EVALUATION OF A NOVEL PARTICLE-BASED MULTI-ANALYTE TECHNOLOGY FOR THE MEASUREMENT OF ANTI-FIBRILLARIN ANTIBODIES

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KEY MESSAGES

- Anti-fibrillarin antibodies detected with the new particle-based multi-analyte technology (PMAT) demonstrate good performance in characterized systemic sclerosis (SSc) patients.
- The fibrillarin PMAT assay shows excellent agreement to a fluorescence enzyme immunoassay (FEIA).

INTRODUCTION

Systemic sclerosis (SSc) is a heterogeneous autoimmune disease associated with several anti-nuclear antibodies (ANA), including those in the classification criteria [anti-centromere, anti-topoisomerase I (Scl-70), anti-RNA Pol III]. However, the presence of less common antibodies such as anti-fibrillarin (U3-RNP), that generate a clumpy nucleolar pattern by HEp-2 indirect immunofluorescence (IIF, ICAP AC-9), can be associated with clinical subsets of SSc and therefore play a role in diagnosis and prognosis. This study aimed to evaluate a new particle-based multi-analyte technology (PMAT) for the measurement of anti-fibrillarin antibodies.

METHODS

A total of 149 patient samples were collected to evaluate the PMAT assay which included: well-characterized samples from SSc patients collected in France (two sites, n=32), and 15 routine samples in Italy (Careggi Hospital) selected based on AC-9 staining by IIF (>1:640, clumpy nucleolar pattern), along with 102 non-SSc controls were tested on the anti-fibrillarin PMAT assay (research use only, Inova Diagnostics, USA). Anti-fibrillarin antibody data performed by fluorescence enzyme immunoassay (FEIA, Thermo Fisher, Germany) was available for 34 samples.

RESULTS

The anti-fibrillarin PMAT assay showed positivity in 31/32 (96.9%) of SSc patients preselected on AC-9 IIF pattern (Figure 1) while 12/15 (80.0%) of the routine samples from Italy were positive. Collectively, the PMAT assay showed 91.5% [95% Confidence Interval (CI): 80.1-96.6%] sensitivity with 100.0% (95% CI: 96.4-100.0%) specificity in the controls (Figure 2).

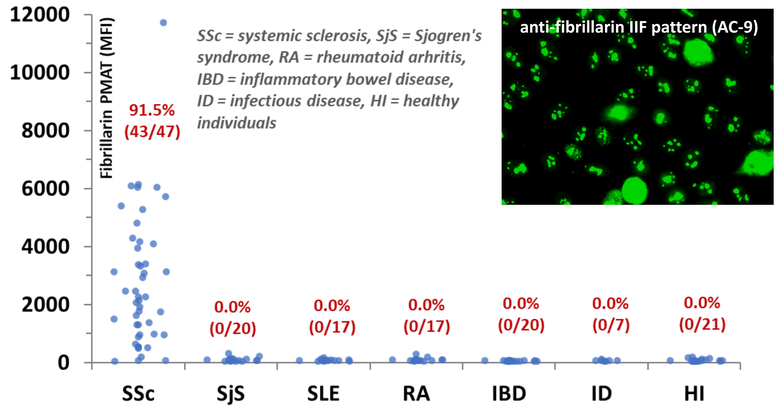

Figure 1 Anti-fibrillarin antibody levels on the particle-based multi-analyte technology (PMAT) assay expressed in median fluorescent intensity (MFI) units among SSc *vs.* controls. Representative nucleolar staining pattern on indirect immunofluorescence (IIF) which corresponds to international consensus on ANA patterns (ICAP) AC-9.

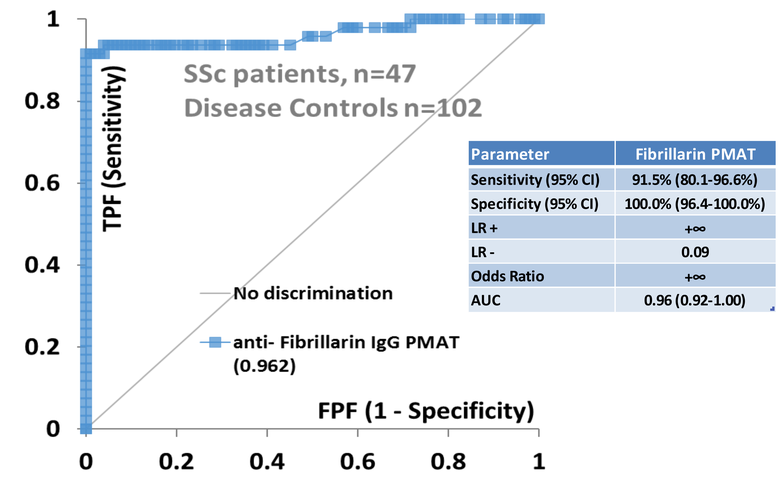

Figure 2 Receiver operating characteristic (ROC) curve analysis in characterized fibrillarin samples (n=47) *vs.* controls (n=102) for the Aptiva anti-fibrillarin particle-based multi-analyte technology (PMAT). The area under the ROC curve (AUC) is listed in parentheses in the graph. LR=likelihood ratio.

In addition, excellent agreement was found between PMAT and FEIA with 100.0% positive qualitative agreement (34/34) and good quantitative agreement (Spearman's rho=0.89, 95% CI:0.77.9-0.95%, p<0.0001 (Figure 3).

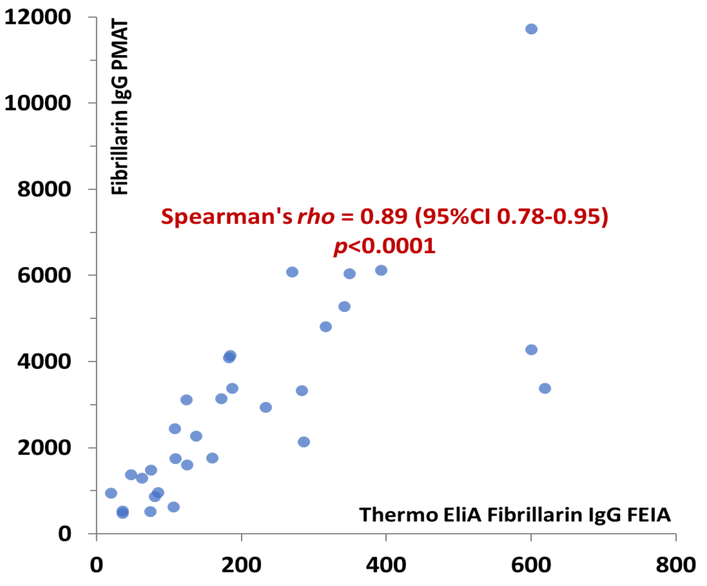

Figure 3 Spearman's quantitative correlations between anti-Fibrillarin particle-based multi-analyte technology (PMAT) assay *vs*. the fluorescence enzyme immunoassay (FEIA) on 34 characterized systemic sclerosis (SSc) patients.

CONCLUSION

The new PMAT assay shows excellent agreement to FEIA for the detection of anti-fibrillarin antibodies. Further studies are warranted to investigate the clinical associations and performance of the new method in combination with other critical markers in the SSc panel.

REFERENCES

1.Tall F, Dechomett M, Riviere S, et al. The clinical relevance of antifibrillarin (anti-U3-RNP) autoantibodies in systemic sclerosis. *Scandinavian Journal of Immunology* 2017, 85, 73-79.