Figure S1

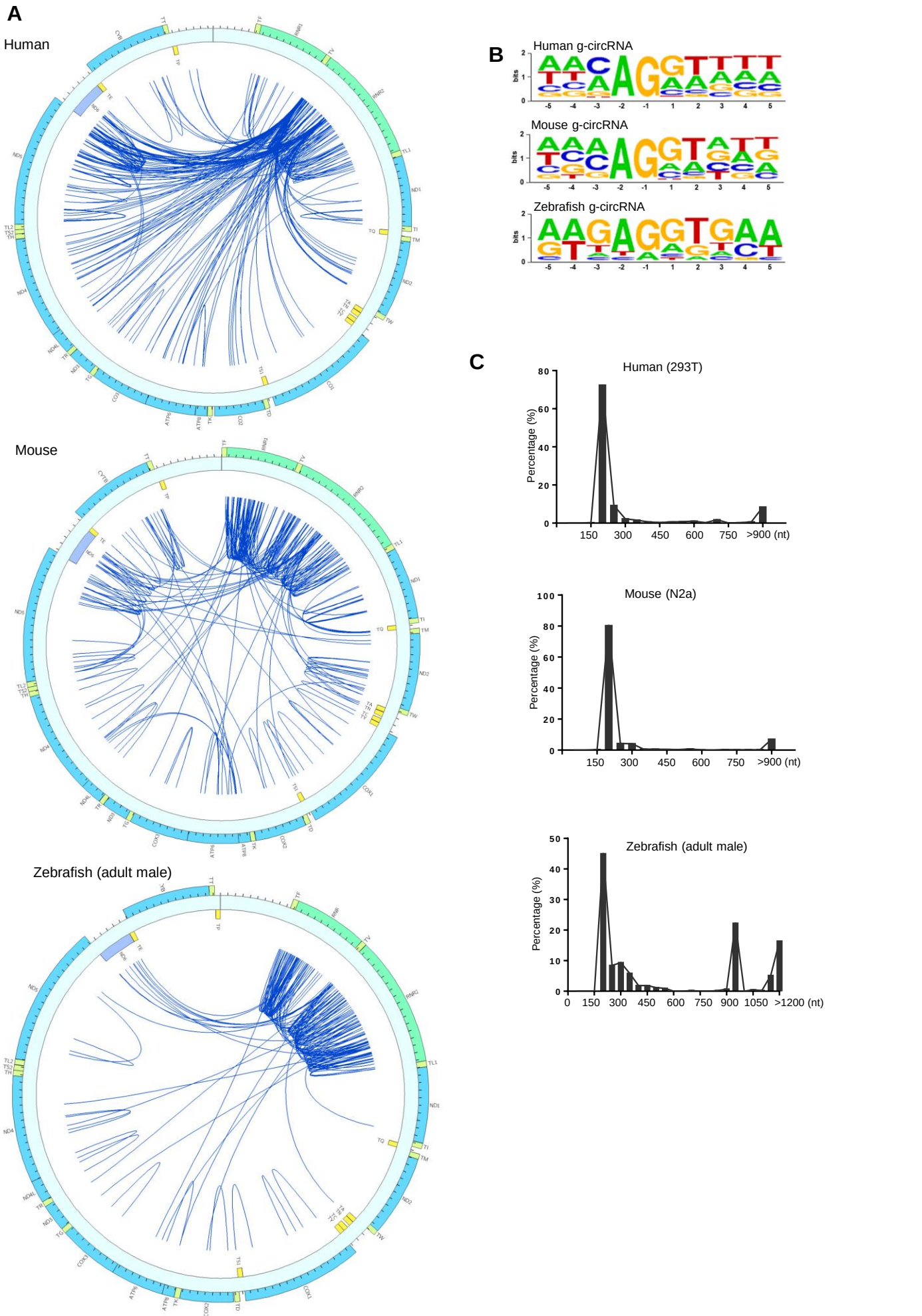

A
Human
Mouse
Zebrafish (adult male)
B
Human g-circRNA
Mouse g-circRNA
Zebrafish g-circRNA
bits
C
Human (293T)
Mouse (N2a)
Zebrafish (adult male)
Percentage (%)
150 300 450 600 750 >900 (nt)
0 150 300 450 600 750 900 1050 >1200 (nt)

Figure S2

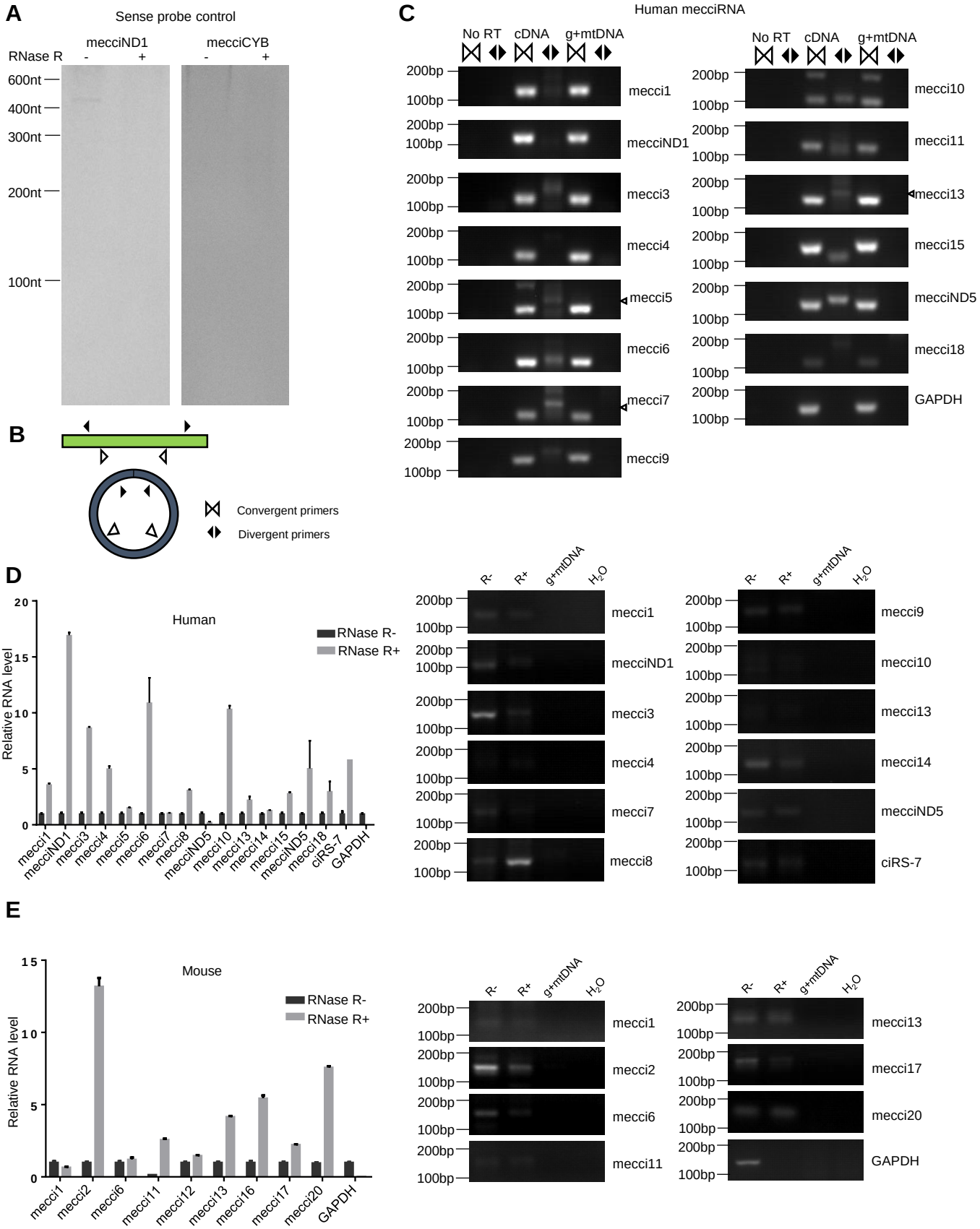

A
Sense probe control
mecciND1
mecciCYB
RNase R
-
+
-
+
600nt
400nt
300nt
200nt
100nt
B
Convergent primers
Divergent primers
C
Human mecciRNA
No RT
cDNA
g+mtDNA
200bp
100bp
mecci1
mecciND1
mecci3
mecci4
mecci5
mecci6
mecci7
mecci9
mecci10
mecci11
mecci13
mecci15
mecciND5
mecci18
GAPDH
D
Human
RNase R-
RNase R+
Relative RNA level
20
15
10
5
0
mecci1
mecciND1
mecci3
mecci4
mecci5
mecci6
mecci7
mecci8
mecciND5
mecci10
mecci13
mecci14
mecci15
mecciND5
mecci18
ciRS-7
GAPDH
R-
R+
g+mtDNA
H2O
mecci1
mecciND1
mecci3
mecci4
mecci7
mecci8
mecci9
mecci10
mecci13
mecci14
mecciND5
ciRS-7
E
Mouse
RNase R-
RNase R+
Relative RNA level
15
10
5
0
mecci1
mecci2
mecci6
mecci11
mecci12
mecci13
mecci16
mecci17
mecci20
GAPDH
R-
R+
g+mtDNA
H2O
mecci1
mecci2
mecci6
mecci11
mecci13
mecci17
mecci20
GAPDH

Figure S3

A

Sample	chrM reads	mecciRNA junction reads
Nuc-DNA	158025	0
Mt-DNA	34676	0

B

Sample	Circular RNA analysis		Linear RNA analysis					
	g-circRNA number	mecciRNA number	total reads	mt-mRNA reads				
				mt-Cytb	mt-Nd5	mt-Co3	mt-Co1	mt-Nd1
wt MEF (SRR6824985)	5991	9	113207764	276097	203321	255401	595868	334556
Rho0 MEF (SRR6824988)	6619	0	111377076	0	0	0	0	0

C

Nascent circRNA identified from Nature Methods, 2018 (HeLa cell)		
	circRNA number	circRNA total reads
g-circRNA	5794	6948
mecciRNA	405	1110

