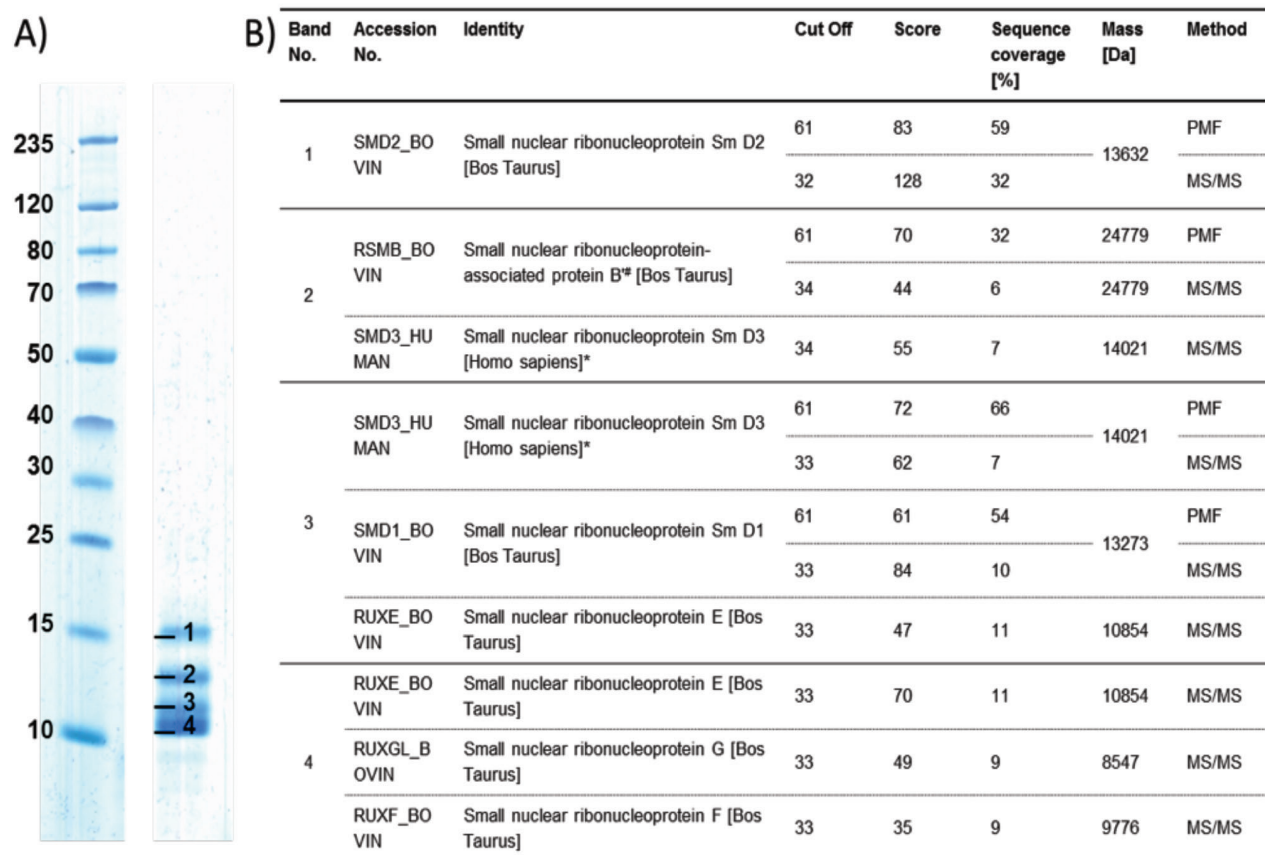


Characteristic	All SLE patients (n=232)	SLE patients for analysis of activity (n=82)
Age, mean (range)	40.4 (19-80)	38.0 (20-69)
Sex, n (%)		
Female	204 (87.9)	73 (89.0)
Male	28 (12.1)	9 (11.0)
Ethnicity, n (%)		
Caucasian	221 (95.3)	74 (90.2)
Asian	10 (4.3)	8 (9.8)
Afro-Americans	1 (0.4)	0 (0)
ACR criteria, mean (range)	5.9 (3-10)	6.3 (4-9)
Disease duration, mean (range)	9.9 (0-46)	9.6 (0-29)
Early onset (≤ 18 years), n (%)	33 (14.5)	10 (12.2)
BILAG-2004, mean (range)	Not assessed	12.0 (0-48)
Severe, n (%)		16 (19.5)
Moderate, n (%)		37 (45.1)
Mild, n (%)		15 (18.3)
Inactive, n (%)		14 (17.1)
mSLEDAI, mean (range)	5.0 (0-30)	4.5 (0-26)
Medication for SLE activity, mean (range)		
Prednisolone (mg/day), mean (%)	8.5 (84.7)	8.9 (81.7)
Hydroxychloroquine (mg/day), mean (%)	257.1 (37.9)	259.1 (53.7)
Azathioprine (mg/day), mean (%)	92.0 (26.6)	95.2 (25.6)
Cyclophosphamide (mg/month), mean (%)	822.7 (14.7)	782.1 (17.1)
Mycophenolate mofetil (mg/day), mean (%)	1464.7 (17.0)	1991.7 (14.6)
Methotrexate (mg/week), mean (%)	42.3 (2.7)	48.7 (6.1)

