



This work has been fully supported by Croatian Science Foundation under the project 5699.

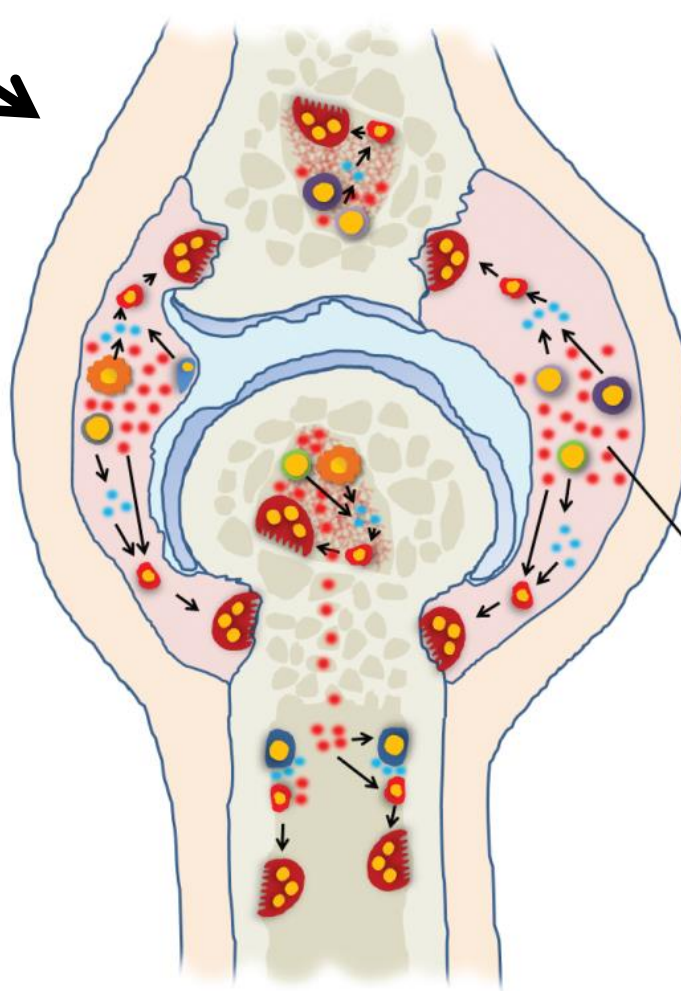
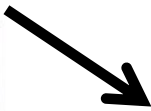
# **Lymphocytic subpopulations associated with disease activity and levels of proinflammatory cytokines in rheumatoid and psoriatic arthritis**

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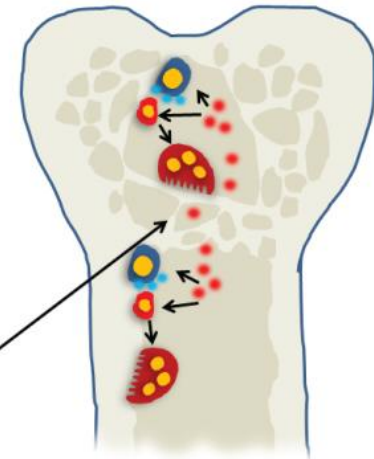
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# Rheumatoid arthritis and peripheral psoriatic arthritis



