Supplemental Table 1. Sensitivity Analysis of Patient and Disease Characteristics in Rituximab Treated Population

	Group 1[S] N=10	Group 2[S] N=6	Group 3[S] N=3	P value*
Age Mean ± SD Median, IQR	51±13 55(38,61)	50±17 49(45,59)	54±19 51(36,74)	0.98
Sex Female N (%)	2(20%)	6(100%)	1(33%)	0.005
Ethnicity Black N (%) Other N (%) White N (%)	 0(0%) 2(20%) 8(80%)	 0(0%) 0(0%) 6(100%)	 1(33%) 0(0%) 2(67%)	0.16
ANCA MPO N (%) PR3 N (%) PR3&MPO N (%)	 3(30%) 7(70%) 0(0%)	 0(0%) 5 (83%) 1(17%)	 2(67%) 1(33%) 0(0%)	0.11
Disease GPA N (%) MPA N (%) ANCA GN (Renal limited) N (%)	 7(70%) 1(10%) 2(20%)	 3(50%) 0(0%) 3 (50%)	 3(100%) 0(0%) 0(0%)	0.57
Organ involvement N (%) Upper Respiratory N (%) Pulmonary N (%) Renal N (%)	 6(60%) 7(70%) 8(89%)	 5(83%) 6(100%) 3(100%)	 3(100%) 2(67%) 2(67%)	 0.49 0.32 0.66
Peak serum creatinine at disease onset (mg/dl)	10 1.7±0.9 1.8(1.0,2.1)	4 3.2±2.1 2.7(1.8,4.5)	2 1.6±0.0 1.6(1.6,1.6)	0.33
%$CD5^+$ B cells at time of B cell repopulation	58±15 55(48,70)[a]	19±10 17(11,30)[b]	16±6 13(12,23)[b]	0.001
%$CD5^+$ B cells at last sample available prior to flare	24±14 26(18,27)	14±5 16(11,17)	4.0±0.2 4.0(3.9,4.2)	0.05
Dose of MMF for remission maintenance (g/day)	0.90±0.69 1.0(0,1.25)	0.33±0.51 0(0,1.0)	2.0±1.0 2.0(1.0,3.0)	0.01
Time to relapse from rituximab (months)	31±10 28(25,34)[a]	15±5 16(12,18)[b]	43±19 35(29,65)[a,b]	0.002
Time to relapse from B cell repopulation (months)	22±9 20(17,25)[a]	6.3±4.2 7.0(3.0,8.5)[b]	35±19 27(22,56)[a,b]	0.002
Total B cell number ($x10^4$/ml blood)	6.0±5.5 4.6(2.4,8.3)	2.7±2.2 1.9(1.4,3.2)	3.8±2.8 3.9(1.0,6.5)	0.49
ANCA titer[¥] (U/ml)	42±38 38(10,50)	53±42 60(5,71)	17±18 8.3(6.0,38)	0.55

ANCA titers were determined by the McLendon Clinical Laboratories at the University of North Carolina using ELISA kits specific for either MPO or PR3 (Inova Diagnostics, San Diego, CA). Negative titers are ≤ 20 U/ml.

[¥]ANCA titer indicates the MPO-ANCA titer for MPO-ANCA patients or the PR3-ANCA titer for PR-3 patients combined together as a group for all patients in either remission or active disease.

* P values were calculated by Kruskal-Wallis Test for continuous variables and by Fisher Exact Test for categorical variables. Different superscript letters indicate a statistically significant difference between groups after a Bonferroni correction ($p < 0.017$).

Supplemental Table 2. Comparison of Additional B Cell Subsets in Remission and Active Disease

	Active	Remission	Healthy Control	P value*
CD21 median fluorescence intensity (MFI)	116±54 123(58)	220±102 225(136)	244±83 234(102)	<0.001
% Naïve B cells	63±22 69(30)	65±19 68(30)	57±14 57(17)	0.04
%IgD,CD27 Double-negative B cells	10.4±6.9 8.8(7.5)	10.1±8.3 8.0(7.7)	6.8±4.7 5.5(4.6)	0.009
%Switched memory B cells	17.3±12.5 15.2(16.6)	17.0±11.9 14.5(12.4)	22.2±8.8 21.6(13.2)	0.004
%Non-switched memory B cells	8.4±6.3 6.2(7.0)	8.7±8.3 5.7(7.7)	14.1±7.6 13.1(9.3)	<0.001
%IgM^+CD5^+ B cells	15.3±12.8 11.0(13.7)	20.7±9.4 19.5(11.5)	20.8±10.3 20.2(12.4)	0.01
%Bm2'3δ B cells	7.6±12.3 3.6(7.2)	12.7±15.0 8.4(14.0)	8.8±4.7 8.3(4.7)	0.002

B cell data are given as mean ± Standard Deviation (SD) and as median (range) for $CD19^+$ B cells.

*p values were calculated by Kruskal-Wallis test for comparison in three groups and Wilcoxon two sample test for two groups.