BLOOD LYMPHOCYTE AND MONOCYTE SUBPOPULATION ABBERATIONS IN HIGH DISEASE ACTIVITY RHEUMATOID ARTHRITIS, ANKYLOSING SPONDYLITIS AND PSORIATIC ARTHRITIS

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Introduction

Autoimmunity is presumed to be a major driving force in pathogenesis of chronic rheumatic diseases, including rheumatic arthritis (RA), ankylosing spondylitis (AS) and psoriatic arthritis (PsA). Even though the pathogenesis of RA, AS and PsA is associated with abnormalities in immune cells, the specificities and importance of T-cell, B-cell and monocyte abberancies for a particular rheumatic disease have not yet been fully elucidated.

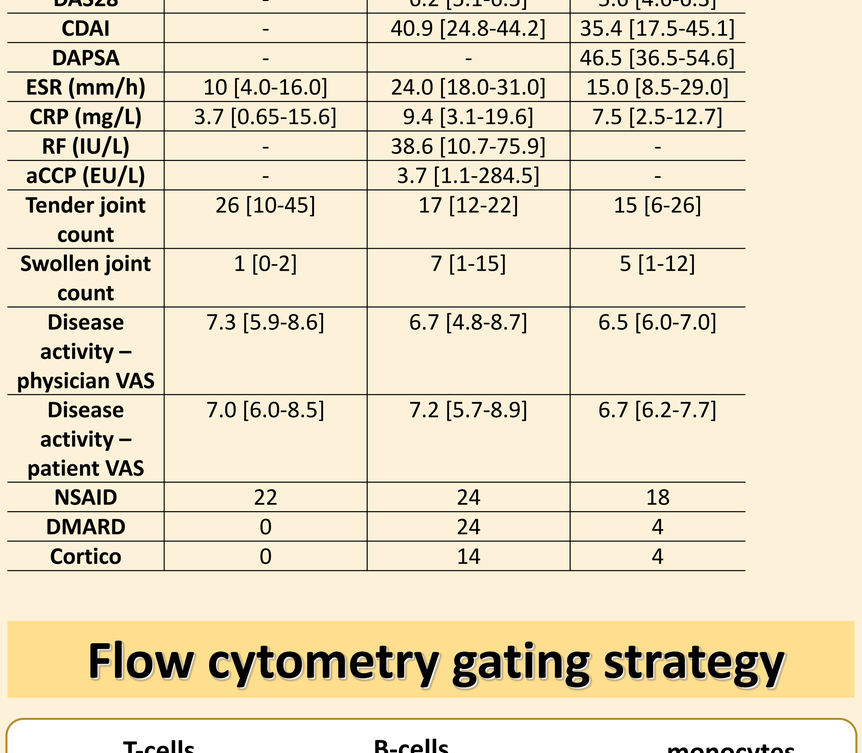
Aim

The aim of our study was to compare the frequency of circulatory T-cell, B-cell and monocyte subpopulations between RA, AS, PsA patients and controls, and to correlate them with the disease activity parameters in chronic patients with high disease activity.

Patient characteristics

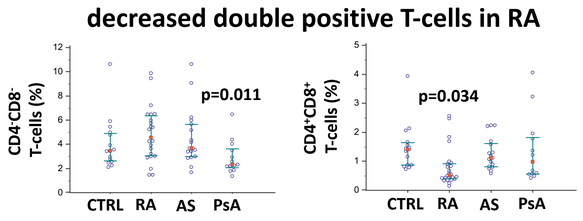
	Ankylosing spondylitis	Rheumatoid arthritis	Psoriatic arthritis	Controls
Age (years)	60 [52-66]	66 [52-73]	55 [51-64]	55 [43-68]
Gender (male/female)	9/13	3/27	9/13	6/18
Disease duration (years)	22 [14-29]	15 [7-21]	15 [10-21]	
BASDAI	6.07 [4.90-7.21]	-	-	
ASDAS	2.91 [2.41-3.46]	-	-	
DAS28	-	6.2 [5.1-6.5]	5.6 [4.6-6.3]	
CDAI	-	40.9 [24.8-44.2]	35.4 [17.5-45.1]	
DAPSA	-	-	46.5 [36.5-54.6]	
ESR (mm/h)	10 [4.0-16.0]	24.0 [18.0-31.0]	15.0 [8.5-29.0]	
CRP (mg/L)	3.7 [0.65-15.6]	9.4 [3.1-19.6]	7.5 [2.5-12.7]	
RF (IU/L)	-	38.6 [10.7-75.9]	-	
aCCP (EU/L)	-	3.7 [1.1-284.5]	-	
Tender joint count	26 [10-45]	17 [12-22]	15 [6-26]	
Swollen joint count	1 [0-2]	7 [1-15]	5 [1-12]	
Disease activity – physician VAS	7.3 [5.9-8.6]	6.7 [4.8-8.7]	6.5 [6.0-7.0]	
Disease activity – patient VAS	7.0 [6.0-8.5]	7.2 [5.7-8.9]	6.7 [6.2-7.7]	
NSAID	22	24	18	
DMARD	0	24	4	
Cortico	0	14	4	

