeze / thaw cycle.
Storage buffer	pH: 7.00 Preservative: 0.025% Proclin 300 Constituents: 79% PBS, 20% Glycerol (glycerin, glycerine)
Purity	Immunogen affinity purified
Clonality	Polyclonal

Isotype

IgG

Applications

The Abpromise guarantee

Our **Abpromise guarantee** covers the use of ab227168 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
IHC-P		1/100 - 1/1000.
WB		1/500 - 1/10000. Predicted molecular weight: 25 kDa.
ICC/IF		1/100 - 1/1000.

Target

Function

Multifunctional redox sensitive protein with various roles in different cellular compartments. In the nucleus is one of the major chromatin-associated non-histone proteins and acts as a DNA chaperone involved in replication, transcription, chromatin remodeling, V(D)J recombination, DNA repair and genome stability. Proposed to be an universal biosensor for nucleic acids. Promotes host inflammatory response to sterile and infectious signals and is involved in the coordination and integration of innate and adaptive immune responses. In the cytoplasm functions as sensor and/or chaperone for immunogenic nucleic acids implicating the activation of TLR9-mediated immune responses, and mediates autophagy. Acts as danger associated molecular pattern (DAMP) molecule that amplifies immune responses during tissue injury. Released to the extracellular environment can bind DNA, nucleosomes, IL-1 beta, CXCL12, AGER isoform 2/sRAGE, lipopolysaccharide (LPS) and lipoteichoic acid (LTA), and activates cells through engagement of multiple surface receptors. In the extracellular compartment fully reduced HMGB1 (released by necrosis) acts as a chemokine, disulfide HMGB1 (actively secreted) as a cytokine, and sulfonyl HMGB1 (released from apoptotic cells) promotes immunological tolerance (PubMed:23519706, PubMed:23446148, PubMed:23994764, PubMed:25048472). Has proangiogenic activity (By similarity). May be involved in platelet activation (By similarity). Binds to phosphatidylserine and phosphatidylethanolamide (By similarity). Bound to RAGE mediates signaling for neuronal outgrowth (By similarity). May play a role in accumulation of expanded polyglutamine (polyQ) proteins such as huntingtin (HTT) or TBP (PubMed:23303669, PubMed:25549101).

Nuclear functions are attributed to fully reduced HGMB1. Associates with chromatin and binds DNA with a preference to non-canonical DNA structures such as single-stranded DNA, DNA-containing cruciforms or bent structures, supercoiled DNA and ZDNA. Can bent DNA and enhance DNA flexibility by looping thus providing a mechanism to promote activities on various gene promoters by enhancing transcription factor binding and/or bringing distant regulatory sequences into close proximity (PubMed:20123072). May have an enhancing role in nucleotide excision repair (NER) (By similarity). However, effects in NER using in vitro systems have been reported conflictingly (PubMed:19446504, PubMed:19360789). May be involved in mismatch repair (MMR) and base excision repair (BER) pathways (PubMed:15014079, PubMed:16143102, PubMed:17803946). May be involved in double strand break repair such as non-homologous end joining (NHEJ) (By similarity). Involved in V(D)J recombination by acting as a cofactor of the RAG complex: acts by stimulating cleavage and RAG protein binding at the 23

bp spacer of conserved recombination signal sequences (RSS) (By similarity). In vitro can displace histone H1 from highly bent DNA (By similarity). Can restructure the canonical nucleosome leading to relaxation of structural constraints for transcription factor-binding (By similarity). Enhances binding of sterol regulatory element-binding proteins (SREBPs) such as SREBF1 to their cognate DNA sequences and increases their transcriptional activities (By similarity). Facilitates binding of TP53 to DNA (PubMed:23063560). Proposed to be involved in mitochondrial quality control and autophagy in a transcription-dependent fashion implicating HSPB1; however, this function has been questioned (By similarity). Can modulate the activity of the telomerase complex and may be involved in telomere maintenance.