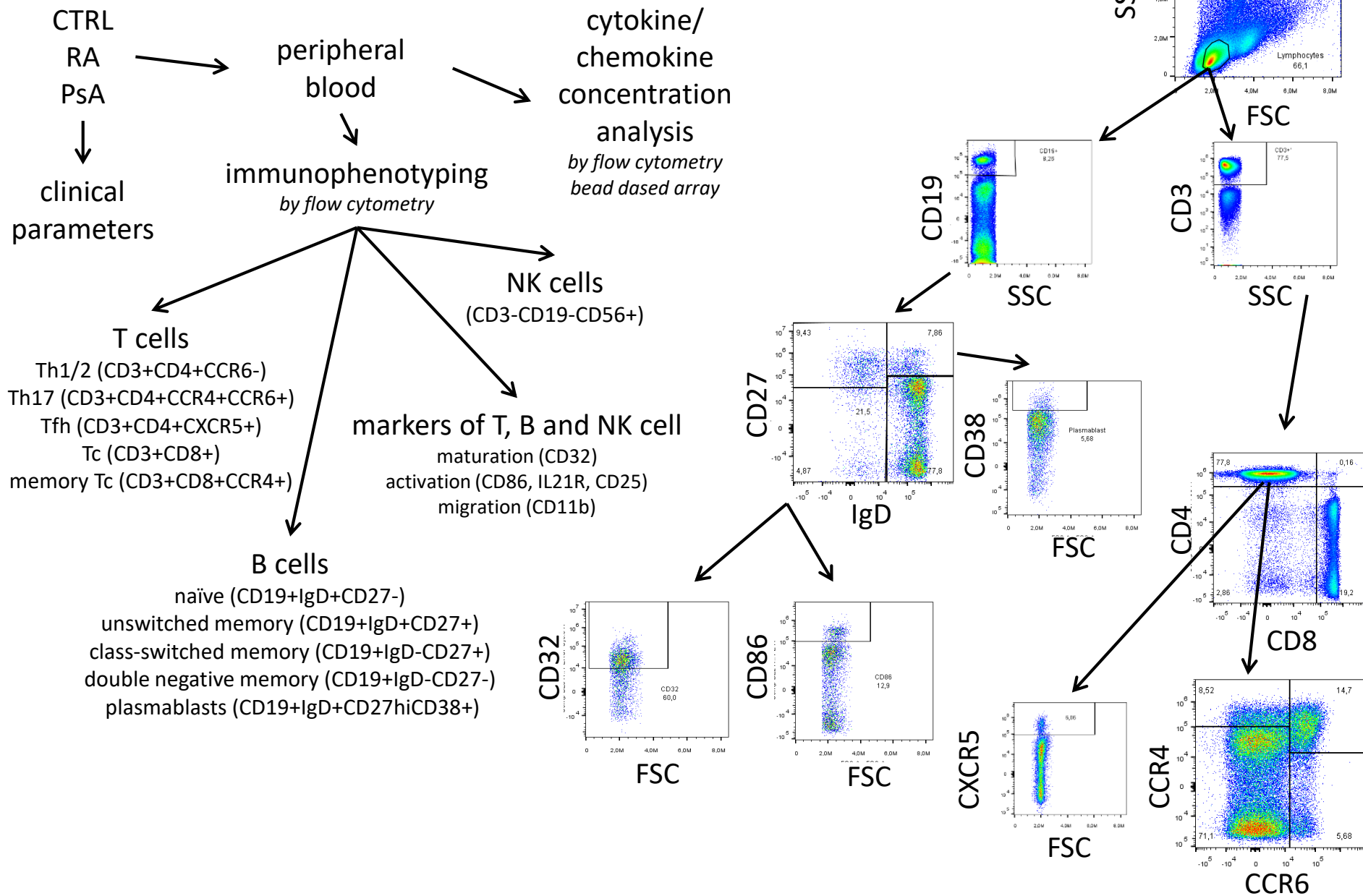
local bone loss

- osteoclast
- osteoclast progenitor
- T lymphocyte
- B lymphocyte
- plasma cell
- Th17 cell
- macrophage
- fibroblast
- osteoblast
- osteoresorptive cytokines
- RANKL



generalized bone loss

# Immunophenotyping

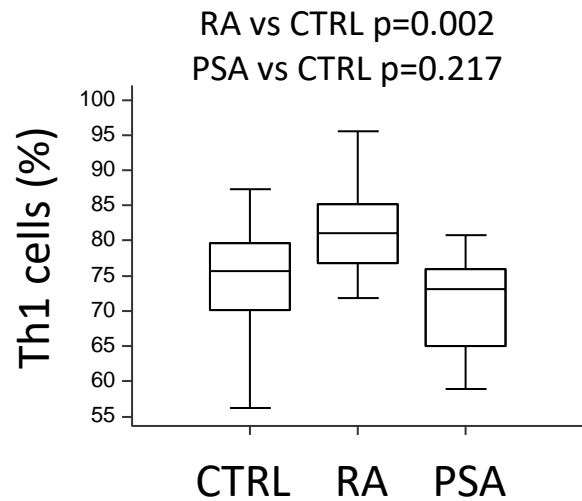
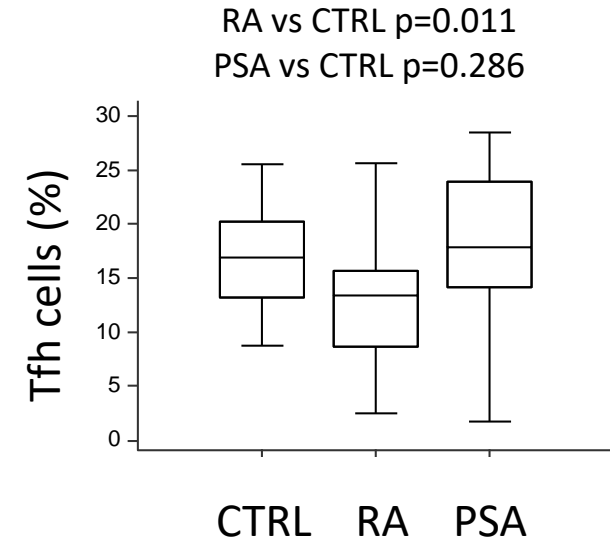
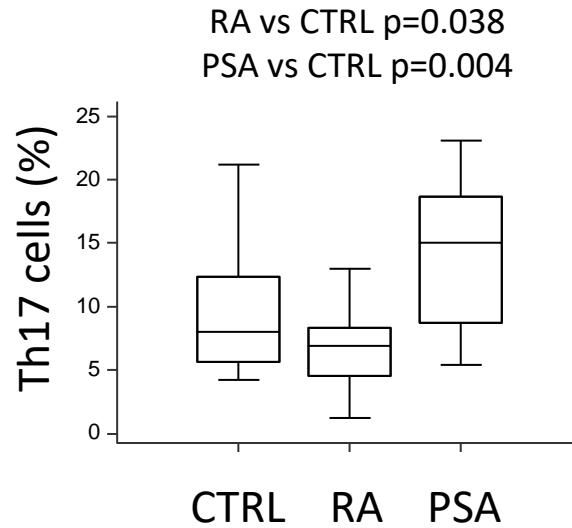
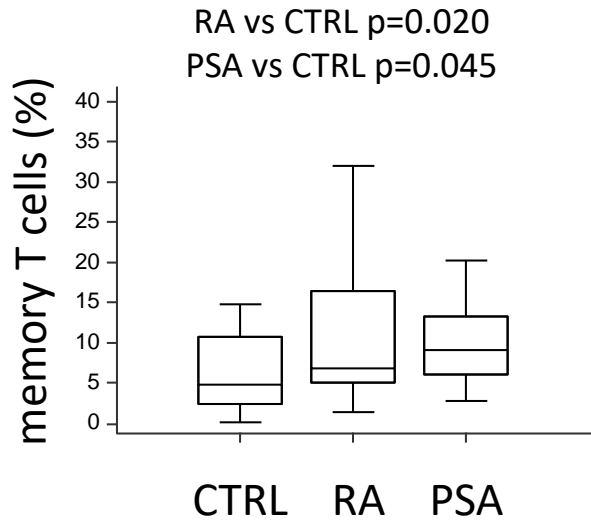