Flow cytometry gating strategy

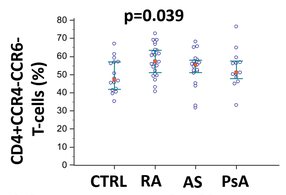


Results

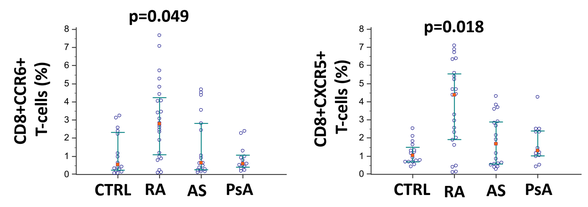
Decreased double-negative T-cells in PsA and decreased double positive T-cells in RA



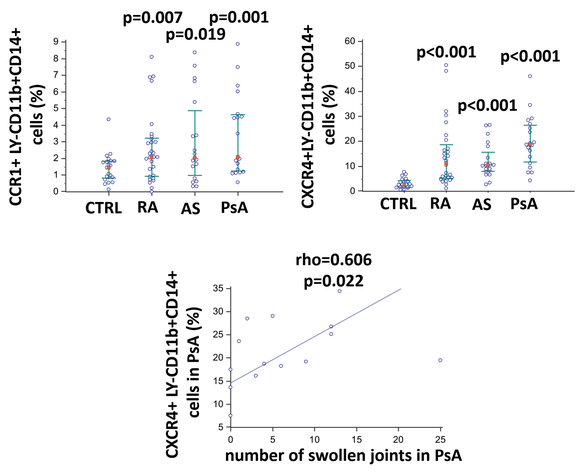
Increased Th1 frequency in RA



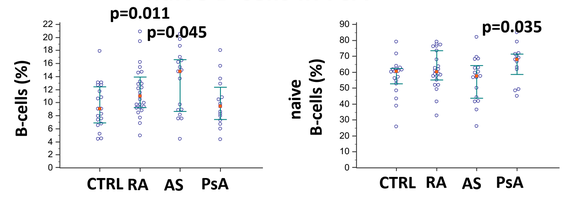
Increased frequency of effector memory T cells and T follicular cytotoxic cells



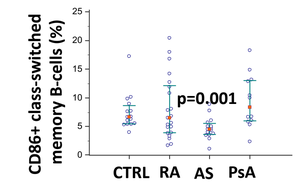
Increased expression of CCR1 and CXCR4 on circulatory monocytes in RA, AS and PsA



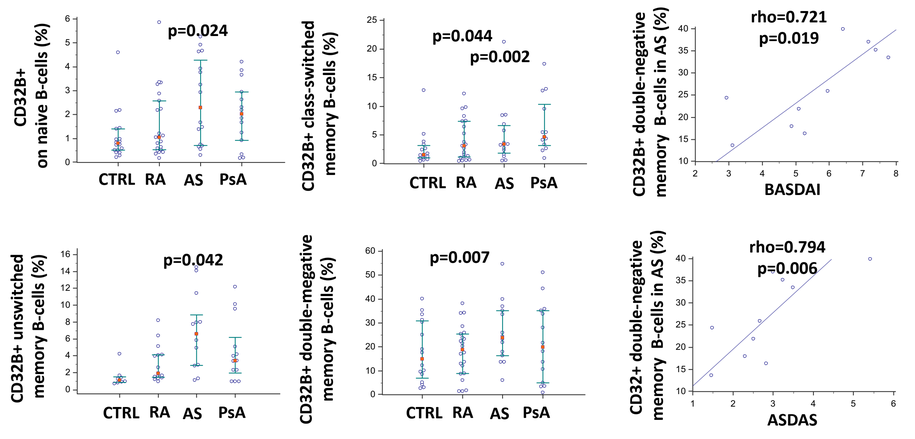
Expanded B-cells in RA and AS, and naive B-cells in PsA



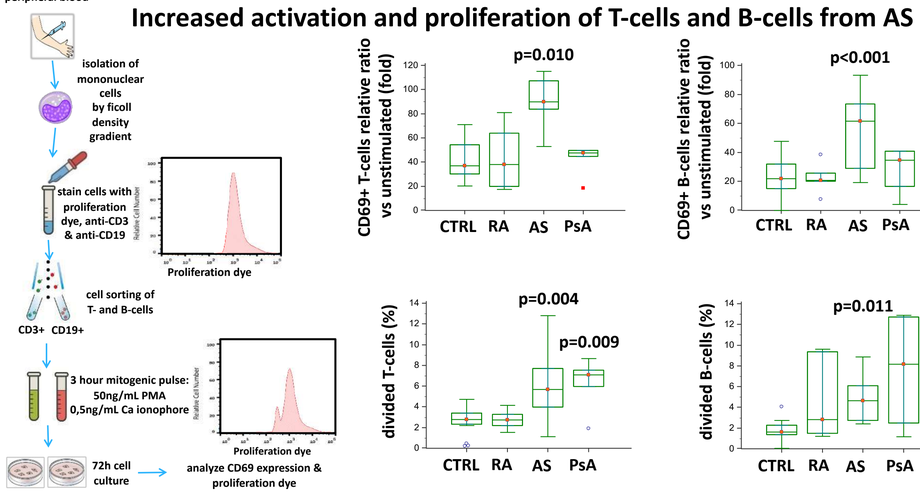
Decreased CD86+ class-switched memory B-cells in AS