In the cytoplasm proposed to dissociate the BECN1:BCL2 complex via competitive interaction with BECN1 leading to autophagy activation (PubMed:20819940). Involved in oxidative stress-mediated autophagy (PubMed:21395369). Can protect BECN1 and ATG5 from calpain-mediated cleavage and thus proposed to control their proautophagic and proapoptotic functions and to regulate the extent and severity of inflammation-associated cellular injury (By similarity). In myeloid cells has a protective role against endotoxemia and bacterial infection by promoting autophagy (By similarity). Involved in endosomal translocation and activation of TLR9 in response to CpG-DNA in macrophages.

In the extracellular compartment (following either active secretion or passive release) involved in regulation of the inflammatory response. Fully reduced HGMB1 (which subsequently gets oxidized after release) in association with CXCL12 mediates the recruitment of inflammatory cells during the initial phase of tissue injury; the CXCL12:HMGB1 complex triggers CXCR4 homodimerization (PubMed:22370717). Induces the migration of monocyte-derived immature dendritic cells and seems to regulate adhesive and migratory functions of neutrophils implicating AGER/RAGE and ITGAM (By similarity). Can bind to various types of DNA and RNA including microbial unmethylated CpG-DNA to enhance the innate immune response to nucleic acids. Proposed to act in promiscuous DNA/RNA sensing which cooperates with subsequent discriminative sensing by specific pattern recognition receptors (By similarity). Promotes extracellular DNA-induced AIM2 inflammasome activation implicating AGER/RAGE (PubMed:24971542). Disulfide HMGB1 binds to transmembrane receptors, such as AGER/RAGE, TLR2, TLR4 and probably TREM1, thus activating their signal transduction pathways. Mediates the release of cytokines/chemokines such as TNF, IL-1, IL-6, IL-8, CCL2, CCL3, CCL4 and CXCL10 (PubMed:12765338, PubMed:18354232, PubMed:19264983, PubMed:20547845, PubMed:24474694). Promotes secretion of interferon-gamma by macrophage-stimulated natural killer (NK) cells in concert with other cytokines like IL-2 or IL-12 (PubMed:15607795). TLR4 is proposed to be the primary receptor promoting macrophage activation and signaling through TLR4 seems to implicate LY96/MD-2 (PubMed:20547845). In bacterial LPS- or LTA-mediated inflammatory responses binds to the endotoxins and transfers them to CD14 for signaling to the respective TLR4:LY96 and TLR2 complexes (PubMed:18354232, PubMed:21660935, PubMed:25660311). Contributes to tumor proliferation by association with AGER/RAGE (By similarity). Can bind to IL1-beta and signals through the IL1R1:IL1RAP receptor complex (PubMed:18250463). Binding to class A CpG activates cytokine production in plasmacytoid dendritic cells implicating TLR9, MYD88 and AGER/RAGE and can activate autoreactive B cells. Via HMGB1-containing chromatin immune complexes may also promote B cell responses to endogenous TLR9 ligands through a B-cell receptor (BCR)-dependent and AGER/RAGE-independent mechanism (By similarity). Inhibits phagocytosis of apoptotic cells by macrophages; the function is dependent on poly-ADP-ribosylation and involves binding to phosphatidylserine on the cell surface of apoptotic cells (By similarity). In adaptive immunity may be involved in enhancing immunity through activation of effector T cells and suppression of regulatory T (TReg) cells (PubMed:15944249, PubMed:22473704). In contrast, without implicating effector or regulatory T-cells, required for tumor infiltration and activation of T-cells expressing the lymphotoxin LTA:LTB heterotrimer thus promoting tumor malignant progression (By similarity). Also reported to limit proliferation of T-cells (By similarity). Released HMGB1:nucleosome complexes formed during apoptosis can signal

through TLR2 to induce cytokine production (PubMed:19064698). Involved in induction of immunological tolerance by apoptotic cells; its pro-inflammatory activities when released by apoptotic cells are neutralized by reactive oxygen species (ROS)-dependent oxidation specifically on Cys-106 (PubMed:18631454). During macrophage activation by activated lymphocyte-derived self apoptotic DNA (ALD-DNA) promotes recruitment of ALD-DNA to endosomes.