# Patient data

	Rheumatoid arthritis	Psoriatic arthritis	Controls
Age (years)	65 [51-74]	56 [44-74]	65 [48-68]
Sex (male/female)	7/73	21/34	21/89
DAS28	5.97 [4.99-6.71]	5.5 [4.05-6.78]	
DAS28 <5.1 / DAS28 >5.1 (no. of patients)	20/60	23/32	
CDAI	37 [24.03-44.10]	33.6 [14.0-52.08]	
Disease duration (years)	18.5 [9-29]	14 [8-30]	
SE (mm/h)	27.5 [19.0-39.5]	14.5 [4.0-46.5]	
CRP (mg/L)	11.9 [4.75-24.5]	2.7 [0.66-29.13]	
RF (IU/L) (n=57)	79.7 [15.0-239.0]	-	
aCCP (EU/L) (n=33)	68.7 [2.23-270.75]	-	
Seropositive (no. of patients)	44	-	
Tender joint count (out of 28)	15 [8-22]	17 [3-26]	
Swollen joint count (out of 28)	7 [2-12]	6 [0-14]	
Disease activity – physician VAS	7 [5.45-8.78]	6.4 [4.7-9.0]	
Disease activity – patient VAS	7 [5.0-8.8]	6.85 [4.9-8.23]	
NSAID	51	40	
DMARD	51	18	
Corticosteroids	33	6	

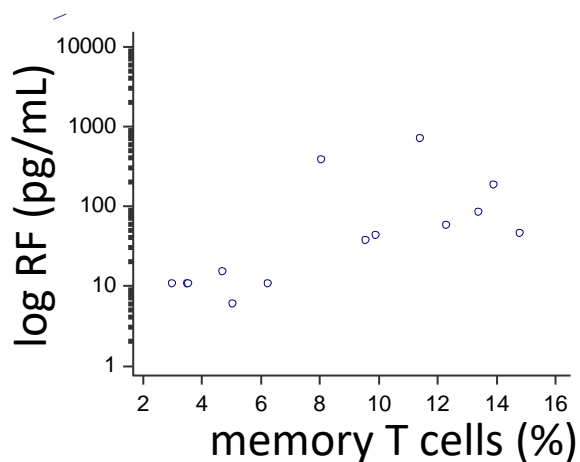
	Control		Rheumatoid arthritis		
	pg/mL	Median	IQR	Median	IQR
<b>TNF</b>	70,32	[38,0-93,6]	<b>90,45</b>	[39,0-131,0]	
<b>IL2</b>	11,65	[ND-27,3]	30,5	[ND-54,0]	
<b>IL4</b>	25,94	[16,0-34,6]	34,15	[23,6-40,9]	
<b>IL10</b>	122,8	[90,3-163,6]	<b>175,99</b>	[119,1-211,3]	
<b>IL6</b>	330,22	[210,3-428,4]	<b>360,28</b>	[237,5-535,5]	
<b>IL17</b>	21,99	[ND-78,4]	<b>81,66</b>	[46,125-121,500]	
<b>CCL2</b>	115,9	[17,2-141,3]	<b>142,22</b>	[20,5-239,2]	
<b>CCL3</b>	13,19	[7,5-17,0]	<b>21,2</b>	[15,0-23,9]	
<b>CCL4</b>	39,86	[30,4-52,840]	<b>60,99</b>	[45,7-69,8]	
<b>CCL5</b>	4436,35	[2182,8-7192,2]	<b>12094,74</b>	[5077,3-17134,7]	
<b>CXCL9</b>	48,74	[31,4-102,6]	<b>251,57</b>	[150,8-480,8]	
<b>CXCL10</b>	81,995	[40,0-141,0]	<b>230,4</b>	[133,6-315,1]	

