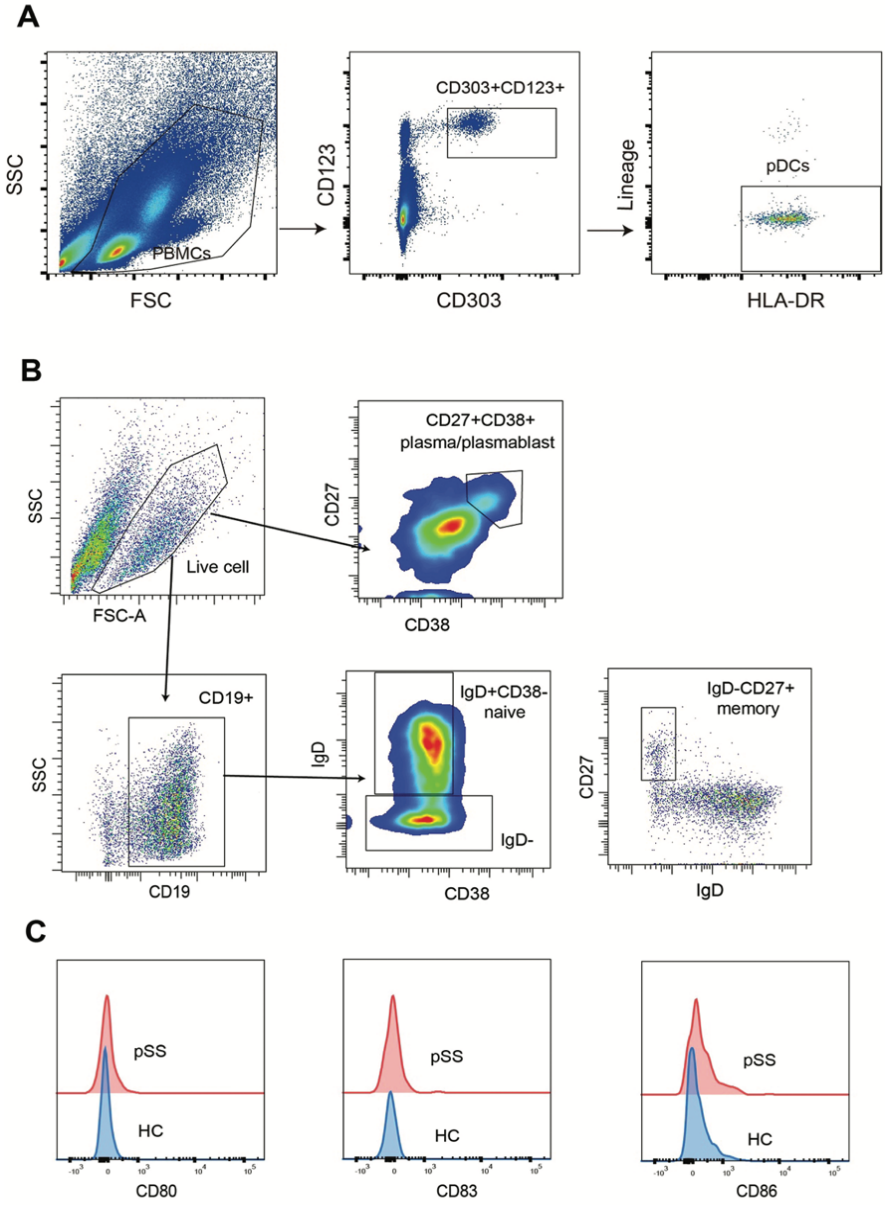
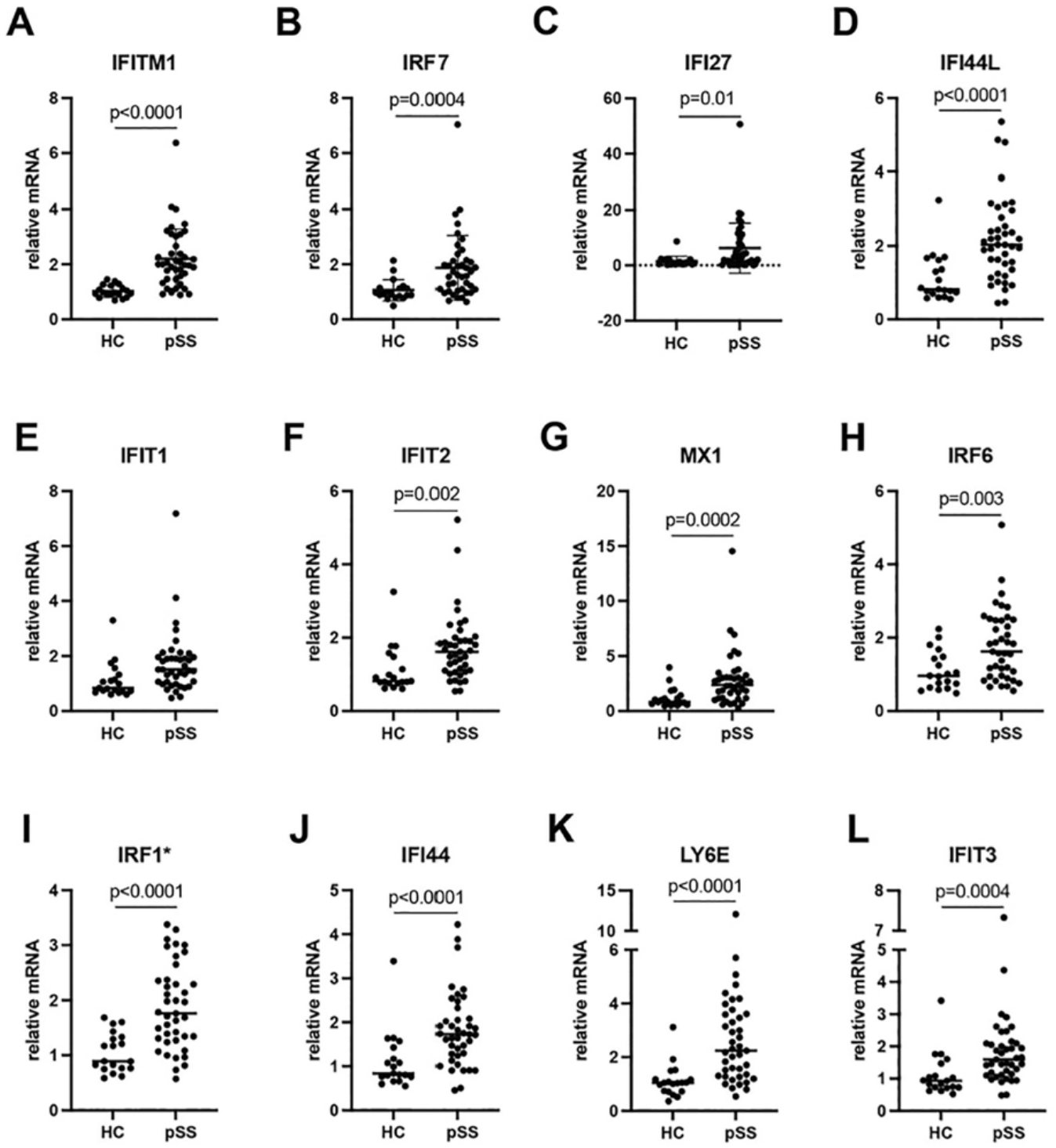
Supplementary Table S1. The primer sequences used in this study.

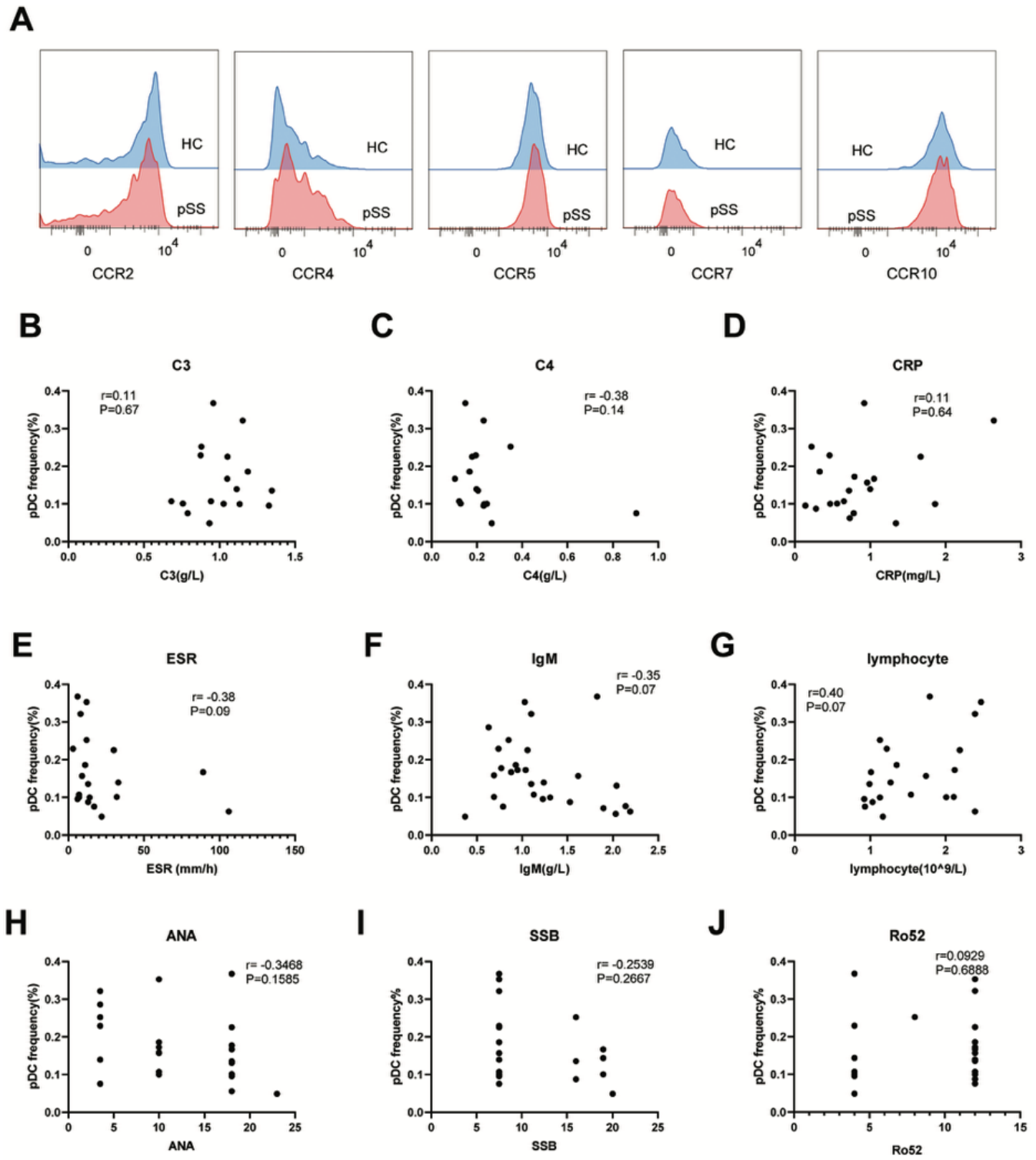
Gene name	Forward primer	Reverse primer
IFITM1	CCAAGGTCCACCGTGATTAAC	ACCAGTTCAAGAAGAGGGTGTT
IFI27	TGCTCTCACCTCATCAGCAGT	CACAACTCCTCCAATCACAACT