Tissue specificity

Ubiquitous. Expressed in platelets (PubMed:11154118).

Sequence similarities

Belongs to the HMGB family.
Contains 2 HMG box DNA-binding domains.

Domain

HMG box 2 mediates proinflammatory cytokine-stimulating activity and binding to TLR4 (PubMed:12765338, PubMed:20547845). However, not involved in mediating immunogenic activity in the context of apoptosis-induced immune tolerance (PubMed:24474694). The acidic C-terminal domain forms a flexible structure which can reversibly interact intramolecularly with the HMG boxes and modulate binding to DNA and other proteins (PubMed:23063560).

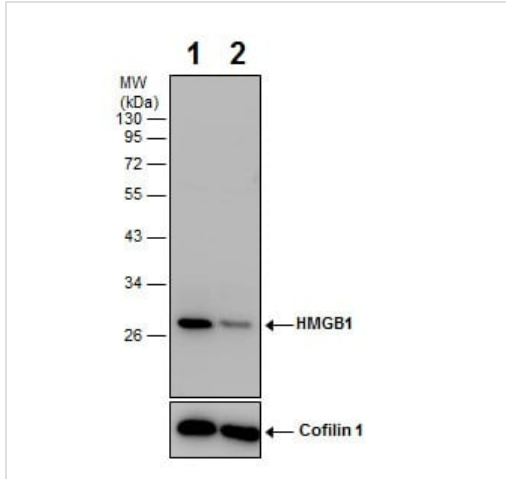
Post-translational modifications

Phosphorylated at serine residues. Phosphorylation in both NLS regions is required for cytoplasmic translocation followed by secretion (PubMed:17114460).
Acetylated on multiple sites upon stimulation with LPS (PubMed:22801494). Acetylation on lysine residues in the nuclear localization signals (NLS 1 and NLS 2) leads to cytoplasmic localization and subsequent secretion (By similarity). Acetylation on Lys-3 results in preferential binding to DNA ends and impairs DNA bending activity.
Reduction/oxidation of cysteine residues Cys-23, Cys-45 and Cys-106 and a possible intramolecular disulfide bond involving Cys-23 and Cys-45 give rise to different redox forms with specific functional activities in various cellular compartments: 1- fully reduced HMGB1 (HMGB1C23hC45hC106h), 2- disulfide HMGB1 (HMGB1C23-C45C106h) and 3- sulfonyl HMGB1 (HMGB1C23soC45soC106so).
Poly-ADP-ribosylated by PARP1 when secreted following stimulation with LPS.
In vitro cleavage by CASP1 is liberating a HMG box 1-containing peptide which may mediate immunogenic activity; the peptide antagonizes apoptosis-induced immune tolerance (PubMed:24474694). Can be proteolytically cleaved by a thrombin:thrombomodulin complex; reduces binding to heparin and proinflammatory activities.

Cellular localization

Nucleus. Chromosome. Cytoplasm. Secreted. Cell membrane. Endosome. Endoplasmic reticulum-Golgi intermediate compartment. In basal state predominantly nuclear. Shuttles between the cytoplasm and the nucleus (PubMed:12231511, PubMed:17114460). Translocates from the nucleus to the cytoplasm upon autophagy stimulation (PubMed:20819940). Release from macrophages in the extracellular milieu requires the activation of NLRC4 or NLRP3 inflammasomes (By similarity). Passively released to the extracellular milieu from necrotic cells by diffusion, involving the fully reduced HGMB1 which subsequently gets oxidized (PubMed:19811284). Also released from apoptic cells (PubMed:16855214, PubMed:18631454). Active secretion from a variety of immune and non-immune cells such as macrophages, monocytes, neutrophils, dendritic cells and natural killer cells in response to various stimuli such as LPS and cytokines involves a nonconventional secretory process via secretory lysosomes (PubMed:12231511, PubMed:14532127, PubMed:15944249). Secreted by plasma cells in response to LPS (By similarity). Found on the surface of activated platelets (PubMed:11154118).