D

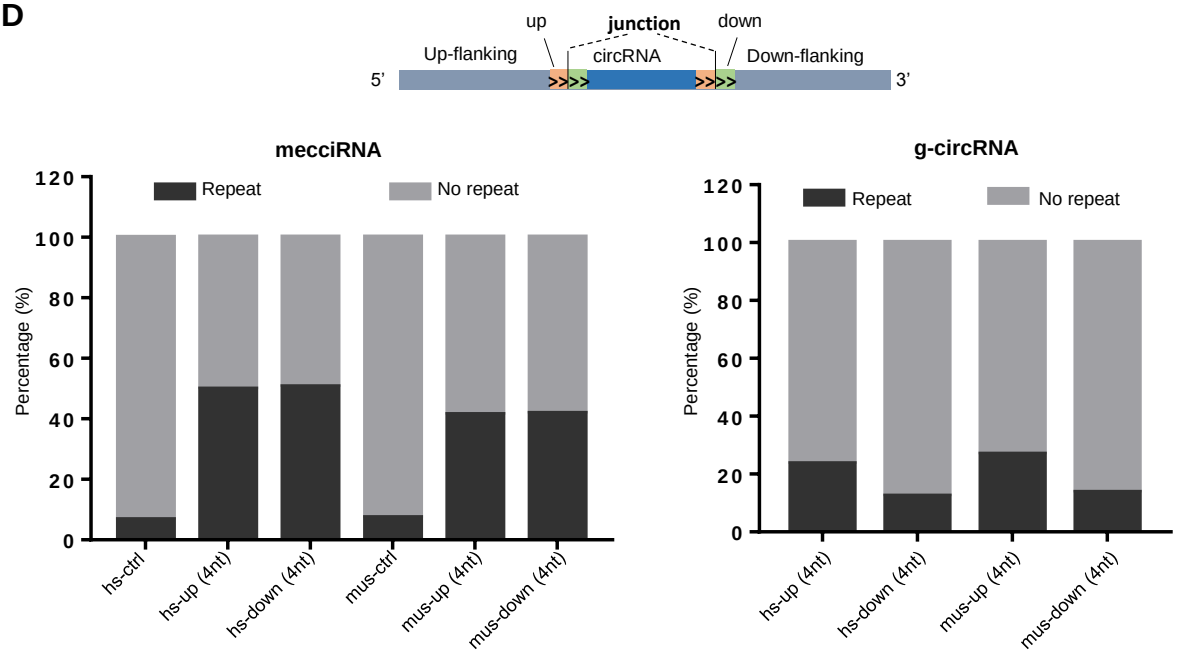


Figure S4

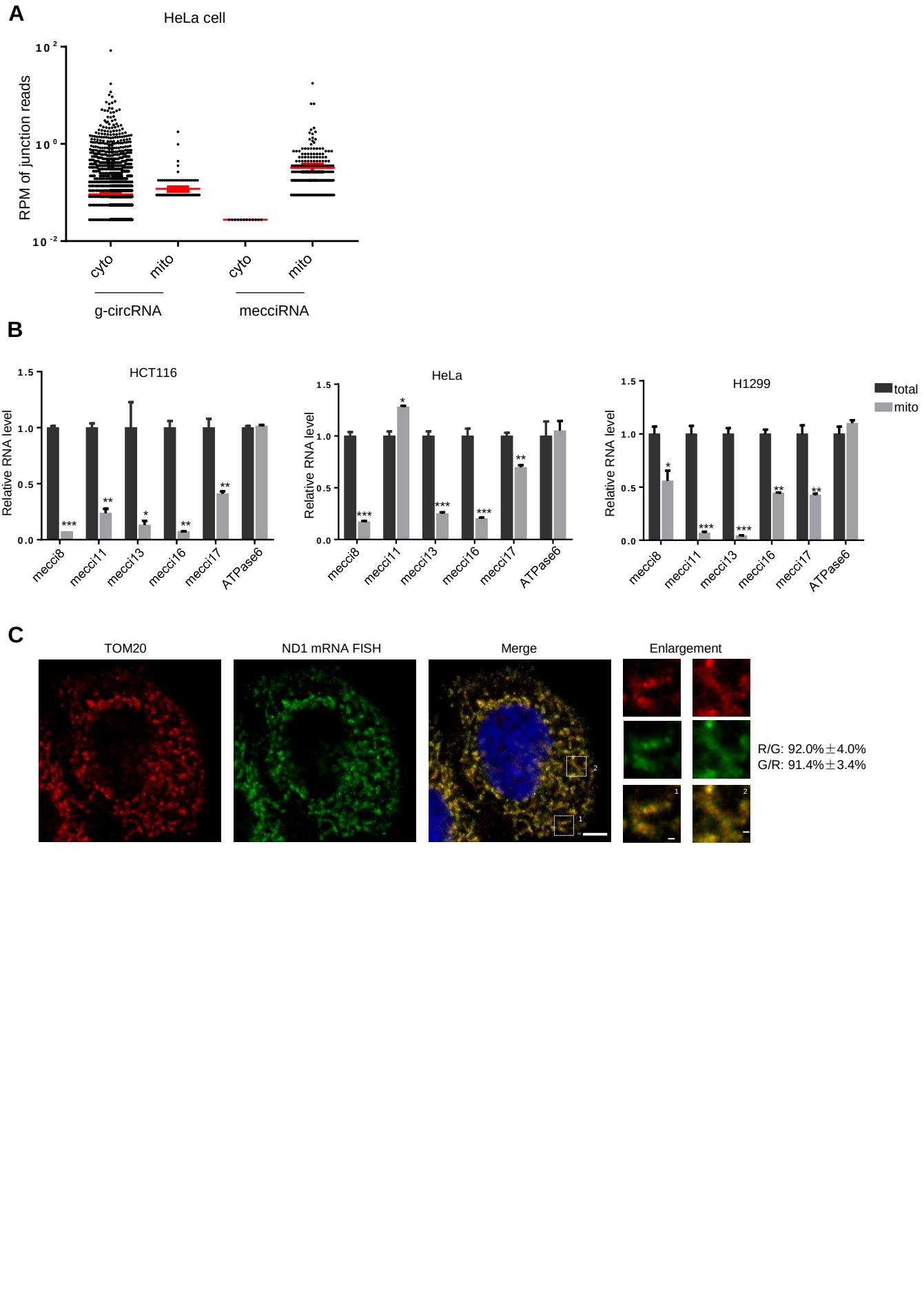

A
HeLa cell
RPM of junction reads
cyto
mito
cyto
mito
g-circRNA
mecciRNA
B
HCT116
HeLa
H1299
Relative RNA level
total
mito
mecci8
mecci11
mecci13
mecci16
mecci17
ATPase6
C
TOM20
ND1 mRNA FISH
Merge
Enlargement
R/G: 92.0%±4.0%
G/R: 91.4%±3.4%

Figure S5

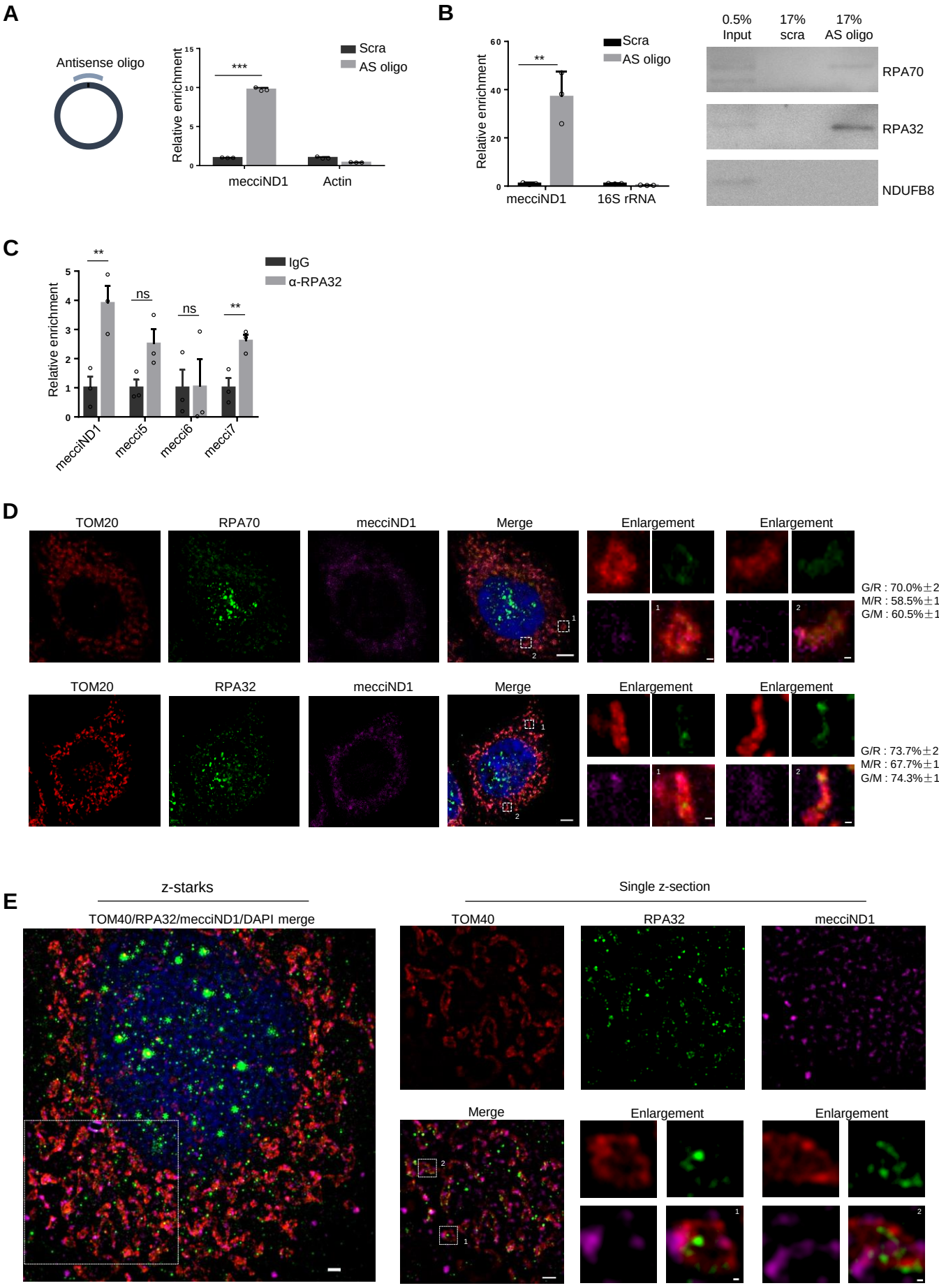

A
Antisense oligo
Relative enrichment
Scra
AS oligo
***
mecciND1
Actin
B
Relative enrichment
Scra
AS oligo
**
mecciND1
16S rRNA
0.5% Input
17% scra
17% AS oligo
RPA70
RPA32
NDUFB8
C
Relative enrichment
IgG
α-RPA32
**
ns
ns
**
mecciND1
mecci5
mecci6
mecci7
D
TOM20
RPA70
mecciND1
Merge
Enlargement
Enlargement
G/R : 70.0%±27.4%
M/R : 58.5%±17.6%
G/M : 60.5%±12.7%
TOM20
RPA32
mecciND1
Merge
Enlargement
Enlargement
G/R : 73.7%±27.7%
M/R : 67.7%±16.0%
G/M : 74.3%±18.3%
E
z-starks
TOM40/RPA32/mecciND1/DAPI merge
Single z-section
TOM40
RPA32
mecciND1
Merge
Enlargement
Enlargement

Figure S6

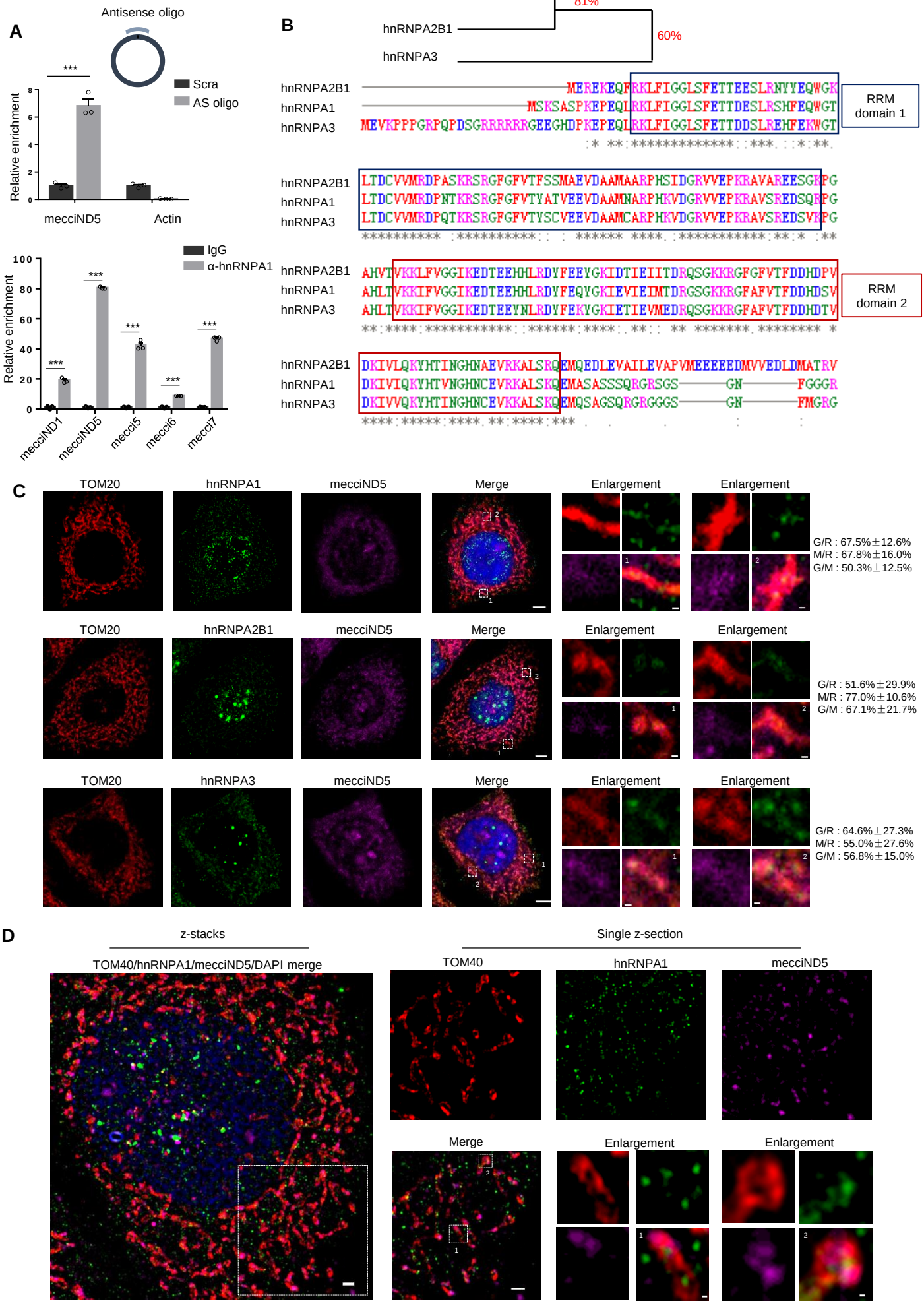

A
Antisense oligo
Scra
AS oligo
***
Relative enrichment
mecciND5
Actin
IgG
α-hnRNPA1
mecciND1
mecciND5
mecci5
mecci6
mecci7
B
hnRNPA1
hnRNPA2B1
hnRNPA3
81%
60%
RRM domain 1
RRM domain 2
C
TOM20
hnRNPA1
mecciND5
Merge
Enlargement
G/R : 67.5%±12.6%
M/R : 67.8%±16.0%
G/M : 50.3%±12.5%
hnRNPA2B1
G/R : 51.6%±29.9%
M/R : 77.0%±10.6%
G/M : 67.1%±21.7%
hnRNPA3
G/R : 64.6%±27.3%
M/R : 55.0%±27.6%
G/M : 56.8%±15.0%
D
z-stacks
Single z-section
TOM40/hnRNPA1/mecciND5/DAPI merge
TOM40
hnRNPA1
mecciND5
Merge
Enlargement

