Immunological signature of amyopathic dermatomyositis
Proof of systemic inflammation

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1 Why studying aDM?

o Dermatomyositis (DM) is an auto-immune mediated inflammatory myopathy associated with specific skin symptoms.
o Amyopathic DM (aDM) is characterized by the lack of muscle involvement (classical DM (cDM) = skin + muscle).
o No specific immunological investigation has been performed to date in aDM patients.

2 How studying aDM?

8 aDM patients (before any suppressive treatment), 19 healthy blood donors (for blood mononuclear cells and serum) and 8 normal skin biopsies (control for skin transcriptomic study) were analyzed.
o T cell population phenotyping was performed using mutiparameter flow cytometry (18 colors).
o Cytokine level in the serum was measured using Luminex technology.
o Total RNA was extracted from snap frozen skin sections for hybridization on Human Transcriptome Array 2,0 chip (Affymetrix). Microarray data were analyzed with the Linear Model for Microarray data suite for « R » (The R foundation).

3 Lymphocytes immunological signature
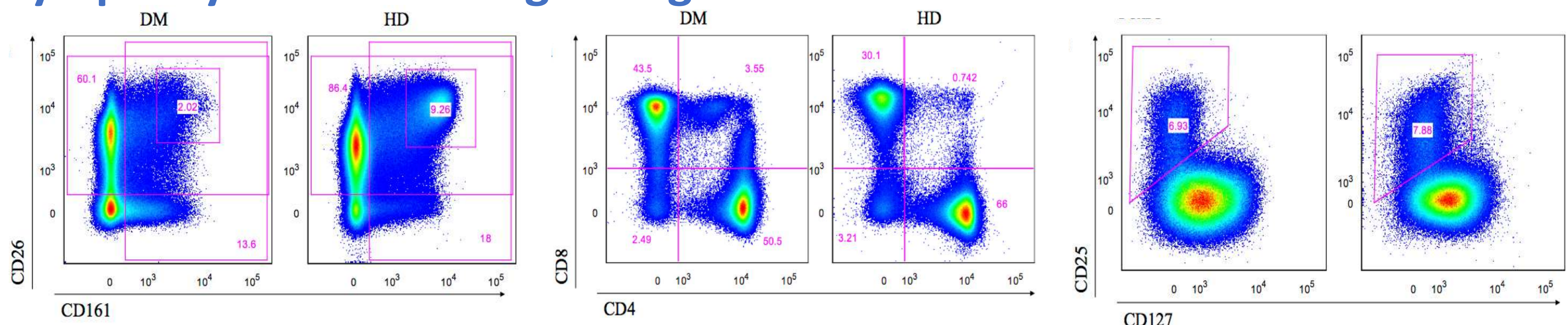
a. Decreased frequency of CD3+CD26+CD161+ (identifying MAIT cells)

The CD3+CD26+CD161+ subpopulation median frequency was 8,45 in amyopathic dermatomyositis patients (n=7) and 13,7 in healthy donors (n=19). $p<0,01$

b. Decreased frequency of CD3+CD4-CD8- (known as regulatory population)

The median percentage of CD3+CD4-CD8- T cells was 0,791 in amyopathic dermatomyositis (n=7) and 1,49 (n=19) in healthy donors. $p<0,05$

c. Conserved frequency of Tregs characterized by CD3+CD4+CD25+ and CD127- and by CD3+CD4+FoxP3+CD127-