Images



Western blot - Anti-HMGB1 antibody (ab227168)

All lanes : Anti-HMGB1 antibody (ab227168) at 1/5000 dilution

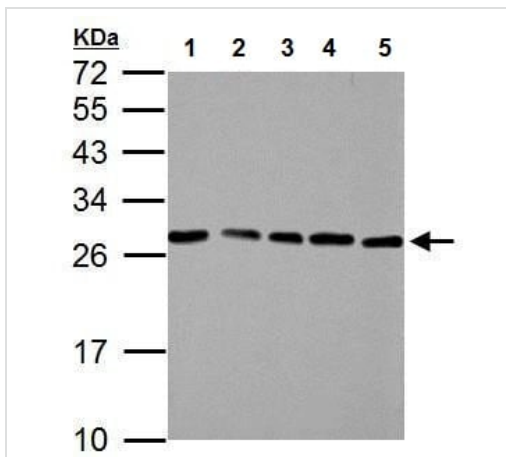
Lane 1 : HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) whole cell lysate

Lane 2 : HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) transfected with HMGB1 shRNA, whole cell lysate

Lysates/proteins at 30 µg per lane.

Predicted band size: 25 kDa

12% SDS-PAGE gel.



Western blot - Anti-HMGB1 antibody (ab227168)

All lanes : Anti-HMGB1 antibody (ab227168) at 1/3000 dilution

Lane 1 : NIH/3T3 (mouse embryonic fibroblast cell line) whole cell lysate

Lane 2 : JC whole cell lysate

Lane 3 : BCL-1 whole cell lysate

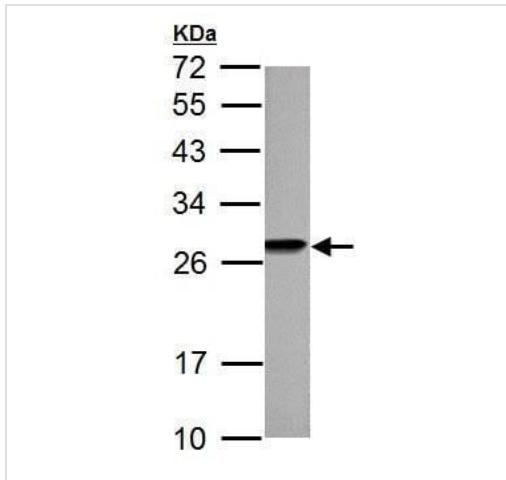
Lane 4 : C2C12 (mouse myoblast cell line) whole cell lysate

Lane 5 : RAW 264.7 (mouse macrophage cell line transformed with Abelson murine leukemia virus) whole cell lysate

Lysates/proteins at 30 µg per lane.

Predicted band size: 25 kDa

12% SDS-PAGE gel.

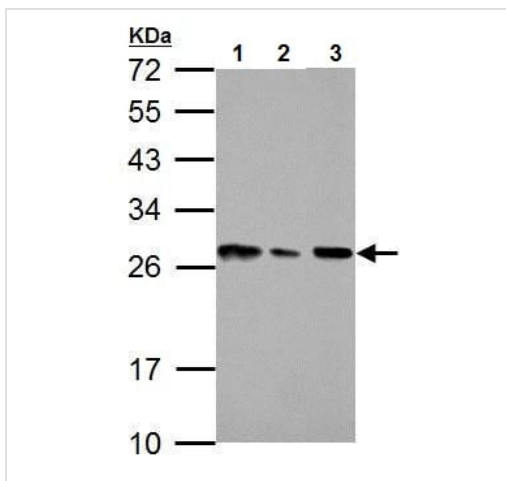


Western blot - Anti-HMGB1 antibody (ab227168)

Anti-HMGB1 antibody (ab227168) at 1/3000 dilution + PC-12 (rat adrenal gland pheochromocytoma cell line) whole cell lysate at 30 μ g

Predicted band size: 25 kDa

12% SDS-PAGE gel.