Figure S7

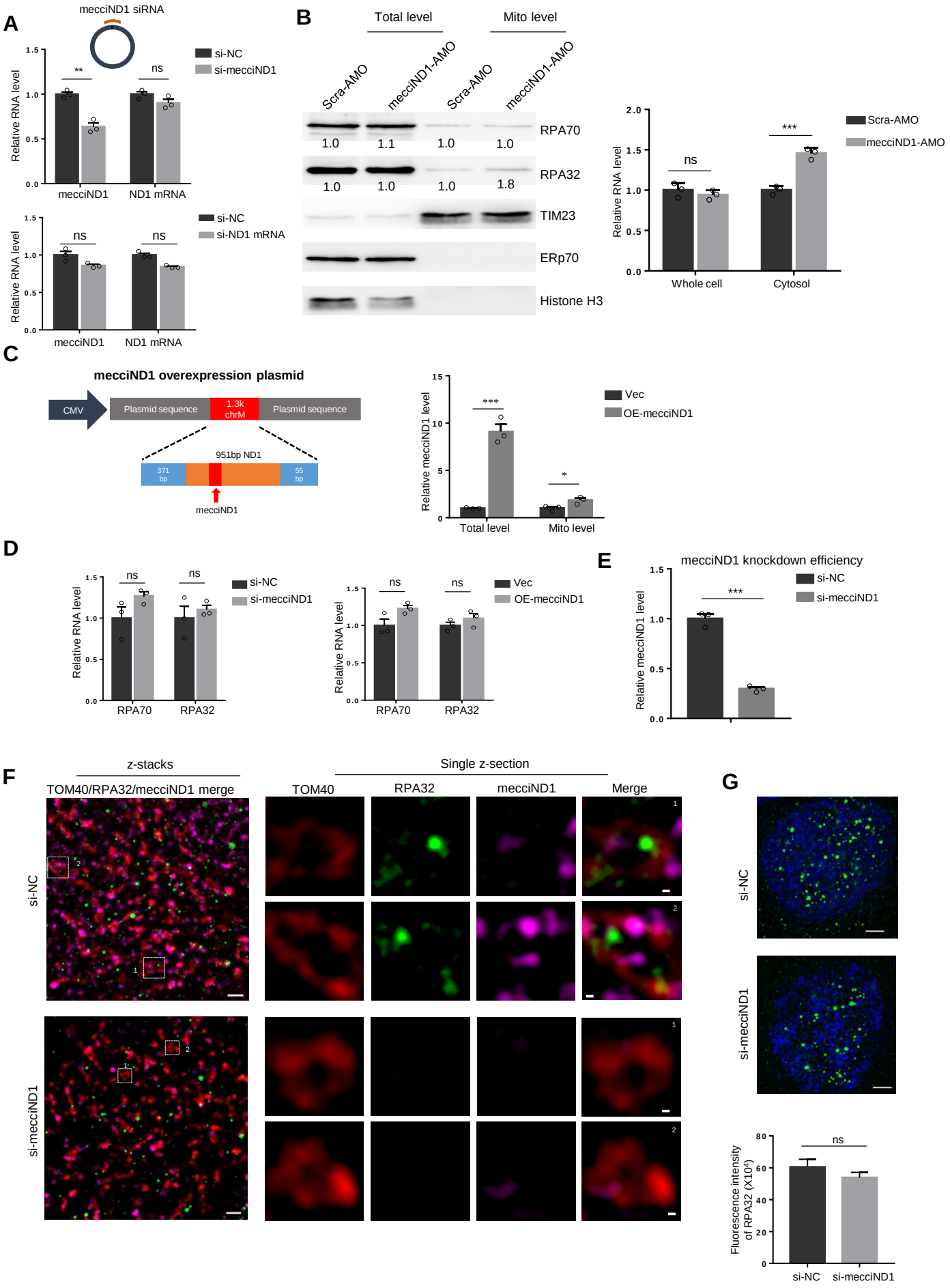

A
mecciND1 siRNA
si-NC
si-mecciND1
Relative RNA level
mecciND1
ND1 mRNA
si-ND1 mRNA
B
Total level
Mito level
Scra-AMO
mecciND1-AMO
RPA70
RPA32
TIM23
ERp70
Histone H3
Whole cell
Cytosol
C
mecciND1 overexpression plasmid
CMV
Plasmid sequence
1.3k chrM
951bp ND1
371 bp
55 bp
Vec
OE-mecciND1
Relative mecciND1 level
D
E
mecciND1 knockdown efficiency
F
z-stacks
Single z-section
TOM40/RPA32/mecciND1 merge
TOM40
RPA32
mecciND1
Merge
G
Fluorescence intensity of RPA32 (X10⁴)

Figure S8

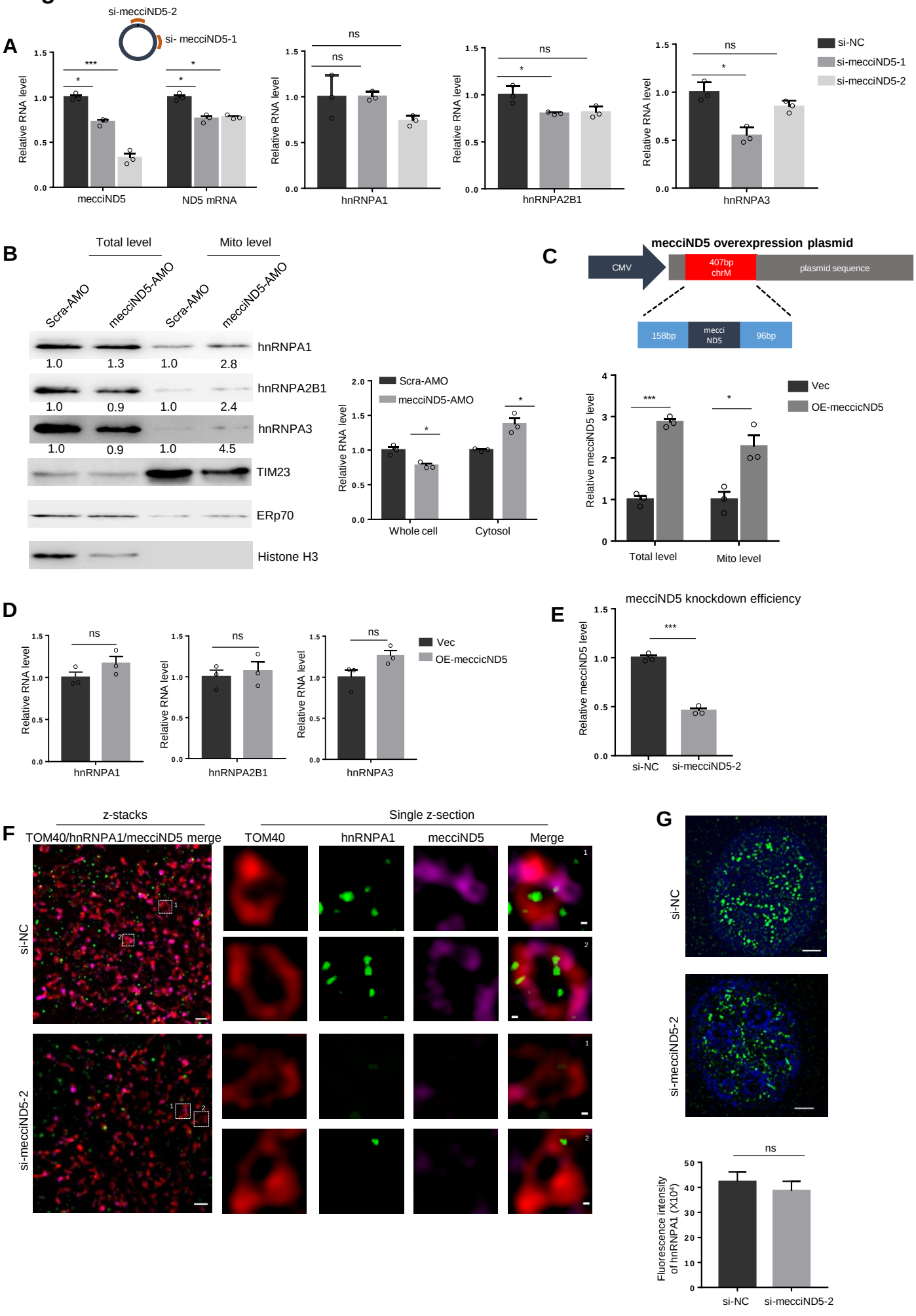
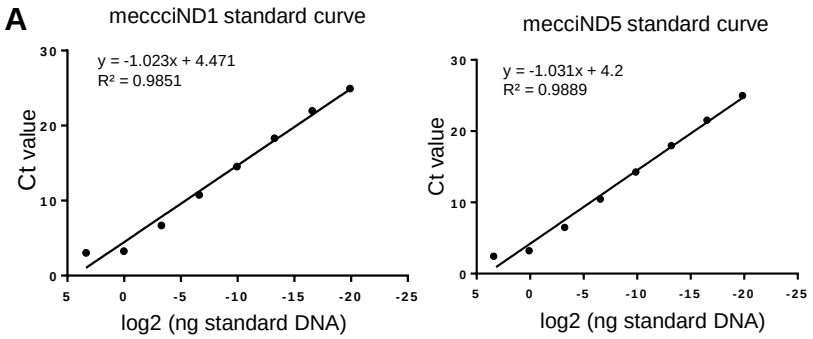
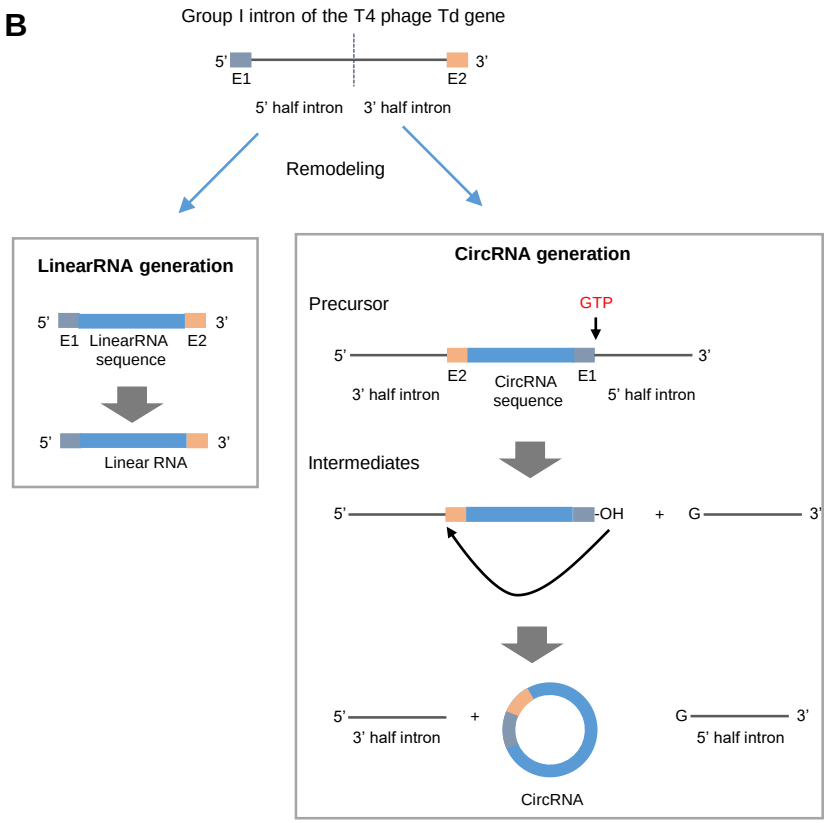
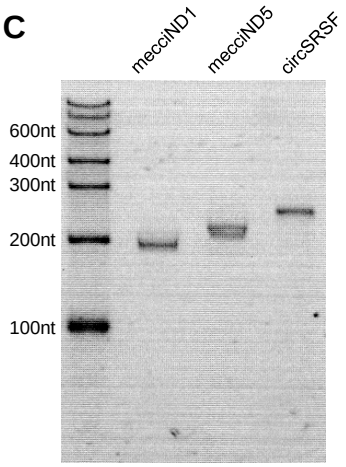

A
si-mecciND5-2
si- mecciND5-1
Relative RNA level
mecciND5
ND5 mRNA
hnRNPA1
hnRNPA2B1
hnRNPA3
si-NC
si-mecciND5-1
si-mecciND5-2
B
Total level
Mito level
Scra-AMO
mecciND5-AMO
hnRNPA1
hnRNPA2B1
hnRNPA3
TIM23
ERp70
Histone H3
Whole cell
Cytosol
C
mecciND5 overexpression plasmid
CMV
407bp chrM
plasmid sequence
158bp
mecci ND5
96bp
Vec
OE-mecciND5
Relative mecciND5 level
Total level
Mito level
D
E
mecciND5 knockdown efficiency
F
z-stacks
Single z-section
TOM40/hnRNPA1/mecciND5 merge
TOM40
hnRNPA1
mecciND5
Merge
G
Fluorescence intensity of hnRNPA1 (X10⁴)

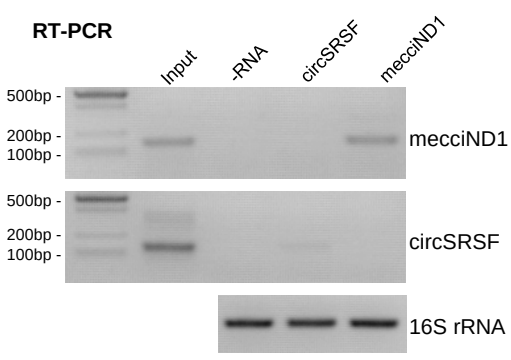
Figure S9

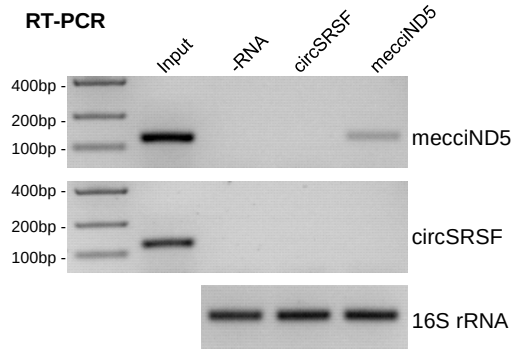


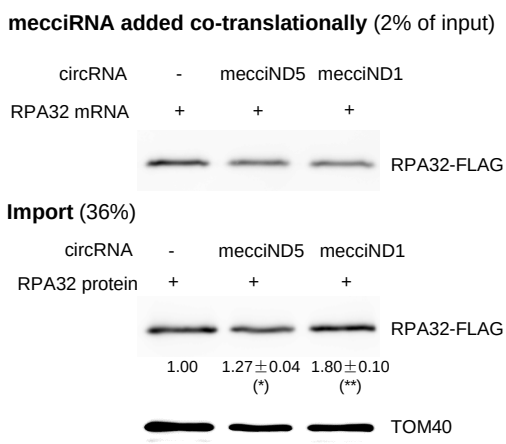
RNA copy number per cell				
	293T	**HeLa**	**RPE-1**	**HepG2**
mecciND1	~74	~61	~52	~109
mecciND5	~195	~330	~118	~222