IFI44	ATGGCAGTGACAACTCGTTTG	TCCTGGTAACTCTCTTCTGCATA
IFIT1	TTGATGACGATGAAATGCCTGA	CAGGTCACCAGACTCCTCAC
IFIT2	AAGCACCTCAAAGGGCAAAAC	TCGGCCCATGTGATAGTAGAC
MX1	GTTTCCGAAGTGGACATCGCA	CTGCACAGGTTGTTCTCAGC
IRF1	ATGCCCATCACTCGGATGC	CCCTGCTTTGTATCGGCCTG
IRF6	CCCCAGGCACCTATACAGC	TCCTTCCCACGGTACTGAAAC
IRF7	GCTGGACGTGACCATCATGTA	GGGCCGTATAGGAACGTGC
IFI44L	AGCCGTCAGGGATGTACTATAAC	AGGGAATCATTTGGCTCTGTAGA
IFIT3	TCAGAAGTCTAGTCACTTGGGG	ACACCTTCGCCCTTTCATTTC
LY6E	CAGCTCGCTGATGTGCTTCT	CAGACACAGTCACGCAGTAGT



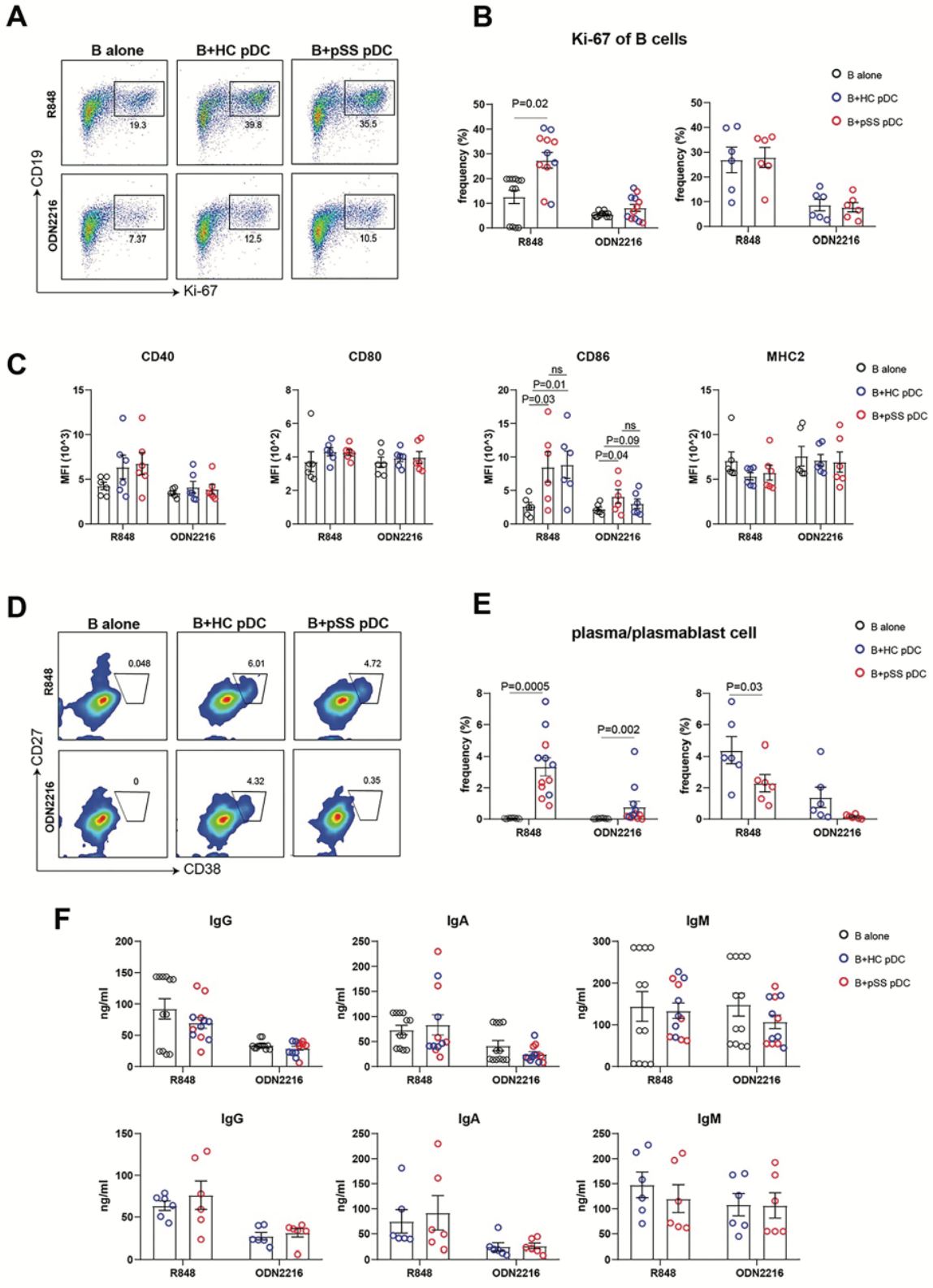
Supplementary Fig. S1. Gating strategy for pDC in PBMCs and B cell subsets.
A: pDCs were gated as CD303+CD123+HLA-DR+LIN- cells; **B:** plasmablast/plasma cells were gated as CD27+CD38+; naïve B cells were gated as CD19+IgD+CD38-; memory B cells were gated as CD19+IgD-CD27+; **C:** Representative flow cytometry data of the activation markers: CD80, CD83 and CD86 on pDC surface.



