

Table SI. Clinical characteristics of patients with new-onset and relapsed SLE.

Categories	New-onset (n=17)	Relapsed (n=62)
Females, % (n/total n)	100.00 (17/17)	91.94 (57/62)
Age, years, mean $\pm$ SD	34.94 $\pm$ 14.98	38.95 $\pm$ 14.82
SLEDAI score, mean $\pm$ SD	12.05 $\pm$ 6.83 ^a	7.55 $\pm$ 6.80
ds-DNA, IU/ml, mean $\pm$ SD	764.64 $\pm$ 502.21 ^a	390.41 $\pm$ 429.01
Anti-ENA, % (n/total n)		
Anti-Sm	29.41 (5/17)	28.89 (13/45)
Anti-Ro52	47.06 (8/17)	53.33 (24/45)
Anti-nRNP/Sm	41.18 (7/17)	53.33 (24/45)
Anti-RIB-P	52.94 (9/17) ^a	22.22 (10/45)
Anti-nucleosome	70.59 (12/17) ^a	40.00 (18/45)
Anti-SSA	64.71 (11/17)	66.67 (30/45)
Anti-SSB	11.76 (2/17)	15.56 (7/45)
Serum markers, mean $\pm$ SD		
C3, g/l	0.37 $\pm$ 0.16 ^a	0.60 $\pm$ 0.26
C4, g/l	0.07 $\pm$ 0.05 ^a	0.13 $\pm$ 0.07
IgG, g/l	17.13 $\pm$ 4.33 ^a	13.63 $\pm$ 4.96
CRP, mg/l	10.93 $\pm$ 12.75	11.83 $\pm$ 16.59
ESR, mm/h, mean $\pm$ SD	62.75 $\pm$ 47.93 ^a	29.64 $\pm$ 24.94
WBC, 10 ⁹ /l, mean $\pm$ SD	4.94 $\pm$ 2.47	6.74 $\pm$ 3.65
RBC, 10 ¹² /l, mean $\pm$ SD	3.43 $\pm$ 0.81	3.73 $\pm$ 0.74
HGB, g/l, mean $\pm$ SD	96.94 $\pm$ 23.88	109.64 $\pm$ 26.38
HCT, l/l, mean $\pm$ SD	0.30 $\pm$ 0.07	0.33 $\pm$ 0.08
PLT, 10 ⁹ /l, mean $\pm$ SD	204.05 $\pm$ 78.72	217.62 $\pm$ 106.06
Lymphocytes, 10 ⁹ /l, mean $\pm$ SD	0.94 $\pm$ 0.46	1.45 $\pm$ 0.93
Monocytes, 10 ⁹ /l, mean $\pm$ SD	0.30 $\pm$ 0.26 ^a	0.45 $\pm$ 0.25
Lymphocytes + Monocytes, 10 ⁹ /l, mean $\pm$ SD	1.24 $\pm$ 0.59 ^a	1.87 $\pm$ 1.10
Neutrophils, 10 ⁹ /l, mean $\pm$ SD	3.65 $\pm$ 2.30	4.77 $\pm$ 3.31
Clinical features, % (n/total n)		
Fever	23.53 (4/17)	22.58 (14/62)
Cutaneous manifestations	35.29 (6/17)	27.42 (17/62)
Alopecia	29.41 (5/17) ^a	8.06 (5/62)
Arthritis	52.94 (9/17)	33.87 (21/62)
Neuropathic lupus	0 (0/17)	6.45 (4/62)
Effusion	35.29 (6/17)	16.13 (10/62)
Hematuresis	41.18 (7/17)	24.19 (15/62)
Pyuria	35.29 (6/17)	14.52 (9/62)
Proteinuria	47.06 (8/17)	32.26 (20/62)
LN	47.06 (8/17)	29.03 (18/62)

dsDNA, double-stranded DNA; anti-ENA, anti-extractable nuclear antigen; anti-Sm, anti-Smith; anti-Ro52, anti-tripartite motif-containing protein 21; anti-nRNP/Sm, anti-nuclear ribonuclear protein/Smith; anti-RIB-P, anti-ribosomal protein P; anti-SSA, anti-Sjögren's-syndrome-related antigen A; anti-SSB, anti-Sjögren's-syndrome-related antigen B; C3, complement 3; C4, complement 4; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; HCT, hematocrit; HGB, hemoglobin; IgG, immunoglobulin G; LN, lupus nephritis; PLT, platelet count; RBC, red blood cell count; SD, standard deviation; SLE, systemic lupus erythematosus; SLEDAI, SLE disease activity index; WBC, white blood cell count. ^aP<0.05 vs. relapsed.

Table SII. Clinical characteristics of patients with SLE and HCs in the validation testing set.

