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Supplemental Information

Mbd2 Mediates Retinal Cell Apoptosis by Targeting the lncRNA Mbd2-AL1/miR-188-3p/Traf3 Axis in Ischemia/Reperfusion Injury

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Mbd2 mediates retinal cell apoptosis by targeting the lncRNA Mbd2-AL1/miR-188-3p/Traf3 axis in ischemia/reperfusion injury

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Supplementary Table 1. upregulated lncRNAs in Scramble/I/R group vs. Scramble group

upregulated lncRNAs in Scramble/I/R group vs. Scramble group		
ENSMUST00000163697	ENSMUST00000180630	ENSMUST00000125004
ENSMUST00000123078	uc.129-	ENSMUST00000149283
AK039484	ENSMUST00000154204	ENSMUST00000138771
ENSMUST00000181828	AK051538	ENSMUST00000141071
ENSMUST00000136537	AK048741	mouseLincRNA0767+
ENSMUST00000145757	ENSMUST00000124091	ENSMUST00000130983
NR_040420	ENSMUST00000160677	AK048998
AK138545	ENSMUST00000135399	mouseLincRNA0543-
ENSMUST00000171450	TCONS_00012085	ENSMUST00000140873
uc009ljz.1	AK020950	uc008eew.1
ENSMUST00000149302	ENSMUST00000146069	ENSMUST00000173538
humanLincRNA0561-	AK003980	AK016924
uc007clk.1	uc.64+	ENSMUST00000147045
ENSMUST00000149054	uc029soj.1	ENSMUST00000099260
ENSMUST00000141528	AK144529	ENSMUST00000162149
uc.252-	AK081864	ENSMUST00000133880
AK155686	ENSMUST00000169387	ENSMUST00000127429
AK142692	uc009hik.1	ENSMUST00000140754
AK134910	ENSMUST00000124653	AK046972
AK154589	AK082284	NR_028263
uc.34-	ENSMUST00000125409	uc009dqv.1
AK032419	ENSMUST00000142248	ENSMUST00000181830
humanLincRNA1945-	uc.19-	ENSMUST00000152860
ENSMUST00000129027	ENSMUST00000135495	ENSMUST00000160516
ENSMUST00000129502	ENSMUST00000174338	AK086566
AK140140	ENSMUST00000099647	ENSMUST00000143806
ENSMUST00000120404	ENSMUST00000149030	NR_102293
uc.250-	ENSMUST00000161623	uc007ees.1
AK139938	uc007ihz.1	ENSMUST00000131987
NR_033526	uc029rkv.1	ENSMUST00000139847
AK040434	ENSMUST00000130883	ENSMUST00000125867
ENSMUST00000129096	AK039081	ENSMUST00000133539
uc009euf.1	AK079872	ENSMUST00000124624
ENSMUST00000146327	uc.426-	ENSMUST00000152779
ENSMUST00000176431	ENSMUST00000167053	TCONS_00025263