Western blot - Anti-HMGB1 antibody (ab227168)

All lanes : Anti-HMGB1 antibody (ab227168) at 1/3000 dilution

Lane 1 : HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) whole cell lysate

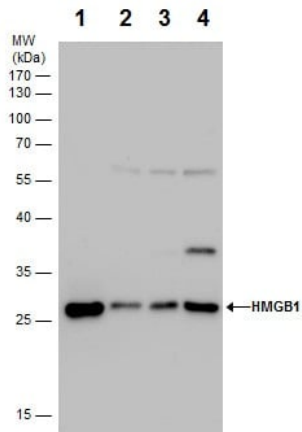
Lane 2 : A431 (human epidermoid carcinoma cell line) whole cell lysate

Lane 3 : A-375 (human malignant melanoma cell line) whole cell lysate

Lysates/proteins at 30 μ g per lane.

Predicted band size: 25 kDa

12% SDS-PAGE gel.



Western blot - Anti-HMGB1 antibody (ab227168)

All lanes : Anti-HMGB1 antibody (ab227168) at 1/3000 dilution

Lane 1 : HEK-293T (human epithelial cell line from embryonic kidney transformed with large T antigen) whole cell extract

Lane 2 : A431 (human epidermoid carcinoma cell line) whole cell extract

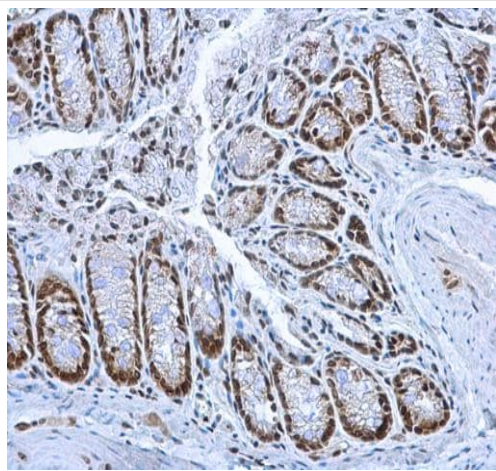
Lane 3 : HeLa (human epithelial cell line from cervix adenocarcinoma) whole cell extract

Lane 4 : HepG2 (human liver hepatocellular carcinoma cell line) whole cell extract

Lysates/proteins at 30 µg per lane.

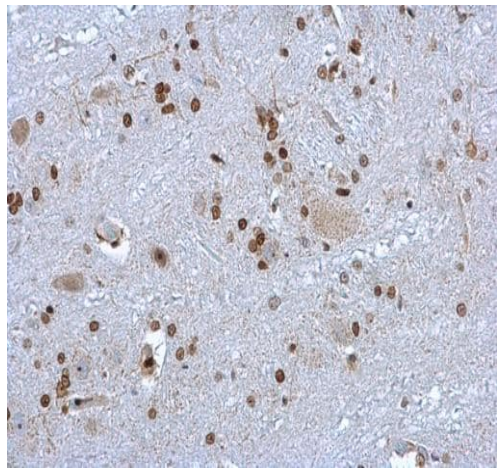
Predicted band size: 25 kDa

12% SDS-PAGE gel.



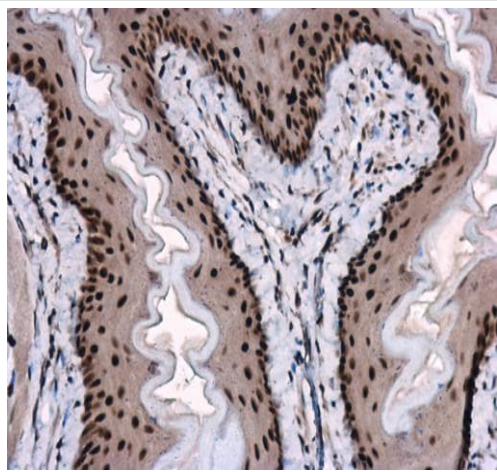
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-HMGB1 antibody (ab227168)

Paraffin-embedded mouse colon tissue stained for HMGB1 using ab227168 at 1/1000 dilution in immunohistochemical analysis.



