Supporting Figure Legends

Figure S1. Protein sequences of Epstein-Barr virus-encoded nuclear antigen 2 and 1 (EBNA2 and EBNA1).

Figure S2. Western Blot of AdOx-treated Raji cells using MMA-19D4 and ADMA-6F12. Cell extract of cells AdOx-treated ("+") or un-treated ("-") were assayed with the indicated antibodies.

Figure S3. Immunoprecipitation of MMA-modified proteins from EBV-negative BL41 cells. (A): Coomassie stain (B) Western blot using MMA-19D4. The stained bands were excised from the gel and compared with the contralateral band from the isotype control-precipitate by mass spectroscopy.

Figure S4. Confirmation of MMA-precipitated proteins, complete Western blots. These are to complete blots which are only partially shown in Figure 3. **S4 A** THO complex subunit (Aly/REF); **S4 B** Coilin (COIL); **S4C** RNA helicase DDX5/p68 (DDX5); **S4 D** cluster of fragile X mental retardation syndrome-related protein 1 (FXR1); **S4 E** heterogeneous ribonucleoprotein K (HNRNPK); **S4 F** double strand break repair protein 11 (MRE11); **S4 G** nuclear receptor interacting protein 1 (NRIP/DCAF6); **S4 H** Nucleolin (NCL); **S4 I** cluster of pre-mRNA-processing-splicing factor 8 (PRPF8); **S4 K** cluster of RNA-binding protein 26 (RBM26); **S4 L** thyroid hormone receptor associated protein 3 (THRAP3).

Figure S5. Confirmation of MMA-modification of MRE11 by Western blot using 19D4. MRE11 was precipitated using commercially available MRE11 serum and pre-immune serum. The precipitates were stained either with anti-MRE11 or with 19D4 as indicated.

Figure S6. Immune-precipitation of HA-tagged SMD1, SMD2, SMD3. **S6A** HEK293T cells were transfected with HA-tagged SMD1-3 as indicated. Cell extract was precipitated with anti-HA or control. The Western blot was stained with MMA-19D4. **S6B** Western blot using anti-HA to verify the expression of the indicated SMD1-3 proteins.

Figure S1

A) EBNA-2 protein sequence. RGs are highlighted.

```
        10         20         30         40         50
MPTFYLALHG GQTYHLIVDT DSLGNPSLSV IPSNPYQEQL SDTPLIPLTI
        60         70         80         90        100
FVGENTGVPP PLPPPPPPPP PPPPPPPPPP PPPPPPPPSP PPPPPPPPPP
       110        120        130        140        150
QRRDAWTQEP SPLDRDPLGY DVGHGPLASA MRMLWMANYI VRQSRGDRGL
       160        170        180        190        200
ILPQGPQTAP QARLVQPHVP PLRPTAPTIL SPLSQPRLTP PQPLMMPPRP
       210        220        230        240        250
TPPTPLPPAT LTVPPRPTRP TTLPPTPLLT VLQRPTELQP TPSPPRMHLP
       260        270        280        290        300
VLHVPDQSMH PLTHQSTPND PDSPEPRSPT VFYNIPPMPL PPSQLPPPAA
       310        320        330        340        350
PAQPPPGVIN DQQLHHLPSG PPWWPPICDP PQPSKTQGQS RGQSRGRGRG
       360        370        380        390        400
RGRGRGKGKS RDKQRKPGGP WRPEPNTSSP SMPELSPVLG LHQGQGAGDS
       410        420        430        440        450
PTPGPSNAAP VCRNSHTATP NVSPIHEPES HNSPEAPILF PDDWYPPSID
       460        470        480
PADLDESWDY IFETTESPSS DEDYVEGPSK RPRPSIQ
```

B) EBNA-1 protein sequence. RGs are highlighted.

```
        10         20         30         40         50
MSDEGPGTGP GNGLGEKGDT SGPEGSGGSG PQRRGGDNHG RGRGRGRGRG
        60         70         80         90        100
GGRPGAPGGS GSGPRHRDGV RRPQKRPSCI GCKGTHGGTG AGAGAGGAGA
       110        120        130        140        150
GGAGAGGGAG AGGGAGGAGG AGGAGAGGGA GAGGGAGGAG GAGAGGGAGA
       160        170        180        190        200
GGGAGGAGAG GGAGGAGGAG AGGGAGAGGG AGGAGAGGGA GGAGGAGAGG
       210        220        230        240        250
GAGAGGAGGA GGAGAGGAGA GGGAGGAGGA GAGGAGAGGA GAGGAGAGGA
       260        270        280        290        300
GGAGAGGAGG AGAGGAGGAG AGGGAGGAGA GGGAGGAGAG GAGGAGAGGA
       310        320        330        340        350
GGAGAGGAGG AGAGGGAGAG GAGAGGGGRG RGGSGGRGRG GSGGRGRGGS
       360        370        380        390        400
GGRRGRGRER ARGGSRERAR GRGRGRGEKR PRSPSSQSSS SGSPPRRPPP
       410        420        430        440        450
GRRPFFHPVG EADYFEYHQE GGPDGEPDVP PGAIEQGPAD DPGEGPSTGP
       460        470        480        490        500
RGQGDGGRRK KGGWFGKHRG QGGSNPKFEN IAEGLRALLA RSHVERTTDE
       510        520        530        540        550
GTWVAGVFVY GGSKTSLYNL RRGTALAIPQ CRLTPLSRLP FGMAPGPGPQ
       560        570        580        590        600
PGPLRESIVC YFMVFLQTHI FAEVLKDAIK DLVMTKPAPT CNIRVTVCSF
```