Categories	SLE (n=30)	HCs (n=20)
Females, % (n/total n)	96.67 (29/30)	85.00 (17/20)
Age, years, mean $\pm$ SD	40.47 $\pm$ 11.78	35.15 $\pm$ 9.03
SLEDAI score, mean $\pm$ SD	7.43 $\pm$ 6.50	-
ds-DNA, IU/ml, mean $\pm$ SD	401.43 $\pm$ 372.33	0.00 (0/20)
Anti-ENA, % (n/total n)		
Anti-Sm	31.25 (5/16)	0.00 (0/20)
Anti-Ro52	50.00 (8/16)	0.00 (0/20)
Anti-nRNP/Sm	56.25 (9/16)	0.00 (0/20)
Anti-RIB-P	23.08 (6/16)	0.00 (0/20)
Anti-nucleosome	50.00 (8/16)	0.00 (0/20)
Anti-SSA	56.25 (9/16)	0.00 (0/20)
Anti-SSB	6.25 (1/16)	0.00 (0/20)
Serum markers, mean $\pm$ SD		
C3, g/l	0.52 $\pm$ 0.24	-
C4, g/l	0.12 $\pm$ 0.07	-
IgG, g/l	14.47 $\pm$ 5.38	-
CRP, mg/l	11.72 $\pm$ 17.22	-
ESR, mm/h, mean $\pm$ SD	37.10 $\pm$ 27.68	-
WBC, 10 ⁹ /l, mean $\pm$ SD	6.10 $\pm$ 3.86	5.94 $\pm$ 0.85
RBC, 10 ¹² /l, mean $\pm$ SD	3.30 $\pm$ 0.67 ^a	4.75 $\pm$ 0.36
HGB, g/l, mean $\pm$ SD	95.80 $\pm$ 24.09 ^a	136.15 $\pm$ 14.45
HCT, l/l, mean $\pm$ SD	0.29 $\pm$ 0.07 ^a	0.40 $\pm$ 0.04
PLT, 10 ⁹ /l, mean $\pm$ SD	190.87 $\pm$ 91.33	235.00 $\pm$ 54.05
Lymphocytes, 10 ⁹ /l, mean $\pm$ SD	1.01 $\pm$ 0.63 ^a	2.16 $\pm$ 0.39
Monocytes, 10 ⁹ /l, mean $\pm$ SD	0.35 $\pm$ 0.21	0.42 $\pm$ 0.11
Lymphocytes + Monocytes, 10 ⁹ /l, mean $\pm$ SD	1.36 $\pm$ 0.83 ^a	2.58 $\pm$ 0.50
Neutrophils, 10 ⁹ /l, mean $\pm$ SD	4.71 $\pm$ 3.75	3.27 $\pm$ 0.82
Clinical features, % (n/total n)		
Fever	33.33 (10/30)	0.00 (0/20)
Cutaneous manifestations	13.33 (4/30)	0.00 (0/20)
Alopecia	0.00 (0/30)	0.00 (0/20)
Arthritis	20.00 (6/30)	0.00 (0/20)
Neuropathic lupus	10.00 (3/30)	0.00 (0/20)
Effusion	26.67 (8/30)	0.00 (0/20)
Hematuresis	26.92 (7/26)	0.00 (0/20)
Pyuria	19.23 (5/26)	0.00 (0/20)
Proteinuria	38.46 (10/26)	0.00 (0/20)
LN	40.00 (12/30)	0.00 (0/20)

dsDNA, double-stranded DNA; anti-ENA, anti-extractable nuclear antigen; anti-nRNP/Sm, anti-nuclear ribonuclear protein/Smith; anti-RIB-P, anti-ribosomal protein P; anti-Ro52, anti-tripartite motif-containing protein 21; anti-SSA, anti-Sjögren's-syndrome-related antigen A; anti-SSB, anti-Sjögren's-syndrome-related antigen B; anti-Sm, anti-Smith; C3, complement 3; C4, complement 4; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; HCs, healthy controls; HCT, hematocrit; HGB, hemoglobin; IgG, immunoglobulin G; LN, lupus nephritis; PLT, platelet count; RBC, red blood cell count; SD, standard deviation; SLE, systemic lupus erythematosus; SLEDAI, SLE disease activity index; WBC, white blood cell count. ^aP<0.05 vs. HCs.

Table SIII. Clinical characteristics of patients with SLE, HCs and patients with RA in the double validation testing set.