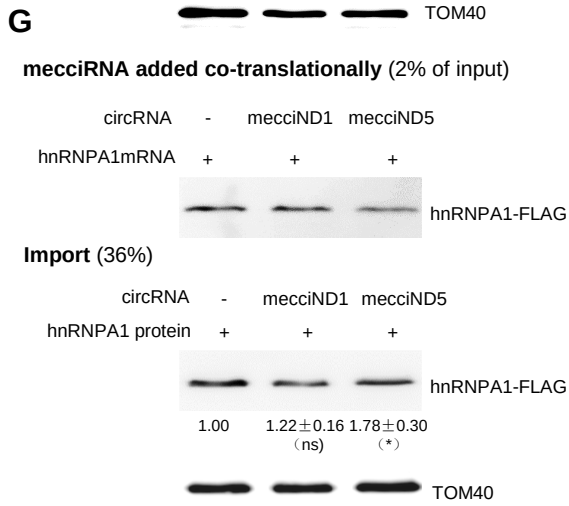












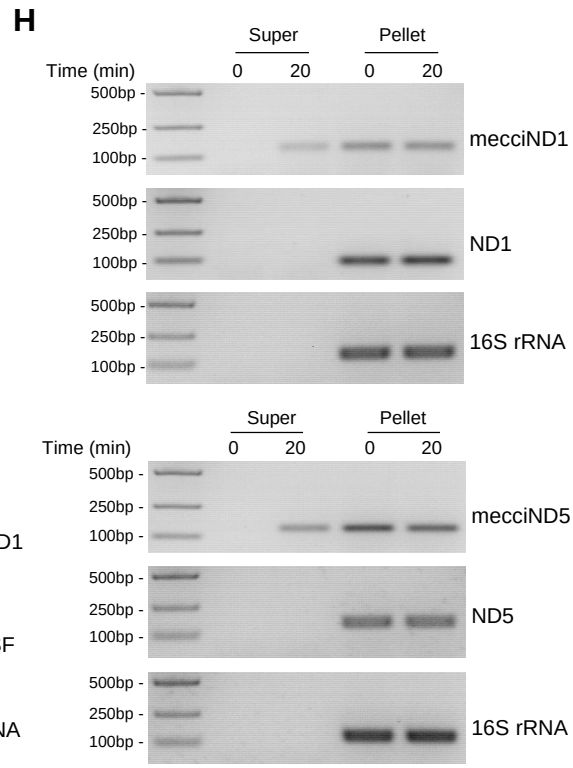


Figure S10

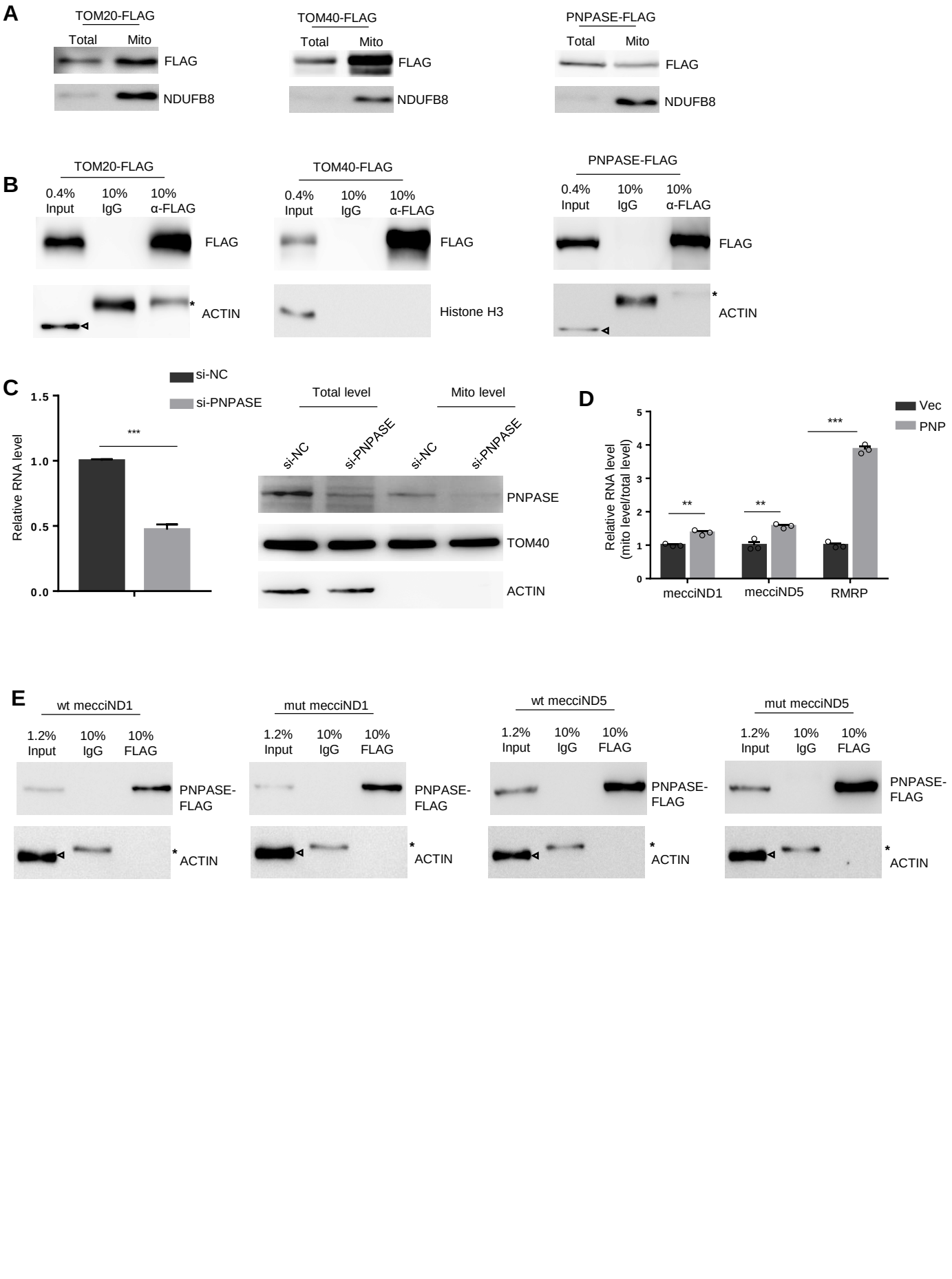
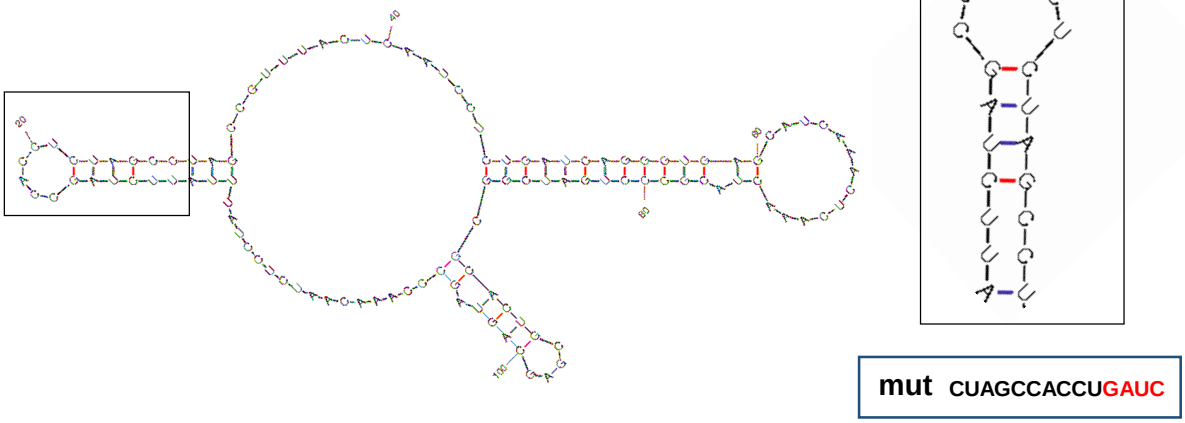
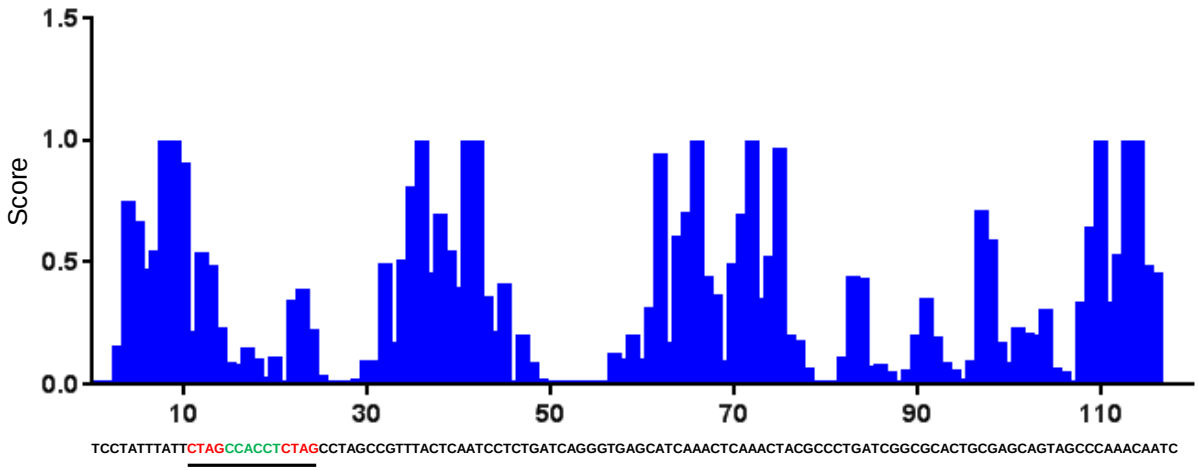

A
TOM20-FLAG
Total
Mito
FLAG
NDUFB8
TOM40-FLAG
Total
Mito
FLAG
NDUFB8
PNPASE-FLAG
Total
Mito
FLAG
NDUFB8
B
TOM20-FLAG
0.4% Input
10% IgG
10% α-FLAG
FLAG
ACTIN
TOM40-FLAG
0.4% Input
10% IgG
10% α-FLAG
FLAG
Histone H3
PNPASE-FLAG
0.4% Input
10% IgG
10% α-FLAG
FLAG
ACTIN
C
si-NC
si-PNPASE
Relative RNA level
1.5
1.0
0.5
0.0
***
Total level
Mito level
si-NC
si-PNPASE
si-NC
si-PNPASE
PNPASE
TOM40
ACTIN
D
Vec
PNP
Relative RNA level (mito level/total level)
5
4
3
2
1
0
**
**
***
mecciND1
mecciND5
RMRP
E
wt mecciND1
1.2% Input
10% IgG
10% FLAG
PNPASE-FLAG
ACTIN
mut mecciND1
1.2% Input
10% IgG
10% FLAG
PNPASE-FLAG
ACTIN
wt mecciND5
1.2% Input
10% IgG
10% FLAG
PNPASE-FLAG
ACTIN
mut mecciND5
1.2% Input
10% IgG
10% FLAG
PNPASE-FLAG
ACTIN