Figure S2

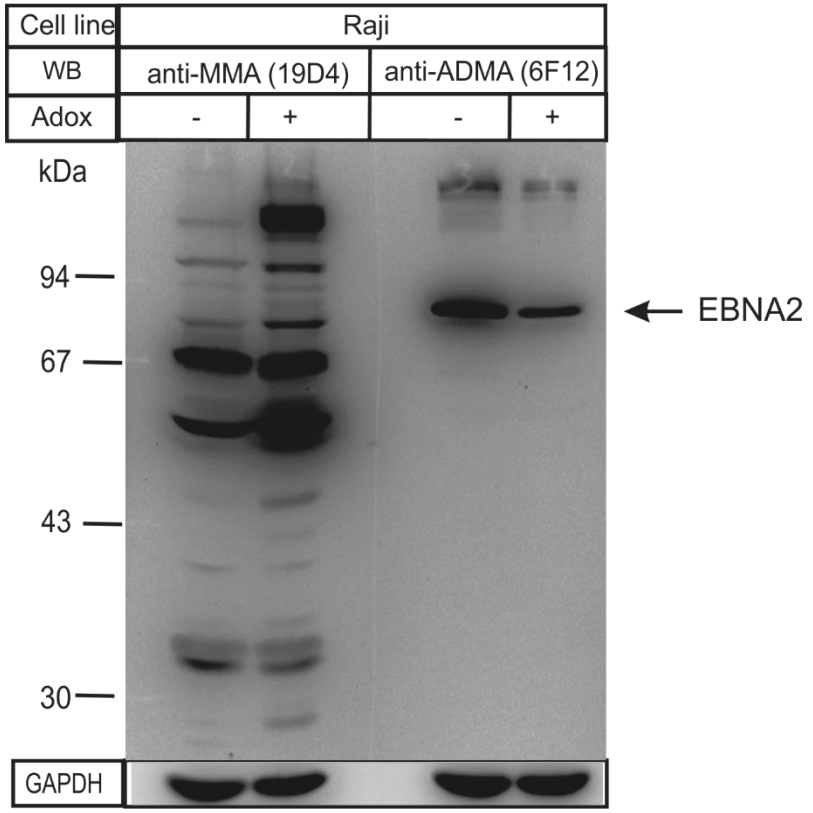
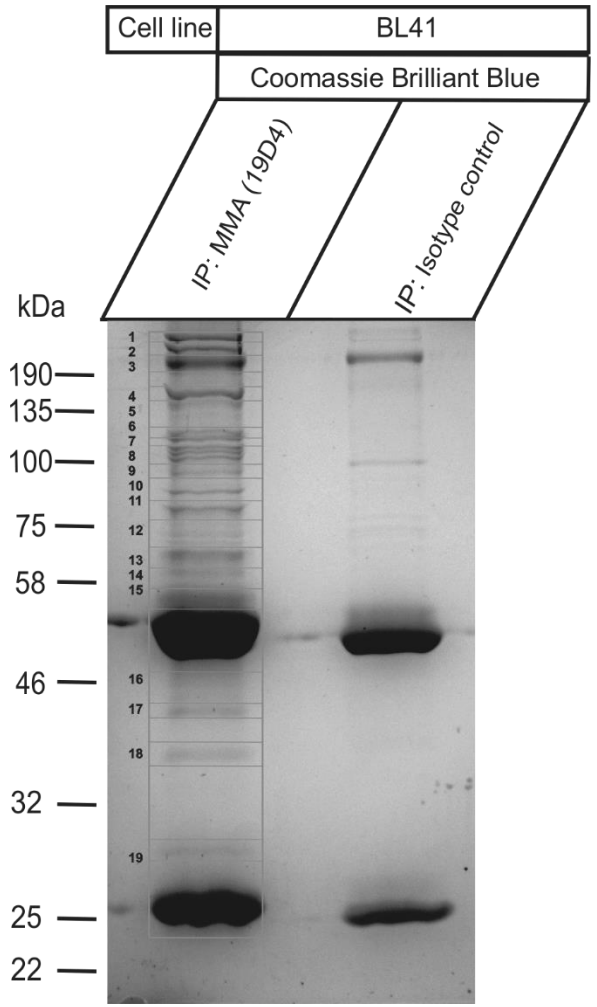

Cell line
Raji
WB
anti-MMA (19D4)
anti-ADMA (6F12)
Adox
-
+
-
+
kDa
94
67
43
30
EBNA2
GAPDH

Figure S3 A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BL41
Coomassie Brilliant Blue
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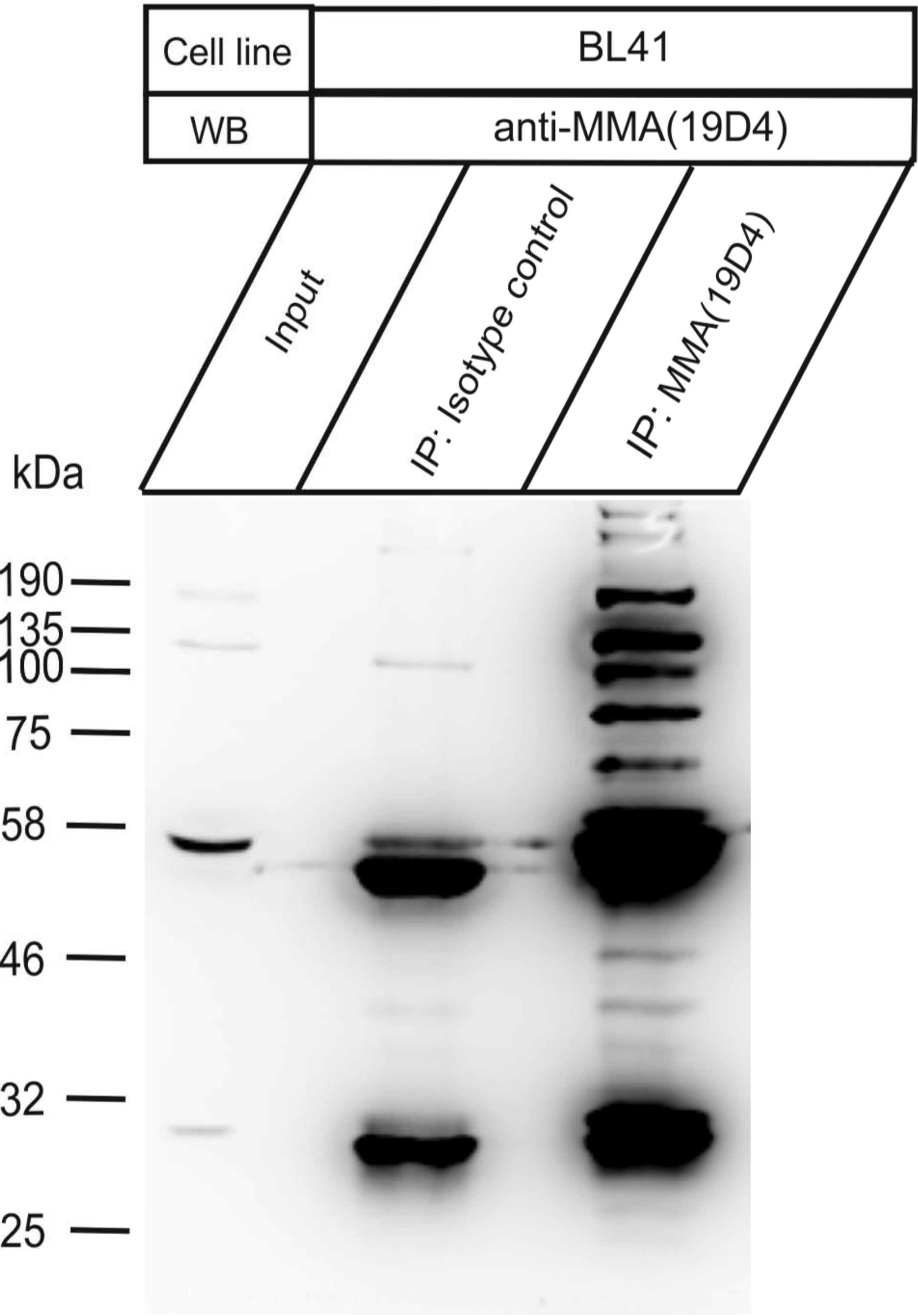
IP: Isotype control
kDa
190
135
100
75
58
46
32
25
22

