SERUM PROTEOMICS REVEALS AN IMMUNOPROTEOMIC PROFILE DISTINGUISHING EARLY-STAGE MYCOSIS FUNGOIDES FROM ATOPIC DERMATITIS

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INTRODUCTION

- **Early-stage mycosis fungoides (eMF)**, the most common cutaneous T-cell lymphoma, is frequently misdiagnosed as **atopic dermatitis (AD)**.
- International registry data document average diagnostic delays of **3 to 6 years**, during which patients may receive immunosuppressive therapy that promotes disease progression.
- The two diseases have distinct immunologic environments, Th1-predominant in eMF and Th2-skewed in AD, so non-invasive serum biomarkers could complement existing diagnostic approaches.

OBJECTIVE

- To identify serum proteins that distinguish early-stage mycosis fungoides from atopic dermatitis using high-throughput proteomics.
- **Secondary aim:** to confirm that any differences reflect disease biology rather than the age imbalance between the two cohorts.

METHODS

- Serum from patients with eMF (n = 30, stage IA to IIA) and moderate-to-severe AD (n = 17)
- Profiled with four Olink Target 96 panels; 315 proteins retained after quality control
- Differential expression by limma with empirical Bayes moderation
- Age modeled as a continuous covariate; significance at FDR q < 0.05

CONCLUSIONS

- Serum proteomics distinguishes eMF from AD through a **Th1/Th2 immunologic contrast** at the circulating protein level.
- **INPP1** is a novel candidate biomarker for eMF with a keratinocyte-predominant tissue signal.
- Prospective validation in age-matched, treatment-naive cohorts is warranted.

RESULTS

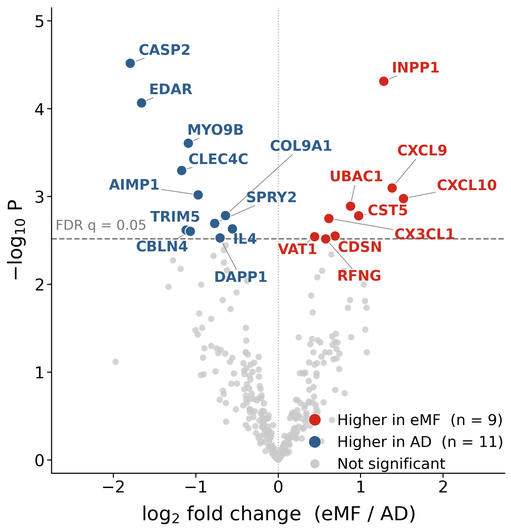

Figure 1. *Volcano plot of the analyzed serum proteome, eMF vs. AD (limma, age-adjusted). Twenty proteins met FDR q < 0.05: nine higher in eMF, eleven higher in AD. Age coefficients were non-significant for all 20 (p > 0.13).*

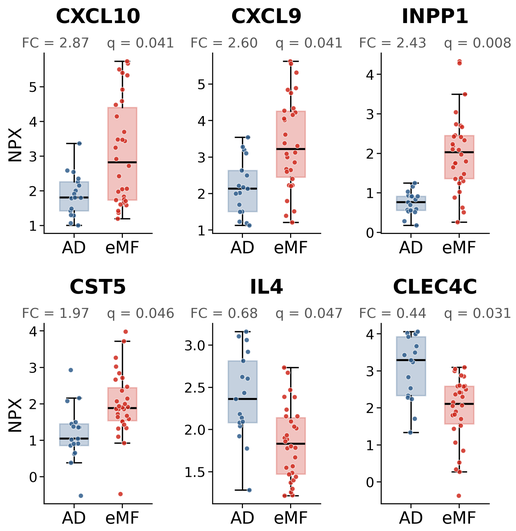

Figure 2. *Th1/Th2 contrast in representative markers. IFN-γ-inducible chemokines CXCL10 and CXCL9 and the phosphoinositide enzyme INPP1 are elevated in eMF; the Th2 cytokine IL4 and the pDC marker CLEC4C are elevated in AD. Boxes show median and IQR; dots are individual patients.*

Table 2. *Twenty differentially expressed serum proteins (FDR q < 0.05)*

Protein	log_2 FC	Fold change	q value
CASP2	-1.80	0.29	0.008
INPP1	+1.28	2.43	0.008
EDAR	-1.66	0.32	0.009
MYO9B	-1.09	0.47	0.019
CLEC4C	-1.17	0.44	0.031
CXCL9	+1.38	2.60	0.041
AIMP1	-0.97	0.51	0.041
CXCL10	+1.52	2.87	0.041
UBAC1	+0.88	1.83	0.044
COL9A1	-0.64	0.64	0.046
CST5	+0.98	1.97	0.046
CX3CL1	+0.61	1.53	0.046
SPRY2	-0.77	0.59	0.047
IL4	-0.56	0.68	0.047
TRIM5	-1.12	0.46	0.047
CBLN4	-1.07	0.48	0.047
CDSN	+0.69	1.61	0.047
VAT1	+0.44	1.36	0.047
DAPP1	-0.71	0.61	0.047
RFNG	+0.57	1.49	0.047

Red = higher in eMF (n = 9) | Blue = higher in AD (n = 11)

COHORT CHARACTERISTICS

Table 1. *Study cohort*

Characteristic	eMF (n = 30)	AD (n = 17)
Age, y, mean (SD)	63.0 (14.0)	42.6 (19.9)
Age, y, median [range]	66 [30 to 81]	34 [19 to 75]
Female, n (%)	18 (60)	10 (59)
White, n (%)	16 (53)	14 (82)
On disease-directed therapy, n (%)	24 (80)	Not applicable
SCORAD, mean (SD)	Not applicable	34.9 (11.4)

CONTACT INFORMATION

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