# Altered T lymphocyte subpopulations

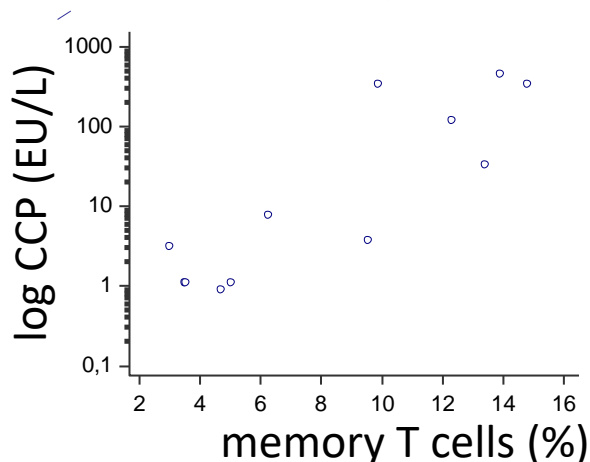


# Correlations of altered T lymphocyte populations with clinical parameters

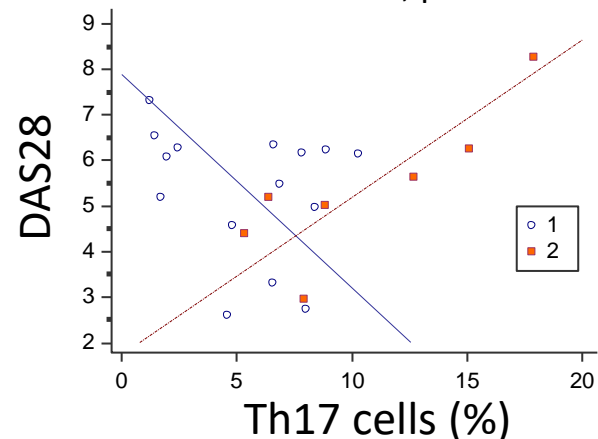
rho=0.687, p=0.007



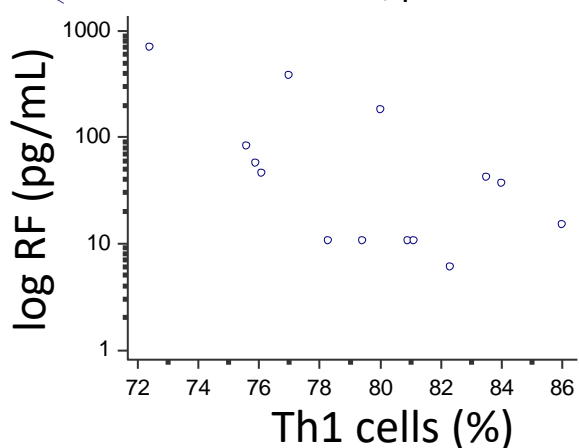
rho=0.876, p=0.002



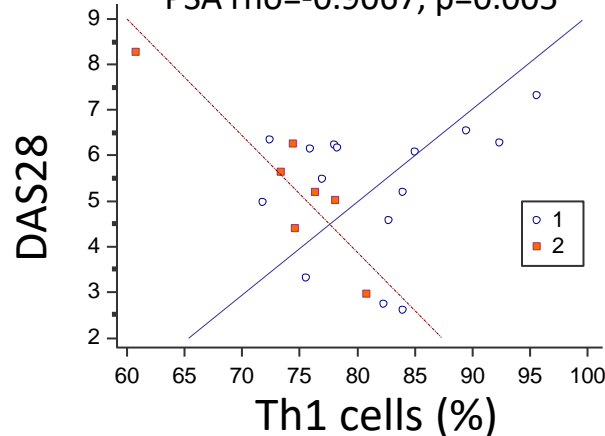
RA rho=-0.264, p=0.34  
PSA rho=0.821, p=0.023



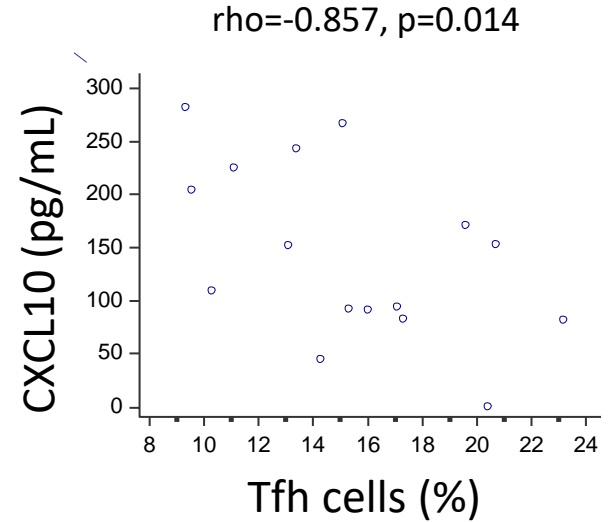
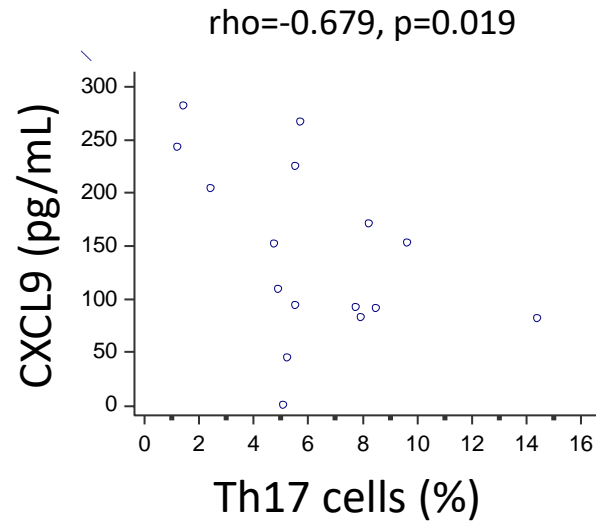
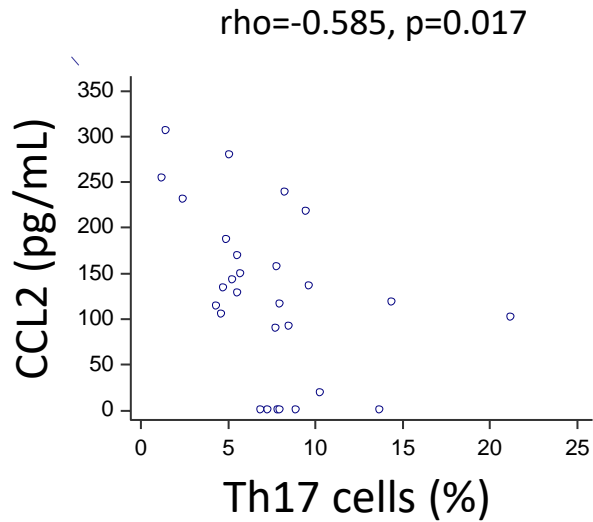
rho=-0.606, p=0.022



