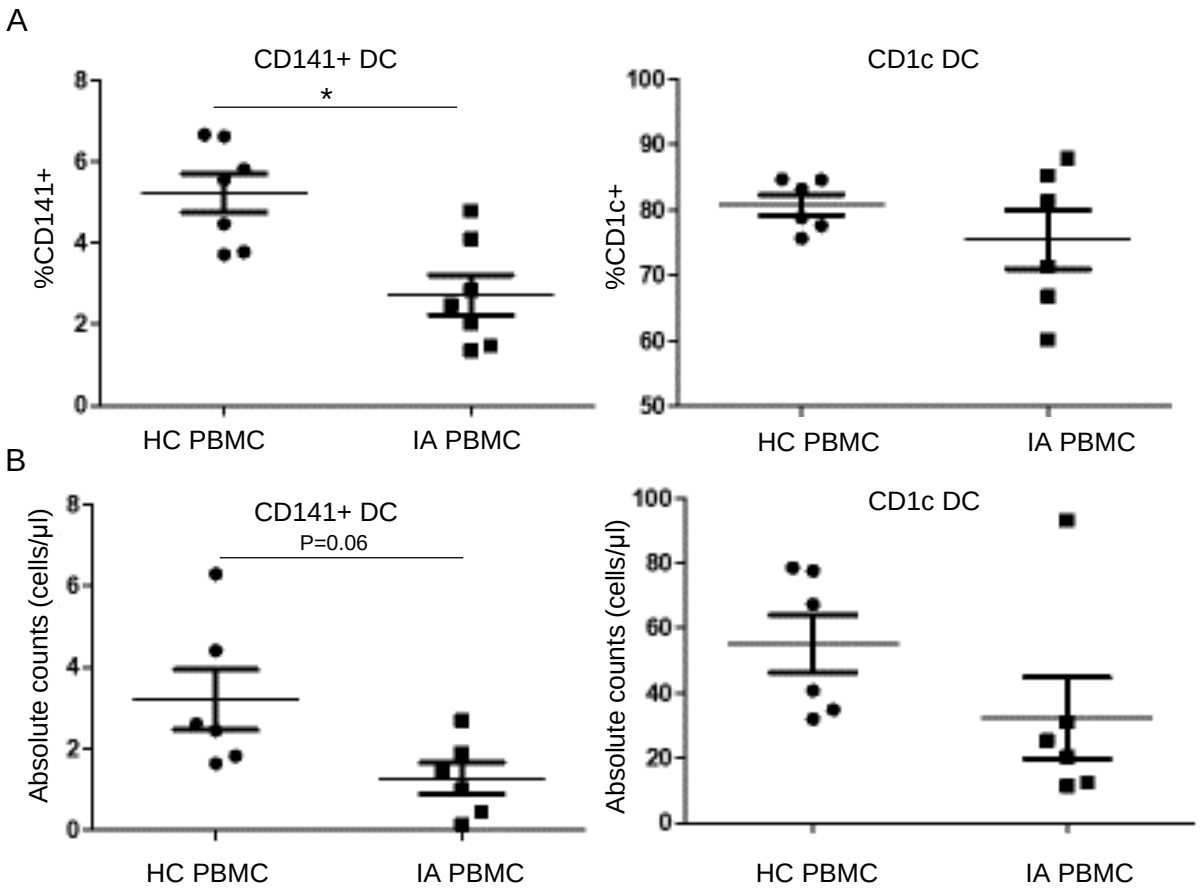
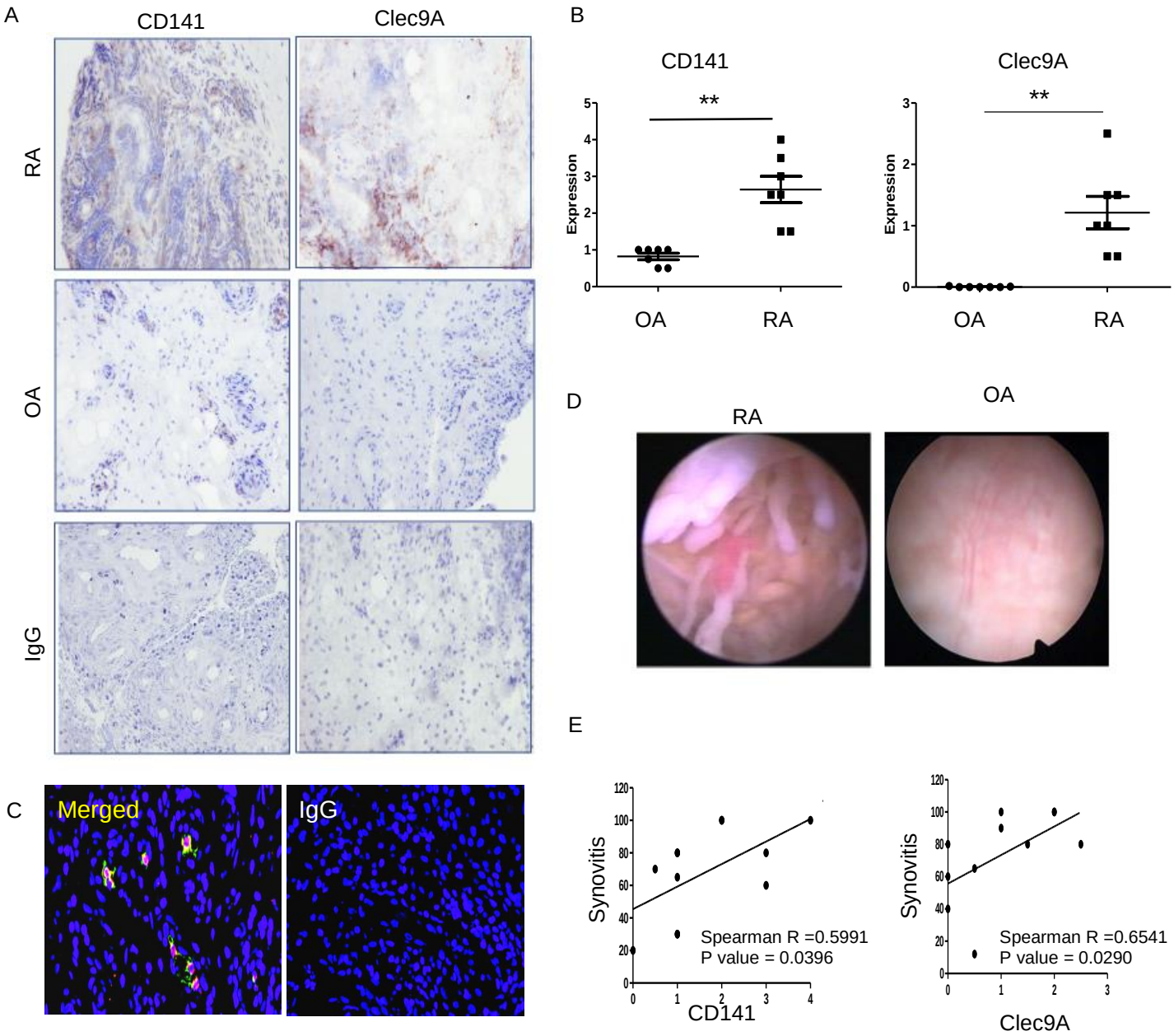
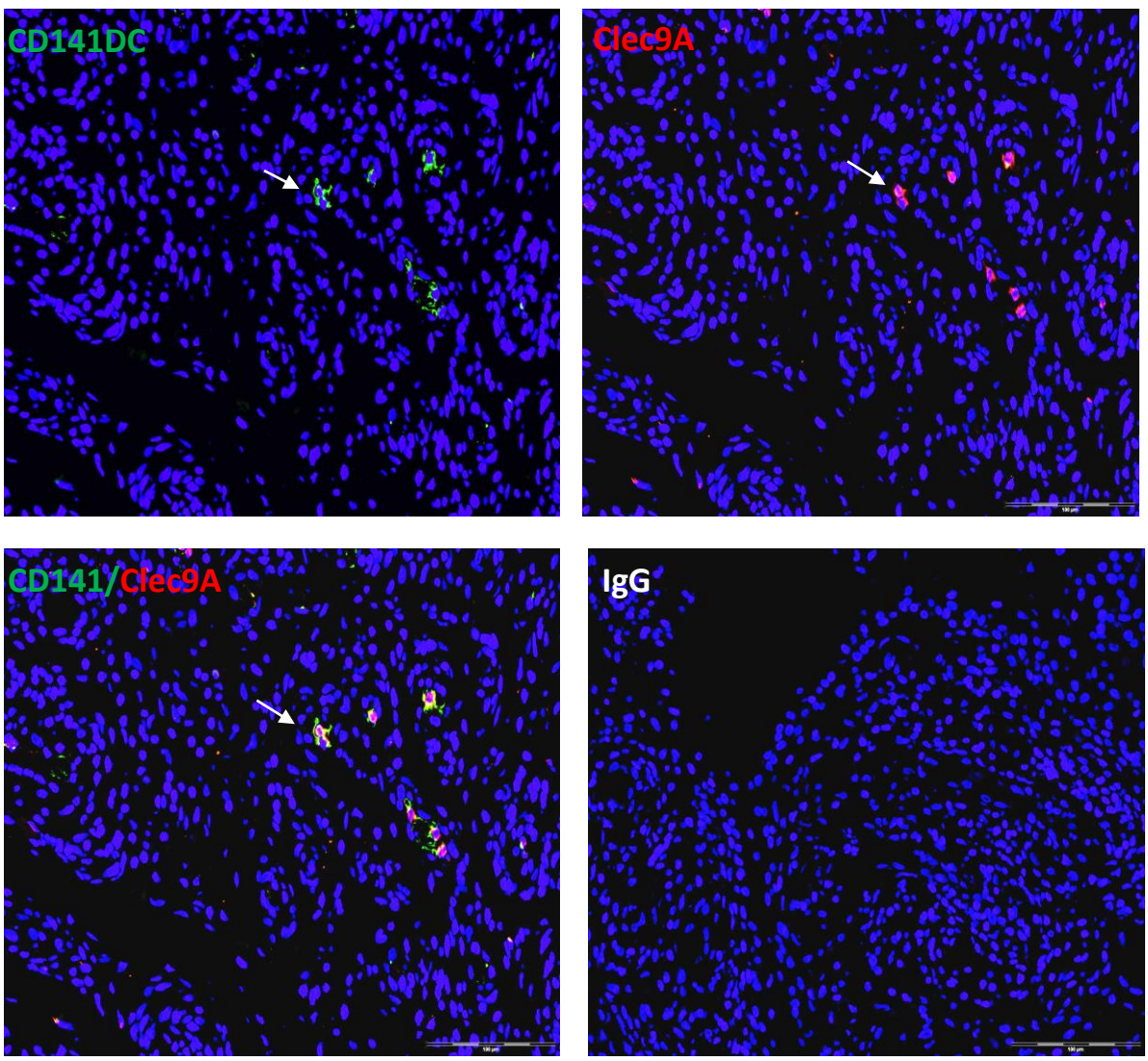


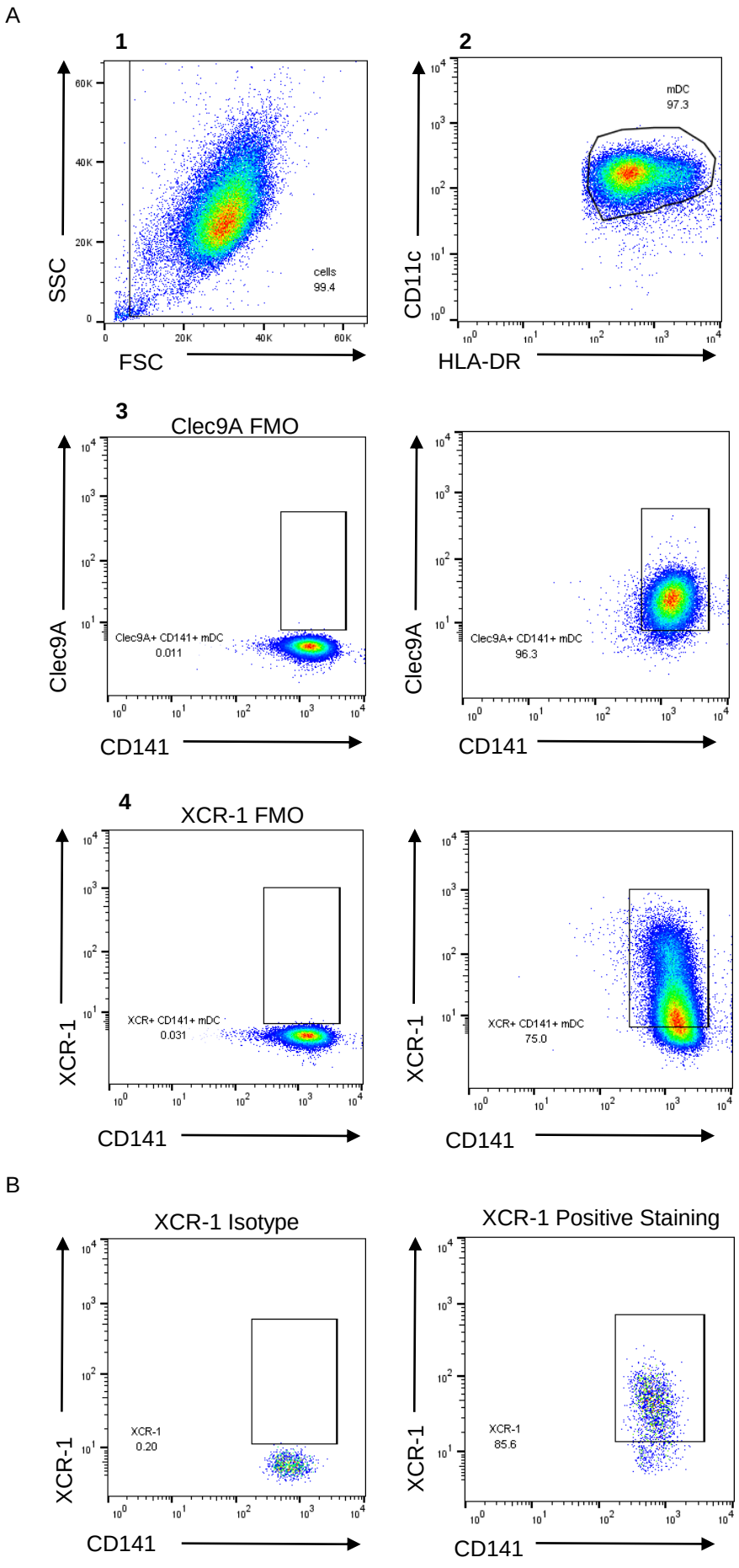
Supplementary Figure 1: (**A**) The percentage of $CD141^+$ mDC and $CD1c^+$ mDC in healthy control (HC) and inflammatory arthritis (IA) and PBMC as a percentage of $Lineage^-$ $HLADR^+$ cells (n=6) and (**B**) the absolute numbers of these cells relative to beads. *P<0.05 significantly different to control.