AK003907	ENSMUST00000142818	uc009avw.1
ENSMUST00000139786	ENSMUST00000156701	ENSMUST00000180544
AK132438	AK139467	ENSMUST00000137683
mouseLincRNA1097-	ENSMUST00000177480	AK030568
AK030243	ENSMUST00000180982	NR_040746
humanLincRNA0635+	ENSMUST00000143129	ENSMUST00000137043
AK144133	TCONS_00015979	TCONS_00015184
ENSMUST00000159153	AK156905	ENSMUST00000180757
ENSMUST00000119517	ENSMUST00000120603	ENSMUST00000176773
TCONS_00036126	humanLincRNA0194+	ENSMUST00000159700
AK157120	AK047632	AK085151
ENSMUST00000149420	uc.461+	ENSMUST00000161664
ENSMUST00000149692	ENSMUST00000169214	ENSMUST00000123946
ENSMUST00000180460	ENSMUST00000159117	ENSMUST00000051531
uc012fvb.1	ENSMUST00000127068	ENSMUST00000065709
ENSMUST00000126912	AK032249	ENSMUST00000110954
AK047380	ENSMUST00000171273	ENSMUST00000026264
ENSMUST00000126846	AK033143	ENSMUST00000151023
AK009126	mouseLincRNA1098+	ENSMUST00000147329
AK140706	uc.247+	ENSMUST00000153000
ENSMUST00000159399	AK042899	uc007ktl.1
ENSMUST00000135931	ENSMUST00000135601	AK148890
AK043360	AK020372	ENSMUST00000134755
ENSMUST00000163665	humanLincRNA0650-	ENSMUST00000140514
ENSMUST00000155086	ENSMUST00000159037	NR_045176
ENSMUST00000154578	uc.367+	ENSMUST00000181302
AK020279	ENSMUST00000153863	AK040345
ENSMUST00000176131	ENSMUST00000181514	humanLincRNA1605+
uc.77-	ENSMUST00000167073	uc007pkb.2
NR_045542	AK142125	uc009dml.1
AK046984	ENSMUST00000163081	ENSMUST00000155728
AK052120	ENSMUST00000144793	uc.74-
ENSMUST00000137375	AK089653	AK143399
ENSMUST00000132787	mouseLincRNA1511-	AK034976
ENSMUST00000180819	AK157323	ENSMUST00000133112
AK041489	CF616316	ENSMUST00000143340
ENSMUST00000154896	TCONS_00034053	AK015830
AK018645	NR_029382	NR_030675
NR_015467	uc007rvk.1	ENSMUST00000122109
ENSMUST00000148857	AK054326	ENSMUST00000160470
AK089422	ENSMUST00000133365	ENSMUST00000162801
ENSMUST00000107148	NR_045640	ENSMUST00000156295

uc007baf.1	AK156102	ENSMUST00000172812
ENSMUST00000159157	ENSMUST00000142932	ENSMUST00000174520
ENSMUST00000149805	ENSMUST00000173251	uc029sug.1
ENSMUST00000147861	AK040898	AK045182
ENSMUST00000151257	ENSMUST00000132434	ENSMUST00000145421
uc007zgf.1	AK047864	uc008elz.1
AK052777	ENSMUST00000130038	AK081208
TCONS_00013499	ENSMUST00000152600	uc007txt.1
AK142735	AK039385	ENSMUST00000139702
AK148874	ENSMUST00000147654	AK028736
TCONS_00003993	AK020425	ENSMUST00000125424
ENSMUST00000159393	ENSMUST00000156145	ENSMUST00000118822
AK037099	ENSMUST00000160159	TCONS_00009802
TCONS_00006732	ENSMUST00000136126	ENSMUST00000127318
ENSMUST00000181422	ENSMUST00000145728	AK035280
ENSMUST00000136610	AK037210	AK013121
uc029wtn.1	uc029xdn.1	uc007sgd.1
ENSMUST00000177445	AK031651	ENSMUST00000163608
uc009ril.1	BY573946	AK016790
ENSMUST00000125326	NR_015610	AK153797
ENSMUST00000144231	ENSMUST00000155767	uc.335+
AK140170	ENSMUST00000140461	ENSMUST00000067521
AK045044	uc.276+	NR_040295
ENSMUST00000120786	AK153393	AK085385
ENSMUST00000146281	uc012gti.1	ENSMUST00000143841
AK049728	humanlincRNA0518+	AK082454
TCONS_00025329	ENSMUST00000139607	AK038145
ENSMUST00000151412	ENSMUST00000124559	AK045073
ENSMUST00000151582	ENSMUST00000141336	ENSMUST00000155423
ENSMUST00000140602	ENSMUST00000162912	AK043671
AK155038	TCONS_00009665	AK132396
AK079498	humanlincRNA0043+	uc007dlv.1
AK133451	uc007ssb.1	AK043028
ENSMUST00000161580	uc008hdz.1	ENSMUST00000181387
AK089789	ENSMUST00000123262	AK142149
AK020824	ENSMUST00000154706	uc011zox.1
ENSMUST00000130441	AK077872	uc007ydb.1
ENSMUST00000128766	ENSMUST00000161769	humanlincRNA1178+
ENSMUST00000180281	ENSMUST00000122281	ENSMUST00000180377
AK140232	ENSMUST00000140487	ENSMUST00000149117
uc007dtm.1	AK142657	ENSMUST00000118579
ENSMUST00000118575	AK052802	AK135681