Figure S11

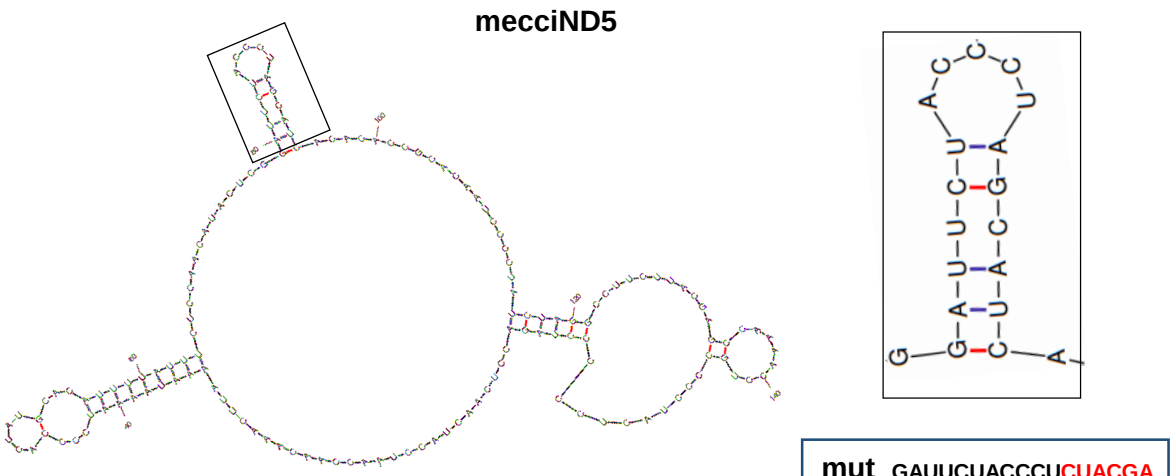
A



B



C



D

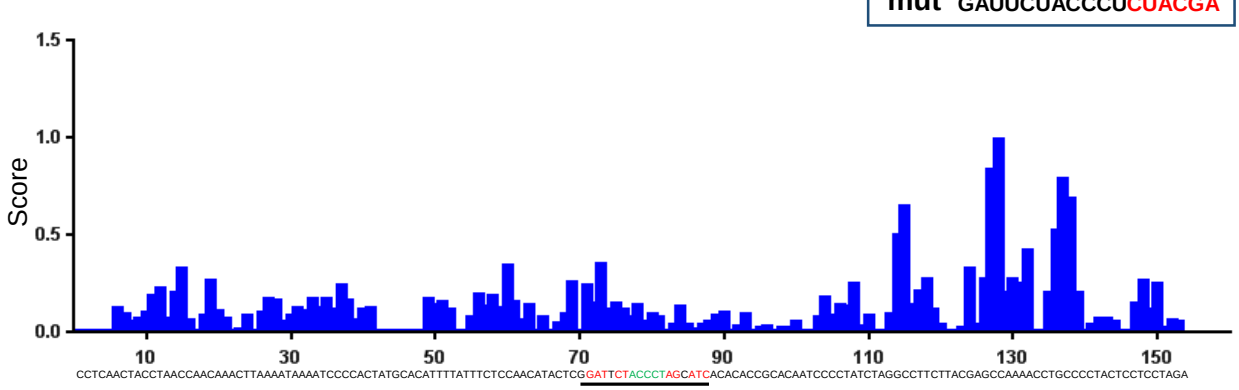
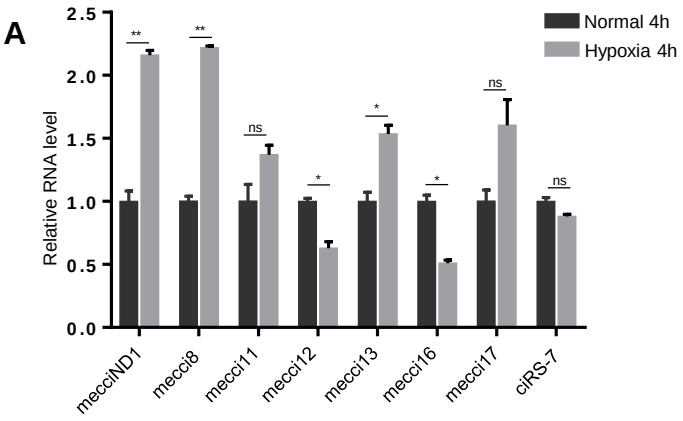
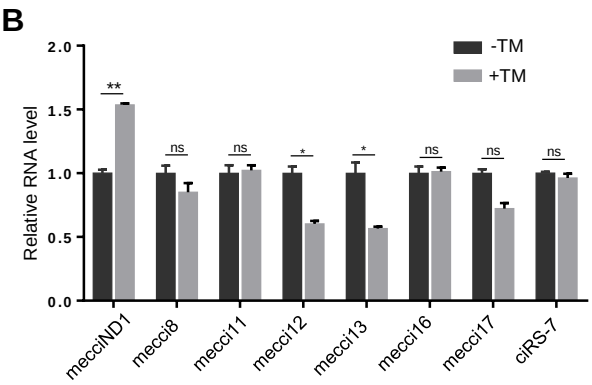
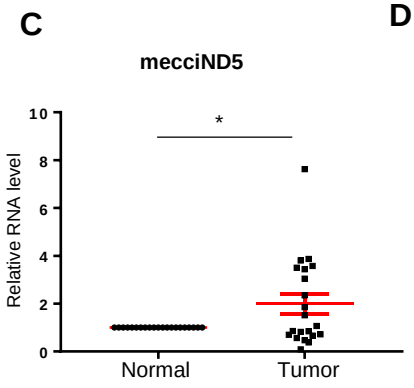
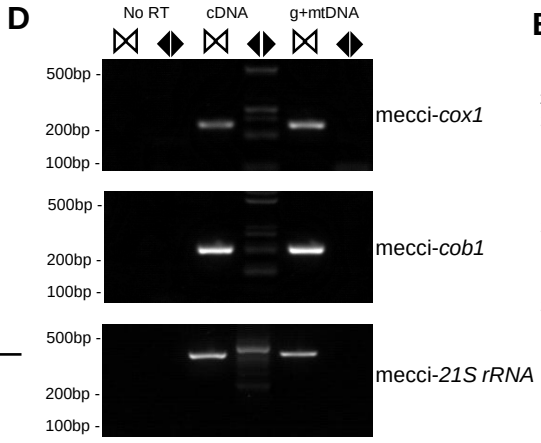


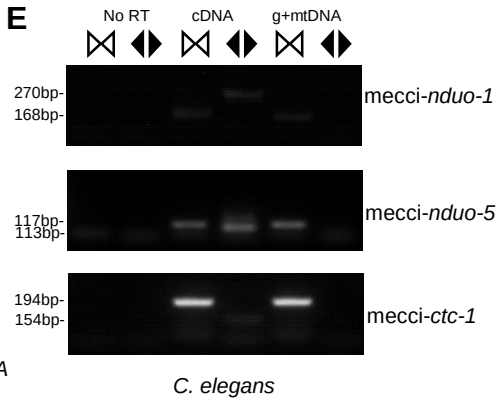
Figure S12

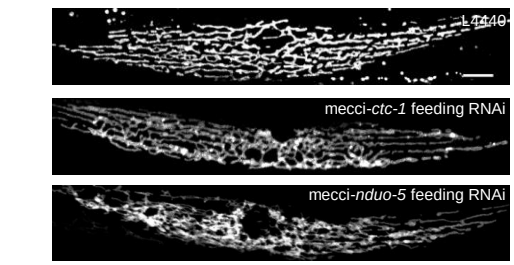

A
Normal 4h
Hypoxia 4h
Relative RNA level
mecciND1
mecci8
mecci11
mecci12
mecci13
mecci16
mecci17
ciRS-7


B
-TM
+TM
Relative RNA level
mecciND1
mecci8
mecci11
mecci12
mecci13
mecci16
mecci17
ciRS-7


C
mecciND5
Relative RNA level
Normal
Tumor


D
No RT
cDNA
g+mtDNA
mecci-cox1
mecci-cob1
mecci-21S rRNA
S. pombe


E
No RT
cDNA
g+mtDNA
mecci-nduo-1
mecci-nduo-5
mecci-ctc-1
C. elegans


F
L4440
mecci-ctc-1 feeding RNAi
mecci-nduo-5 feeding RNAi

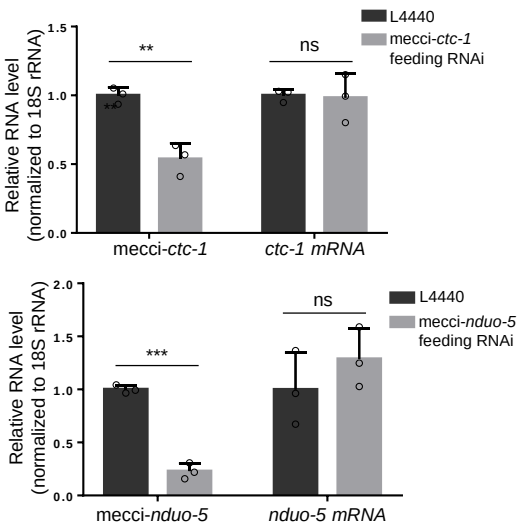

L4440
mecci-ctc-1 feeding RNAi
Relative RNA level (normalized to 18S rRNA)
mecci-ctc-1
ctc-1 mRNA
L4440
mecci-nduo-5 feeding RNAi
mecci-nduo-5
nduo-5 mRNA

Table S1

human-hg19

#chrom	start	stop	strand	gene
chrM	694	1847	H	RNR1,RNR2
chrM	754	1174	H	RNR1
chrM	817	1920	H	RNR1,RNR2
chrM	822	2020	L	RNR1,RNR2
chrM	844	1924	H	RNR1,RNR2
chrM	844	11507	H	RNR1,ND4
chrM	932	2150	L	RNR1,RNR2
chrM	981	1195	H	RNR1
chrM	1316	1496	H	RNR1
chrM	1679	1834	H	RNR2,RNR2
chrM	1679	2763	H	RNR2
chrM	1679	4198	H	RNR2,ND1
chrM	1679	4875	H	RNR2,ND2
chrM	1679	5349	H	RNR2,ND2
chrM	1679	8830	H	RNR2,ATP6
chrM	1679	8899	H	RNR2,ATP6
chrM	1679	9522	H	RNR2,COX3
chrM	1679	10350	H	RNR2,ND3
chrM	1679	10769	H	RNR2,ND4
chrM	1679	11409	H	RNR2,ND4
chrM	1679	11744	H	RNR2,ND4
chrM	1679	11858	H	RNR2,ND4
chrM	1679	12098	H	RNR2,ND4
chrM	1679	12505	H	RNR2,ND5
chrM	1679	13306	H	RNR2,ND5
chrM	1679	13554	H	RNR2,ND5
chrM	1679	13640	H	RNR2,ND5
chrM	1679	13978	H	RNR2,ND5
chrM	1679	14131	H	RNR2,ND5
chrM	1679	14137	H	RNR2,ND5
chrM	1679	14150	H	RNR2,ND6
chrM	1679	14385	H	RNR2,ND6
chrM	1679	14529	H	RNR2,ND6
chrM	1679	15647	H	RNR2,CYTB
chrM	1683	6330	L	RNR2,COX1
chrM	1691	1847	H	RNR2
chrM	1691	1896	H	RNR2
chrM	1691	1998	H	RNR2
chrM	1691	2795	H	RNR2
chrM	1691	5360	H	RNR2,ND2
chrM	1691	7127	H	RNR2,COX1
chrM	1691	7826	H	RNR2,COX2
chrM	1691	9159	H	RNR2,ATP6
chrM	1691	10752	H	RNR2,ND4L
chrM	1691	13846	H	RNR2,ND5
chrM	1691	13984	H	RNR2,ND5
chrM	1691	14049	H	RNR2,ND5
chrM	1691	14150	H	RNR2,ND6
chrM	1691	14373	H	RNR2,ND6
chrM	1691	15491	H	RNR2,CYTB
chrM	1691	16288	H	RNR2
chrM	1695	3263	H	RNR2

chrM	1695	4992	H	RNR2,ND2
chrM	1695	12562	H	RNR2,ND5
chrM	1695	14377	H	RNR2,ND6
chrM	1700	2781	H	RNR2
chrM	1700	5100	H	RNR2,ND2
chrM	1700	5369	H	RNR2,ND2
chrM	1700	6557	H	RNR2,COX1
chrM	1700	8472	H	RNR2,ATP8
chrM	1700	9427	H	RNR2,COX3
chrM	1700	10100	H	RNR2,ND3
chrM	1700	10631	H	RNR2,ND4L
chrM	1700	11146	H	RNR2,ND4
chrM	1700	11304	H	RNR2,ND4
chrM	1700	11584	H	RNR2,ND4
chrM	1700	11942	H	RNR2,ND4
chrM	1700	12394	H	RNR2,ND5
chrM	1700	12465	H	RNR2,ND5
chrM	1700	12709	H	RNR2,ND5
chrM	1700	12918	H	RNR2,ND5
chrM	1700	13654	H	RNR2,ND5
chrM	1700	13963	H	RNR2,ND5
chrM	1700	13993	H	RNR2,ND5
chrM	1700	14055	H	RNR2,ND5
chrM	1700	14125	H	RNR2,ND5
chrM	1700	15411	H	RNR2,CYTB
chrM	1708	1924	H	RNR2
chrM	1708	5349	H	RNR2,ND2
chrM	1708	13588	H	RNR2,ND5
chrM	1708	14377	H	RNR2,ND6
chrM	1716	1920	H	RNR2
chrM	1716	3846	H	RNR2,ND1
chrM	1716	7982	H	RNR2,COX2
chrM	1716	10631	H	RNR2,ND4L
chrM	1716	13384	H	RNR2,ND5
chrM	1716	13468	H	RNR2,ND5
chrM	1716	13640	H	RNR2,ND5
chrM	1716	14150	H	RNR2,ND6
chrM	1721	3173	L	RNR2
chrM	1727	1896	H	RNR2
chrM	1727	1934	H	RNR2
chrM	1727	1998	H	RNR2
chrM	1734	1924	H	RNR2
chrM	1749	1983	L	RNR2
chrM	1756	2594	L	RNR2
chrM	1766	1934	H	RNR2
chrM	1766	2007	H	RNR2
chrM	1766	6603	H	RNR2,COX1
chrM	1778	2594	L	RNR2
chrM	1784	7697	L	RNR2,COX2
chrM	1787	2093	H	RNR2
chrM	1787	7700	H	RNR2,COX2
chrM	1793	2346	L	RNR2
chrM	1799	2150	L	RNR2
chrM	1799	2455	L	RNR2

chrM	1828	2346	L	RNR2
chrM	1839	1998	H	RNR2
chrM	1839	2342	H	RNR2
chrM	1877	2138	H	RNR2
chrM	1983	2141	L	RNR2
chrM	1998	2485	H	RNR2
chrM	1998	2841	H	RNR2
chrM	2002	11603	H	RNR2,ND4
chrM	2065	2778	L	RNR2
chrM	2149	2455	L	RNR2
chrM	2166	16151	H	RNR2
chrM	2203	7479	L	RNR2,COX1
chrM	2211	2422	L	RNR2
chrM	2211	13019	L	RNR2,ND5
chrM	2211	13634	L	RNR2,ND5
chrM	2217	11584	H	RNR2,ND4
chrM	2217	13640	H	RNR2,ND5
chrM	2219	2515	H	RNR2
chrM	2219	4168	H	RNR2,ND1
chrM	2219	5104	H	RNR2,ND2
chrM	2219	5349	H	RNR2,ND2
chrM	2219	7945	H	RNR2,COX2
chrM	2219	14017	H	RNR2,ND5
chrM	2219	14067	H	RNR2,ND5
chrM	2219	14131	H	RNR2,ND5
chrM	2219	14421	H	RNR2,ND6
chrM	2219	16151	H	RNR2
chrM	2223	5154	H	RNR2,ND2
chrM	2223	8441	H	RNR2,ATP8
chrM	2223	8818	H	RNR2,ATP6
chrM	2223	10095	H	RNR2,ND3
chrM	2223	12973	H	RNR2,ND5
chrM	2223	14134	H	RNR2,ND5
chrM	2226	2387	H	RNR2
chrM	2226	4260	H	RNR2,ND1
chrM	2226	5349	H	RNR2,ND2
chrM	2226	8822	H	RNR2,ATP6
chrM	2226	9190	H	RNR2,ATP6
chrM	2226	9427	H	RNR2,COX3
chrM	2226	9857	H	RNR2,COX3
chrM	2226	10629	H	RNR2,ND4L
chrM	2226	10763	H	RNR2,ND4
chrM	2226	10853	H	RNR2,ND4
chrM	2226	11409	H	RNR2,ND4
chrM	2226	11603	H	RNR2,ND4
chrM	2226	11744	H	RNR2,ND4
chrM	2226	11972	H	RNR2,ND4
chrM	2226	13306	H	RNR2,ND5
chrM	2226	13384	H	RNR2,ND5
chrM	2226	13584	H	RNR2,ND5
chrM	2226	13588	H	RNR2,ND5
chrM	2226	13792	H	RNR2,ND5
chrM	2226	13855	H	RNR2,ND5
chrM	2226	14024	H	RNR2,ND5