Figure S3 B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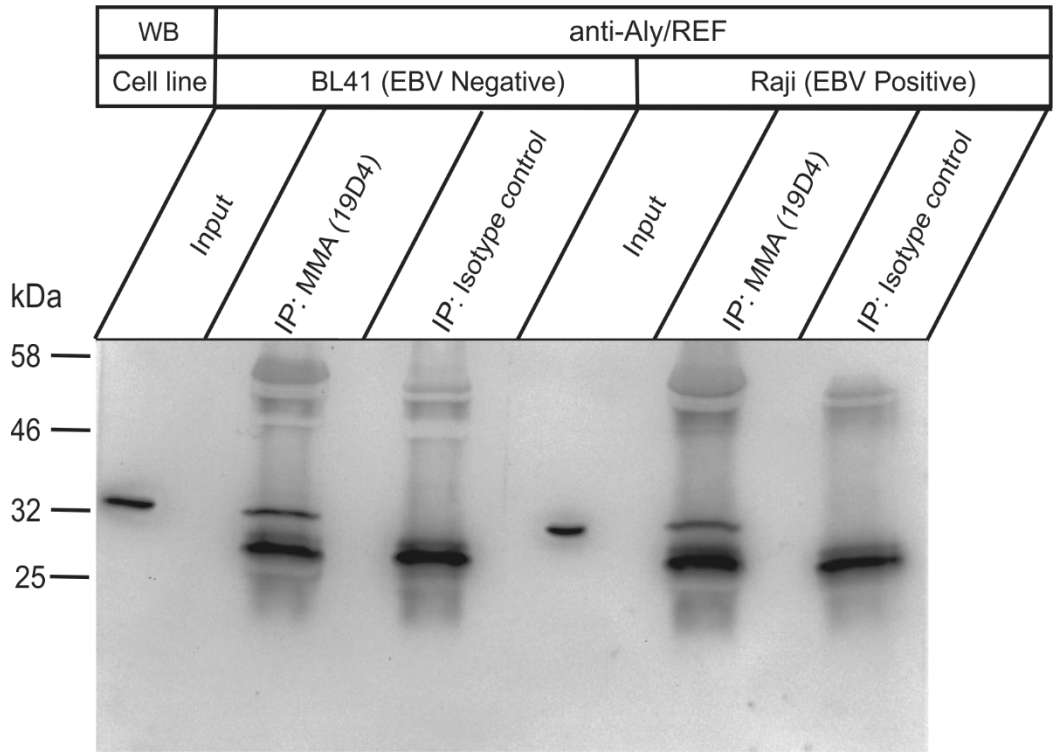
BL41
WB
anti-MMA(19D4)
Input
IP: Isotype control
IP: MMA(19D4)
kDa
190
135
100
75
58
46
32
25

Figure S4 A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anti-Aly/REF
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
58
46
32
25

Figure S4 B

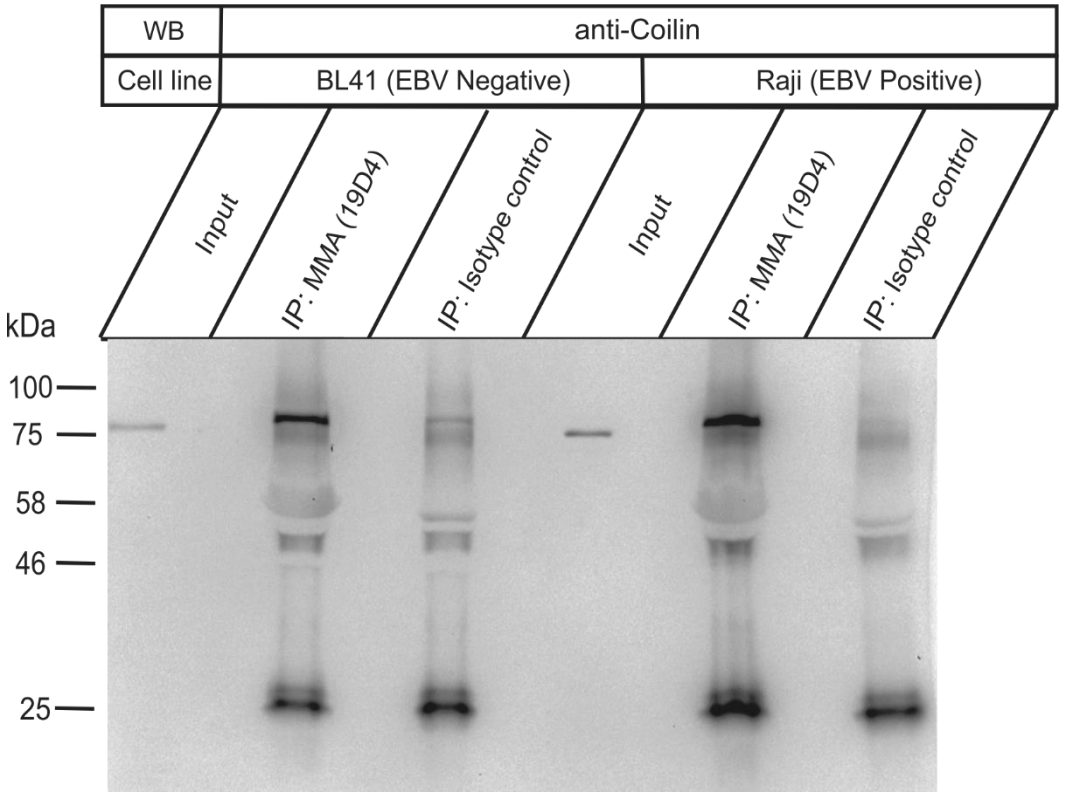

WB
anti-Coilin
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
100
75
58
46
25