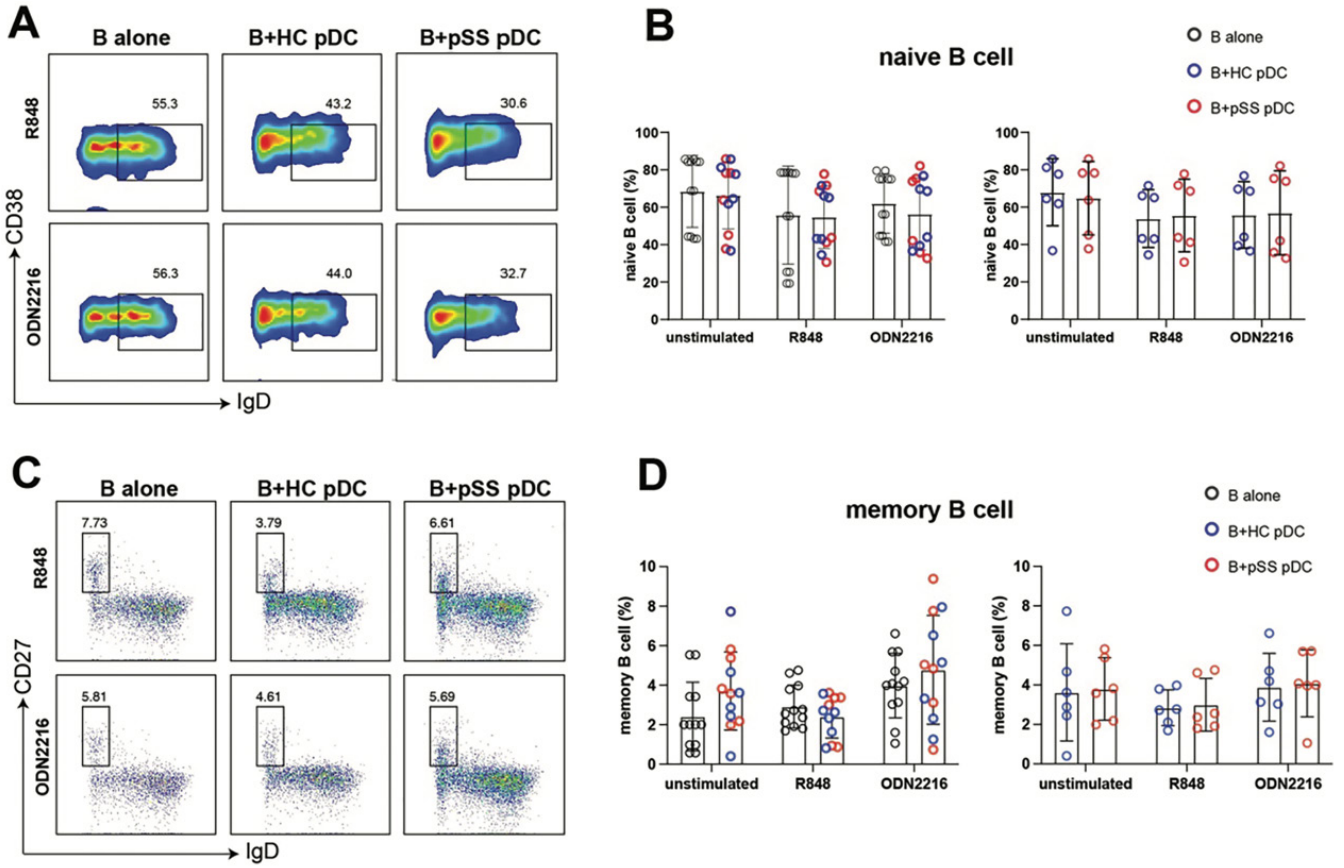
Supplementary Fig. S2. Gene expression of 12 interferon (IFN) type I inducible genes in PBMCs of pSS and HC.
Freshly isolated PBMCs from pSS (n=41) and HC (n=19) were collected, and quantitative PCR (qPCR) was conducted. Based on the normality of data distribution, p-values were calculated using independent samples t-test (**I**) or Mann-Whitney test (**A, B, C, D, E, F, G, H, J, K, L**).



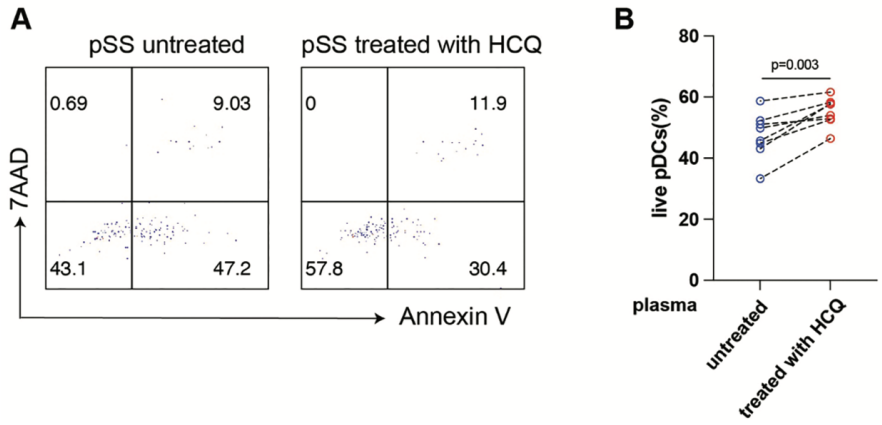
Supplementary Fig. S3. Correlation analysis about pDC frequency and clinical indicators.