d. Increased frequency of CD3+CD8+CD28null (described as regulatory CD8 T cells) (data not shown)
e. Decreased frequency of iNKT (data not shown)
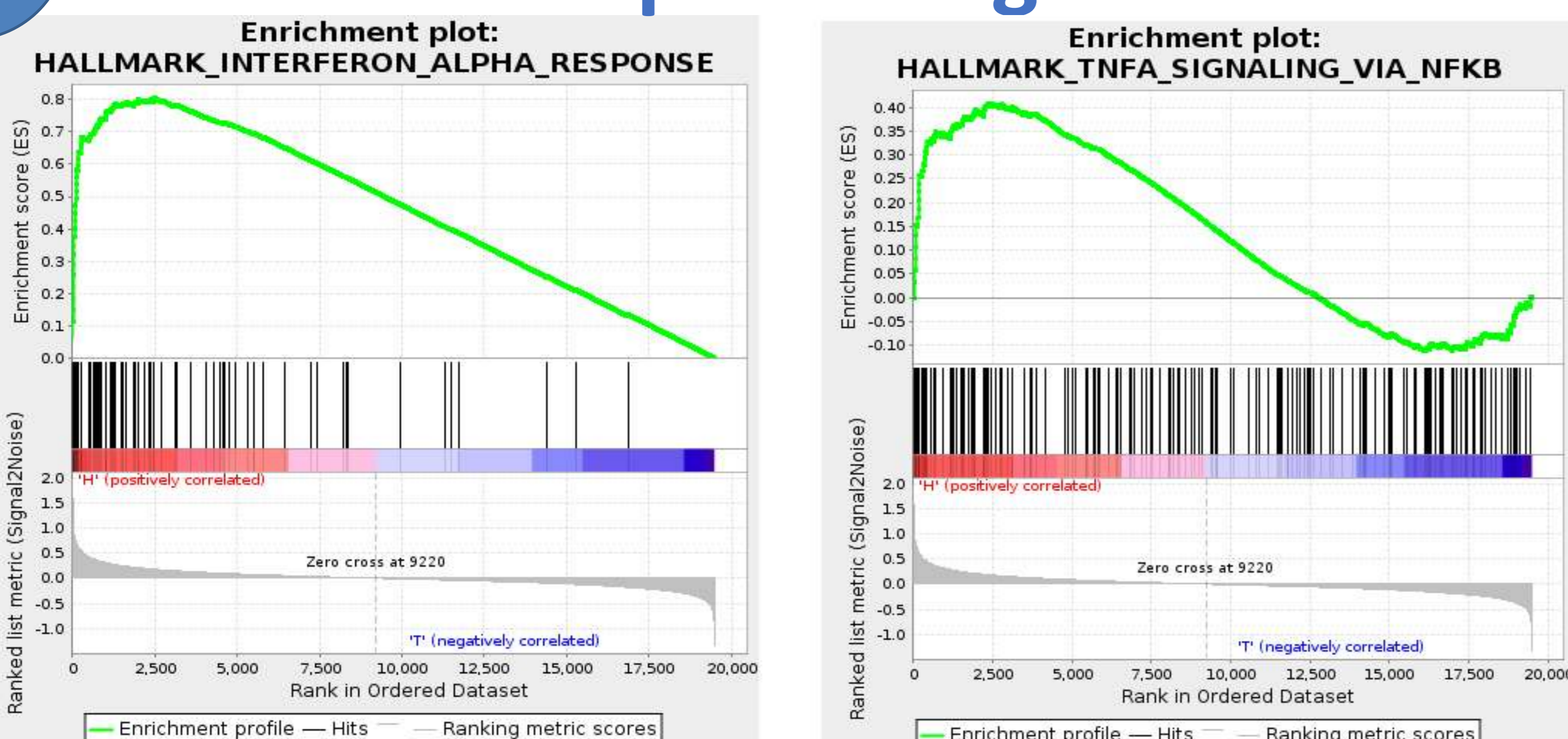
4 Cytokines immunological signature

Significant increase in the serum level of:
o **IL-10** ($p<0,05$)
o **IL-6** ($p<0,05$)
o **TNFα** ($p<0,05$) in amyopathic dermatomyositis patients compared with healthy donors.