Figure S4 C

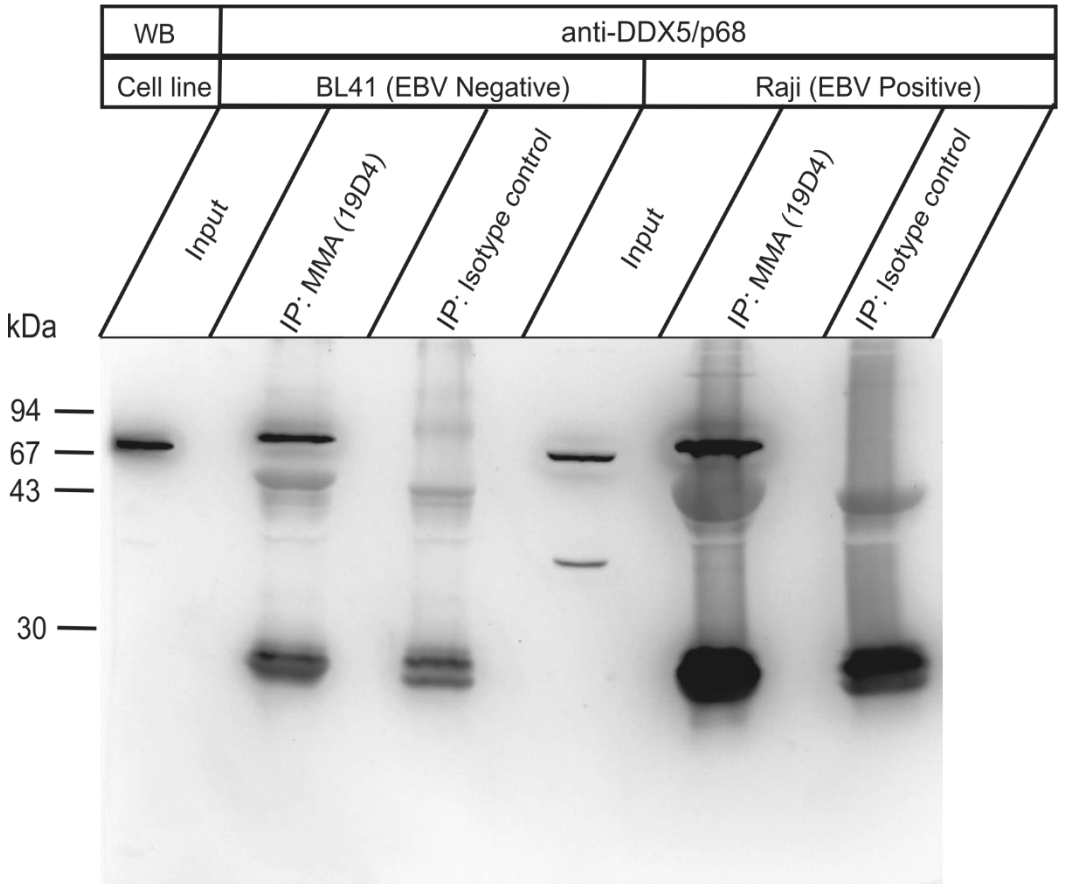
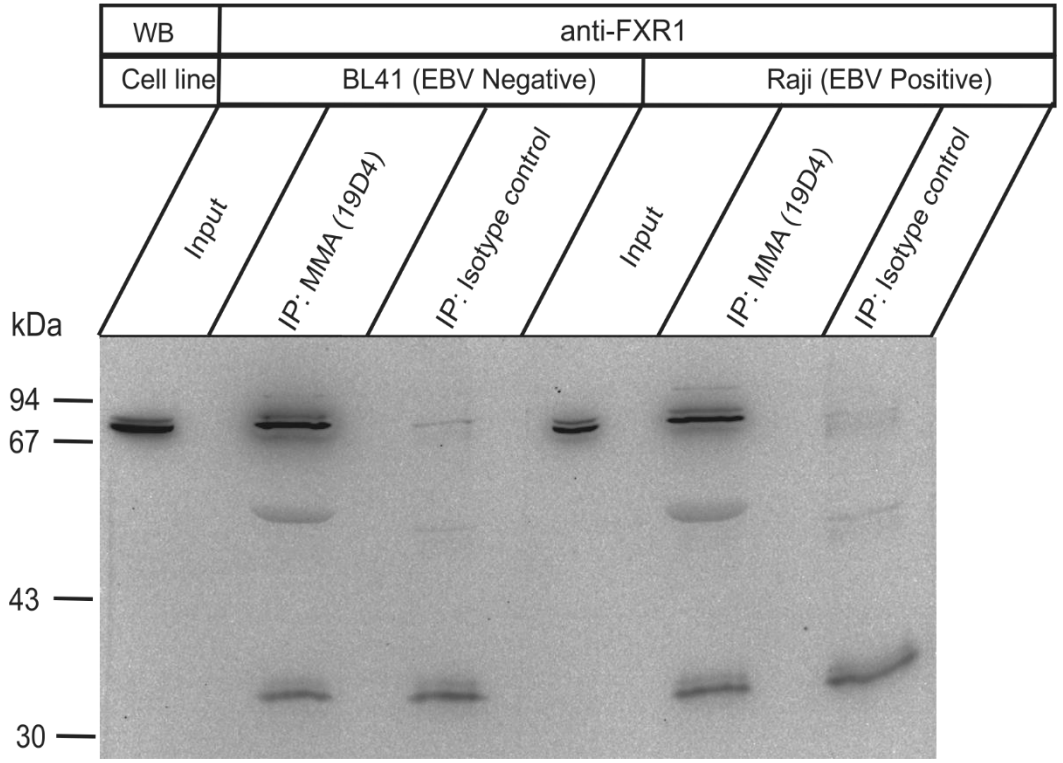

WB
anti-DDX5/p68
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
94
67
43
30

Figure S4 D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anti-FXR1
Cell line
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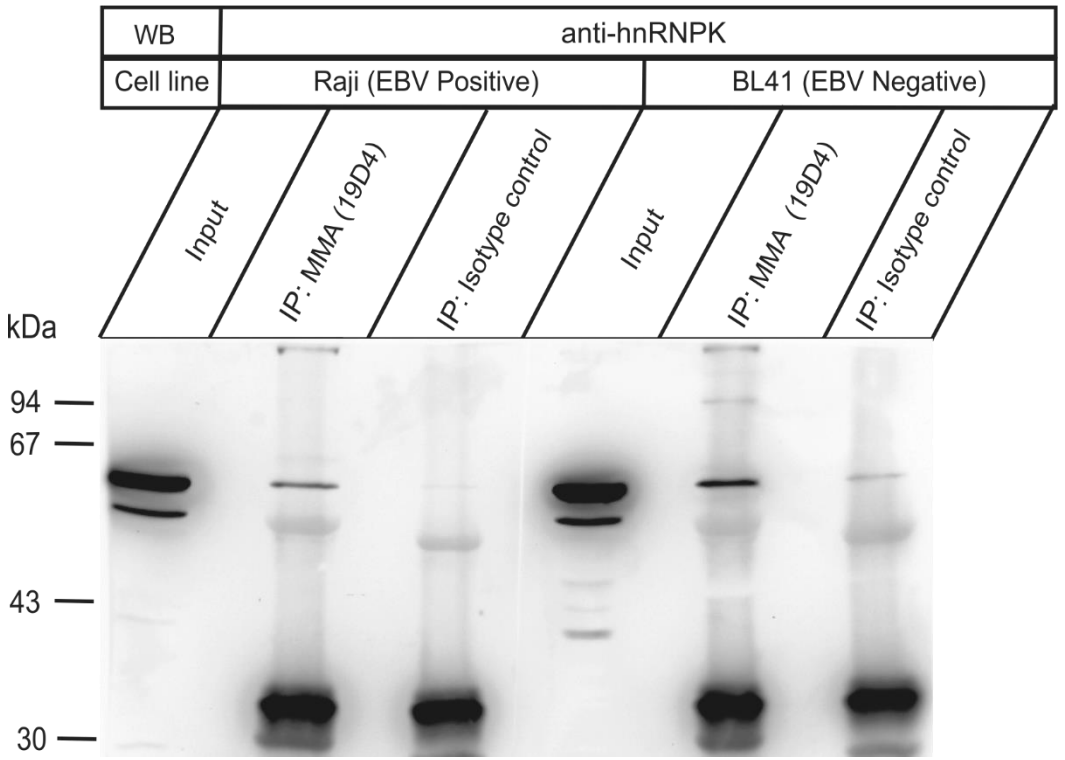
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
94
67
43
30