ENSMUST00000157701	AK037904	NR_027952
ENSMUST00000156396	ENSMUST00000144292	AK052126
ENSMUST00000129240	AK142890	uc009fbu.1
ENSMUST00000143025	ENSMUST00000162289	ENSMUST00000126627
humanlincRNA0933+	NR_039577	TCONS_00002220
ENSMUST00000155715	ENSMUST00000155761	ENSMUST00000137546
AK132891	ENSMUST00000154759	ENSMUST00000149299
ENSMUST00000132481	ENSMUST00000161304	ENSMUST00000156814
ENSMUST00000117697	2_00008059	ENSMUST00000181427
ENSMUST00000129374	NR_046233	AK018099
ENSMUST00000126446	humanlincRNA1907-	ENSMUST00000151468
ENSMUST00000148298	uc.275-	BM938732
AK037460	uc.195-	AK157381
AI390166	mouselincRNA0538-	AK144955
AK085893	ENSMUST00000150545	AK007047
uc.481-	ENSMUST00000156882	uc007qnc.1
ENSMUST00000176215	uc012coq.1	ENSMUST00000152911
ENSMUST00000181178	ENSMUST00000180919	AK133460
ENSMUST00000140231	AK016451	AK048415
ENSMUST00000144696	ENSMUST00000129260	

Supplementary Table 2. downregulated lncRNAs in MBD2 siRNA group

downregulated lncRNAs in MBD2 siRNA group		
ENSMUST00000177480	AK154589	ENSMUST00000099260
AK156905	AK052120	ENSMUST00000151412
AK016451	ENSMUST00000124091	ENSMUST00000122281
AK132396	ENSMUST00000162912	AK140140
AK156905	AK154589	ENSMUST00000180757
ENSMUST00000147654	uc029sug.1	AK140140
uc.247+	AK037904	ENSMUST00000137375
uc007zgf.1	ENSMUST00000137043	AK028736
ENSMUST00000135495	NR_033526	ENSMUST00000163697
NR_046233	ENSMUST00000151023	AK153393
TCONS_00002220	ENSMUST00000130883	ENSMUST00000163697
AK020372	AK132891	ENSMUST00000145728
ENSMUST00000154706	NR_033526	ENSMUST00000133880
AK018099	NR_045176	TCONS_00003993
TCONS_00006732	ENSMUST00000156701	ENSMUST00000119517
ENSMUST00000150545	ENSMUST00000120404	uc009hik.1
ENSMUST00000149299	AK054326	humanlincRNA0194+
ENSMUST00000142932	TCONS_00012085	ENSMUST00000140873