A: Representative flow cytometry data of chemokine receptors (CCR2, CCR4, CCR5, CCR7 and CCR10) of pDCs. **B-J:** Linear regression and Pearson's correlation were used to explore potential relationship between pDC and key clinical indicators of pSS. Spearman correlation analysis was applied for exploring pDC percentage in PBMC and clinical indicators of patients.C3(n=17), C4(n=16), CRP(n=20), ESR(n=20), IgM(n=28), lymphocyte(n=21), ANA(N=23), SSB(N=21), Ro52(n=21). ANA: anti-nuclear antibody; SSB: anti-SSB IgG; Ro52: anti-Ro 52 IgG.



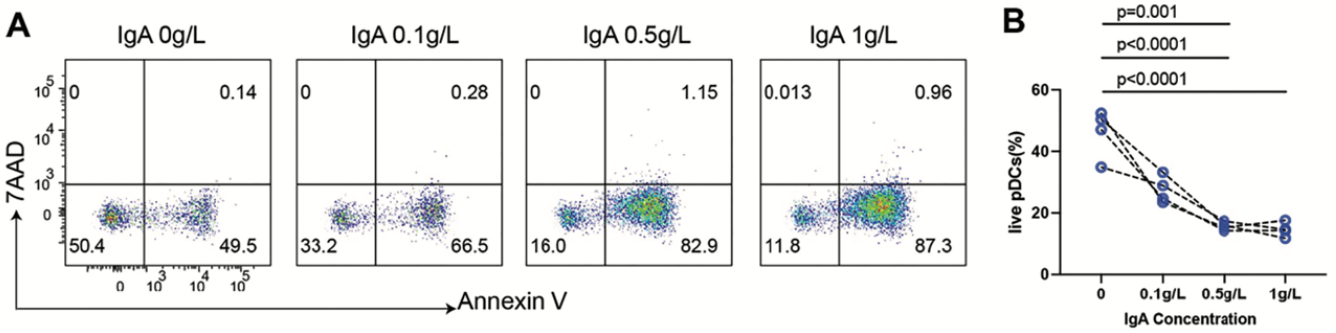
Supplementary Fig. S4. Co-culture of pDCs and activated B cells.
A: Representative flow cytometric graph of ki-67 in B cells cultured alone or cultured with activated pDCs (R848 for TLR7 activation, ODN2216 for TLR9 activation). **B:** The effect of pDCs on B cell proliferation (n=12) and the effects comparison between HC (n=6) or pSS (n=6) derived pDC on B cells. **C:** Expression level of activation markers on B cells cultured alone or cultured with pDCs (n=12). **D:** Representative flow cytometric graph of B cells (cultured alone or cultured with activated pDCs) differentiation into plasma cells/plasmablasts (n=12). **E:** Comparison of effects of HC (n=6) or pSS (n=6) derived pDCs on B cell differentiation. **F:** Secretion level of IgG, IgA, and IgM by B cells cultured alone or cultured with pDCs (n=12) and the effects comparison between HC (n=6) or pSS (n=6) derived pDC on antibody production by B cells. Data follow normal distributions and are shown as mean ± SEM. Paired and unpaired two-tailed Student's t-test was performed. Data were obtained from independent experiments.