Figure S4 E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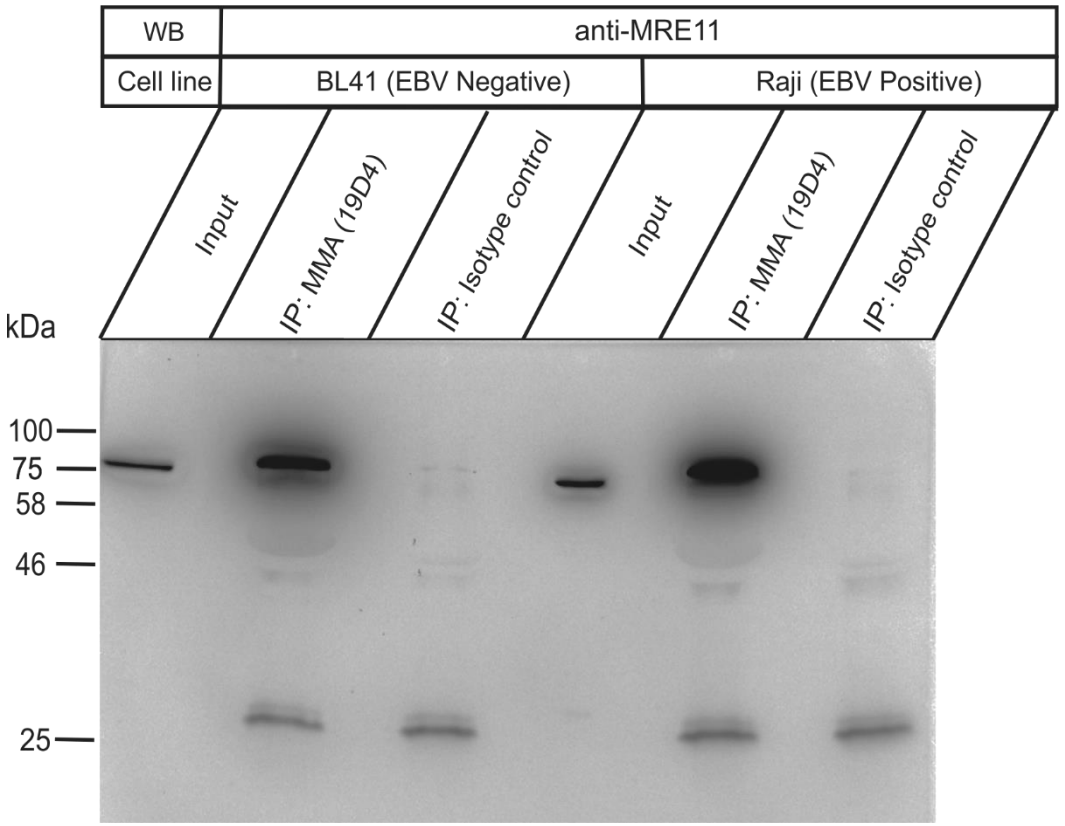
anti-hnRNPK
Cell line
Raji (EBV Positive)
BL41 (EBV Negative)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
94
67
43
30

Figure S4 F


WB
anti-MRE11
Cell line
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Raji (EBV Positive)
Input
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IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
100
75
58
46
25

Figure S4 G

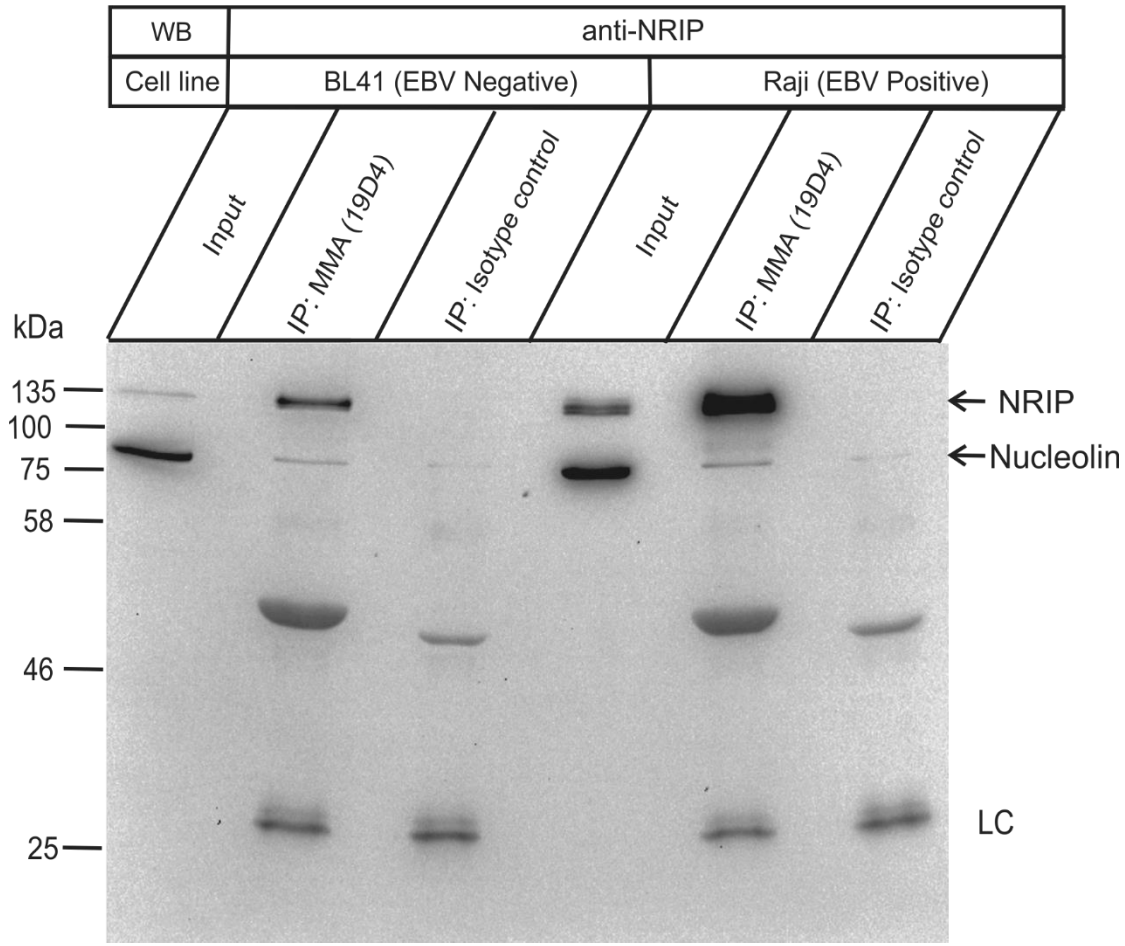

WB
anti-NRIP
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
135
100
75
58
46
25
NRIP
Nucleolin
LC