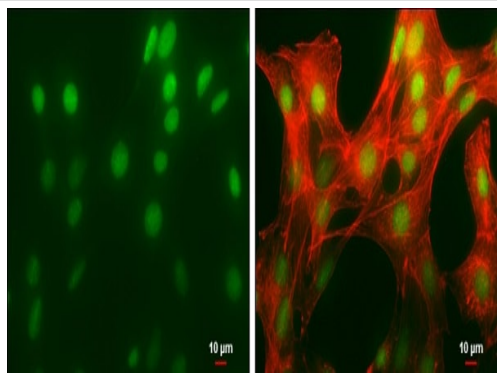
Paraffin-embedded rat brain stem tissue stained for HMGB1 using ab227168 at 1/1000 dilution in immunohistochemical analysis.

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-HMGB1 antibody (ab227168)



Paraffin-embedded mouse esophagus tissue stained for HMGB1 using ab227168 at 1/1000 dilution in immunohistochemical analysis.

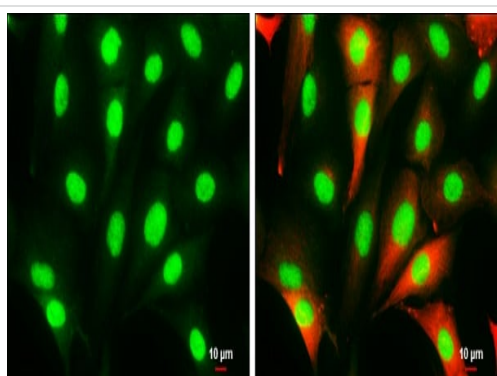
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-HMGB1 antibody (ab227168)



Immunocytochemistry/ Immunofluorescence - Anti-HMGB1 antibody (ab227168)

4% paraformaldehyde-fixed NIH/3T3 (mouse embryonic fibroblast cell line) cells stained for HMGB1 (green) using ab227168 at 1/500 dilution in ICC/IF.

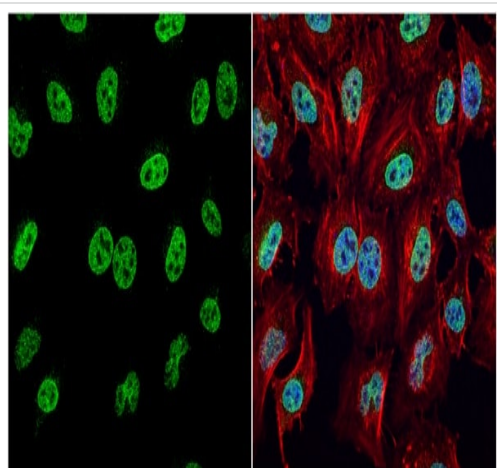
Counterstain: cytoskeleton marker, stained with phalloidin at 1/50 dilution.



Immunocytochemistry/ Immunofluorescence - Anti-HMGB1 antibody (ab227168)

4% paraformaldehyde-fixed SK-N-SH (human neuroblastoma cell line) cells stained for HMGB1 (green) using ab227168 at 1/1000 dilution in ICC/IF.

Counterstain: beta Tubulin 3/ Tuj1, a cytoskeleton marker, stained with beta Tubulin 3/ Tuj1 antibody at 1/500 dilution.



Immunocytochemistry/ Immunofluorescence - Anti-HMGB1 antibody (ab227168)

4% paraformaldehyde-fixed HeLa (human epithelial cell line from cervix adenocarcinoma) cells stained for HMGB1 (green) using ab227168 at 1/1000 dilution in ICC/IF.

Counterstain: cytoskeleton marker, stained with phalloidin at 1/200 dilution. Nuclear Counterstain: Hoechst 33342.

Please note: All products are "FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES"

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