### Table S2

|                    | Any flare |              |                | Severe flare |              |                |
|--------------------|-----------|--------------|----------------|--------------|--------------|----------------|
|                    | YES       | NO           | **P value**    | YES          | NO           | **P value**    |
| **Entire patient cohort (all treatment arms)** |           |              |                |              |              |                |
| **B cell subsets** |           |              |                |              |              |                |
| CD19+CD20-         | -18.6 (48.7-21.3) | -21.4 (51.9-23.5) | 0.575 | -14.3 (53.8-29.5) | -2.0 (50.0-20.6) | 0.323 |
| CD19+CD20+CD27-    | 53.8 (4,81-141.7) | 56.5 (10,8-151.3) | 0.863 | 52.2 (4,3-141.7) | 54.5 (9.1-150.5) | 0.691 |
| CD19+CD20+CD69-    | -32.6 (72.9-75.7) | -28.6 (72.5-86.9) | 0.532 | -21.8 (70.0-107.3) | -31.4 (73.1-75.0) | 0.431 |
| CD19+CD20+CD27-    | -36.8 (65.9-2.5)  | -42.1 (66.3-1.1)  | 0.400 | -37.5 (66.7-12.9) | -38.9 (65.2-0.0) | 0.313 |
| CD19+CD20+CD138-   | -40.7 (74.9-52.8) | -43.3 (80.0-71.0) | 0.727 | -21.5 (68.5-107.7) | -41.3 (78.1-60.9) | 0.024 |
| CD19+CD20+CD138-   | -37.0 (73.7-84.8) | -39.9 (78.6-39.3) | 0.331 | -23.5 (67.2-51.0) | -39.4 (77.0-38.6) | 0.028 |
| CD19+CD20+CD27+    | -37.6 (73.3-24.0) | -33.9 (71.5-0.0)  | 0.603 | -28.7 (67.8-74.8) | -37.7 (73.7-10.7) | 0.088 |
| CD19+CD20+CD38+    | -24.1 (66.2-59.2) | -30.1 (65.8-23.6) | 0.071 | -19.0 (62.5-113.6) | -27.8 (66.2-39.2) | 0.045 |
| **Sero logical markers** |           |              |                |              |              |                |
| C3                 | 2.3 (7.8-15.9)   | 2.5 (8.2-16.5)   | 0.946            | 1.0 (10.0-17.4) | 2.6 (7.9-16.0) | 0.891 |
| C4                 | 10.5 (7.1-33.6)  | 11.8 (3.8-33.3)  | 0.310            | 12.5 (8.3-37.5) | 11.1 (5.9-33.3) | 0.991 |
| anti-dsDNA (all patients) | -1.9 (39.1-0.0) | -21.7 (47.9-0.0) | **<0.001** | 0.0 (36.5-9.7) | -13.3 (44.0-0.0) | **0.020** |
| anti-dsDNA (patients positive at baseline) | -24.0 (48.6-7.4) | -33.0 (54.6-6.5) | **<0.001** | -11.2 (49.5-17.1) | -29.8 (51.6-2.4) | **0.003** |
| **Belimumab**      |           |              |                |              |              |                |
| C3                 | 4.0 (6.0-16.8)   | 4.6 (7.3-18.5)   | 0.913            | 2.2 (6.8-17.6) | 4.4 (6.5-17.7) | 0.987 |
| C4                 | 14.3 (0.0-40.0)  | 15.2 (0.0-40.0)  | 0.670            | 16.3 (0.0-55.4) | 14.3 (0.0-40.0) | 0.248 |
| anti-dsDNA (all patients) | -10.8 (45.0-0.0) | -26.4 (52.0-0.0) | **<0.001** | -10.5 (43.7-8.2) | -20.5 (48.3-0.0) | 0.071 |
| anti-dsDNA (patients positive at baseline) | -31.5 (52.3-3.3) | -39.0 (56.9-14.7) | **0.008** | -19.6 (57.9-13.4) | -35.9 (54.3-10.4) | **0.022** |
| **Placebo**        |           |              |                |              |              |                |
| CD19+CD20-         | 0.7 (27.3-33.9)  | -5.2 (39.3-24.6) | 0.082            | 11.7 (23.6-50.6) | -2.8 (31.0-30.7) | 0.062 |
| CD19+CD20+CD27-    | 0.0 (7.1-33.6)   | -11.6 (38.3-33.7) | 0.038            | 13.5 (8.3-37.5) | -7.7 (5.9-33.3) | 0.093 |
| CD19+CD20+CD69-    | -25.0 (69.2-81.8) | -30.3 (75.7-11.2) | 0.681            | 3.2 (64.3-112.8) | -30.4 (72.3-74.2) | 0.159 |
| CD19+CD20+CD27+    | 0.0 (26.4-38.6)  | -5.7 (38.5-27.6)  | 0.104            | 4.8 (19.3-57.3) | -3.9 (31.7-31.6) | 0.101 |
| CD19+CD20+CD138-   | -15.8 (66.9-93.8) | -31.7 (76.6-81.5) | 0.270            | -6.7 (54.9-140.1) | -24.0 (74.0-41.5) | 0.106 |
| CD19+CD20+CD138-   | -16.1 (60.6-63.6) | -35.1 (78.7-59.0) | **0.012** | 6.7 (39.5-143.7) | -27.2 (70.7-53.2) | **0.002** |
| CD19+CD20+CD27+    | -14.8 (55.2-60.0) | -7.4 (52.0-38.4)  | 0.772            | -0.7 (52.6-85.8) | -14.3 (53.9-46.3) | 0.184 |
| CD19+CD20+CD38+    | 4.3 (48.4-85.2)  | -8.5 (52.5-96.2)  | 0.366            | 41.2 (37.2-154.6) | -61.5 (50.8-81.2) | **0.038** |
| **Sero logical markers** |           |              |                |              |              |                |
| C3                 | -1.2 (-12.2-14.3) | -1.1 (-10.1-9.0) | 0.497            | -1.9 (14.2-17.4) | -1.1 (10.7-17.7) | 0.845 |
| C4                 | 0.0 (14.3-23.5)  | 3.3 (12.0-18.8)  | 0.802            | 0.0 (20.0-25.0) | 0.0 (12.5-20.0) | 0.723 |
| anti-dsDNA (all patients) | 0.0 (25.1-12.5) | -3.4 (33.3-5.6)  | 0.087            | 0.0 (24.3-22.5) | 0.0 (20.3-10.3) | 0.525 |
| anti-dsDNA (patients positive at baseline) | -7.9 (35.4-21.8) | -21.2 (42.4-11.4) | 0.106 | -4.9 (36.5-24.6) | -16.7 (37.2-16.9) | 0.316 |

Data are presented as medians (interquartile range) of the relative to baseline percentage changes. P values are derived from non-parametrical Mann-Whitney U tests. Statistically significant P values are in bold.

C3: complement component 3; C4: complement component 4