chrM	2226	14125	H	RNR2,ND5	
chrM	2226	14137	H	RNR2,ND5	
chrM	2226	14377	H	RNR2,ND6	
chrM	2226	14394	H	RNR2,ND6	
chrM	2226	14493	H	RNR2,ND6	
chrM	2242	2795	H	RNR2	
chrM	2242	9184	H	RNR2,ATP6	
chrM	2242	13162	H	RNR2,ND5	
chrM	2242	13978	H	RNR2,ND5	
chrM	2242	14150	H	RNR2,ND6	
chrM	2242	15665	H	RNR2,CYTB	
chrM	2242	16288	H	RNR2	
chrM	2249	3149	H	RNR2	
chrM	2249	10308	H	RNR2,ND3	
chrM	2249	11808	H	RNR2,ND4	
chrM	2249	14150	H	RNR2,ND6	
chrM	2249	14529	H	RNR2,ND6	
chrM	2254	3058	H	RNR2	
chrM	2254	5135	H	RNR2,ND2	
chrM	2254	7906	H	RNR2,COX2	
chrM	2254	11298	H	RNR2,ND4	
chrM	2263	2955	H	RNR2	
chrM	2263	5168	H	RNR2,ND2	
chrM	2263	9043	H	RNR2,ATP6	
chrM	2263	10137	H	RNR2,ND3	
chrM	2263	12709	H	RNR2,ND5	
chrM	2263	13306	H	RNR2,ND5	
chrM	2263	13627	H	RNR2,ND5	
chrM	2273	13561	H	RNR2,ND5	
chrM	2284	14024	H	RNR2,ND5	
chrM	2284	14067	H	RNR2,ND5	
chrM	2294	2455	L	RNR2	
chrM	2324	4926	H	RNR2,ND2	
chrM	2391	14377	H	RNR2,ND6	
chrM	2398	11323	H	RNR2,ND4	
chrM	2402	10308	H	RNR2,ND3	
chrM	2405	14198	L	RNR2,ND6	
chrM	2415	9190	H	RNR2,ATP6	
chrM	2437	2594	L	RNR2	
chrM	2455	3230	L	RNR2	
chrM	2503	2857	H	RNR2	
chrM	2515	3187	H	RNR2	
chrM	2585	2841	H	RNR2	
chrM	2626	2795	H	RNR2	
chrM	2644	3117	H	RNR2	
chrM	2778	3055	L	RNR2	
chrM	2823	2987	H	RNR2	
chrM	2913	3121	H	RNR2	
chrM	2929	13571	H	RNR2,ND5	
chrM	2987	3149	H	RNR2	
chrM	3307	8830	H	ND1,ATP6	
chrM	3534	3846	H	ND1	
chrM	3597	3740	H	ND1	mecciND1
chrM	4012	4198	H	ND1	

chrM	4023	4192	H	ND1	
chrM	8468	8625	H	ATP8,ATP6	
chrM	8472	8625	H	ATP8,ATP6	
chrM	9786	9954	H	RNR2,COX3	
chrM	10091	10241	H	ND3	
chrM	10752	14131	H	ND4L,ND5	
chrM	10924	14092	H	ND4,ND5	
chrM	12360	12564	H	ND5	
chrM	12369	12573	H	ND5	
chrM	12375	12564	H	ND5	
chrM	12558	14529	H	ND5,ND6	
chrM	12832	12988	H	ND5	
chrM	13297	13449	H	ND5	
chrM	13301	13453	H	ND5	
chrM	13306	13468	H	ND5	
chrM	13678	14125	H	ND5	
chrM	13792	13999	H	ND5	
chrM	13792	14024	H	ND5	
chrM	13846	13999	H	ND5	mecciND5
chrM	13846	14067	H	ND5	
chrM	13846	14413	H	ND5,ND6	
chrM	13855	14125	H	ND5	
chrM	13855	14277	H	ND5,ND6	
chrM	13855	14421	H	ND5,ND6	
chrM	13886	14055	H	ND5	
chrM	13978	14150	H	ND5,ND6	
chrM	14004	14277	H	ND5,ND6	
chrM	14024	14217	H	ND5,ND6	
chrM	14055	14377	H	ND5,ND6	
chrM	14067	14350	H	ND5,ND6	
chrM	14067	14413	H	ND5,ND6	
chrM	14135	14377	H	ND5,ND6	
chrM	14921	15491	H	CYTB	
chrM	15491	15740	H	CYTB	

mouse-mm9

#chrom	start	stop	strand	gene
chrM	67	1878	H	mt-Rnr1,mt-Rnr2
chrM	73	710	L	mt-Rnr1
chrM	73	745	L	mt-Rnr1
chrM	73	1415	L	mt-Rnr1,mt-Rnr2
chrM	73	2029	L	mt-Rnr1,mt-Rnr2
chrM	103	292	L	mt-Rnr1
chrM	103	296	L	mt-Rnr1
chrM	103	354	L	mt-Rnr1
chrM	103	406	L	mt-Rnr1
chrM	103	710	L	mt-Rnr1
chrM	103	1409	L	mt-Rnr1,mt-Rnr2
chrM	103	1415	L	mt-Rnr1,mt-Rnr2
chrM	103	2312	L	mt-Rnr1,mt-Rnr2
chrM	115	2606	H	mt-Rnr1,mt-Rnr2
chrM	123	284	H	mt-Rnr1
chrM	123	523	H	mt-Rnr1
chrM	123	1730	H	mt-Rnr1,mt-Rnr2
chrM	123	6817	H	mt-Rnr1,COX1
chrM	123	11599	H	mt-Rnr1
chrM	123	13985	H	mt-Rnr1,ND6
chrM	133	523	H	mt-Rnr1
chrM	171	1409	L	mt-Rnr1,mt-Rnr2
chrM	176	2649	L	mt-Rnr1,mt-Rnr2
chrM	185	718	L	mt-Rnr1
chrM	206	505	H	mt-Rnr1
chrM	208	427	H	mt-Rnr1
chrM	208	475	H	mt-Rnr1
chrM	208	505	H	mt-Rnr1
chrM	208	662	H	mt-Rnr1
chrM	208	1266	H	mt-Rnr1,mt-Rnr2
chrM	208	1481	H	mt-Rnr1,mt-Rnr2
chrM	217	2649	L	mt-Rnr1,mt-Rnr2
chrM	221	427	H	mt-Rnr1
chrM	221	487	H	mt-Rnr1
chrM	221	2592	H	mt-Rnr1,mt-Rnr2
chrM	221	11158	H	mt-Rnr1,ND4
chrM	223	505	H	mt-Rnr1
chrM	223	574	H	mt-Rnr1
chrM	223	12710	H	mt-Rnr1,ND5
chrM	223	14732	H	mt-Rnr1,CYTB
chrM	229	13392	H	mt-Rnr1,ND5
chrM	234	13775	H	mt-Rnr1,ND6
chrM	255	718	L	mt-Rnr1
chrM	263	523	H	mt-Rnr1
chrM	263	581	H	mt-Rnr1
chrM	278	718	L	mt-Rnr1
chrM	278	1996	L	mt-Rnr1,mt-Rnr2
chrM	316	505	H	mt-Rnr1
chrM	316	622	H	mt-Rnr1
chrM	316	1378	H	mt-Rnr1,mt-Rnr2
chrM	316	1432	H	mt-Rnr1,mt-Rnr2
chrM	327	1443	H	mt-Rnr1,mt-Rnr2

chrM	334	523	H	mt-Rnr1
chrM	334	627	H	mt-Rnr1
chrM	334	646	H	mt-Rnr1
chrM	334	1686	H	mt-Rnr1,mt-Rnr2
chrM	340	546	H	mt-Rnr1
chrM	340	5527	H	mt-Rnr1,COX1
chrM	369	523	H	mt-Rnr1
chrM	369	15125	H	mt-Rnr1,CYTB
chrM	386	745	L	mt-Rnr1
chrM	386	2495	L	mt-Rnr1,mt-Rnr2
chrM	424	750	L	mt-Rnr1
chrM	427	646	H	mt-Rnr1
chrM	427	648	H	mt-Rnr1
chrM	427	702	H	mt-Rnr1
chrM	427	1094	H	mt-Rnr1
chrM	427	1288	H	mt-Rnr1,mt-Rnr2
chrM	427	1350	H	mt-Rnr1,mt-Rnr2
chrM	427	1686	H	mt-Rnr1,mt-Rnr2
chrM	427	2120	H	mt-Rnr1,mt-Rnr2
chrM	427	2172	H	mt-Rnr1,mt-Rnr2
chrM	427	2209	H	mt-Rnr1,mt-Rnr2
chrM	427	2294	H	mt-Rnr1,mt-Rnr2
chrM	427	2427	H	mt-Rnr1,mt-Rnr2
chrM	427	2606	H	mt-Rnr1,mt-Rnr2
chrM	427	5969	H	mt-Rnr1,COX1
chrM	427	12920	H	mt-Rnr1,ND5
chrM	427	13058	H	mt-Rnr1,ND5
chrM	433	627	H	mt-Rnr1
chrM	441	627	H	mt-Rnr1
chrM	441	648	H	mt-Rnr1
chrM	468	2100	H	mt-Rnr1,mt-Rnr2
chrM	473	1378	H	mt-Rnr1,mt-Rnr2
chrM	482	646	H	mt-Rnr1
chrM	482	836	H	mt-Rnr1
chrM	497	750	L	mt-Rnr1
chrM	497	850	L	mt-Rnr1
chrM	497	3907	L	mt-Rnr1
chrM	501	652	H	mt-Rnr1
chrM	523	702	H	mt-Rnr1
chrM	523	1562	H	mt-Rnr1,mt-Rnr2
chrM	523	2209	H	mt-Rnr1,mt-Rnr2
chrM	523	2632	H	mt-Rnr1,mt-Rnr2
chrM	523	13889	H	mt-Rnr1,ND6
chrM	547	1273	H	mt-Rnr1,mt-Rnr2
chrM	565	1292	H	mt-Rnr1,mt-Rnr2
chrM	568	718	L	mt-Rnr1
chrM	582	828	H	mt-Rnr1
chrM	588	756	L	mt-Rnr1
chrM	591	1909	H	mt-Rnr1,mt-Rnr2
chrM	618	1415	L	mt-Rnr1,mt-Rnr2
chrM	618	14568	L	mt-Rnr1,CYTB
chrM	642	2592	H	mt-Rnr1,mt-Rnr2
chrM	642	13916	H	mt-Rnr1,ND6
chrM	652	1350	H	mt-Rnr1,mt-Rnr2

chrM	652	2093	H	mt-Rnr1,mt-Rnr2
chrM	652	3825	H	mt-Rnr1
chrM	652	12131	H	mt-Rnr1,ND5
chrM	652	14741	H	mt-Rnr1,CYTB
chrM	657	1783	H	mt-Rnr1,mt-Rnr2
chrM	657	12136	H	mt-Rnr1,ND5
chrM	710	984	L	mt-Rnr1
chrM	710	992	L	mt-Rnr1
chrM	719	1243	L	mt-Rnr1,mt-Rnr2
chrM	737	1198	H	mt-Rnr1,mt-Rnr2
chrM	737	1266	H	mt-Rnr1,mt-Rnr2
chrM	737	5969	H	mt-Rnr1,COX1
chrM	750	981	L	mt-Rnr1
chrM	750	984	L	mt-Rnr1
chrM	750	1409	L	mt-Rnr1,mt-Rnr2
chrM	756	992	L	mt-Rnr1
chrM	756	1028	L	mt-Rnr1
chrM	756	2455	L	mt-Rnr1,mt-Rnr2
chrM	841	1996	L	mt-Rnr1,mt-Rnr2
chrM	870	1376	L	mt-Rnr1,mt-Rnr2
chrM	1095	11259	H	mt-Rnr2,ND4
chrM	1104	1269	L	mt-Rnr2
chrM	1104	1436	L	mt-Rnr2
chrM	1110	5927	L	mt-Rnr2,COX1
chrM	1116	1350	H	mt-Rnr2
chrM	1132	1322	H	mt-Rnr2
chrM	1213	1378	H	mt-Rnr2
chrM	1213	1878	H	mt-Rnr2
chrM	1219	1409	L	mt-Rnr2
chrM	1219	2021	L	mt-Rnr2
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chrM	1266	2209	H	mt-Rnr2
chrM	1266	13916	H	mt-Rnr2,ND6
chrM	1266	13979	H	mt-Rnr2,ND6
chrM	1266	15151	H	mt-Rnr2,CYTB
chrM	1266	15418	H	mt-Rnr2
chrM	1273	1562	H	mt-Rnr2
chrM	1273	10492	H	mt-Rnr2,ND4
chrM	1301	1562	H	mt-Rnr2
chrM	1322	1964	L	mt-Rnr2
chrM	1322	14286	L	mt-Rnr2,CYTB
chrM	1330	1562	H	mt-Rnr2
chrM	1330	1682	H	mt-Rnr2
chrM	1330	12710	H	mt-Rnr2,ND5
chrM	1330	14479	H	mt-Rnr2,CYTB
chrM	1330	15418	H	mt-Rnr2
chrM	1338	1562	H	mt-Rnr2
chrM	1358	1562	H	mt-Rnr2
chrM	1413	2649	L	mt-Rnr2