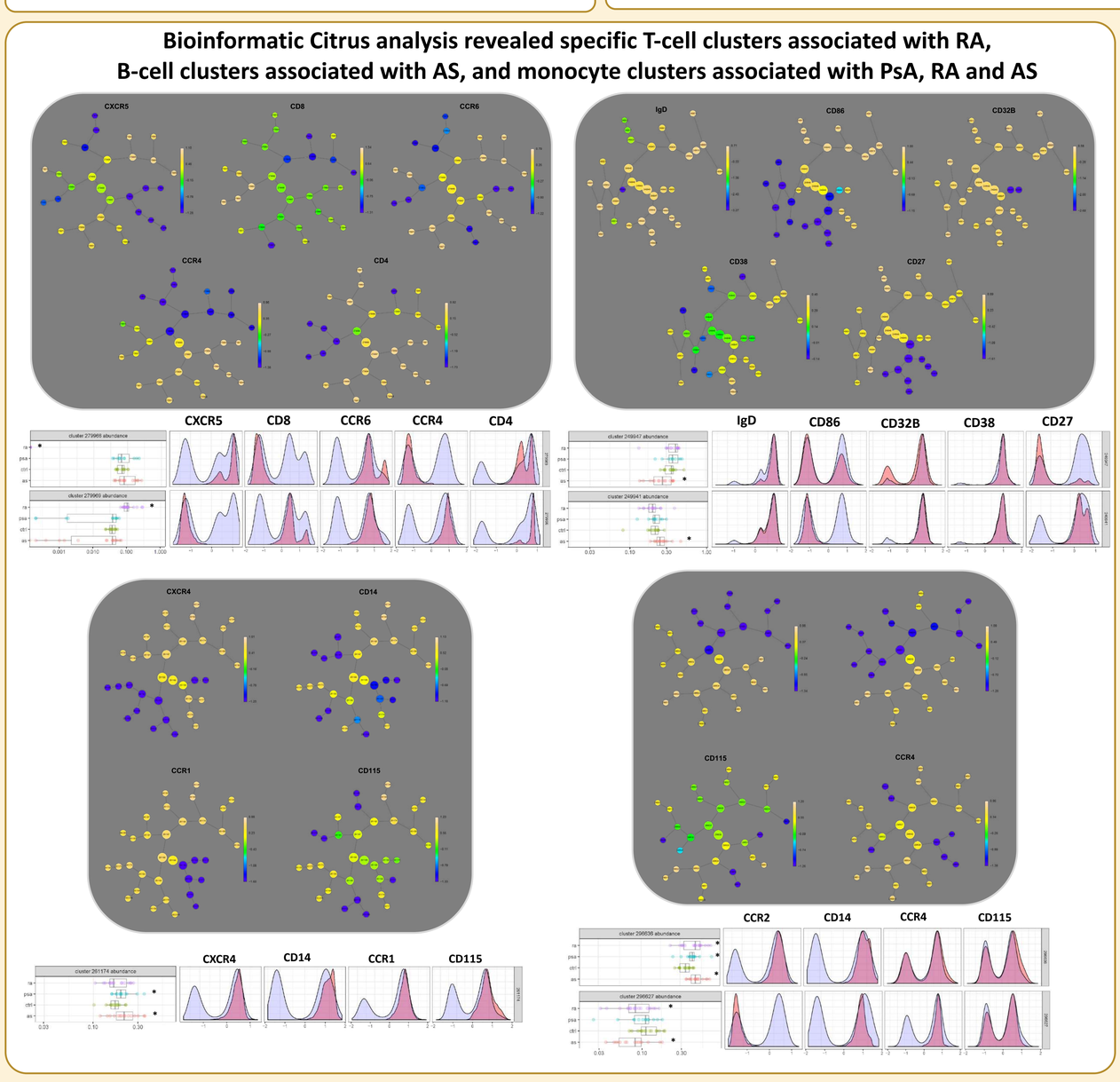
Increased CD32B+ B-cell subpopulations in AS correlates with disease activity indices



Increased activation and proliferation of T-cells and B-cells from AS



Bioinformatic Citrus analysis revealed specific T-cell clusters associated with RA, B-cell clusters associated with AS, and monocyte clusters associated with PsA, RA and AS



Conclusions

- PsA have lower double-negative T-cell frequency, while RA had lower double-positive T-cell frequency
- CD32B expression is increased on B-cell subpopulations in AS and is associated with disease activity indices in AS
- T- and B-cells from AS activate and proliferate more potently in vitro
- CCR1 and CXCR4 are upregulated on monocytes of RA, AS and PsA
- bioinformatic Citrus analysis revealed distinct T-cell, B-cell and monocyte clusters specifically associated with certain disease

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