

# Systemic Lupus Erythematosus

## Nucleosome Autoantibody



### ANTIBODY TO NUCLEOSOMES (NUC) IS A HIGHLY SPECIFIC TEST FOR SLE (SYSTEMIC LUPUS ERYTHEMATOSUS).

Combined testing for antibody to (NUC) nucleosomes and to ds-DNA is recommended.

#### WHAT IS SLE?

SLE is a complex polygenic autoimmune disease characterised by anti-nuclear autoantibodies often detectable years before clinical disease onset. It is associated with chronic activation of the immune system, with progression to inflammatory damage affecting multiple organs. The incidence of Lupus is about ten-fold higher in the Chinese population.

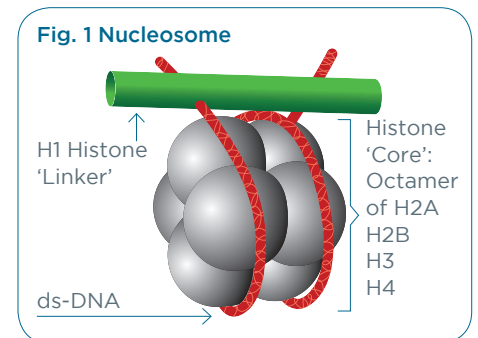
#### HOW USEFUL IS ANTI-NUCLEOSOME ANTIBODY FOR THE DIAGNOSIS OF SLE?

- More sensitive marker for Lupus than ds-DNA antibody.
- Positive in about 40% of patients who test negative for anti-dsDNA antibody.
- Correlates with active disease.
- Prognostic value remains uncertain.

The ds-DNA antibody test is the time-honoured diagnostic assay for SLE. However as the ds-DNA test has 50% sensitivity there is clearly a need for another test.

#### WHAT IS THE NUCLEOSOME?

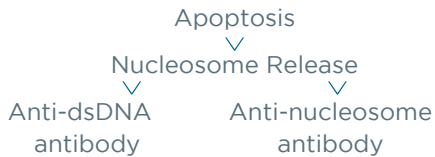
Nucleosomes are fundamental units of chromatin. Each nucleosome is composed of 146bp of ds-DNA wrapped around a histone core comprising of an octamer of H2A, H2B, H3 and H4 held together by H1 histone (Fig. 1). Nucleosomes are linked to each other like 'beads on a string'.



#### HOW ARE ANTI-NUCLEOSOME AND ANTI-dsDNA ANTIBODIES GENERATED?

The nucleosome is the macromolecular complex that initiates autoantibody formation to nucleosomes and to ds-DNA. The antibodies, generated after release of nucleosomes following apoptotic cell death, give homogeneous immunofluorescence staining of chromosomes in the anti-nuclear antibody (ANA) test. The antibodies are responsible for the multi-organ involvement in SLE through deposition of immune complexes in tissues such as the kidney.

**Fig. 2 Generation of antibodies to Nucleosome and dsDNA**



### HOW DOES THE SENSITIVITY AND SPECIFICITY OF ANTI-NUCLEOSOME ANTIBODY COMPARE TO ANTIBODY TO ds-DNA?

**Fig. 3 Systemic Lupus Erythematosus: Anti-nucleosome and Anti-dsDNA antibody**

	Sensitivity	Specificity
Anti-nucleosome	65%	98%
Anti-dsDNA	50%	98%

Correlates with active disease

### WHAT OTHER ANTIBODIES ARE USEFUL FOR THE DIAGNOSIS OF LUPUS?

**Fig. 4 Diagnostic antibodies for SLE**

Anti-nucleosome	65%
Anti-dsDNA	50%
Anti-ribosomal P	20%
Anti-sm	5%
Anti-PCNA	3%

### WHAT OTHER DISEASE ARE NUCLEOSOME ANTIBODIES ASSOCIATED WITH?

Nucleosome antibodies are also present in 40% of ANA-positive patients with type 1 autoimmune hepatitis.

### SPECIMEN REQUIREMENTS

**Sample Type:**

1 x Gel (SST) Tube (Gold Top)

**Sample Transport:**

Ambient temperature

**Medicare Rebate:**

Yes

**Turnaround:**

Weekly

### REFERENCES

- Gomez-Puerta J, Burlingame R, Cervera R. Anti-Chromatin (Anti-Nucleosome) Antibodies. *Lupus*. 2006; 15:408-11.
- Decker P. Nucleosome Autoantibodies. *Clin Chim Acta*. 2006; 366:48-60.
- Fairhurst AM, Wandstrat AE, Wakeland EK. Systemic Lupus Erythematosus: Multiple Immunological Phenotypes in A Complex Genetic Disease. *Adv Immunol*. 2006;92:1-69.

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