Categories	SLE (n=45)	HC (n=38)	RA (n=30)
Females, % (n/total n)	89.79 (40/45)	85.71 (32/38)	83.33 (25/30)
Age, years, mean $\pm$ SD	37.14 $\pm$ 16.36	36.32 $\pm$ 8.19	53.04 $\pm$ 12.41
SLEDAI score, mean $\pm$ SD	9.16 $\pm$ 7.43	-	-
DAS28	-	-	4.93 $\pm$ 1.54
ds-DNA, IU/ml, mean $\pm$ SD	516.28 $\pm$ 528.10	0.00 (0/38)	0.00 (0/30)
Anti-ENA, % (n/total n)			
Anti-Sm	26.19 (11/42)	0.00 (0/38)	0.00 (0/30)
Anti-Ro52	52.38 (22/42)	0.00 (0/38)	13.33 (4/30)
Anti-nRNP/Sm	45.24 (19/42)	0.00 (0/38)	3.33 (1/30)
Anti-RIB-P	21.43 (9/42)	0.00 (0/38)	0.00 (0/30)
Anti-nucleosome	42.86 (18/42)	0.00 (0/38)	0.00 (0/30)
Anti-SSA	66.67 (28/42)	0.00 (0/38)	6.67 (2/30)
Anti-SSB	15.22 (7/42)	0.00 (0/38)	0.00 (0/30)
Serum markers			
RF, % (n/total n)	38.89 (7/18)	0.00 (0/38)	63.33 (19/30)
ACPA, % (n/total n)	16.67 (3/18)	0.00 (0/38)	56.67 (17/30)
C3, g/l, mean $\pm$ SD	0.59 $\pm$ 0.26	-	1.00 $\pm$ 0.23
C4, g/l, mean $\pm$ SD	0.12 $\pm$ 0.07	-	0.22 $\pm$ 0.07
IgG, g/l, mean $\pm$ SD	13.98 $\pm$ 4.74	-	14.97 $\pm$ 8.13
CRP, mg/l, mean $\pm$ SD	10.99 $\pm$ 14.48	-	53.07 $\pm$ 57.08
ESR, mm/h, mean $\pm$ SD	31.05 $\pm$ 31.21	-	57.57 $\pm$ 39.49
WBC, 10 ⁹ /l, mean $\pm$ SD	6.61 $\pm$ 3.37	6.17 $\pm$ 1.39	6.60 $\pm$ 2.10
RBC, 10 ¹² /l, mean $\pm$ SD	3.98 $\pm$ 0.68 ^a	4.62 $\pm$ 0.35	3.84 $\pm$ 0.55
HGB, g/l, mean $\pm$ SD	116.59 $\pm$ 24.13 ^a	136.03 $\pm$ 12.25	104.86 $\pm$ 16.27
HCT, l/l, mean $\pm$ SD	0.36 $\pm$ 0.07 ^a	0.41 $\pm$ 0.03	0.32 $\pm$ 0.07
PLT, 10 ⁹ /l, mean $\pm$ SD	232.43 $\pm$ 102.48	249.47 $\pm$ 62.29	279.21 $\pm$ 137.34
Lymphocytes, 10 ⁹ /l, mean $\pm$ SD	1.59 $\pm$ 0.95 ^a	2.16 $\pm$ 0.55	1.36 $\pm$ 0.66
Monocytes, 10 ⁹ /l, mean $\pm$ SD	0.48 $\pm$ 0.27	0.36 $\pm$ 0.10	0.41 $\pm$ 0.20
Lymphocytes + Monocytes, 10 ⁹ /l, mean $\pm$ SD	2.01 $\pm$ 1.16 ^a	2.52 $\pm$ 0.62	1.77 $\pm$ 0.73
Neutrophils, 10 ⁹ /l, mean $\pm$ SD	4.46 $\pm$ 2.83	3.52 $\pm$ 1.00	4.74 $\pm$ 1.96
Clinical features, % (n/total n)			
Fever	15.56 (7/45)	0.00 (0/42)	0.00 (0/30)
Cutaneous manifestations	40.00 (18/45)	0.00 (0/42)	0.00 (0/30)
Alopecia	15.56 (7/45)	0.00 (0/42)	0.00 (0/30)
Arthritis	46.67 (21/45)	0.00 (0/42)	100.00 (30/30)
Neuropathic lupus	8.89 (4/45)	0.00 (0/42)	0.00 (0/30)
Effusion	24.44 (11/45)	0.00 (0/42)	0.00 (0/30)
Hematuresis	28.89 (13/45)	0.00 (0/42)	0.00 (0/30)
Pyuria	15.56 (7/45)	0.00 (0/42)	0.00 (0/30)
Proteinuria	33.33 (15/45)	0.00 (0/42)	0.00 (0/30)
LN	24.44 (11/45)	0.00 (0/42)	0.00 (0/30)

ACPA, anti-citrullinated protein antibodies; dsDNA, double-stranded DNA; Anti-ENA, anti-extractable nuclear antigen; Anti-nRNP/Sm, anti-nuclear ribonuclear protein/Smith; Anti-RIB-P, anti-ribosomal protein P; Anti-Ro52, anti-tripartite motif-containing protein 21; Anti-SSA, anti-Sjögren's-syndrome-related antigen A; Anti-SSB, anti-Sjögren's-syndrome-related antigen B; Anti-Sm, anti-Smith; C3, complement 3; C4, complement 4; CRP, C-reactive protein; DAS28, disease activity score 28; ESR, erythrocyte sedimentation rate; HC, healthy control; HCT, hematocrit; HGB, hemoglobin; IgG, immunoglobulin G; LN, lupus nephritis; PLT, platelet count; RA, rheumatoid arthritis; RBC, red blood cell count; SD, standard deviation; SLE, systemic lupus erythematosus; SLEDAI, SLE disease activity index; WBC, white blood cell count. ^aP<0.05 vs. HCs.