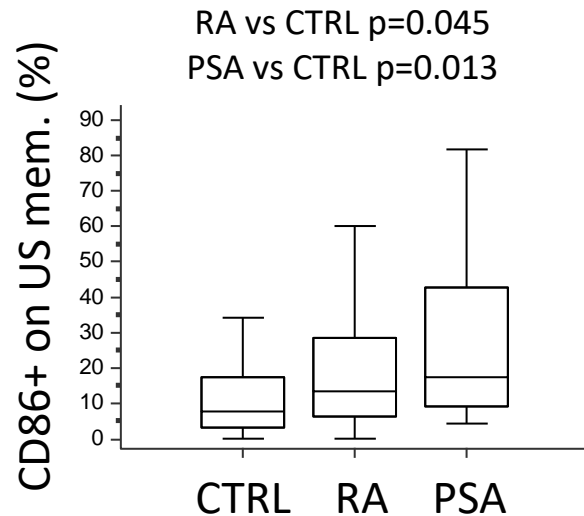
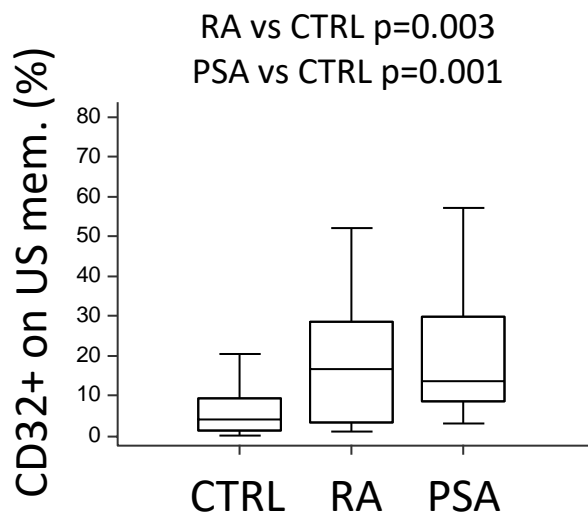
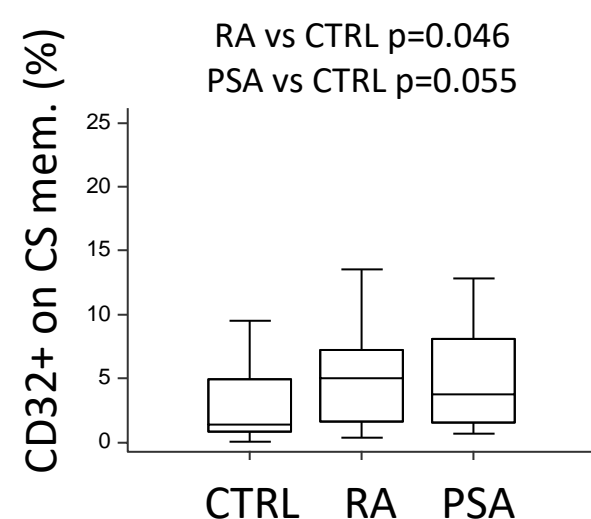
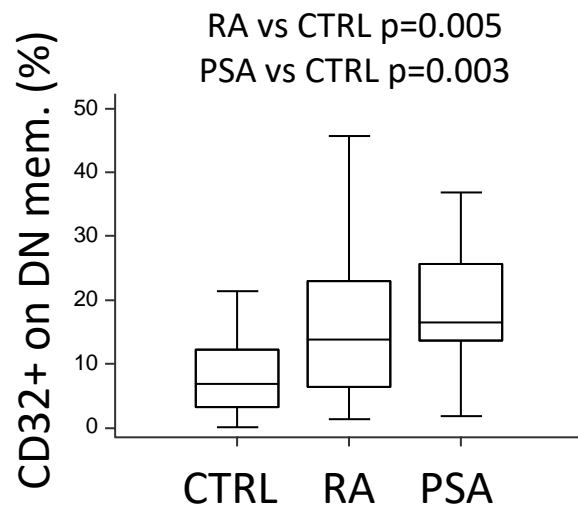
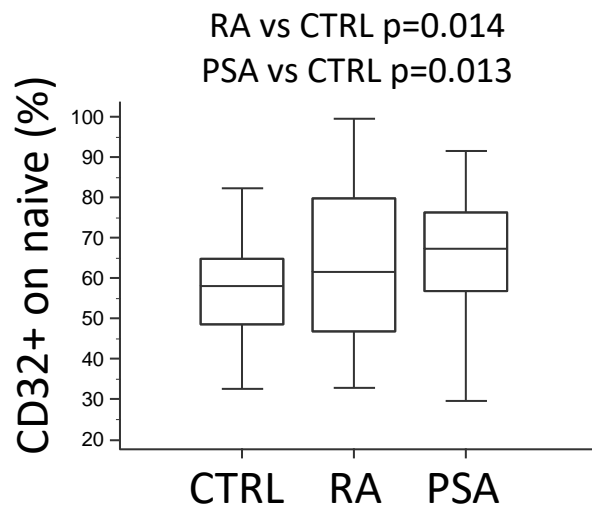
RA rho=0.250, p=0.37  
PSA rho=-0.9067, p=0.005