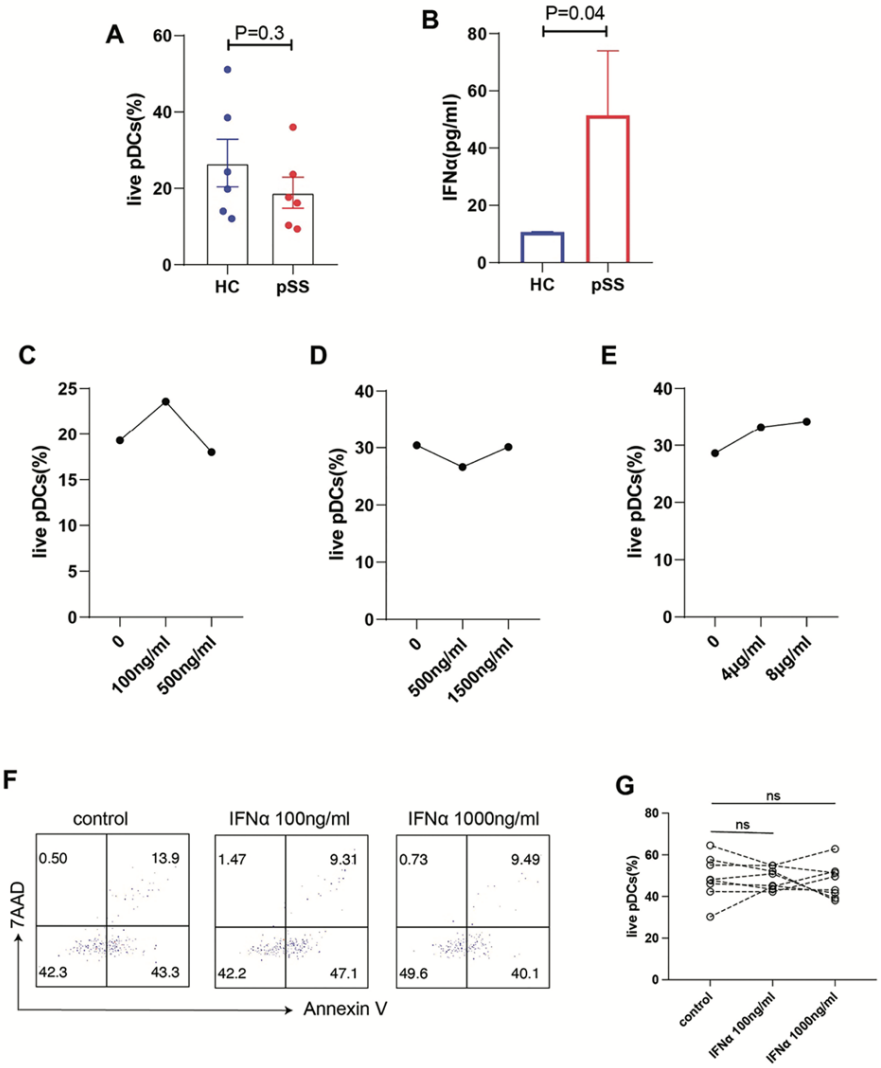
Supplementary Fig. S5. Frequency of naïve and memory B cells when co-cultured with pDC.
A: Representative flow cytometric graph of naive B cells (cultured alone or cultured with pDCs) (n=12). **B:** Comparison of effects about HC (n=6) or pSS (n=6) derived pDCs on naïve B cells. **C:** Representative flow cytometric graph of B cells (cultured alone or cultured with pDCs) differentiation into memory B cells (n=12). **D:** Comparison of effects about HC (n=6) or pSS (n=6) derived pDCs on memory B cell differentiation. Data follow normal distributions and are shown as mean ± SEM. Paired and unpaired two-tailed Student's t-test was performed. Data were obtained from independent experiments.



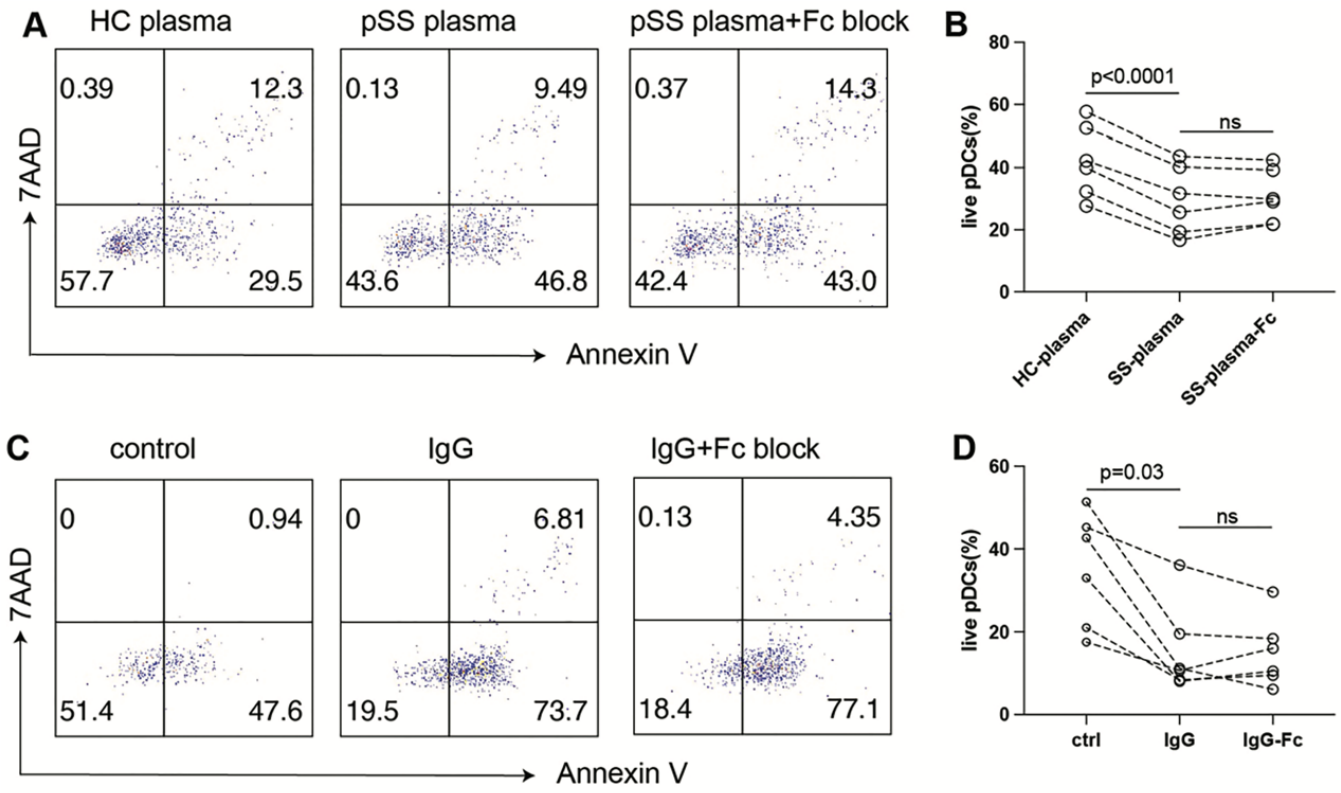
Supplementary Fig. S6. Stimulation of pDCs by plasma from pSS (untreated) and pSS (treated with HCQ).
Representative flow cytometric graph (**A**) and Statistical graph (**B**) of apoptosis detection, pDCs were stimulated by plasma of pSS (untreated) and pSS (treated with HCQ) (n=8). The data follows normal distribution, p-value was calculated using paired t-test.



Supplementary Fig. S7. Detection of pDC apoptosis with IgA stimulation.
Representative flow cytometric graph (**A**) and Statistical graph (**B**) of apoptosis detection, pDCs were stimulated by IgA with a increasing concentration (n=4). Based on the normality of data distribution, one-way ANOVA was used.



Supplementary Fig. S8. The viability of primary pDC and exploration of IFNα on pDC survival.