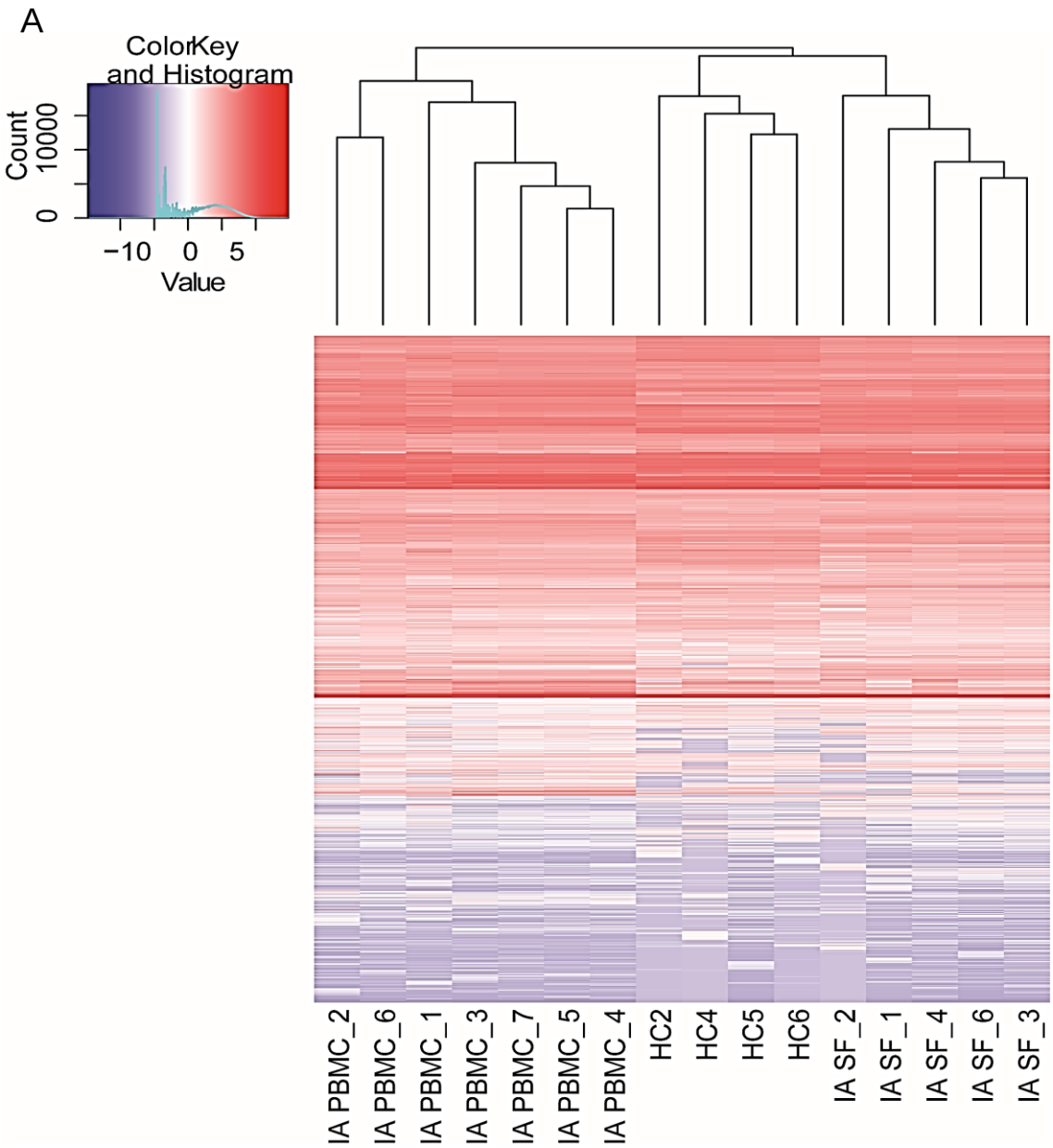
Supplementary Figure 2: (**A**) and (**B**)) Representative images and semi-quantification of immunohistochemical staining for CD141 and Clec9A, in synovial tissue from RA and OA patients (n=7) (Original magnification 20x). Haematoxylin staining was used for counterstaining. (**C**) Representative immunofluorescence images of CD141 Clec9A dual staining in RA synovial tissue. Nuclei are stained with DAPI (blue), CD141 is stained with Alexa-Fluor-488-conjugated goat anti-mouse superclonal™ secondary antibody (red), Clec9A is stained with Cy™3–conjugated goat anti-rabbit secondary antibody (green) and colocalisation of $CD141^+$ $Clec9A^+$ cells is depicted in yellow, original magnification of photomicrographs x 20. (**D**) Representative images of *in vivo* images of macroscopic synovitis from an RA and OA patient. (**E**) Correlation between CD141 expression or Clec9A expression and macroscopic synovitis. *P<0.05, **P<0.01 significantly different to control.

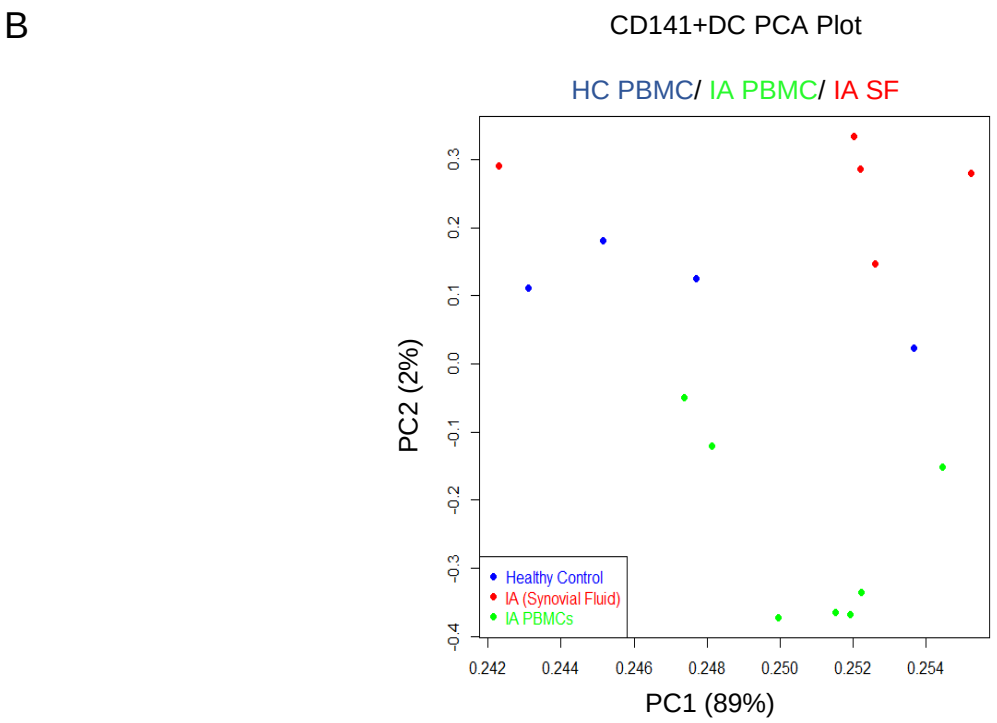


Supplementary Figure 3. Immunofluorescence staining for CD141 (green), cle9A (red), merged image of CD141/Cle9A (yellow) and IgG control. Nuclei were counterstained with DAPI. Original magnification 20X.