# Correlations of altered T lymphocyte populations with serum cytokine levels



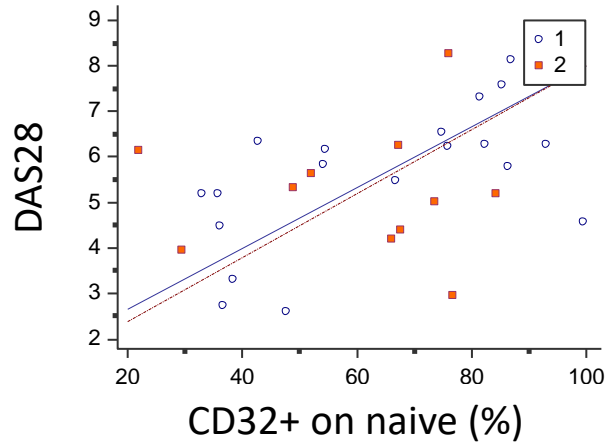
# CD32+ and CD86+ expression on B cell subpopulations



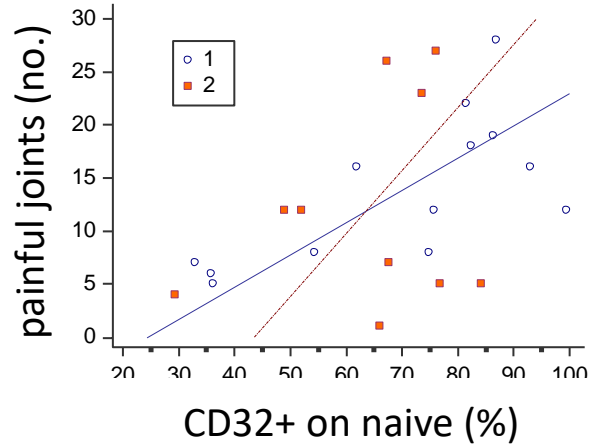


# Correlations of CD32+ and CD86+ expression on B lymphocytes populations with clinical parameters

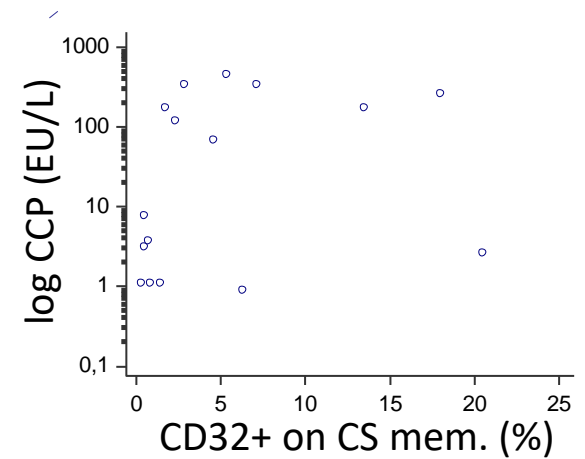
RA rho=0.558, p=0.013  
PSA rho=0.483, p=0.177



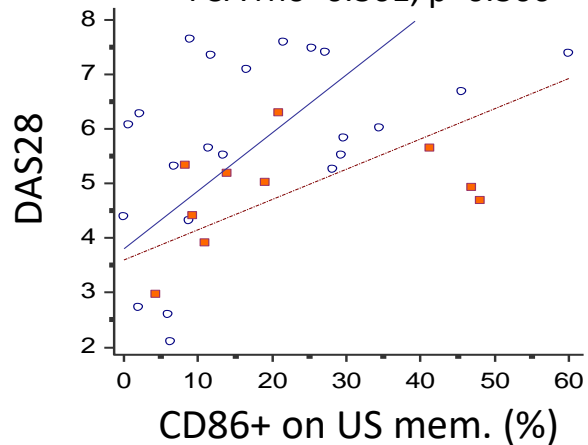
RA rho=0.726, p=0.005  
PSA rho=0.786, p=0.093



