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The fibroblast activity biomarker, PRO-C11, quantified in serum, is associated with disease activity and treatment response in patients with hidradenitis suppurativa

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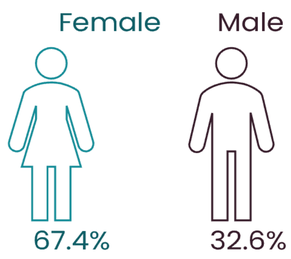
BACKGROUND

Hidradenitis suppurativa (HS) is a chronic inflammatory skin disease characterized by inflammatory nodules, abscesses and sinus tracts. A key pathological feature is fibrosis, which is caused by accumulation of extracellular matrix (ECM) proteins. Type XI collagen is a minor fibrillar collagen, produced by dermal fibroblasts, and are upregulated in skin fibrosis.

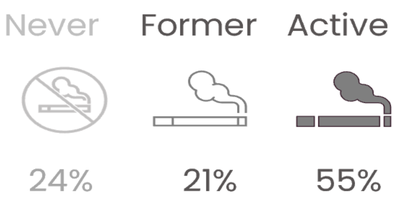
This study investigated the relationship between the serological biomarker PRO-C11, quantifying type XI collagen formation, with disease severity and treatment response in HS patients.

PATIENT CHARACTERISTICS



Age
mean (SD)
43.9 years (14.4)

Smoking Status



BMI
mean, SD
29.2 kg/m^2 (6.7)

METHODS

The biomarker, PRO-C11, was developed and validated according to FDA guidelines for bioanalytical method validation, and measured in serum from 430 HS patients from the Copenhagen Hidradenitis Suppurativa Cohort. The Cohort included newly referred consecutive ourpatients fulfilling the modified Dessau criteria from Department of Dermato-Venereology and Wound Healing Centre, Bispebjerg Hospital, Denmark. During their visit, 35 patients initiated anti-TNF-α therapy, 151 initiated topical treatment, and 139 initiated treatment with systemic antibiotics.

Differences in PRO-C11 levels between disease severity groups based on Hurley Stages and the International HS severity score system (IHS4) scores were analysed using linear models. Spearman correlations were used to investigate the association between baseline biomarker levels to systemic inflammatory markers, and the change in IHS4 scores over 3-6 months according to the different type of treatments.

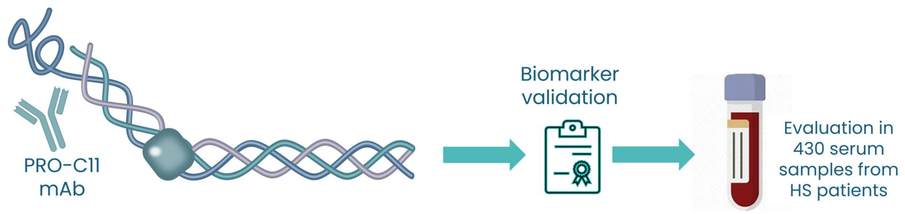


Figure 1. The biomarker PRO-C11 target the N-terminal pro-peptide of type XI collagen and are validated for measurements in human serum