chrM	1415	1570	L	mt-Rnr2
chrM	1429	1682	H	mt-Rnr2
chrM	1429	1686	H	mt-Rnr2
chrM	1451	1682	H	mt-Rnr2
chrM	1451	1686	H	mt-Rnr2
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chrM	1533	2248	L	mt-Rnr2
chrM	1541	2029	L	mt-Rnr2
chrM	1562	2100	H	mt-Rnr2
chrM	1562	10234	H	mt-Rnr2,ND4
chrM	1622	1844	H	mt-Rnr2
chrM	1622	2592	H	mt-Rnr2
chrM	1677	11441	H	mt-Rnr2,ND4
chrM	1692	2544	H	mt-Rnr2
chrM	1793	2294	H	mt-Rnr2
chrM	1817	2029	L	mt-Rnr2
chrM	1844	2089	H	mt-Rnr2
chrM	1844	4126	H	mt-Rnr2,ND2
chrM	1844	5718	H	mt-Rnr2,COX1
chrM	1844	12606	H	mt-Rnr2,ND5
chrM	1844	13259	H	mt-Rnr2,ND5
chrM	1844	13438	H	mt-Rnr2,ND5
chrM	1844	13464	H	mt-Rnr2,ND5
chrM	1844	13775	H	mt-Rnr2,ND6
chrM	1844	13916	H	mt-Rnr2,ND6
chrM	1863	2135	H	mt-Rnr2
chrM	1863	6305	H	mt-Rnr2,COX1
chrM	1863	13370	H	mt-Rnr2,ND5
chrM	1863	15151	H	mt-Rnr2,CYTB
chrM	1868	2135	H	mt-Rnr2
chrM	1868	4882	H	mt-Rnr2,ND2
chrM	1868	15137	H	mt-Rnr2,CYTB
chrM	1870	2120	H	mt-Rnr2
chrM	1870	2135	H	mt-Rnr2
chrM	1870	3833	H	mt-Rnr2
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chrM	1889	2083	L	mt-Rnr2
chrM	1910	3625	H	mt-Rnr2,ND1
chrM	1919	2209	H	mt-Rnr2
chrM	1925	2135	H	mt-Rnr2
chrM	1925	2164	H	mt-Rnr2
chrM	1925	3635	H	mt-Rnr2,ND1
chrM	1950	2294	H	mt-Rnr2
chrM	1988	2235	L	mt-Rnr2
chrM	1997	2235	L	mt-Rnr2
chrM	2161	2672	L	mt-Rnr2
chrM	2209	2464	H	mt-Rnr2
chrM	2209	2632	H	mt-Rnr2
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chrM	2294	2464	H	mt-Rnr2
chrM	2294	2663	H	mt-Rnr2
chrM	2323	2540	H	mt-Rnr2
chrM	2323	2544	H	mt-Rnr2

chrM	2340	2532	L	mt-Rnr2
chrM	2356	2592	H	mt-Rnr2
chrM	2360	2592	H	mt-Rnr2
chrM	2380	2592	H	mt-Rnr2
chrM	2729	3892	L	ND1
chrM	2934	3233	H	ND1
chrM	2947	12257	H	ND1,ND5
chrM	3009	3179	L	ND1
chrM	3243	3465	H	ND1
chrM	3250	3472	H	ND1
chrM	3253	5969	H	ND1,COX1
chrM	3504	13556	H	ND1,ND5
chrM	3911	4143	H	ND2
chrM	3943	13689	H	ND2,ND6
chrM	4363	4525	H	ND2
chrM	4368	4525	H	ND2
chrM	4504	4657	H	ND2
chrM	4525	4780	H	ND2
chrM	4568	4769	H	ND2
chrM	4623	4856	H	ND2
chrM	4732	13773	H	ND2,ND6
chrM	4780	4947	H	ND2
chrM	4857	14044	H	ND2,ND6
chrM	5694	5888	L	COX1
chrM	5759	5954	H	COX1
chrM	5759	5969	H	COX1
chrM	5824	6026	H	COX1
chrM	11429	13259	H	ND4,ND5
chrM	11441	11599	H	ND4
chrM	11441	15062	H	ND4,CYTB
chrM	11758	13773	H	ND5,ND6
chrM	11758	15220	H	ND5,CYTB
chrM	11816	13514	H	ND5
chrM	11816	15403	H	ND5
chrM	11841	12727	H	ND5
chrM	11848	12020	H	ND5
chrM	11854	14989	H	ND5,CYTB
chrM	12074	12311	H	ND5
chrM	13082	13370	H	ND5
chrM	13423	13773	H	ND5,ND6
chrM	13689	13979	H	ND6
chrM	13689	15211	H	ND6,CYTB
chrM	13715	13916	H	ND6
chrM	13715	13985	H	ND6
chrM	13875	14141	H	ND6
chrM	13916	14141	H	ND6
chrM	13916	15272	H	ND6,CYTB
chrM	14311	14779	H	CYTB
chrM	14316	14624	L	CYTB
chrM	14588	14741	H	CYTB
chrM	14835	15012	L	CYTB
chrM	14900	15070	H	CYTB
chrM	14916	15070	H	CYTB
chrM	15070	15220	H	CYTB

fish-danRer11

#chrom	start	stop	strand	gene
chrM	1020	1351	H	mt-rnr1
chrM	1037	2043	H	mt-rnr1
chrM	1055	2253	H	mt-rnr1,mt-rnr2
chrM	1073	1307	L	mt-rnr1
chrM	1094	1357	H	mt-rnr1
chrM	1119	1351	H	mt-rnr1
chrM	1122	1709	L	mt-rnr1
chrM	1125	3117	L	mt-rnr1,mt-rnr2
chrM	1128	1317	L	mt-rnr1
chrM	1128	1577	L	mt-rnr1
chrM	1128	1703	L	mt-rnr1
chrM	1128	2320	L	mt-rnr1,mt-rnr2
chrM	1128	2658	L	mt-rnr1,mt-rnr2
chrM	1158	1357	H	mt-rnr1
chrM	1169	2464	L	mt-rnr1,mt-rnr2
chrM	1173	9418	H	mt-rnr1,ATP6
chrM	1198	3348	H	mt-rnr1,mt-rnr2
chrM	1202	2410	H	mt-rnr1,mt-rnr2
chrM	1222	1544	H	mt-rnr1
chrM	1236	1397	L	mt-rnr1
chrM	1242	1577	L	mt-rnr1
chrM	1256	1575	H	mt-rnr1
chrM	1269	1544	H	mt-rnr1
chrM	1280	1605	H	mt-rnr1
chrM	1285	1577	L	mt-rnr1
chrM	1304	1544	H	mt-rnr1
chrM	1347	1544	H	mt-rnr1
chrM	1347	1565	H	mt-rnr1
chrM	1347	2772	H	mt-rnr1,mt-rnr2
chrM	1358	1605	H	mt-rnr1
chrM	1366	1605	H	mt-rnr1
chrM	1374	1577	L	mt-rnr1
chrM	1381	1550	L	mt-rnr1
chrM	1381	1641	L	mt-rnr1
chrM	1383	1641	L	mt-rnr1
chrM	1383	3445	L	mt-rnr1,mt-rnr2
chrM	1401	2529	L	mt-rnr1,mt-rnr2
chrM	1416	3250	H	mt-rnr1,mt-rnr2
chrM	1422	1575	H	mt-rnr1
chrM	1422	1605	H	mt-rnr1
chrM	1444	1785	H	mt-rnr1
chrM	1462	15195	H	mt-rnr1,ND6
chrM	1485	14745	H	mt-rnr1,ND6
chrM	1515	3356	H	mt-rnr1,mt-rnr2
chrM	1605	1824	H	mt-rnr1
chrM	1605	3266	H	mt-rnr1,mt-rnr2
chrM	1637	1870	H	mt-rnr1
chrM	1672	2300	L	mt-rnr1,mt-rnr2
chrM	2068	2320	L	mt-rnr2
chrM	2074	3642	H	mt-rnr2
chrM	2091	2246	H	mt-rnr2
chrM	2091	2295	H	mt-rnr2

chrM	2091	2410	H	mt-rnr2
chrM	2091	14755	H	mt-rnr2,ND6
chrM	2102	2295	H	mt-rnr2
chrM	2102	3306	H	mt-rnr2
chrM	2102	3329	H	mt-rnr2
chrM	2102	3699	H	mt-rnr2
chrM	2102	6166	H	mt-rnr2
chrM	2102	8993	H	mt-rnr2,ATP8
chrM	2102	10863	H	mt-rnr2,ND3
chrM	2102	14318	H	mt-rnr2,ND5
chrM	2102	15051	H	mt-rnr2,ND6
chrM	2102	15102	H	mt-rnr2,ND6
chrM	2112	15132	H	mt-rnr2,ND6
chrM	2116	2951	H	mt-rnr2
chrM	2121	2295	H	mt-rnr2
chrM	2147	2410	H	mt-rnr2
chrM	2149	3253	L	mt-rnr2
chrM	2167	2525	L	mt-rnr2
chrM	2215	2410	H	mt-rnr2
chrM	2215	2567	H	mt-rnr2
chrM	2215	3119	H	mt-rnr2
chrM	2215	3590	H	mt-rnr2
chrM	2215	14871	H	mt-rnr2,ND6
chrM	2253	2567	H	mt-rnr2
chrM	2253	3190	H	mt-rnr2
chrM	2253	3272	H	mt-rnr2
chrM	2301	2529	L	mt-rnr2
chrM	2349	2857	H	mt-rnr2
chrM	2360	2633	H	mt-rnr2
chrM	2387	2658	L	mt-rnr2
chrM	2419	2678	H	mt-rnr2
chrM	2419	2767	H	mt-rnr2
chrM	2455	2753	L	mt-rnr2
chrM	2455	3022	L	mt-rnr2
chrM	2460	2658	L	mt-rnr2
chrM	2468	2714	H	mt-rnr2
chrM	2470	2775	H	mt-rnr2
chrM	2500	2767	H	mt-rnr2
chrM	2500	8524	H	mt-rnr2,COX2
chrM	2602	2767	H	mt-rnr2
chrM	2633	2916	H	mt-rnr2
chrM	2633	2951	H	mt-rnr2
chrM	2633	11910	H	mt-rnr2,ND4
chrM	2696	3110	H	mt-rnr2
chrM	2767	2935	H	mt-rnr2
chrM	2767	3190	H	mt-rnr2
chrM	2809	3266	H	mt-rnr2
chrM	2823	3350	H	mt-rnr2
chrM	2823	9303	H	mt-rnr2,ATP6
chrM	2872	4699	H	mt-rnr2,ND1
chrM	2877	14964	L	mt-rnr2,ND6
chrM	2887	3306	H	mt-rnr2
chrM	2917	3087	H	mt-rnr2
chrM	2945	3350	H	mt-rnr2

chrM	2996	3241	L	mt-rnr2
chrM	2999	3204	L	mt-rnr2
chrM	2999	3500	L	mt-rnr2
chrM	3068	3437	H	mt-rnr2
chrM	3105	3329	H	mt-rnr2
chrM	3187	3463	L	mt-rnr2
chrM	3189	3366	H	mt-rnr2
chrM	3204	10586	L	mt-rnr2
chrM	3288	3472	H	mt-rnr2
chrM	3288	3544	H	mt-rnr2
chrM	3291	3494	H	mt-rnr2
chrM	3303	12276	H	mt-rnr2,ND4
chrM	3306	3472	H	mt-rnr2
chrM	3306	15036	H	mt-rnr2,ND6
chrM	3355	3557	L	mt-rnr2
chrM	3366	3553	H	mt-rnr2
chrM	3366	3598	H	mt-rnr2
chrM	3444	3723	L	mt-rnr2
chrM	3457	3699	H	mt-rnr2
chrM	3457	3727	H	mt-rnr2
chrM	3469	3727	H	mt-rnr2
chrM	6554	6829	H	COX1
chrM	6966	7122	H	COX1
chrM	7750	8039	H	COX1
chrM	8172	8474	H	COX2
chrM	8993	9222	H	ATP8,ATP6
chrM	10086	10332	H	COX3
chrM	11083	11335	H	ND4L,ND4
chrM	11259	11432	H	ND4L,ND4
chrM	11785	12080	L	ND4
chrM	11836	12055	H	ND4
chrM	13127	14215	H	ND5
chrM	13186	13398	H	ND5

Table S2

MecciND1 pulldown band 1 (~30 KD)						
Hits	Protein Mass	No. of Peptide	Sequence	Link	Relative Abundance	Probability
1	36596.35	1	>sp|P01857|IGHG1_HUMAN Ig gamma-1 chain C region OS=Homo sapiens GN=IGHG1	P01857	1.1%	98.3%
2	29342.48	6	>sp|P15927|RFA2_HUMAN Replication protein A 32 kDa subunit OS=Homo	P15927	98.6%	97.8%
MecciND1 pulldown band 2 (~70 KD)						
Hits	Protein Mass	No. of Peptide	Sequence	Link	Relative Abundance	Probability
1	71317.36	2	>sp|P02768|ALBU_HUMAN Serum albumin OS=Homo	P02768	2.6%	90.3%
2	68722.53	8	>sp|P27694|RFA1_HUMAN Replication protein A 70 kDa DNA-binding subunit OS=Homo	P27694	97.0%	99.0%
MecciND5 pulldown bands (~35 KD)						
Hits	Protein Mass	No. of Peptide	Sequence	Link	Relative Abundance	Probability
1	35936.89	2	>sp|P40926|MDHM_HUMAN Malate dehydrogenase, mitochondrial OS=Homo	P40926	1.5%	83.2%
2	37463.7	2	2_HUMAN Heterogeneous nuclear ribonucleoproteins A2/B1 OS=Homo sapiens	P22626	1.6%	99.0%
3	39798.6	4	3_HUMAN Heterogeneous nuclear ribonucleoprotein A3 OS=Homo sapiens GN=HNRNPA3	P51991	5.7%	86.1%
4	38837.04	13	1_HUMAN Heterogeneous nuclear ribonucleoprotein A1 OS=Homo sapiens GN=HNRNPA1	P09651	90.8%	99.0%

