TATLAS ANTIBODIES



Histones

Eukaryotic cells use histone proteins to store DNA in the form of chromatin. Chromatin consists of tightly packed nucleosomes, where each nucleosome particle is built of an octamer with pairs of the four core histones H3, H4, H2A and H2B. Each histone octamer wraps approximately 147 bp of DNA in 1.7 turns around itself. The linker histone H1 links the nucleosomes together and plays a role in modifying chromatin density and folding.

Structure

The main structure of histone proteins is the histone fold domain (HFD), a shared conserved structure composed of three α -helices connected by two loops. Besides the HFD, the histone proteins have more unique "tail" sequences which extend outside the nucleosome particle where they are subjected to various post-translational modifications (PTMs). The PTMs on histones are important for the cells regulation of gene expression.

Histone Exchange

Another mechanism for modifying chromatin structure and gene expression is histone exchange. Each of the four core histones can be replaced either by a new core histone or by one of its variants. The histone variants range from slightly different, where the sequence is altered by just a few amino acids, to having whole domains adding to their structure. By replacing a core histone with a histone variant, specialized functionalities can be achieved.

Divergence

The histone variants have different epigenetic purposes and their occurrence can be tissue specific or linked to certain developing stages.

For example, the variants H3.3 and H2A.Z regulate transcription, whereas the sperm-specific variants TH2B and H2BFWT help condensate the DNA during spermatogenesis. H3 variant CENPA alters the orientation of the DNA wrapping around the nucleosome and is found in centromeric DNA.

The much larger histone H2A variants macroH2A.1 and macroH2A.2 are enriched in female inactivated X chromosomes (Xi) which suggests a role in transcriptional silencing.



Figure 1. Extensive validation of an antibody's specificity and selectivity.

A-C: Western Blot (WB) analysis of the Anti-H2B antibody AMAb91337. Note the presence of a specific band of expected size in both human HEL cell line lysate (**A**) and in mouse NIH-3T3 and rat NBT-II cell line lysates (**B**). The antibody selectivity is further confirmed by WB with recombinant core histone variants, where the antibody only binds to the H2B variant (**C**).

D: IHC staining of human testis with the Anti-H2B monoclonal antibody AMAb91337 shows strong nuclear immunoreactivity in cells in seminiferous ducts as expected.



Figure 2. Comparison of histone variant-specific antibodies.

A,D: The specificity of the antibodies for the respective subunit shown by Western Blot with recombinantly expressed histones. Note the presence of WB-signal only in the lane with the specific histone variant present, including the H2A (AMAb91335, **A**) and the macroH2A.1 (AMAb91347, **D**).

B, **C**, **E**, **F**: IHC staining of human tissues with the Anti-H2A antibody AMAb91335 and the Anti-macroH2A.1 antibody AMAb91347. Note that both antibodies show strong nuclear immunoreactivity in the fallopian tube (**B** and **E**). The nuclear positivity observed in testis differs: while the H2A expression is detected in nearly all cells in seminiferous tubules (AMAb91335, C), the macroH2A.1 is detected only in a subset of cells (AMAb91347, F).



Figure 3. Ortogonal validation of antibody specificity.

A: The specificity of the Anti-macroH2A.1 antibody (AMAb91347) was validated in WB experiments using a highly expressing cell line HEL and a lower expressing cell line PC-3. Note the band of correct size in the HEL cell line lysate, and the absence of signal in the PC-3 lysate. RNA expression (in TPM) for the respective cell lines is shown to the right.

B,C: Immunohistochemical (IHC) staining of human tissues with Anti-macroH2A.1 antibody AMAb91347 shows strong nuclear immunoreactivity in female tissues, including glandular and stromal cells in endometrium (**B**) and in tumor cells in breast cancer (**C**) as expected.

The PrecisA Monoclonals[™] antibodies are developed by Atlas Antibodies, based on the knowledge from the Human Protein Atlas with careful antigen design and extended validation of antibody performance.

The antibodies specifically target regions of the histones that show low or no post-translational modifications producing a good visualization of the total amount of any histone variant in the tissue/cell line.

The PrecisA Monoclonals histone antibodies are therefore great to combine with antibodies targeting specific modifications when performing epigenetic research.

Table 1.

Description of the PrecisA Monoclonals Histone Antibodies by Atlas Antibodies.