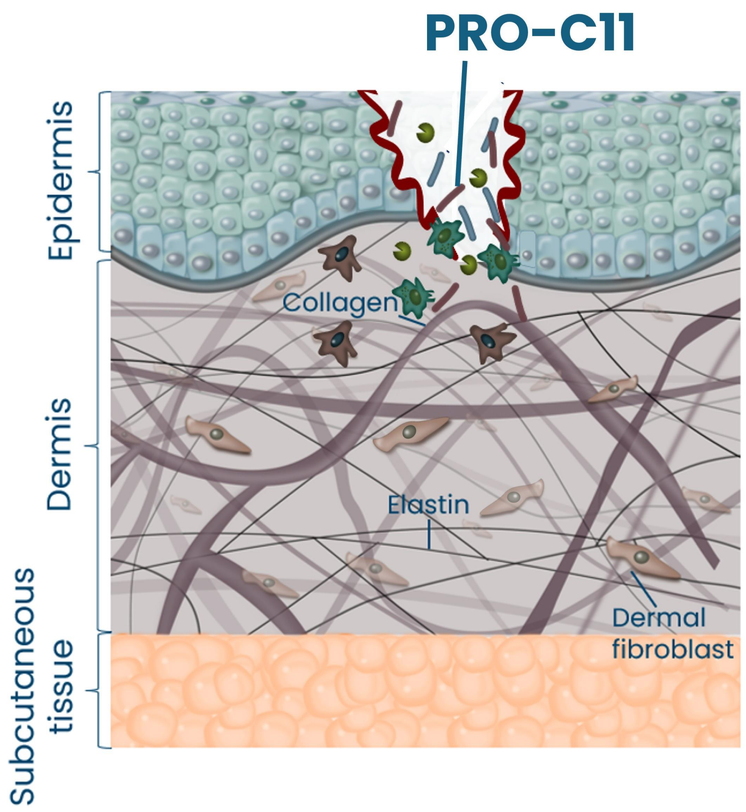
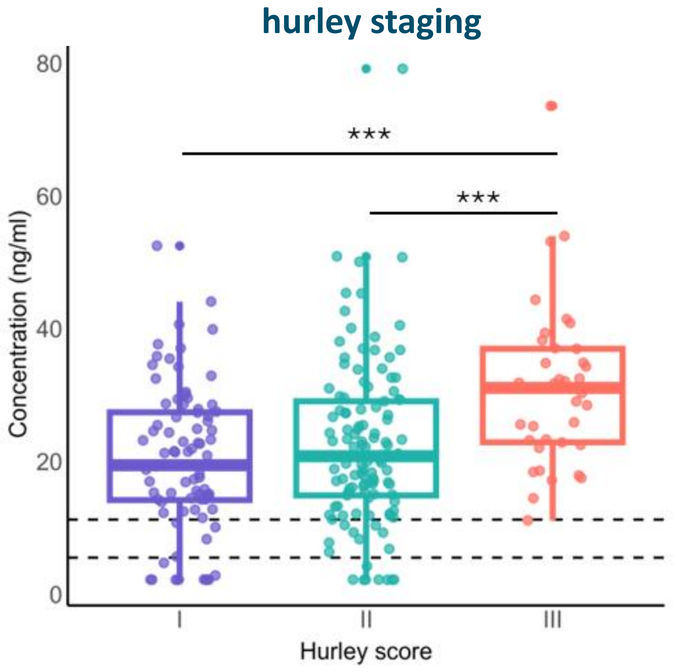


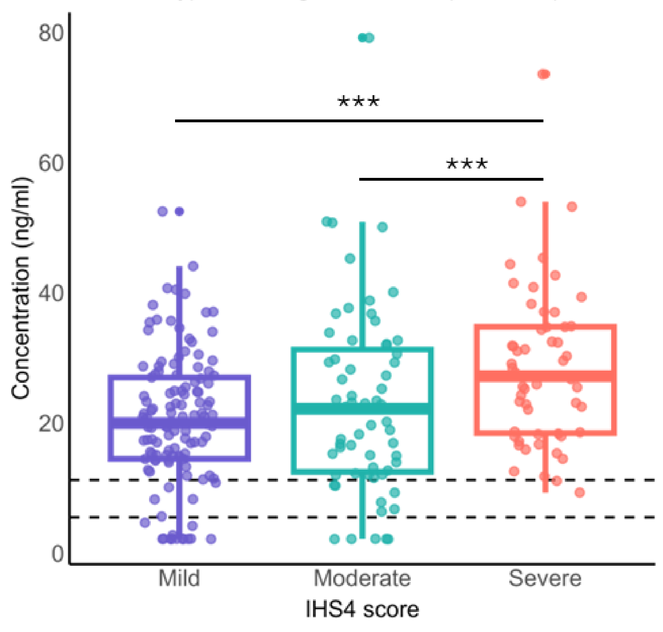
Figure 2. PRO-C11 fragments are released into circulation by activated dermal fibroblasts

RESULTS

PRO-C11 is associated with hurley staging



PRO-C11 is associated with IHS4



Doted lines represent the healthy ranges (IQR) of the biomarkers.
Data were analysed using linear models, with biomarker data log-transformed, and visualized by box-plots.

PRO-C11 is correlated to systemic inflammation

	PRO-C11
ESR	r=0.317 p<0.001
CRP	r=0.365 p<0.001

Higher levels of PRO-C11 is associated with improvements in IHS4 among patients treated with anti-TNF-α therapy

	PRO-C11
Biologics (anti-TNF-α)	r=-0.38 p=0.049
Systemic antibiotics	r=0.07 p=0.489
Topicals	r=-0.20 p=0.119

CONCLUSION

The serum biomarker PRO-C11 was associated with disease severity in patients with HS, and mildly associated with IHS4 improvement after 3–6 months of anti-TNF-α treatment. Such biomarker may serve as objective measures of fibrosis and tissue remodelling in HS, help identifying patients at risk of disease progression and the evaluation of treatment response

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