mouselincRNA0543-	AK133460	uc011zox.1
NR_040295	ENSMUST00000120404	uc007baf.1
ENSMUST00000118579	ENSMUST00000143806	ENSMUST00000180377
AK030243	TCONS_00025263	ENSMUST00000149117
NR_045640	ENSMUST00000181178	ENSMUST00000138771
ENSMUST00000163608	uc007ydb.1	uc012gti.1
AK135681	ENSMUST00000140461	NR_015467
ENSMUST00000129027	AK037460	AK155686
ENSMUST00000174520	ENSMUST00000067521	AK038145
ENSMUST00000144292	NR_039577	AK155686
AK081208	ENSMUST00000173538	mouselincRNA0767+
uc.276+	ENSMUST00000156396	AK018645
AK144529	ENSMUST00000124624	ENSMUST00000149054
uc.426-	ENSMUST00000148857	ENSMUST00000132481
ENSMUST00000180919	ENSMUST00000129096	ENSMUST00000180982
AK077872	ENSMUST00000136610	ENSMUST00000149054
BM938732	ENSMUST00000144231	ENSMUST00000149805
uc009fbu.1	uc009ril.1	BY573946
AK047632	ENSMUST00000129096	ENSMUST00000123078
ENSMUST00000155423	ENSMUST00000133112	ENSMUST00000144793
uc.335+	ENSMUST00000159117	AK042899
NR_102293	AK052126	AK047864
uc008hdz.1	AK007047	ENSMUST00000151582
ENSMUST00000172812	ENSMUST00000099260	ENSMUST00000132434
ENSMUST00000151412	ENSMUST00000135931	AK052777
ENSMUST00000136126	AK037210	uc009euf.1
ENSMUST00000128766	AK051538	ENSMUST00000181514
ENSMUST00000180281	ENSMUST00000137683	ENSMUST00000130983
ENSMUST00000156882	ENSMUST00000148298	uc.275-
ENSMUST00000143025	ENSMUST00000126627	uc009euf.1
ENSMUST00000135399	mouselincRNA1097-	NR_030675
AK082454	ENSMUST00000129502	ENSMUST00000149692
AK013121	AK140706	ENSMUST00000154578
AK048998	AK020824	ENSMUST00000181387
ENSMUST00000153863	AK134910	AK140170
ENSMUST00000143340	ENSMUST00000129502	uc029xdn.1
ENSMUST00000160470	AK140232	uc.64+
ENSMUST00000139607	ENSMUST00000181427	uc007ees.1
AK089653	ENSMUST00000125004	uc.367+
AK045182	NR_040746	ENSMUST00000136537
ENSMUST00000026264	ENSMUST00000143129	ENSMUST00000156701
ENSMUST00000141336	AK039484	ENSMUST00000147045

ENSMUST00000051531	AK142692	humanlincRNA0561-
ENSMUST00000126446	ENSMUST00000140514	ENSMUST00000161580
uc.195-	NR_028263	AK144133
AK020950	AK039484	AK030568
ENSMUST00000181828	AK142692	humanlincRNA0561-
ENSMUST00000155715	AK086566	ENSMUST00000129240
CF616316	ENSMUST00000162149	ENSMUST00000127429
AK043671	ENSMUST00000151468	ENSMUST00000149302
ENSMUST00000137546	AK034976	ENSMUST00000149302
ENSMUST00000123262	ENSMUST00000155728	NR_040420
AK043028	ENSMUST00000163665	ENSMUST00000181830
uc007rvk.1	AK031651	ENSMUST00000149302
ENSMUST00000150545	TCONS_00009802	ENSMUST00000147861
ENSMUST00000125326	ENSMUST00000110954	uc007ssb.1
ENSMUST00000156814	ENSMUST00000123946	AK016924
humanlincRNA1605+	AK039385	AK040434
TCONS_00015184	AK003980	AK039081
uc.481-	ENSMUST00000180630	AK046984
AK143399	ENSMUST00000129374	ENSMUST00000153000
ENSMUST00000176773	humanlincRNA0650-	ENSMUST00000127068
AK133451	ENSMUST00000135601	AK142657
uc009ljz.1	AK079872	TCONS_00034053
uc012coq.1	ENSMUST00000149283	ENSMUST00000145421
ENSMUST00000117697	ENSMUST00000099647	NR_015610
mouselincRNA1098+	TCONS_00015979	NR_045542
AK132438	ENSMUST00000107148	ENSMUST00000169387
ENSMUST00000147329	AK020279	ENSMUST00000140231
ENSMUST00000140602	AK049728	uc.252-
AK016790	ENSMUST00000126846	ENSMUST00000167073
ENSMUST00000161304	ENSMUST00000176131	ENSMUST00000157701
AK139467	ENSMUST00000155761	AK037099
uc029wtn.1	ENSMUST00000129260	uc007txt.1
humanlincRNA1178+	AK079498	AK032419
mouselincRNA1511-	ENSMUST00000127318	uc008eew.1
ENSMUST00000142818	AK081864	ENSMUST00000133365
AK032249	uc007ktl.1	AK041489
ENSMUST00000146327	ENSMUST00000146281	AI390166
AK089789	AK142735	ENSMUST00000176431
NR_027952	ENSMUST00000144696	AK082284
humanlincRNA0043+	ENSMUST00000118575	ENSMUST00000132787
ENSMUST00000145757	uc012fvb.1	ENSMUST00000130038
ENSMUST00000154204	AK144955	AK040345