Figure S4 H

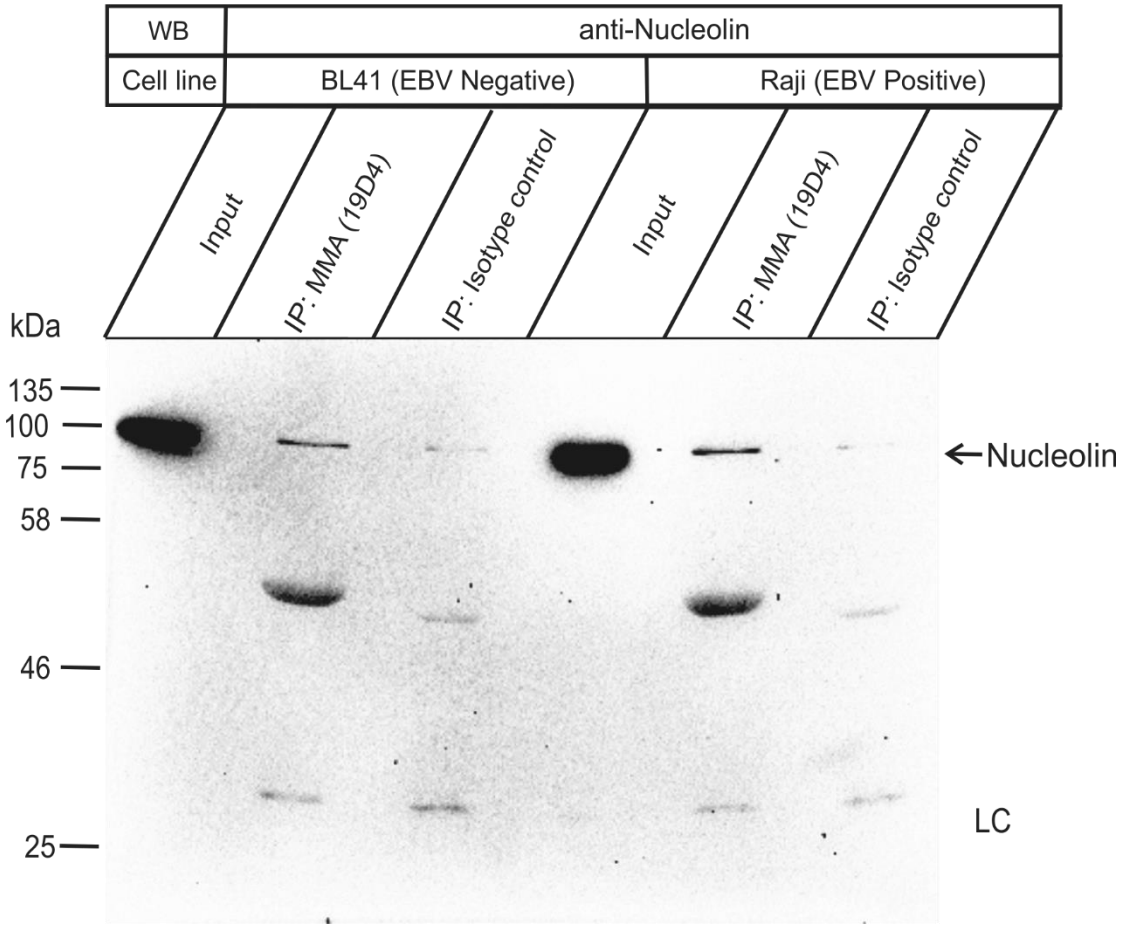
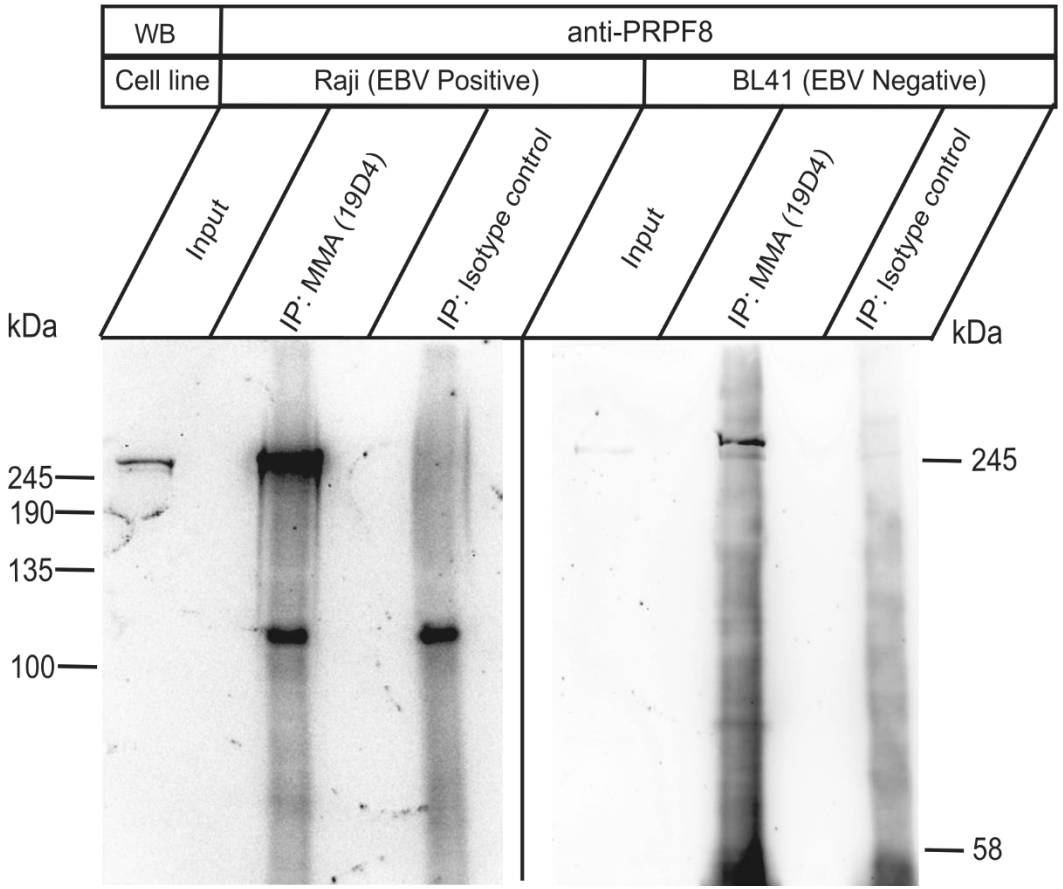

WB
anti-Nucleolin
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
135
100
75
58
46
25
Nucleolin
LC

Figure S4 I


WB
anti-PRPF8
Cell line
Raji (EBV Positive)
BL41 (EBV Negative)
Input
IP: MMA (19D4)
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Input
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IP: Isotype control
kDa
245
190
135
100
kDa
245
58

Figure S4 K

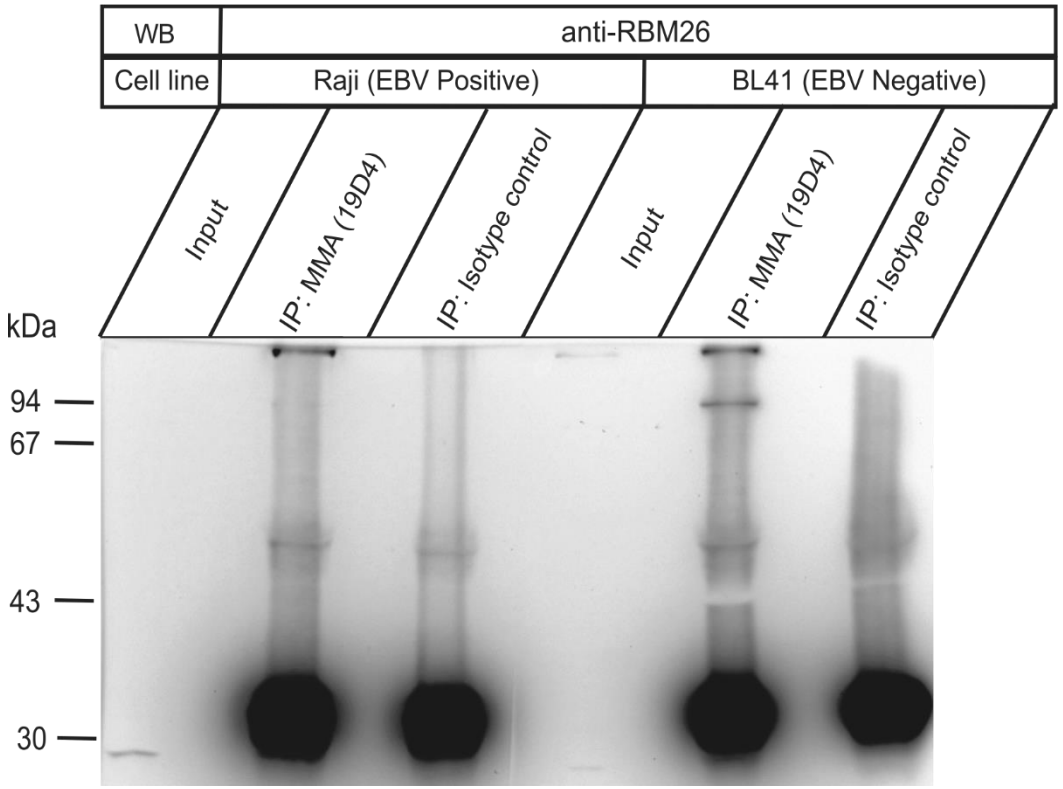

WB
anti-RBM26
Cell line
Raji (EBV Positive)
BL41 (EBV Negative)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
94
67
43
30