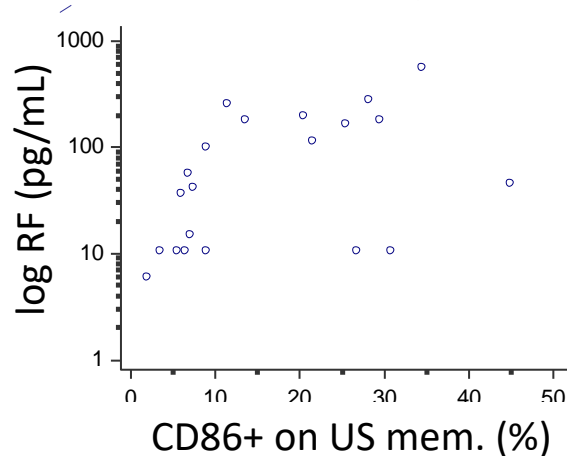
rho=0.502, p=0.040



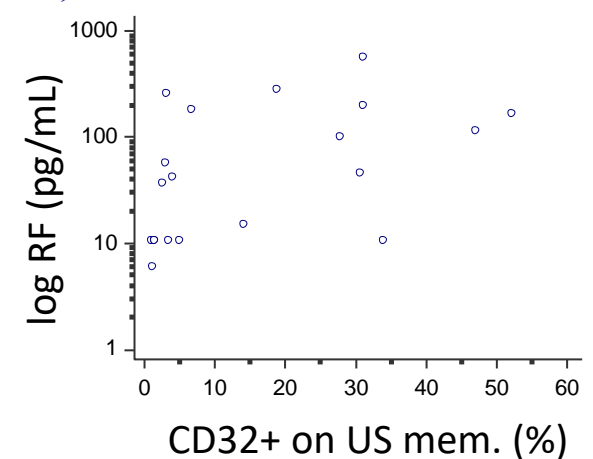
RA rho=0.471, p=0.027  
PSA rho=0.361, p=0.306