Target gene description	Product Name	Product Number	Validated Applications	Isotype
Histone H3	Anti-HIST1H3A	AMAb91331	IHC, WB, ICC-IF	lgG2a
Histone H3	Anti-HIST1H3A	AMAb91332	IHC	lgG2b
Histone H2A	Anti-HIST1H2AG	AMAb91335	IHC, WB	lgG1
Histone H2A	Anti-HIST1H2AG	AMAb91336	IHC	lgG1
Histone H2B	Anti-HIST1H2BC	AMAb91337	IHC, WB	lgG2b
Histone H2B	Anti-HIST1H2BC	AMAb91338	IHC, WB	lgG1
Histone H2A.X	Anti-H2AFX	AMAb91346	IHC, ICC-IF	lgG2a
Histone macroH2A.1	Anti-H2AFY	AMAb91347	IHC, WB, ICC-IF	lgG1
Histone macroH2A.1	Anti-H2AFY	AMAb91348	IHC	lgG1
Histone macroH2A.2	Anti-H2AFY2	AMAb91351	IHC, ICC-IF	lgG1

ABOUT ATLAS ANTIBODIES

Atlas Antibodies is a Swedish biotechnology company that facilitates leading research worldwide through manufacturing and providing primary antibodies and protein standards for targeted proteomics using mass spectrometry.

VERY RELIABLE ANTIBODIES

Atlas Antibodies is the original manufacturer of over 21,000 primary antibodies targeting the majority of human proteins. Building on our heritage with the Human Protein Atlas project, we provide highly validated reagents that enable leading research in biology, diagnostics, and medicine. All our products are rigorously evaluated for specificity, reproducibility and performance and characterized in multiple applications. Our team of researchers develops the next generation of innovative and reliable tools, fundamental to advancing research in neuroscience, oncology, cell biology, stem cells and development.

CREATED BY THE HUMAN PROTEIN ATLAS

With our roots in the Human Protein Atlas project, an integration of antibody-based imaging, proteomics, and transcriptomics, our antibodies are affinity-purified, reproducible, selective, and specific for their target proteins through our enhanced validation process. Our Triple A Polyclonals[™] are developed within the Human Protein Atlas project.

VALIDATED BY ENHANCED VALIDATION

We take great care to validate our antibodies in IHC, WB, and ICC-IF. Our antibodies are validated in all major human tissues and organs and 20 cancer tissues. Each antibody is supported by over 500 staining images. As an additional layer of security, we perform Enhanced Validation. By using 5 different enhanced validation methods we validate our antibodies for each combination of protein, sample, and application. Discover our Triple A Polyclonals[™] and PrecisA Monoclonals[™] antibodies targeting the majority of human proteins in cells, tissues, and organs.

EVIDENCED BY SCIENCE

Made by researchers for researchers our products are used all over the world and referenced in 1000s of scientific peer-reviewed papers.

WE SUPPORT YOUR RESEARCH

Our scientific content and newsletter provide you with timely information about new product releases, research highlights, and much more. In addition, from our website you can download informative white papers, protocols, guides, posters, infographics, roundups of recent research papers, read blog posts and interviews.

HOW TO BUY OUR PRODUCTS

Our products are available worldwide. We deliver to all destinations in Europe (excluding Russia), US, Canada, Australia, New Zealand and Israel. We expand our offering through trusted partners worldwide. You can shop our full catalog online or find your local supplier.

SHOP OUR FULL CATALOG

FIND YOUR LOCAL SUPPLIER



Atlas Antibodies Advanced Polyclonals.

Triple A PolyclonalsTM are rabbit polyclonal primary antibodies developed within the Human Protein Atlas project. IHC characterization data from 44 normal and 20 cancer tissues is available on the Human Protein Atlas portal. Available as **25 µL** and **100 µL** unit size.



Precise. Accurate. Targeted.

PrecisA MonoclonalsTM are mouse monoclonal primary antibodies developed against a number of carefully selected targets. Clones are selected to recognize only unique non-overlapping epitopes and isotypes. Available as **25 \muL** and **100 \muL** unit size.



Visit our website: atlasantibodies.com



Follow us:@atlasantibodies Contact us: contact@atlasantibodies.com

Atlas Antibodies logo, Triple A Polyclonals, PrecisA Monoclonals, PrEST Antigen and QPrEST are trademarks or registered trademarks of Atlas Antibodies AB. All other trademarks are the property of their respective owners. Products are for research use only. Not for use in diagnostic procedures. © Atlas Antibodies AB 2021.

Page 5 (5)



Atlas Antibodies AB Voltavägen 13A 16869 Bromma, Sweden atlasantibodies.com Phone +46(0)8 54 59 58 50 contact@atlasantibodies.com order@atlasantibodies.com support@atlasantibodies.com