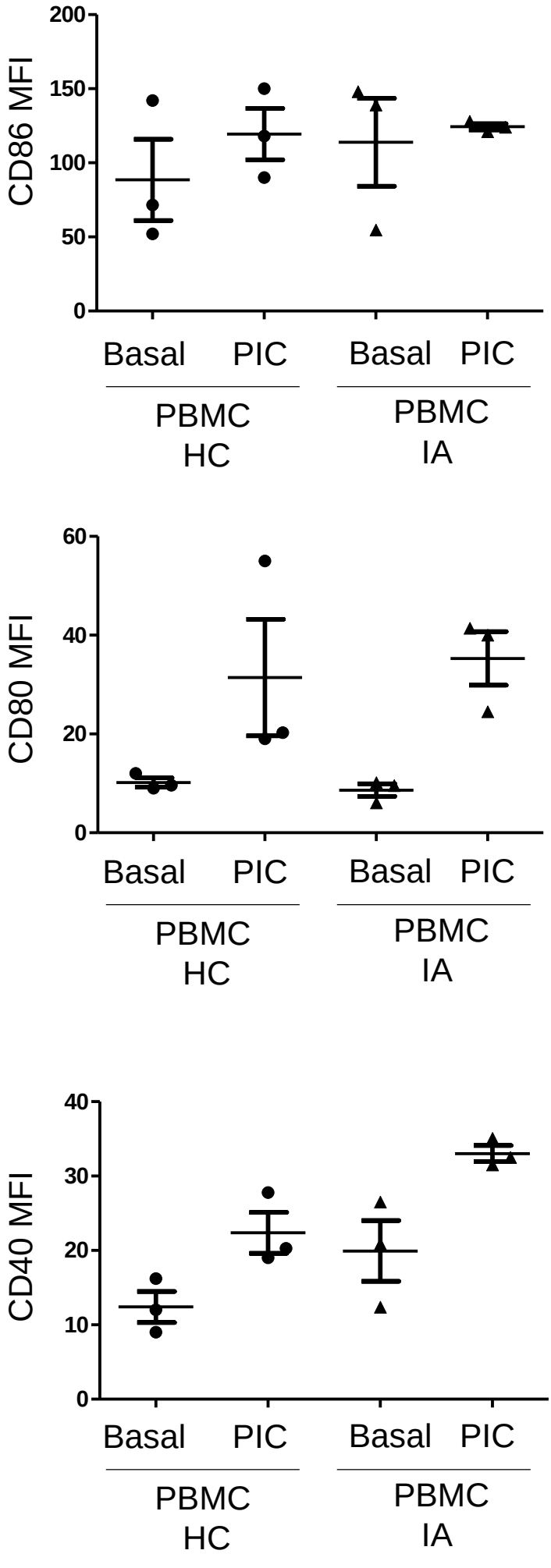


Supplementary Figure 4: (A) Gating strategy of sorted CD141^{+}DC. Following removal of debris, doublets and dead cells, myeloid DC cells were gated on CD11c and HLA-DR. CD141, Clec9A and XCR-1 were all subsequently examined (using FMO controls to determine gating boundaries) to identify/confirm CD141^{+}DC. **(B)** Due to the previously reported difficulty in staining XCR-1, we also performed staining using an appropriate isotype control to confirm positive XCR-1 staining.