Supplementary file 1. Characteristics of SLE patients. SLE: systemic lupus erythematosus; ACR: American College of Rheumatology; BILAG-2004: British Isles Lupus Assessment Group 2004 Index; mSLEDAI: modified SLE Disease Activity Index 2000.



Supplementary file 2. Determination of specificity of Anti-Sm antigen. **A:** SDS-PAGE of affinity purified Anti-Sm antigen. The antigen was analysed via SDS-PAGE (4-12% Bis-Tris gel, blue silver staining) using the NuPAGE system (ThermoFisher Scientific). Lane 1: Spectra™ Multicolor Broad Range Protein Ladder (Thermo Scientific), Lane 2: Sm antigen. The Sm antigen showed 4 visible bands (1-4) which were excised, destained and digested for subsequent MALDI-TOF/TOF MS analysis. **B:** MALDI-TOF/TOF MS analysis of the excised gel bands 1-4. MALDI-TOF/TOF measurements were performed as previously described with a Bruker Autoflex III smartbeam TOF/TOF200 System using flexControl 3.0 software (Jarius *et al.* Journal of Neuroinflammation (2014) 11:206). For protein identification the Mascot search engine Mascot Server 2.3 (Matrix Science, London, UK) was used by searching against the SwissProt database limited to Mammalia. To evaluate the protein hits, a significance threshold of $p < 0.05$ was chosen. PMF: peptide mass fingerprint, MS/MS: tandem MS. SDS-PAGE: sodium dodecyl sulfate polyacrylamide gel electrophoresis; Anti-Sm: anti-Smith antibodies; MALDI: Matrix-assisted laser desorption/ionisation; TOF: time-of-flight mass spectrometer. #SM-B and SM-B' are isoforms produced by alternative splicing (Homo Sapiens). For Bos Taurus, no data base entry exists for the isoform SM-B in SwissProt. *SMD3_HUMAN is 100% identical with the bovine variant (F1MZ00_BOVIN Uncharacterised protein OS: Bos taurus GN. SNRPD3 PE: 1 SV: 2)