Figure S4 L

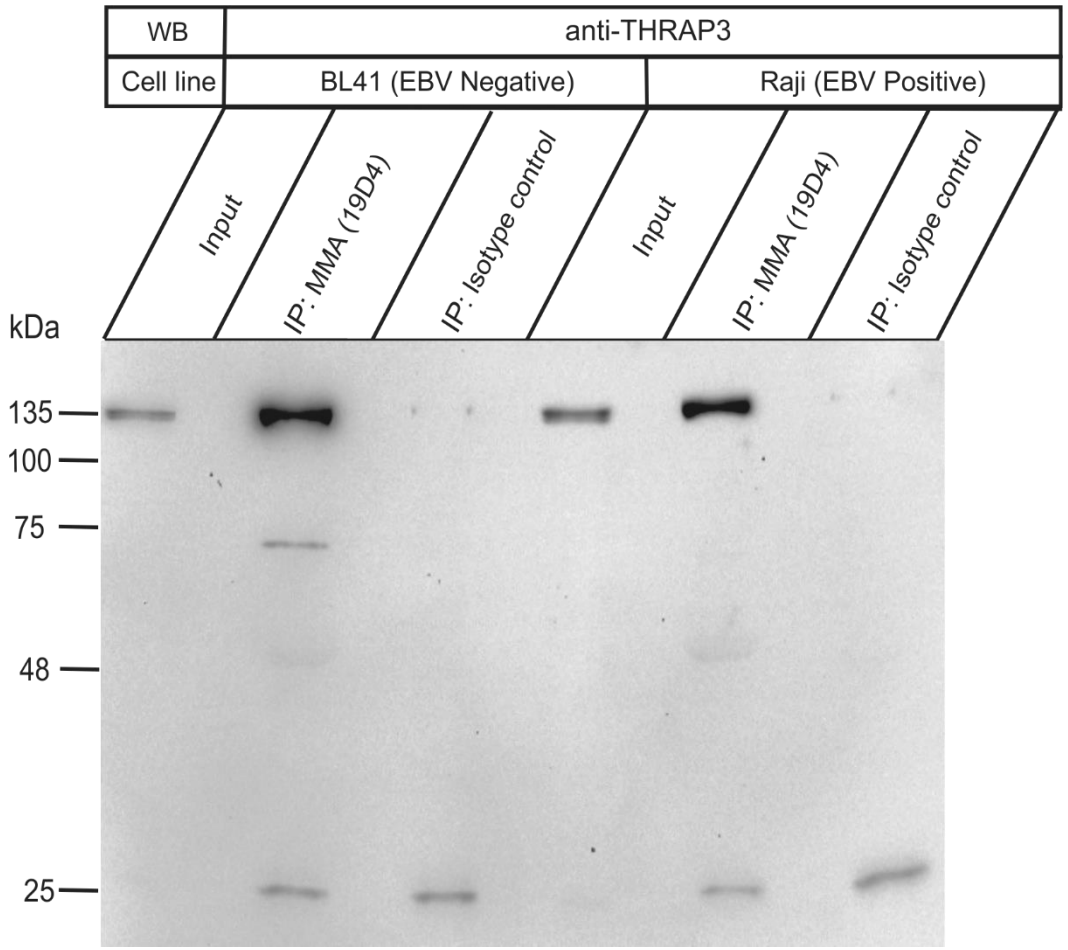

WB
anti-THRAP3
Cell line
BL41 (EBV Negative)
Raji (EBV Positive)
Input
IP: MMA (19D4)
IP: Isotype control
Input
IP: MMA (19D4)
IP: Isotype control
kDa
135
100
75
48
25

Figure S5

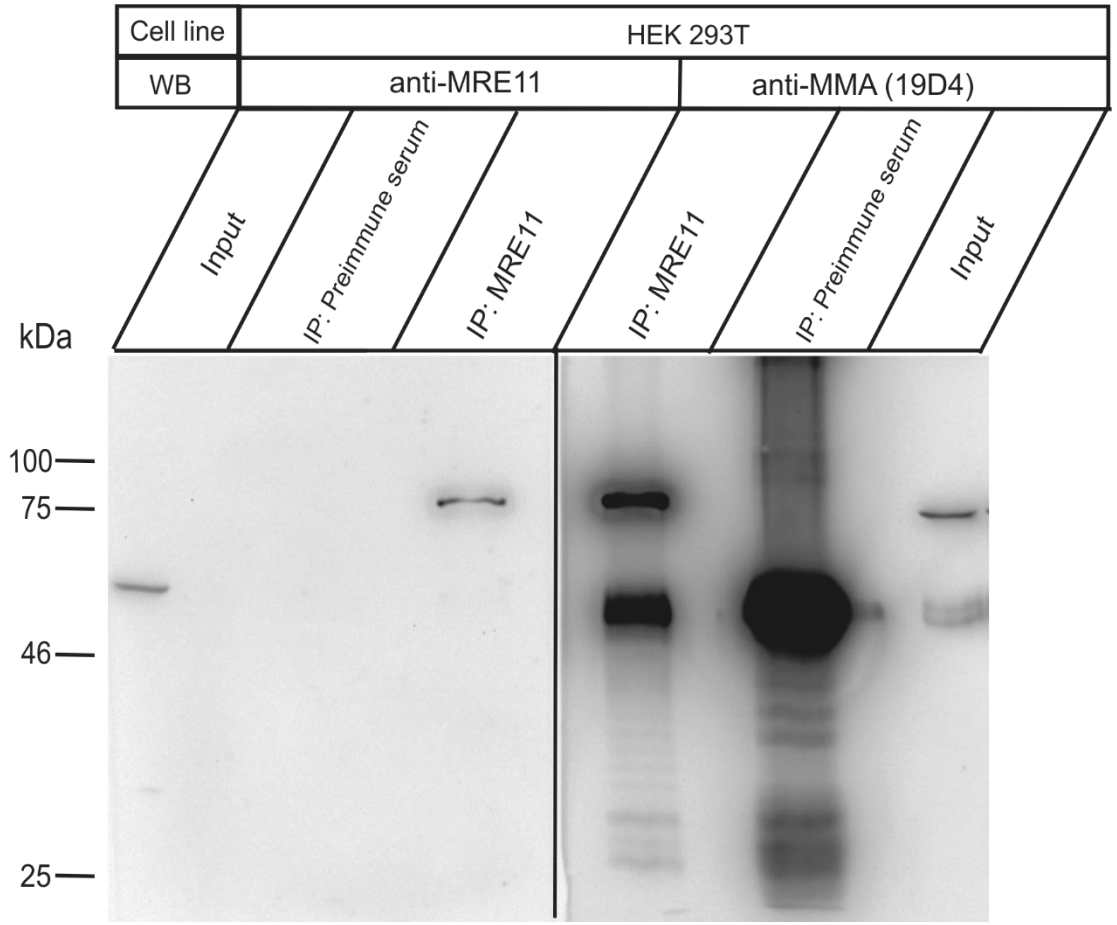
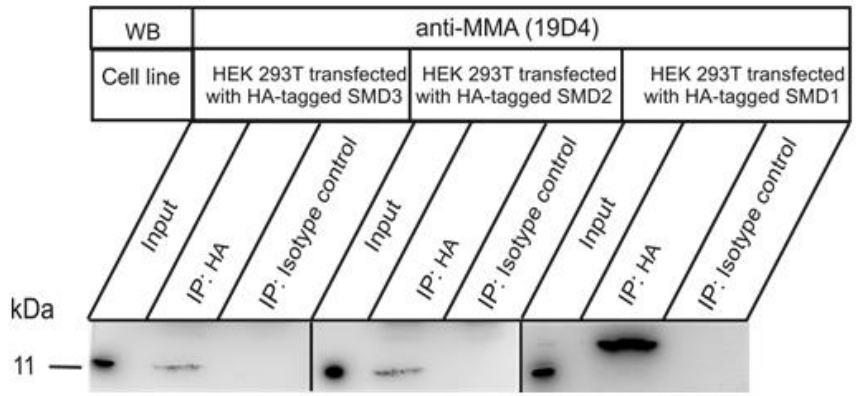