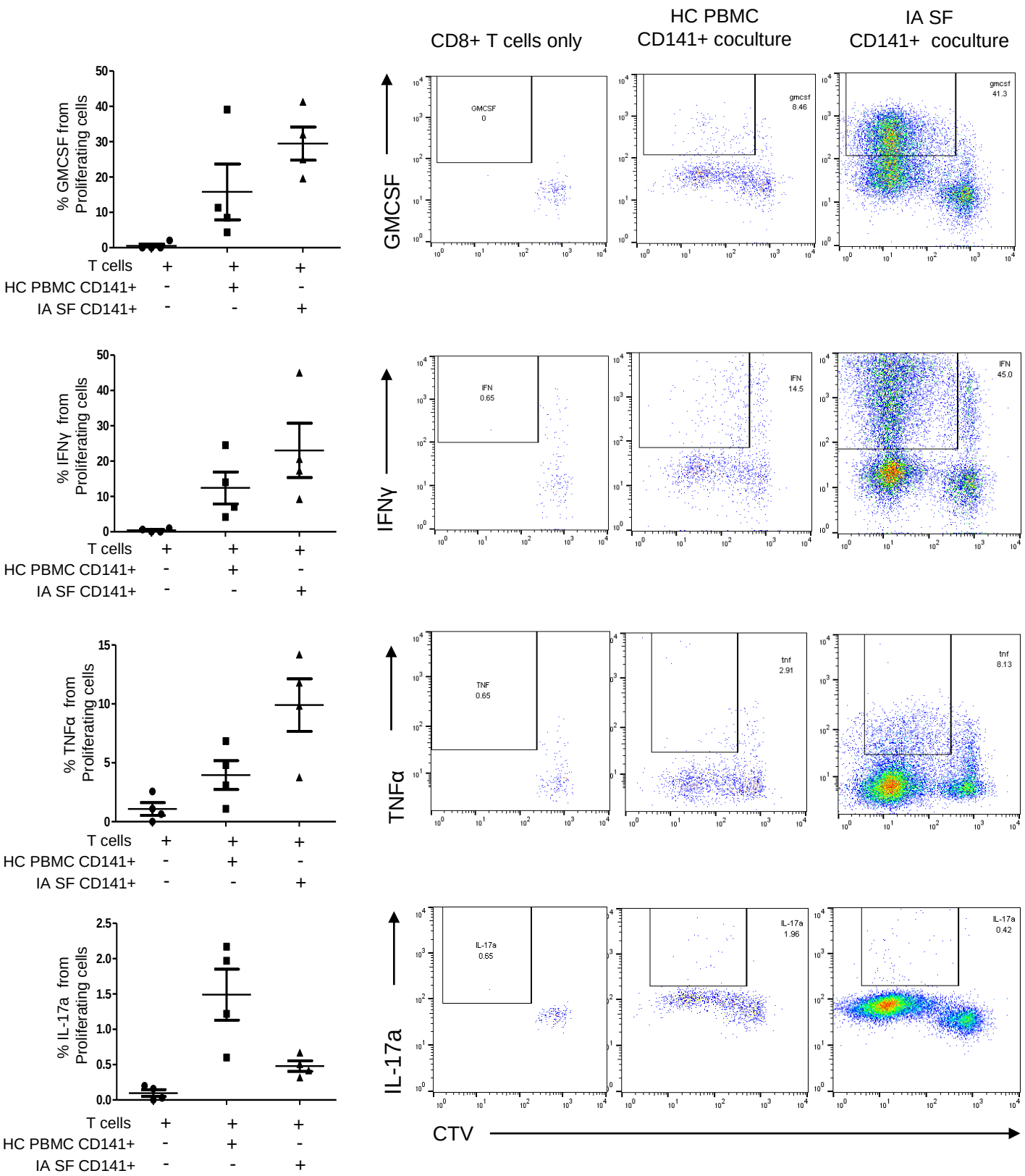




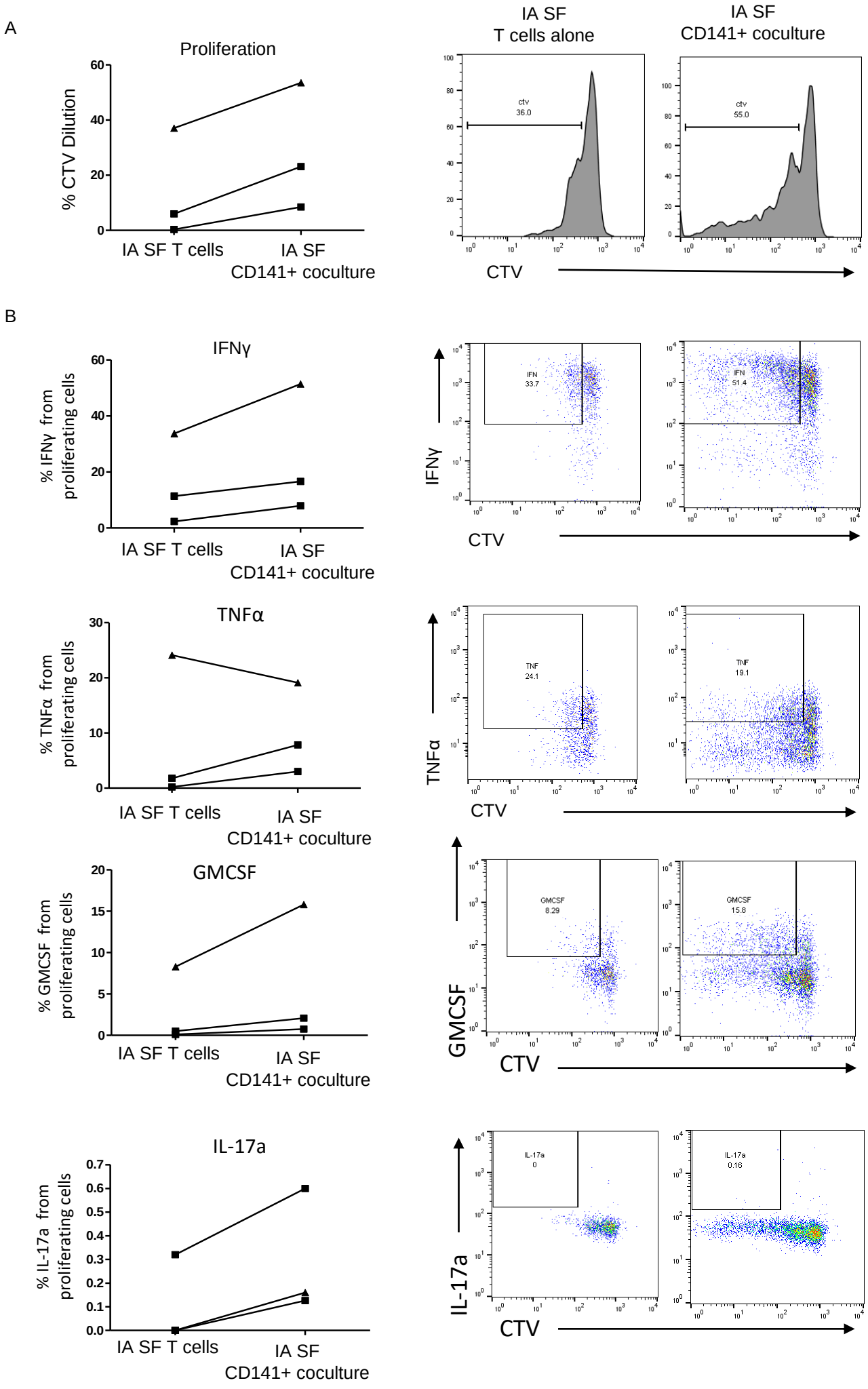
Supplementary Figure 5: Unsupervised Hierarchical clustering of all 18345 genes between inflammatory arthritis (IA) PBMC CD141^{+}DC, IA SF CD141^{+}DC and HC PBMC CD141^{+}DC. (B) PCA analysis was performed on the total datasets of HC PBMC CD141+ DC, IA SF CD141+ DC and IA PBMC CD141+DC. Data shown are from 4 HC donors, 5 IA SF donors and 7 IA blood donors.