There was no difference between for IFN-γ, IL-1β, IL-4, IL-17A, IL-21 and IL-23.
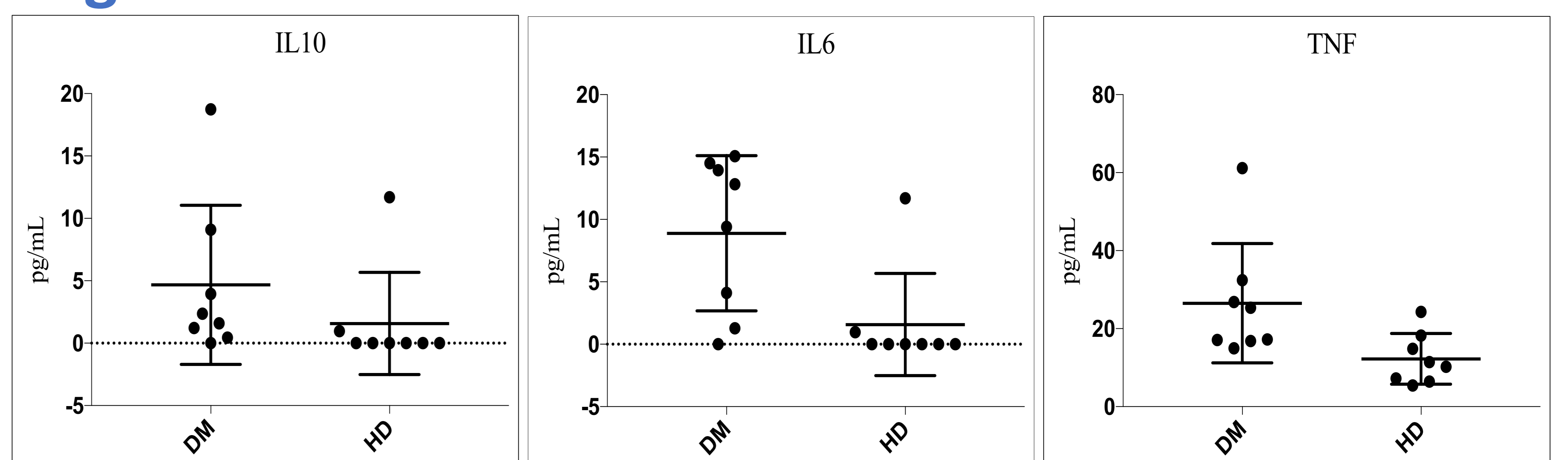
5 Skin Transcriptome signature

Pathway analyses revealed a significant **enrichment in Interferon alpha response genes and cytotoxicity genes** in aDM patients' skin compared to healthy patients' skin (FDR = 0,0)

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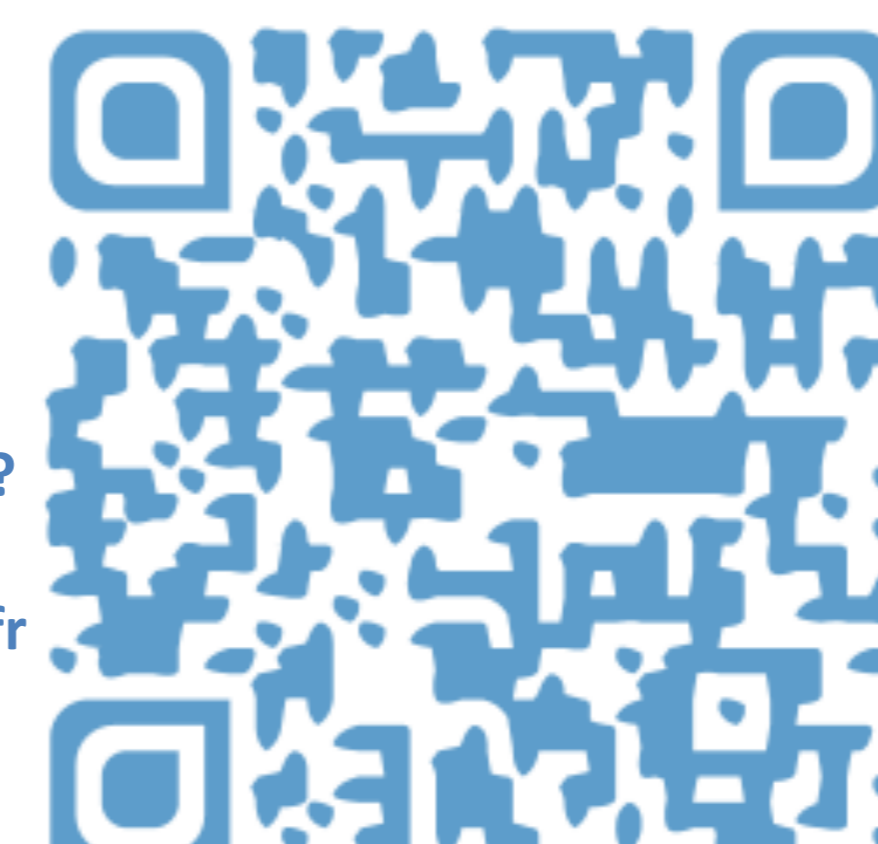
Conclusion

Our study evidences a systemic inflammation in aDM patients. We confirm some immunopathological hypotheses evoked in cDM. Further transcriptomic and cellular investigations will pave the way for the use of innovative systemic and topical targeted drugs in aDM patients.