Cell line
HEK 293T
WB
anti-MRE11
anti-MMA (19D4)
Input
IP: Preimmune serum
IP: MRE11
IP: MRE11
IP: Preimmune serum
Input
kDa
100
75
46
25

Figure S6 A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anti-MMA (19D4)
Cell line
HEK 293T transfected with HA-tagged SMD3
HEK 293T transfected with HA-tagged SMD2
HEK 293T transfected with HA-tagged SMD1
Input
IP: HA
IP: Isotype control
Input
IP: HA
IP: Isotype control
Input
IP: HA
IP: Isotype control
kDa
11

Figure S6 B

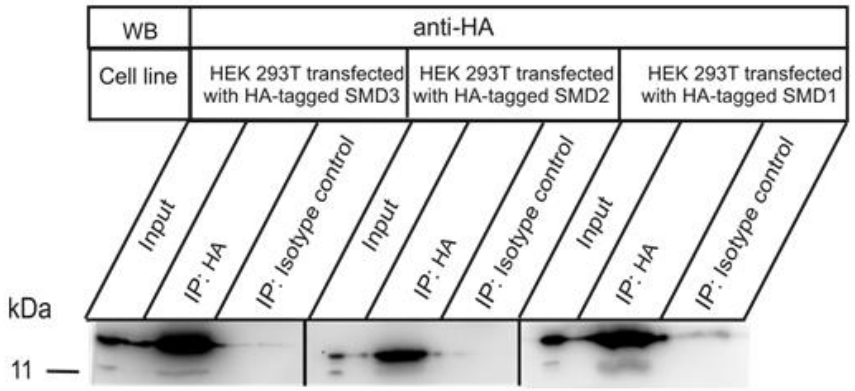
WB
anti-HA
Cell line
HEK 293T transfected with HA-tagged SMD3
HEK 293T transfected with HA-tagged SMD2
HEK 293T transfected with HA-tagged SMD1
Input
IP: HA
IP: Isotype control
Input
IP: HA
IP: Isotype control
Input
IP: HA
IP: Isotype control
kDa
11

Table S1. Proteins precipitated with 19D4 from EBV-positive Raji cells and EBV –negative BL41

For RGs in the protein sequences, refer to uniprot (https:www.uniprot.org)

Gene/Protein	MW kDa	Raji	BL41	MMA known	Ref.	ADMA/SDMA known	Ref.	RG/RGG repeat
PRPF8	274	+	+	N		Y	(27)	N
TLN1	270	+	-	N		n		N
SNRNP200	245	+	+	N		N		N
ESPL1	233	-	+	N		N		Y
CHD4	218	+	-	N		N		N
FOCAD	200	+	-	N		N		N
RAD50	154	+	+	N		N		N
BRD4	152	+	+	N		N	(14)	Y
POLRMT	154	+	+	N		N		N
PRR12	130	+	-	N		N		Y
RBM26	114	+	+	N		N	(14)	Y
DHX38	140	+	-	N		N		Y
EFTUD2	109	+	+	N		N		N
ITCH	103	+	-	N		N		N
PRPF6	107	+	+	N		N		N
TOP3B	97	-	+	N		N	(14)	Y
ABCF1	96	+	-	N		N		N
DDX23	96	+	+	N		N		N
ILF3	95	-	+	Y	(27)	N		Y
SART1	90	+	+	N		N		Y
NIBRIN	85	+	+	N		N		N
POLR3E	80/76	+	+	N		N		N
DPP3	83	+	-	N		N		N
MRE11A	81	+	+	N		Y	(23)	Y
PRPF3	78	+	+	N		N		N
NCL	77	+	-	Y		N	(27)	Y
MTA2	75	-	+	N		N		N
FXR2	74	-	+	Y	(27)	N	(14)	Y
TDRD3	73	+	+	N		N	(14)	Y
PABPC1	71	-	+	Y	(27)	Y	(14)	Y
PCK2	71	+	-	N		N		N
XRCC6/Ku70	70	+	-	N		N		N
FXR1	70	+	-	N		N		Y
KHRSP/FUBP2	73	-	+	N Y	(27)	Y		Y
DDX5	69	-	+	Y	(27)	N	(14)	Y
COIL	63	+	-	N		Y	(23)	Y
PRMT3	60	+	-	N		N		N
CPSF6	59	+	+	Y	(27)	Y	(23)	Y
TCP1/CCT1	60	+	+	N		N		N
CCT8	60	+	-	N		N		N
CCT7	60	+	-	Y		N	(27)	Y
CCT6A	58	-	+	N		N		N
TCP1/CCT4	58	+	-	N		N		N
CCT2	53	-	+	N		N		N
PRPF31	55	+	+	N		N		N
HDAC1	55	-	+	N		N		N
HNRNPK	51	-	+	N		Y	(23)	Y
RBM42	48	-	+	Y	(27)	N		N
AHCY	48	+	-	N		N		N
ACOT7	42	+	-	N		N		N
HADH	42	+	-	N		N		N
PSAT1	40	+	-	N		N		N
ARK72	40	+	-	N		N		N
ALDOC	39	+	-	N		N		N
ILF2	39	-	+	N		N	(14)	Y
WDR57	39	+	+	N		N		N
STRAP	38	+	-	N		N		N
POLR1C	38	+	-	N		N		N
ETFA	35	+	-	N		N		N
U2AF1	35	+	-	N		N		Y
TCEA1	34	+	-	N		N		N
RPL5	34	+	-	N		N		N
SFRS10	34	-	+	N		N		N
BPNT1	33	+	-	N		N		N
PARVB	42	+	-	N		N		N
RPS2	31		+	Y	(27)	N	(14)	Y
SNRPA	31	+	-	N		N		N
HLA DRA1	29	+	-	N		N		N
SRSF1	28	-	+	Y	(27)		(14)	Y
ALYREF	27	+	+	y	(27)	N?		Y
NUDT21	26	+	-	Y		N		N
RPL10	25	+	-	N		N		N
SMD2/SNRDP2	14	+	-	N		N		N
SMD3/SNRPD3	14	+	-	Y	(42)	Y		Y
SMD1/SNRPD1	13	+	-	Y	(42)	N		Y
LSM4	11	+	-	Y	(27)	N		Y