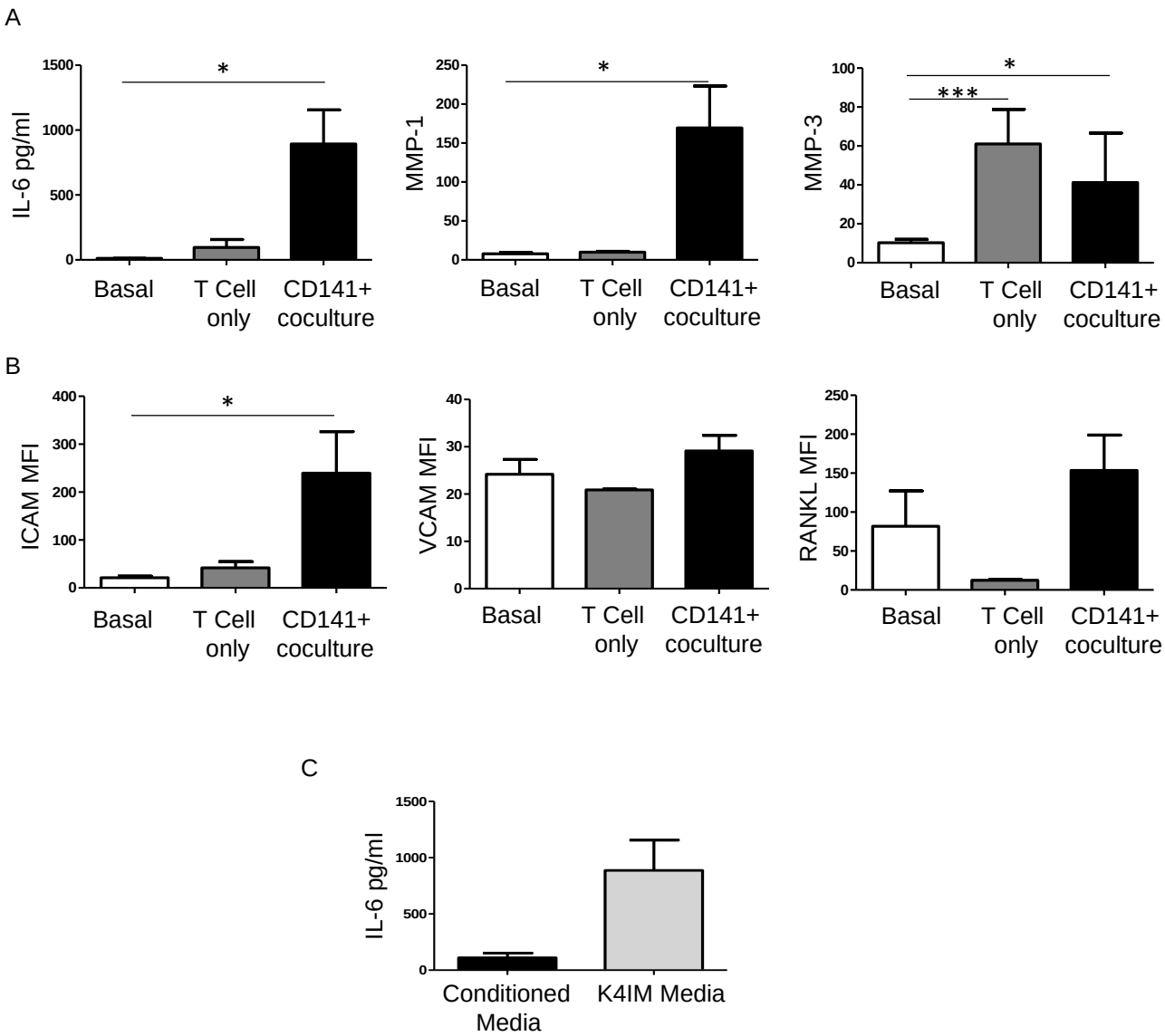
Supplementary Figure 6: Expression of CD86, CD80 and CD40 on sorted peripheral blood CD141^{+}DC from HC or IA patients peripheral blood (n=3) basally or following stimulation with Poly:IC (1µg/ml).