ENSMUST00000167053	ENSMUST00000136537	AK142890
AK148890	ENSMUST00000159700	AK156102
AK085385	AK048415	uc008elz.1

Supplementary Table 3 primers of genes

Gene name	Forward primer(5'to3')	Reverse primer(5'to3')	RT primer(5'to3')
LncRNA Mbd2-AL1	AACTTGA AATCCCTCCTGTG CT	AGGCTTCAGTTCC AAACACTC	
miR-188-3p	CTCCCACATGCAG GGT	CAGTGC GTGTCGTGGAGT	GTCGTATCCAGTG CGTGTCGTGGAGT CGGCAATTGCACT GGATACGACTGCA AACC
Traf3	TCCAATTCCTAA CCGCACC	GACCTGGGCTTGT AACCTCC	
GAPDH	CAA GGTCATCCATGAC AACTTTG	GTCCACCACCCTG TTGCTG TAG	
U6	CTCGCTTCGGCAG CACA	AACGCT TCACGAATTTGCG T	
mBS1	GGTGGTGTAATAG AATTA GGAAAATAAGT	CTAAAAATATACT ACCAACCCCC	
mBS2	GG TGGTGTAATAGAA TTAGGAAAATAAG T	AAAATATACTAC CAACCC CC	
mBS3	GGTGTAATAGAAT TAGGAAAATAAGT T	AAATCTTC ATCTACCTCCCAA AAA	
mBS4	GGTGTAATAGAAT TAGGAAAATAAGT T	AAAATAAAAATA TACTACCAACCC C	
mBS5	GGTGGTGTA ATAGAATTAGGAA AATAAGT	TAAAAATATACTA CCAACCCCC	

Reagents of primary RGCs isolation

D-lysine (Sigma P6407);

laminin (Sigma L-6274);

Thy1.2 antibody (SIGMA M7898);

papain solution papain solution (Solarbio G8430), 2 mg L-cysteine (Sigma C-2529), 100 μ l 0.4% DNase (Sigma D-4527) in 10 ml DPBS);

Lo Ovomucoid (including 600 mg BSA, 600 mg Trypsin inhibitor (ROCHE 4693159001) in 40 ml DPBS);

Rabbit anti-mouse microphage antibody (Accurate chemical AIA31240);

panning buffer (Add 2 ml DPBS/0.2% BSA to 18 ml DPBS. Add 200 μ l insulin and 120 μ g

N-acetyl cysteine and 10ul Neurobasal);

RGC growth media (mainly containing Pen/Strep, insulin, sodium pyruvate, T3, L-glutamine, B27, BDNF, CNTF, Forskolin and bFGF, etc.)

Positive cells analysis in retina sections and whole-mount

For quantification, 10 randomly selected fields were observed in each section to count the TUNEL positive RGCs normalized to total nuclei in ganglion cell layer, 4 central retina slices were analyzed per animal. We quantified the number of cells in the ganglion cell layer (GCL) (in a blinded manner). The Statistician did not know the grouping condition of these retina samples. Images of retinal whole mounts were photographed from 2 different regions at the distance of 1 and 2 mm to the disc of each quadrant of the retina using a microscope of LEICA DMI3000B equipped with fluorescence illumination (Weztlar, Germany). Images were captured at a 20-fold magnification. Mean count of survival RGCs normalized to MBD2-WT/Sham group in 4 different groups. 8 regions were captured per retina for analyzing.