Disease features	Anti-Sm Cut off 3.6 RU/ml (specificity 99%)			Anti-dsDNA Cut off 157.4 IU/ml (specificity 99%)			C3 Cut off 90 mg/dl		
	Sm positive	Sm negative	p value	dsDNA positive	dsDNA negative	p value	C3 low	C3 normal	p value
Epidemiology									
Age, ^a mean	36,82	41,65	0,0174	38,29	41,31	0,1054	37,00	42,94	0,0019
Female, ^b n (%)	50 (83.3)	154 (89.5)	0,2490	60 (85.7)	144 (88.9)	0,5142	85 (87.6)	99 (88.4)	1,0000
Caucasian, n	51	170		64	157		90	109	
Afroamerican, n	1	0		1	0		0	0	
Asian, ^b n	8	2	0,0004^c	5	5	0,1695 ^c	7	3	0,1932 ^c
Disease duration, ^a y, mean	7,57	10,79	0,0279	9,77	10,01	0,8758	7,77	11,32	0,0014
Age at disease onset, ^a mean	28,73	30,62	0,2979	28,17	30,97	0,0790	28,81	31,35	0,3112
ACR									
Number of ACR criteria, ^a mean	6,23	5,76	0,0242	5,89	5,88	0,8371	5,94	5,79	0,5032
Malar rash, ^b n (%)	38 (64.4)	111 (64.5)	1,0000	45 (65.2)	104 (64.2)	1,0000	66 (68.0)	67 (60.4)	0,3110
Discoid rash, ^b n (%)	4 (6.8)	28 (16.3)	0,0813	5 (7.3)	27 (16.7)	0,0632	17 (17.5)	13 (11.7)	0,2432
Photosensitivity, ^b n (%)	26 (44.1)	83 (48.3)	0,6510	27 (39.1)	82 (50.6)	0,1158	40 (41.2)	55 (49.6)	0,2651
Oral ulcers, ^b n (%)	13 (22.0)	31 (18.0)	0,5647	10 (14.5)	34 (21.0)	0,2776	13 (13.4)	27 (24.3)	0,0532
Arthritis, ^b n (%)	51 (86.4)	134 (77.9)	0,1881	54 (78.3)	131 (80.9)	0,7193	76 (78.4)	89 (80.2)	0,8639
Serositis, ^b n (%)	32 (54.2)	69 (40.1)	0,0686	39 (56.5)	62 (38.3)	0,0136	46 (47.4)	47 (42.3)	0,4870
Renal disorder, ^b n (%)	39 (66.1)	86 (50.0)	0,0350	39 (56.5)	86 (53.1)	0,6670	54 (55.7)	58 (52.3)	0,6765
Epilepsy or psychosis, ^b n (%)	13 (22.0)	17 (9.9)	0,0239	11 (15.9)	19 (11.7)	0,3972	12 (12.4)	16 (14.4)	0,6897
Hematologic, ^b n (%)	36 (61.0)	100 (58.1)	0,7602	41 (59.4)	95 (58.6)	1,0000	60 (61.9)	59 (53.2)	0,2105
Immune disorder, ^b n (%)	59 (100)	160 (93.0)	0,0399	68 (98.6)	151 (93.2)	0,1146	95 (97.9)	104 (93.7)	0,1792
ANA, ^b n (%)	59 (100)	171 (99.4)	1,0000	69 (100)	161 (99.4)	1,0000	97 (100)	110 (99.1)	1,0000
SLEDAI									
mSLEDAI, ^a mean	5,94	4,61	0,2168	6,63	4,28	0,0313	6,20	4,10	0,0341
Laboratory									
ESR, ^a mm, mean	32.85	29,57	0,4330	32,02	29,68	0,8195	29,61	31,26	0,8644
Leukocytes, ^a /nl, mean	6,80	6,49	0,4159	6,46	6,62	0,6145	6,20	7,03	0,0134
Lymphocytes, ^a /nl, mean	0,91	1,04	0,0611	0,87	1,06	0,1035	0,93	1,09	0,1733
Monocytes, ^a /nl, mean	0,41	0,39	0,3219	0,42	0,39	0,4285	0,33	0,46	0,0160
Thrombocytes, ^a /nl, mean	245,55	249,43	0,9848	239,11	252,52	0,3612	246,44	256,80	0,3345
CRP, ^a mg/dl, mean	1,09	1,08	0,7380	1,45	0,91	0,0122	1,18	1,12	0,6044
C3, ^a mg/dl, mean	87.61	95,60	0,2203	83,91	97,87	0,0014	69,84	113,92	1,0000
C4, ^a mg/dl, mean	13.89	14,61	0,6697	12,39	15,38	0,0253	9,38	18,82	<0,0001
Proteinuria, ^a mg/d, mean (%)	761.7 (45.3)	322.5 (27.1)	0,0340	668.4 (40.0)	341.5 (28.6)	0,1638	704.4 (41.2)	252.4 (26.8)	0,0171

Supplementary file 3. Comparison of anti-Sm with anti-dsDNA antibodies and complement component 3 regarding epidemiology, clinical and laboratory disease features in SLE patients. All used autoantibody cut-offs were read out of receiver-operating characteristics curve analysis at a specificity of 99% (compare Table 1); ^a *p*-values were calculated using Mann-Whitney U-test; ^b *p*-values were calculated using Fisher's exact test; ^c frequency of biomarker in Asians compared to Caucasians; statistically significant findings were highlighted in bold.

Anti-Sm: anti-Smith-antibodies; anti-dsDNA: anti-double-stranded DNA antibodies; SLE: systemic lupus erythematosus; C3, complement component 3; ACR: American College of Rheumatology; ANA: antinuclear antibodies; mSLEDAI: modified Systemic Lupus Erythematosus Disease Activity Index 2000; CRP: C-reactive protein; ESR: erythrocyte sedimentation rate.

	SLE with nephritis (prot > 500mg/d)	SLE without nephritis (prot < 500mg/d)	p-value	OR	95% CI
	pos. (%) / neg. (%)	pos. (%) / neg. (%)			
Anti-Sm	16(48.5)/17(51.5)	37(23.1)/123(76.9)	0.0049	3.13	1.44 to 6.80
Anti-dsDNA	16(48.5)/17(51.5)	44(27.5)/116(72.5)	0.0231	2.48	1.15 to 5.34
Anti-Sm/Anti-dsDNA	12(48.0)/13(52.0)	18(15.7)/97(84.3)	0.0009	4.97	1.96 to 12.64

Supplementary file 4. Immunological profile in SLE patients with and without lupus nephritis.

SLE: systemic lupus erythematosus; anti-Sm: anti-Smith antibodies; anti-dsDNA: anti-double-stranded DNA antibodies; prot: proteinuria; OR: odds ratio; 95% CI: 95% confidence interval. *p*-values calculated using Fisher's exact test.