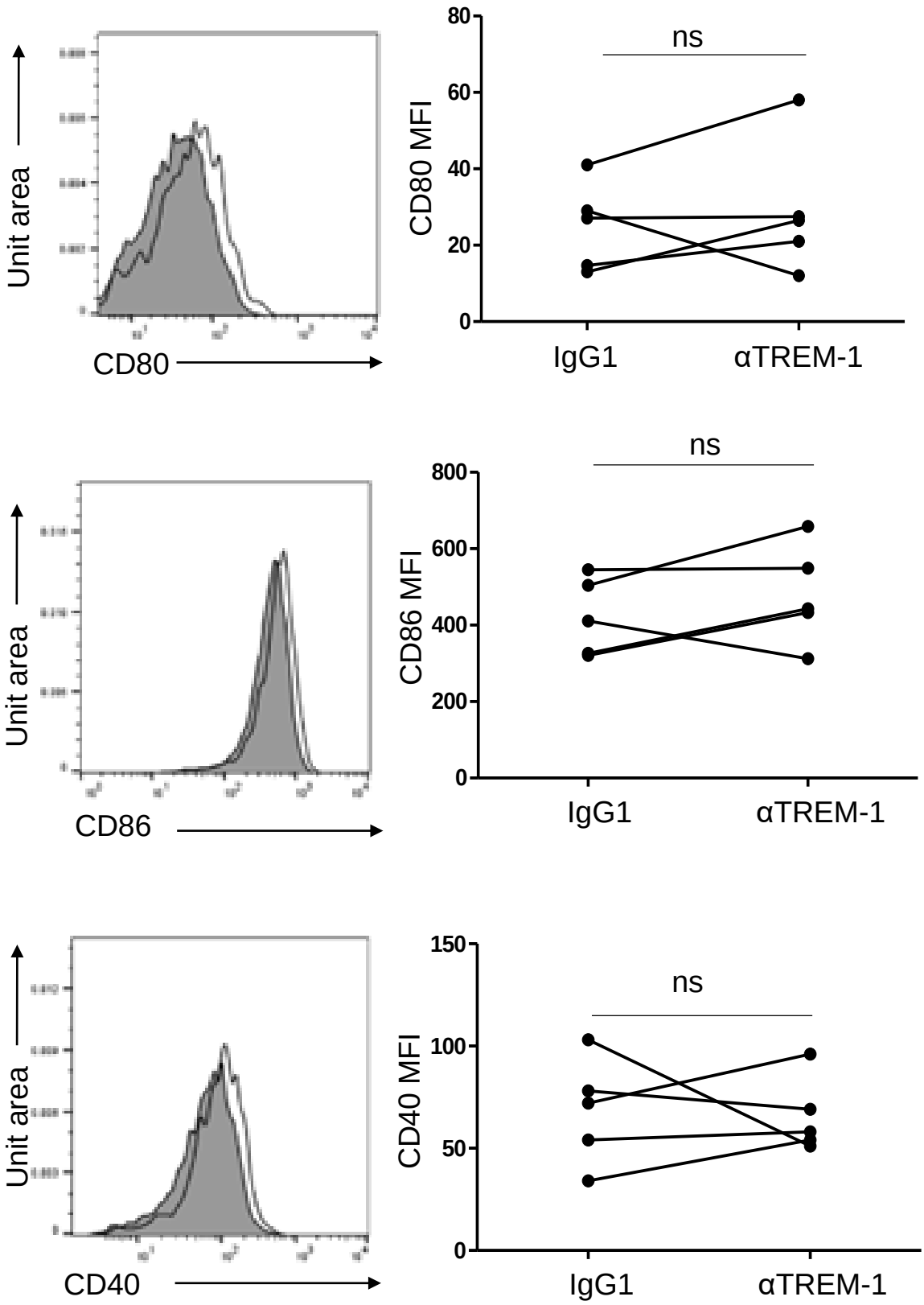
Supplementary Figure 7: Sorted IA synovial fluid (SF) CD141$^+$ DC or HC PBMC CD141$^+$ DC (n=4) were cocultured with allogeneic CD3$^+$ T cells from a single donor for 6 days at a ratio of 1:10 after which proliferation and cytokine production was assessed by flow cytometry. After 6 days coculture CD3$^+$ T cells were restimulated with PMA/ionomycin in the presence of brefeldin A, stained intracellularly with fluorochrome-conjugated antibodies specific for GMCSF, IFNγ TNFα and IL-17a and analysed by flow cytometry. Representative flow cytometry plots showing cytokine staining in CD8$^+$ T cells and dot plots representing the percentage of indicated cytokine within the proliferating CD8$^+$ population.



Supplementary Figure 8: Inflammatory arthritis (IA) synovial fluid (SF) $CD3^+$ T cells were sorted and cultured alone or with autologous synovial $CD141^+$ DC (n=3) for 4 days at a ratio of 1:10 after which proliferation and cytokine production was assessed by flow cytometry. The frequency of proliferating cells was measured by CTV dilution. After 4 days coculture $CD3^+$ T cells were restimulated with PMA/ionomycin in the presence of brefeldin A, stained intracellularly with fluorochrome-conjugated antibodies specific for IFNγ, TNFα, GMCSF and IL-17a and analysed by flow cytometry. (**A)** Dot plots representing the percentage of proliferating cells in $CD8^+$ T cell populations and representative histograms showing the dilution of CTV. (**B)** Representative flow cytometry plots showing cytokine staining in $CD8^+$ T cells and dot plots representing the percentage of indicated cytokine within the proliferating $CD8^+$ population.



Supplementary Figure 9: (**A**) Levels of IL-6, MMP-1 and MMP-3 from control K4IM cells, K4IM cells stimulated with supernatants from T cells cultured on their own or K4IM cells stimulated with supernatants from CD141^{+}DC-T cell cocultures. **(B)** Bar graphs representing the MFI of ICAM, VCAM and RANKL on control K4IM cells, K4IM cells stimulated with supernatants from T cells cultured on their own or K4IM cells stimulated with supernatants from CD141^{+}DC-T cell cocultures. (**C)** Levels of IL-6 in CD141^{+}DC-T cell cocultures and K4IM supernatants stimulated with these cocultures



Supplementary Figure 10: MFI and representative histograms displaying expression of CD80, CD86 and CD40 on HC peripheral blood CD141^{+} DC stimulated via plate bound αTREM-1 or IgG1 control for 24 hr (n=5).