A: Freshly isolated PBMCs of pSS and matched HC were cultured in 1640 RPMI with 100ng/ml IL3 for 4 hours, viability was detected by flow cytometry. **B:** Plasma IFNα levels of pSS and HC were determined by ELISA. **C-E:** pDCs from 3 healthy donors were stimulated with different concentrations of recombinant human interferon-α 2a (rhIFN-α 2a), viability was detected by flow cytometry. Representative flow cytometric graph (**F**) and Statistical graph (**G**) of apoptosis detection, pDCs were stimulated by increasing concentration of interferon-α 2a for 2 hours with 100ng/ml IL3 (n=4). Based on the normality of data distribution, p-values were calculated using independent samples t-test (A), Mann-Whitney test (B), and one-way ANOVA(G). ns. means no significance.



Supplementary Fig. S9. Detection of pDC apoptosis with FcR blockade.
Representative flow cytometric graph (**A**) and Statistical graph (**B**) of apoptosis detection, pDCs were stimulated by plasma of pSS (untreated) with or without Fc-blocker (n=6). Representative flow cytometric graph (**C**) and Statistical graph (**D**) of apoptosis detection, pDCs were stimulated by IgG with or without Fc-blocker (n=6). The data follows normal distribution, p-values were calculated using one-way ANOVA (**B, D**). ns: means no significance.

Supplementary Table S2. Clinical characteristics of untreated SLE patients involved in this study.

NO.	Gender	age	fever	Skin/mucosa	Arthritis	proteinuria	haematuria	dsDNA-IgG
SLE1	female	40	0	0	1	1	1	1
SLE2	female	15	1	1	0	1	1	1
SLE3	female	52	1	1	1	1	1	1
SLE4	male	68	0	0	0	1	1	0
SLE5	female	32	0	0	1	0	0	1
SLE6	female	49	1	0	1	0	0	1
SLE7	female	13	1	1	0	1	1	1
SLE8	female	33	1	1	1	1	1	1
SLE9	female	28	0	0	1	0	0	1

0 means negative, and 1 means positive.