Table SIV. Specific circRNAs primers used for reverse transcription quantitative polymerase chain reaction analysis.

Name	Sequences	
	Forward	Reverse
hsa_circ_0044235	TGAGTTTGGTGATTCAGCTTGC	AACAAGGCTTCTTCTGAGTGT
hsa_circ_0068367	TGTCTACAACAGAGGCATGAATGA	GCTGCAGCAGAAGGCAGTAA
hsa_circ_0037274	GAGCAGCCATGCGTCTTTG	GTCACCGATGAGCTGCTTGT
β-actin	CATGTACGTTGCTATCCAGGC	CTCCTTAATGTCACGCACGAT
circRNAs, circular RNA; hsa, <i>Homo sapiens</i> .		

Table SV. Top 30 differently expressed circRNAs in patients with SLE.

circRNAs	Alias	Fold change	Regulation	circRNA type	Gene symbol
hsa_circRNA_405468	-	27.9009483	Up	Intronic	MT2A
hsa_circRNA_014772	hsa_circ_0014772	8.3820399	Up	Exonic	NES
hsa_circRNA_001481	hsa_circ_0001481	8.3660437	Up	Sense overlapping	EMB
hsa_circRNA_100914	hsa_circ_0023903	7.3713049	Up	Exonic	PICALM
hsa_circRNA_059665	hsa_circ_0059665	7.3195629	Up	Exonic	ABHD12
hsa_circRNA_404584	-	7.154245	Up	Exonic	FLG-AS1
hsa_circRNA_103653	hsa_circ_0006693	7.1452545	Up	Exonic	ANKRD17
hsa_circRNA_004658	hsa_circ_0004658	7.047651	Up	Exonic	EMILIN2
hsa_circRNA_103654	hsa_circ_0001417	6.9385157	Up	Exonic	ANKRD17
hsa_circRNA_101835	hsa_circ_0005615	6.8618818	Up	Exonic	NFATC3
hsa_circRNA_101836	hsa_circ_0000711	6.7925687	Up	Exonic	NFATC3
hsa_circRNA_101838	hsa_circ_0039930	6.6503035	Up	Exonic	NFATC3
hsa_circRNA_100045	hsa_circ_0009674	6.4240941	Up	Exonic	CTNNBIP1
hsa_circRNA_050900	hsa_circ_0050900	6.1038178	Up	Exonic	ACTN4
hsa_circRNA_104839	hsa_circ_0050900	5.9595076	Up	Exonic	CDC14B
hsa_circRNA_405498	-	-22.5621337	Down	Exonic	GCSH
hsa_circRNA_068367	hsa_circ_0068367	-16.7771025	Down	Exonic	VPS8
hsa_circRNA_083948	hsa_circ_0083948	-15.5983831	Down	Exonic	EIF4EBP1
hsa_circRNA_402338	-	-15.1476308	Down	Exonic	ANAPC1
hsa_circRNA_000865	hsa_circ_0000706	-13.9077005	Down	Intronic	DYNC1LI2
hsa_circRNA_086760	hsa_circ_0086760	-13.3616	Down	Exonic	DCTN3
hsa_circRNA_100750	hsa_circ_0020929	-13.214055	Down	Exonic	STIM1
hsa_circRNA_000932	hsa_circ_0000932	-12.83321	Down	Exonic	SUPT5H
hsa_circRNA_063811	hsa_circ_0063811	-12.3319849	Down	Exonic	CELSR1
hsa_circRNA_405510	-	-11.7108306	Down	Intronic	ANKRD11
hsa_circRNA_102520	hsa_circ_0050512	-10.9079728	Down	Exonic	UBA2
hsa_circRNA_052067	hsa_circ_0052067	-10.6041281	Down	Exonic	PPP2R1A
hsa_circRNA_100177	hsa_circ_0011692	-10.2842585	Down	Exonic	STK40
hsa_circRNA_068697	hsa_circ_0068697	-9.7107677	Down	Exonic	DLG1
hsa_circRNA_400059	hsa_circ_0092289	-9.4576071	Down	Intronic	RRBP1

circRNAs, circular RNAs; SLE, systemic lupus erythematosus.