DIARECT

Part of BBI Solutions

Histone, Nucleosome and dsDNA Antigens

Histones, the major components of nucleosomes, are responsible for establishing chromatin structure in the nucleus of eukaryotic cells. The histone octamer of each nucleosome core particle contains a $(H3\text{-}H4)_2$ tetramer, organizing the central part of the DNA, and two flanking H2A-H2B dimers. Histone H1, the linker histone, is located between each nucleosome (MacAlpine and Almouzni 2013).

Histones H3 and H4 have long tails protruding from the nucleosome, which can be covalently modified (methylation, acetylation, phosphorylation and ubiquitination) at several residues. The combination of those modifications and those of core histones H2A and H2B constitute the so-called histone code (Strahl and Allis 2000; Jenuwein *et al.* 2001).

Dynamics of chromatin structure depend on posttranslational modification of histones and appearance of various histone variants. This is important for different molecular mechanisms including DNA repair, transcription, replication, recombination, control of gene expression and epigenetic responses to external signaling (Maeshima *et al.* 2014).

The chronic autoimmune disease systemic lupus erythematosus (SLE) can involve several organs and systems within the human body and is characterized by production of various autoantibodies (Cozzani *et al.* 2014).

Anti-nucleosome antibodies (ANuAs) are directed against histone epitopes, dsDNA and conformational epitopes created by the interaction between dsDNA and core histones. ANuAs have been shown to be a good diagnostic marker for systemic lupus erythematosus (SLE). Antibodies to histones (AHAs) are even more common autoantibodies seen in patients with SLE (Bizzaro *et al.* 2012) and are directed towards epitopes of histone complexes or individual histones (Burlingame *et al.* 1994; Santiago *et al.* 2007).

Complementing the dsDNA plasmid produced in *E. coli* and the nucleosome antigen from calf thymus, DIARECT offers isolated histone antigen also purified from calf thymus.

Ordering Information		
12300	dsDNA (plasmid)	0.1 mg
12301		1.0 mg
31100	Histone	0.1 mg
31101	(non recombinant; bovine)	1.0 mg
31000	Nucleosome	0.1 mg
31001	(non recombinant; bovine)	1.0 mg

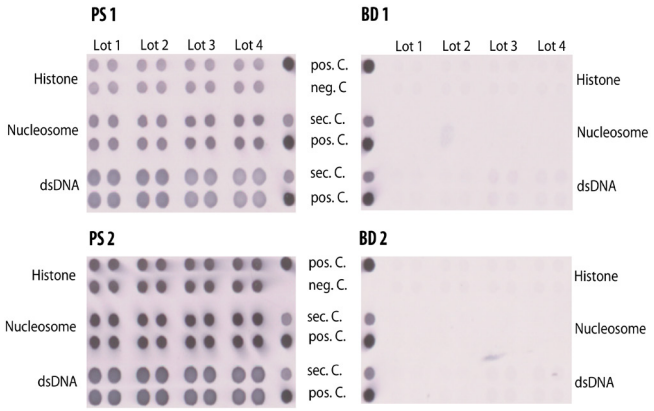

Figure 1: Immunodot analyses of histone, nucleosome and dsDNA antigens with sera from SLE patients (PS1-2) and blood donors (BD1-2). The presence of histone, nucleosome, and dsDNA antibodies was determined by spotting quadruplicates of recombinant dsDNA antigen produced in E. coli and non-recombinant histone and nucleosome antigens purified from calf thymus. On one side of each array positive (pos. C.), negative (neg. C.) and secondary antibody incubation controls (sec. C.) were printed.

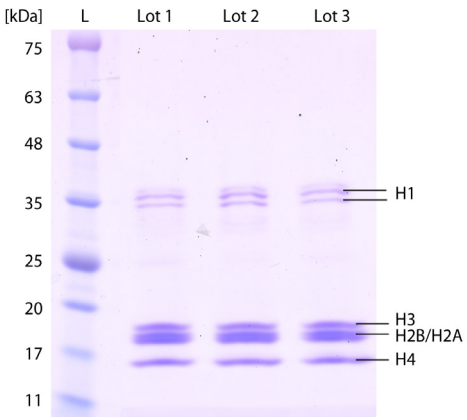

Figure 2: SDS-PAGE of three independent lots of non-recombinant DIARECT histones (including histone H1, H3, H2A, H2B and H4). The molecular weight of protein standards included in the size ladder (L) are indicated on the left.

References:
Bizzaro *et al.* (2012) Autoimmun Rev. 12 (2): 97-106
Burlingame *et al.* (1994) J Clin Invest. 94 (1): 184-192
Cozzani *et al.* (2014) Autoimmune Dis. 2014: 321359
Jenuwein *et al.* (2001) Science. 293 (5532): 1074-1080
MacAlpine and Almouzni (2013) Cold Spring Harb Perspect Biol. 5 (8): a010207
Maeshima *et al.* (2014) Chromosoma. 123 (3): 225-237
Santiago *et al.* (2007) J Rheumatol. 34 (7): 1528-1534
Strahl and Allis (2000) Nature. 403 (6765): 41-45

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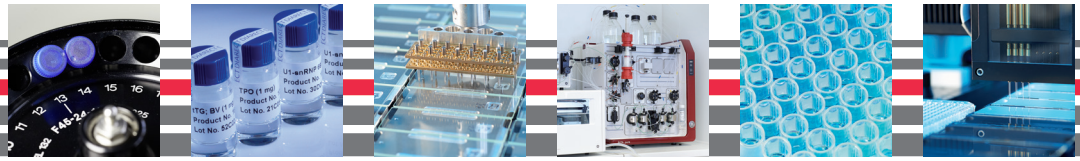

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