**Supplementary File 1a. Phenotypic Characteristics of SLE Patients Related to AIM2 Autoantibody Level.**

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| --- | --- | --- | --- | --- | --- | --- |
| Feature | (1) Anti-AIM2+**OD> 20**n=9 | (2) Anti-AIM2+**4.3<OD<20**n=32 | (3) Anti-AIM2- **OD<4.3**n=90 | p value 1 vs 2 | p value 1 vs 3 | p value 2 vs 3 |
| Age (years) at blood draw, mean ± SD | 46.7 ± 13.2  | 52.8 ± 11.4  | 52.1 ± 13.8  | 0.1431 | 0.2338 | 0.7120 |
| Physician Global Disease Activity | 0.73 ± 0.28 | 0.61 ± 0.60 | 0.44 ± 0.51 | 0.2735 | **0.0156** | 0.2014 |
| SLEDAI | 3.77 ± 2.11 | 1.88 ± 2.21 | 1.05 ± 1.61 | **0.0249** | **0.0001** | 0.0742 |
| IFI16 Positive | 7/9 (78%) | 12/32 (38%) | 12/90 (13%) | 0.0570 | **<0.0001** | **0.0080** |
| DNA positive | 6/9 (67%) | 6/32 (19%)  | 8/90 (9%) | **0.0106** | **0.0002** | 0.1929 |
| C3 (mg/dL) | 104.1 ± 29.0  | 117.7 ± 38.7 | 121.4 ± 29.0 | 0.2204 | 0.1069 | 0.3291 |
| C4 (mg/dL) | 14.9 ± 7.7 | 20.8 ± 8.0 | 25.0 ± 9.3 | **0.0378** | **0.0019** | **0.0084** |

**Supplementary File 1b. Immunologic phenotype of SLE patients related to AIM2 autoantibody status.**

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| Feature | Anti-AIM2+n=41 | Anti-AIM2-n=90 | p value |
| Age (years) at blood draw, mean ± SD | 51.4 ± 11.9 | 52.1 ± 13.8  | 0.8636 |
| Female | 38/41 (93%) | 72/90 (80%) | 0.0764 |
| Anti-Smith Positive | 6/41 (15%) | 12/89 (13%) | >0.999 |
| **Anti-Ro Positive** | **18/41 (44%)** | **19/90 (21%)** | **0.0114** |
| **Anti-La Positive** | **10/41 (24%)** | **7/90 (8%)** | **0.0125** |
| Anti-RNP Positive | 6/41 (15%) | 13/90 (14%) | >0.999 |
| Anti-Cardiolipin Positive  | 27/40 (68%) | 50/90 (56%) | 0.2474 |
| Anti-B2 Glycoprotein | 15/39 (38%) | 24/90 (27%) | 0.2124 |
| Lupus anti-coagulant | 14/41 (34%) | 31/90 (34%) | >0.999 |

**Supplementary File 1c: Lupus nephritis renal biopsies used in confocal imaging.**

|  |  |  |
| --- | --- | --- |
| Age | Sex | Diagnosis |
| 36.9 | F | Diffuse proliferative lupus nephritis, ISN/RPS Class IV-A/C (S) with early segmental consolidation  |
| 36.7 | F | Diffuse proliferative and membranous lupus nephritis with focal segmental glomerulosclerosis (ISN/RPS Class IV A/C-G + V) |
| 19.9 | F | Diffuse proliferative and focally necrotizing lupus glomerulonephritis, ISN/RPS Class IV-G (A) and tubulointerstitial inflammation with scattered interstitial immune complex deposits  |
| 12.9 | F | Diffuse proliferative lupus nephritis, ISN/RPS Class IV-G (A/C) |
| 28.6 | F | Diffuse proliferative lupus nephritis, ISN/RPS Class IV-G (A) |