rho=0.550, p=0.010

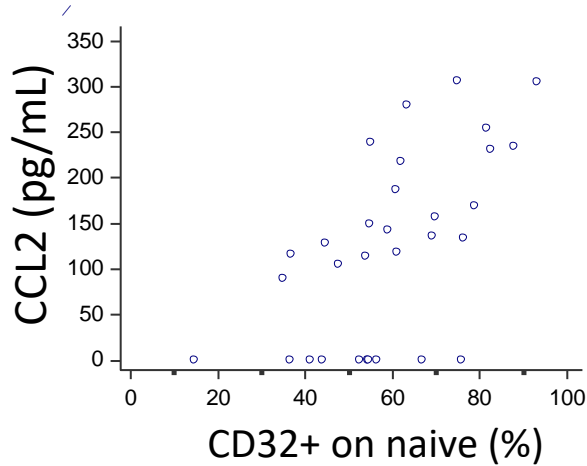


rho=0.578, p=0.006

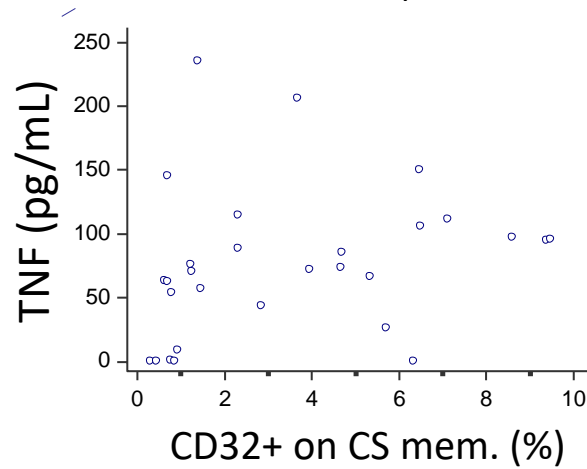


# Correlations of CD32+ and CD86+ expression on B lymphocytes populations with serum cytokine levels

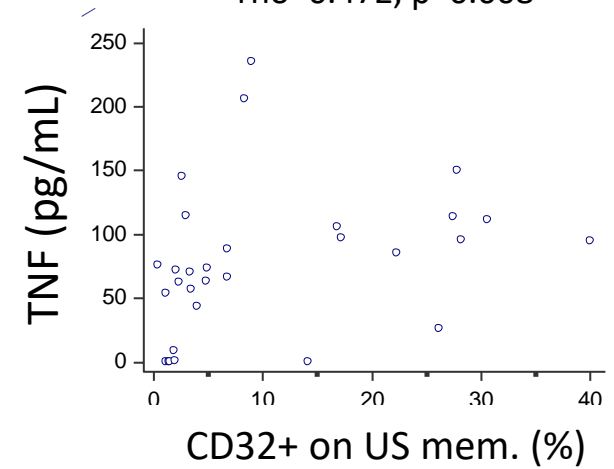
$\rho=0.504, p=0.005$



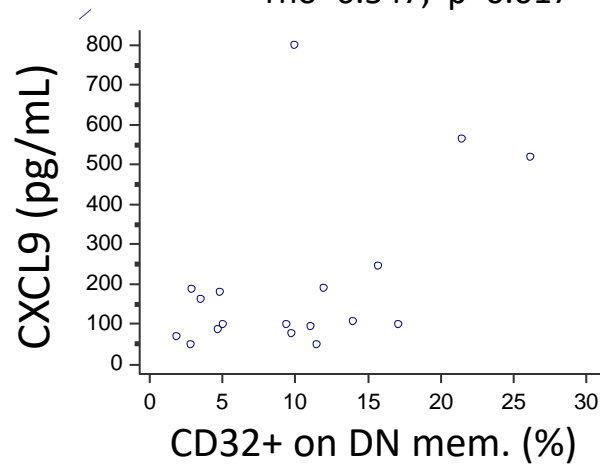
$\rho=0.549, p=0.002$



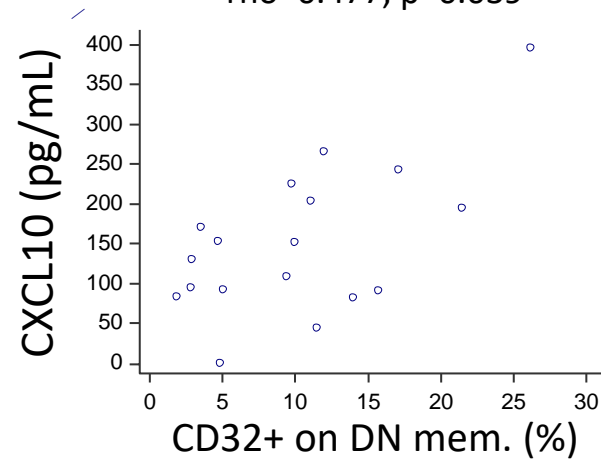
$\rho=0.472, p=0.008$



$\rho=0.547, p=0.017$

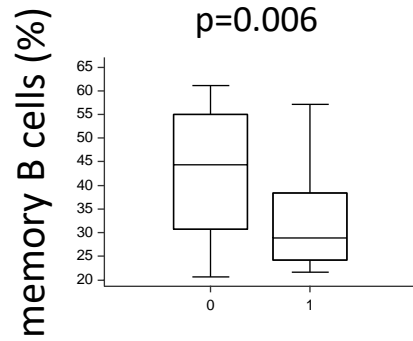


$\rho=0.477, p=0.039$

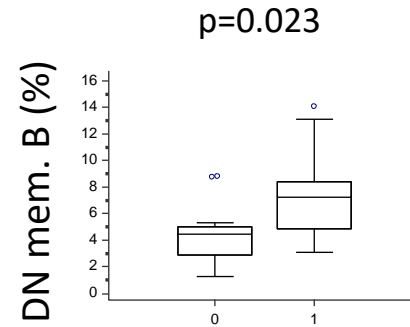
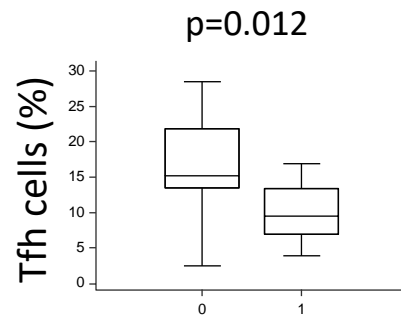
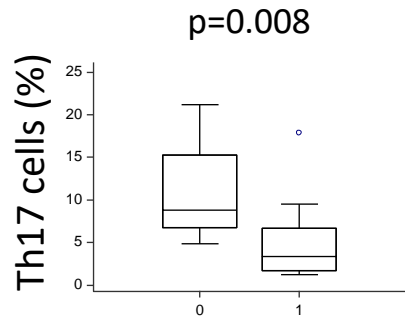
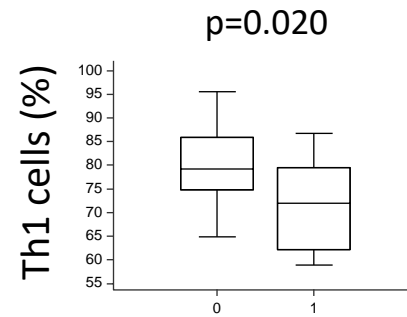


# Subpopulation differences in regards to therapy

DMARD



anti-TNF



corticosteroids

# Conclusions

- memory T cells are expanded both in RA and PSA and correlate with RF and CCP levels
- Th17 and Tfh cells are found in lower frequency in RA and higher in PSA, while the Th17 frequency correlates with DAS28 positively in PSA
- CD32+ expression on naive and memory, and CD86+ on unswitched memory B cells is increased both in RA and PSA
- expression of CD32+ on naive and CD86+ on unswitched memory B cells correlates with DAS28 and RF in RA
- CD32+ expression on class switched and unswitched memory B cells correlates with RF, CCP and TNF levels
- these subpopulations may be of particular interest for further research, since their frequency is associated with disease activity and increased levels of proinflammatory and proresorptive cytokines

This work has been fully supported by Croatian Science Foundation under the project 5699.



## Acknowledgements

### Laboratory for Molecular Immunology

Prof. Danka Grčević, MD, PhD

Prof. Nataša Kovačić, MD, PhD

Prof. Vedran Katavić, MD, PhD

Prof. Zrinka Jajić, MD, PhD – KBC „Sestre Milosrdnice”

Prof. Asja Stipić Marković, MD, PhD – KB „Sveti Duh”

Prof. Branimir Anić – KBC „Zagreb”

Doc. Tomislav Kelava, MD, PhD

Marinko Artuković, MD, PhD

Darja Flegar, MD

Antonio Markotić, MD

Sanja Ivčević

Katerina Zrinski Petrović