Publication of the Month

June 06/07: ANA detection with ELISA?

The frequency of antinuclear antibodies (ANA) is especially high in a number of systemic rheumatic diseases. As well, these autoantibodies can be found in many other diseases, autoimmune or not. ANA detection is part of the diagnostic criteria of rheumatic diseases such as SLE. ANA screening assays are often performed by indirect immunofluorescence (IIF), either on rodent tissue or HEp-2 or Hep-2000 cells. The frequency of ANA testing has increased rapidly in clinical routine and, subsequently, the number of positive tests has also increased. This means that autoimmunity laboratories now perform many follow-up assays which are more expensive and, in the majority of cases, give a negative result. To avoid such expensive and time-consuming procedures, it would be efficient to have a screening method that could detect those sera which are positive by IIF for autoantibodies relevant for the diagnosis of rheumatic diseases.
The following study evaluated a commercially available ELISA assay for anti-nuclear antibodies (ANA) screening in a large routine laboratory setting:

Sinclair D, Saas M et al
Can an ELISA replace immunofluorescence for the detection of anti-nuclear antibodies? The routine use of ANA screening ELISAs
Clinical Laboratory 2007, 53 (3-4): 183-191

In this study, in a routine serology laboratory setting, 2000 consecutive sera with requests for an ANA screen were tested by ELISA and results compared to those obtained by immunofluorescence. From these results an ANA ratio cut-off protocol was established to guide further action. A second series of 7000 samples was studied to assess the efficacy of this. The antigens included in the ELISA used are Ro (52 and 60), La, Sm, RNP, Scl-70, Jo-1, PM-Scl, histones, centromere nucleosomes and double stranded DNA.
Among 2000 routine samples 162 showed a positive result with the ELISA. This agreed reasonably well with the IIF screening experience which yielded 216 positives. 54 patients had an ANA that was visible by immunofluorescence but who had no ANA by ELISA. Further study of these 54 patients showed them to have the following ANA patterns: nuclear matrix, tubulin, peroxisomes, nuclear mitotic apparatus, vimentin and lysosomal patterns. Although well described, the antibodies giving rise to these patterns are not known to have significant clinical correlations. None of these patients showed clinical signs or symptoms that led to a referral for consultant rheumatologist opinion in the intervening time.

According to the authors' experience, the change from IIF to ELISA has not compromised the clinical outcome for their patients. Results show that the ANA ELISA can successfully replace IIF for the detection of clinically significant antibodies.