Table S3

Oligos used in this study			
human mecciRNA detection primer			
name	forward primer 5'-3'	reverse primer 5'-3'	
h_con_mecci1	CCAACCCCTTAAACACCCCT	TAGTAATAGGGCAAGGACGC	for human mecciRNA PCR and realtime-PCR
h_div_mecci1	CCGATCCGTCCCTAACAAAC	GAATTGTGTAGGCGAATAGG	
h_con_mecci3	CCTAACCCTGACTTCCCTAA	AGGTGGATGCGACAATGGAT	
h_div_mecci3	CCATTGTCGCATCCACCT	GTTAACGAGGGTGGTAAGGA	
h_con_mecci4	CAAGTATTGACTCACCCATC	GGTGGTCAAGTATTTATGGT	
h_div_mecci4	TACTGCCAGCCACCATGAAT	GAAATACATAGCGGTTGTTG	
h_con_mecci5	CTATTCGCCTACACAATTCTC	AAAGTGATTGGCTTAGTGG	
h_div_mecci5	CCACTAAGCCAATCACTTT	GAGAATTGTGTAGGCGAATAG	
h_con_mecci6	CTAGCCACCTCTAGCCTAGC	GTTTGGGCTACTGCTCGCAG	
h_div_mecci6	GCATCAAACTCAAACTAC	ATCAGAGGATTGAGTAA	
h_con_mecci8	TCCATTGTCGCATCCACCTT	TGGCTCAGTGTCAGTTCGA	
h_div_mecci8	TCGAACTGACACTGAGCCA	AAGGTGGATGCGACAATGGA	
h_con_mecci9	AACAACAACCTATTTAGC	CGTGATAGTGGTTCGCTGG	
h_div_mecci9	CAGGCACATACTTCCTATTC	GCTAAATAGGTTGTTGTTG	
h_con_mecci10	ATAACCCAATACCAAACGCC	TTAGTAGTATAGTGATGCC	
h_div_mecci10	CAGTCCTAGCTGCTGGCATC	AGTAGGACTGCTGTGATTAG	
h_con_mecci11	CTCCAACATACTCGGATTCT	GATTTGGTGCTGTGAAATTG	
h_div_mecci11	CTACTCCTCCTAGACCTAAC	TGTGCGGTGTGTGATGCTAG	
h_con_mecci13	CACCTACTCATGCACCTAAT	GACAGCGATTTCTAGGATAG	
h_div_mecci13	CTATCCTAGAAATCGCTGTC	GAAGATGATAAGTGTAGAGG	
h_con_mecci14	CCTATACTCCCTCTACATAT	AGGAGAATGGGGGATAGGTG	
h_div_mecci14	AACCCTCATTCACACGAGA	TTAATGTGGTGGGTGAGTGAG	
h_con_mecci15	CATGTGCCTAGACCAAGAAG	CTATGATGGACCATGTAACG	
h_div_mecci15	CGTTACATGGTCCATCATAG	GCTTCTTGGTCTAGGCACAT	
h_con_mecci18	ACTCCACCTCAATCACACTA	TAGGTAGGAGTAGCGTGGT	
h_div_mecci18	ACCACGCTACTCCTACCTA	TAGTGTGATTGAGGTGGAGT	
h_con_mecciND1	ACCTCAACCTAGGCCTCCTA	CATATGAGATTGTTTGGGCT	
h_div_mecciND1	TGAGCATCAAACTCAAACTAC	CTAGGCTAGAGGTGGCTAGAA	
h_con_mecciND5	CTCAACTACCTAACCAACAA	TAAGAAGGCCTAGATAGGGG	
h_div_mecciND5	CATCACACACCGCACAATC	AGAATCCGAGTATGTTGGAG	
h_ciRS-7	AACTACCCAGTCTTCCATCA	AGACTTGAAGTCGCTGGAAG	
mouse mecciRNA detection primer			
name	forward primer 5'-3'	reverse primer 5'-3'	
m_div_mecci1	GCTTAAGACACCTTGCCTA	TACACCGGTCTATGGAGGTT	for mouse mecciRNA PCR and realtime-PCR
m_div_mecci2	TTTAGATTATAGCCAAAAGAGGGACA	TTTTTGGGTAACCAGCTATCAC	
m_div_mecci6	AGCTAGAAACCCCGAAACCA	TTCATTATGCAAAAGGTACAAGG	
m_div_mecci11	GTGGGCAATTGATGAATAGGC	TCTTCCTTACAACCCATCCCT	
m_div_mecci12	CAGGCAGTGCCTCTAATACT	CATGAACGGCTAAACGAGGG	
m_div_mecci13	GCCACATAGACGAGTTGATTC	AGAGGGACAGCTCTTCTGGAA	
m_div_mecci16	GGTAACTTGGTCCGTTGATC	GGGATAACAGCGCAATCCTA	
m_div_mecci17	TATCCTGACCGTGCAAAGGT	CAGGCAGTGCCTCTAATACT	
m_div_mecci20	GGATTGCGCTGTTATCCCTA	CAGGACATCCCAATGGTGTAG	
real-time qPCR primer			
Name	forward primer 5'-3'	reverse primer 5'-3'	
q_h/m GAPDH	CTTCATTGACCTCAACTACATGG	CTCGCTCCTGGAAGATGGTGAT	used for both human and mouse
q_18S rRNA	CGGCGACGACCCATTCGAAC	GAATCGAACCCTGATTCCCCGTC	
q_Actin	GAGTACTTGCGCTCAGGAG	CCAACACAGTGCTGTCTGG	
h_q_ND1	CCCTAAAACCCGCCACATCTA	GAGCGATGGTGAGAGCTAAGGT	
h_q_mecciND5	ATCTAGGCCTTCTTACGAGC	ATTGTGCGGTGTGTGATGCT	
h_q_ND5	GCAGCCATTCAAGCAATCCTA	AGGCGAGGATGAAACCGATA	
h_q_ATP6	TCGGTTGTTGATGAGATATTTGGA	CGCCGCAGTACTGATCATTCT	
h_q_12s rRNA	TAGAGGAGCCTGTTCTGTAATCGAT	CGACCCTTAAGTTTCATAAGGGCTA	
h_q_RPA70	GGGGATACAAACATAAAGCCCA	CGATAACGCGGCGGACTATT	
h_q_RPA32	GGTAGCCTTTAAGATCATGCCC	CTGTTGGCTTTGCTTAGTACCA	
qh_mtDNA_UUR	CACCCAAGAACAGGGTTTGT	TGGCCATGGGTATGTTGTTA	used for mtDNA copy number
qh_nucDNA_B2M	TGCTGTCTCCATGTTTGATGTATCT	TCTCTGCTCCCCACCTCTAAGT	
h_q_hnRNPA1	CCACGAAACCAAGGTGGCTA	TCCCTGTCACTTCTCTGGCT	
h_q_hnRNPA2B1	AGAGGCTTTGGCTTTGTTAC	CCACTCCTAGAACTCTGAAC	
h_q_hnRNPA3	TGGAAGAAGCTCGGGCAGT	ACCTGCAGCTTTCCTGACAA	
h_q_PNPASE	CTGCACTACGAGTTTCCTCC	GACCCATTTGACTCTAGGAC	
h_q_RMRP	CAGAGAGTGCCACGTGCATA	CTAGAGGGAGCTGACGGATG	used for *in vitro* assay
h_16S	ACCAGACGAGCTACCTAAGA	CTTGGACAACCAGCTATCAC	
E1-linear ND1-E2	CTACCGTTTAATATTCTCCT	ACCCAAGAAAACATATTGTGG	
E1-linear ND5-E2	CTACCGTTTAATATTCCCTAG	CCCAAGAAAACATGGAGTAG	
div_E2-mecciND1-E1	CTAGCCTAGCCGTTTACTC	GGAGAATATTAAACGGTAGACC	
div_E2-mecciND5-E1	CTCCAACATACTCGGATTCT	CTAGGGAATATTAAACGGTAGAC	
div_E2-circSRSF-E1	GGATGGAACTGAAGTCAATG	AATCAATATTAAACGGTAGACCC	
q-4mut-mecciND1	CTCTGATCAGGGTGAGCATC	TGAGTAAACGGCTAGGGATC	used for detection of mut mecciND1

q-6mut-mecciND5	CTAGGCCTTCTTACGAGCCA	ATTGTGCGGTGTGTTCGTA	and mecciND5
***C. elegans* mecciRNA PCR primer**			
Name	forward primer 5'-3'	reverse primer 5'-3'	
con_mecci-*ctc-1*	TCATAAAGATATCGGAACTC	CGATTATAGTAGGTATTACC	used for *C.elegans* mecciRNA identification
div_mecci-*ctc-1*	CGTTTAGAATTAGCTAAACC	CCAACCATACCAGATCAAAG	
con_mecci-*nudo-5*	GGCCTATTTACTATATTTTT	CAAAGTAACTATTGAAAAAC	
div_mecci-*nduo-5*	CAATAGTTACTTTGGGCCTA	CTATTTGTGAAAGTGTCCTC	
con_mecci-*nudo-1*	GGGCCCACCAAGGTTACA	GGTATAATTGGGGCCATC	
div_mecci-*nduo-1*	ACTTGTACCAGGAATTTC	CCCATCCAATAAAGCTTG	
q_div_mecci-*ctc-1*	GTATAGATTTGGATTCACGTGC	CTAGTACCAACCATACCAGATC	*C. elegans* mecciRNA real-time PCR primer
q_*ctc-1* _out	GGTATTGTCAGACAATCTACAC	GTGAGCTCATACTACACAACC	
q_div_mecci-*nduo-5*	GGACACTTTCACAAATAGGTTTTTC	GGCTACCACCTTCTTCAAATC	
q_*nduo-5* out	TTGGTTACAGTTTTCGTCTTTGA	GAAAAGTCTTGGGATGTTAAGAAGA	
S. pombe mecciRNA PCR primer			
Name	forward primer 5'-3'	reverse primer 5'-3'	
con-pombe-mecci-*cox1*	AATAGGCCTCTTAACGTTGCT	TTGTTGTGATTTCGTTGCGTA	used for *S. pombe* mecciRNA identification
div-pombe-mecci-*cox1*	CCTCAGAGACTTTACGCAACG	CAAGTAGTTCCAGCATATAGC	
con-pombe-mecci-*21SrRNA*	GTTCAGTATAGAGGTTAGTCG	TAACTTCGCTCATTGAGCACA	
div-pombe-mecci-21*SrRNA*	CTCTGTTTGACACCTCGATG	CGACTAACCTCTATACTGAAC	
con-pombe-mecci-*cob1*	GAGCTGTATTGCCCGAATTCC	GACCGCATAGTCATTACTGACC	
div-pombe-mecci-*cob1*	AGGATACACACCAGGAGAAG	CAGCTAAGACAATCACCTATC	
primers for plasmids			
mecciND1-OE-F	ATTCTGCAGTCGACGGTACCGGATCAGG ACATCCCGATGG		mecciND1 overexpression plasmid
mecciND1-OE-R	TATCTAGATCCGGTGGATCCGTTTAAGC TCCTATTATTTA		
mecciND1-mut4-F	TATTCTAGCCACCTGATCCCTAGCCGTT TACTCAATCC		stem-loop mutant (mut) mecciND1 overexpression plasmid
mecciND1-mut4-R	GAGTAAACGGCTAGGGATCAGGTGGCT AGAATAAATAGG		
mecciND5-OE-F	GATCCGCTAGCGCTACCGGTACCCTACT AAACCCCATTA		mecciND5 overexpression plasmid
mecciND5-OE-R	TTATCTAGATCCGGTGGATCCTTATGCC TTTTTGGGTTGAG		
mecciND5-mut6-F	CTCGGATTCTACCCTCTACGAACACACC GCACAATCCCCT		stem-loop mutant (mut) mecciND5 overexpression plasmid
mecciND5-mut6-R	GATTGTGCGGTGTGTTCGTAGAGGGTAG AATCCGAGTATG		
BglII-EcoRI-3xflag-F	GATCTATGGACTACAAAGACCATGACGG TGATTATAAAGATCATGACATCGATTAC AAGGATGACGATGACAAGTAAG		C-terminal FLAG-tagged human TOM20, TOM40, PNPASE plasmid construction
BglII- EcoRI -3xflag-R	AATTCTTACTTGTCATCGTCATCCTTGTA ATCGATGTCATGATCTTTATAATCACCG TCATGGTCTTTGTAGTCCATA		
AgeI-TOM20-F	GTCAGATCCGCTAGCGCTACCGGTATGG TGGGTCGGAACAGCGC		
TOM20-BglII-R	GAATTCGAAGCTTGAGCTCGAGATCTTT CCACATCATCTTCAGCCA		
AgeI-TOM40-F	GTCAGATCCGCTAGCGCTACCGGTATGG GGAACGTGTTGGCTGC		
TOM40-BglII-R	GAATTCGAAGCTTGAGCTCGAGATCTGC CGATGGTGAGGCCAAAGC		
BglII-BamHI-3xflag-F	GATCTATGGACTACAAAGACCATGACGG TGATTATAAAGATCATGACATCGATTAC AAGGATGACGATGACAAGTAAG		
BglII- BamHI -3xflag-R	GATCCTTACTTGTCATCGTCATCCTTGTA ATCGATGTCATGATCTTTATAATCACCG TCATGGTCTTTGTAGTCCATA		
AgeI-PNPASE-F	GTCAGATCCGCTAGCGCTACCGGTATGG CGGCCTGCAGGTACTG		
PNPASE-BglII-R	CGAAGCTTGAGCTCGAGATCTCTGAGAA TTAGATGATGAC		
Group I intron sequence of Td ge	GGTTCTACATAAATGCCTAACGACTATCCCTTTGGGGAGTAGGGTCAAGTGACT CGAAACGATAGACAACTTGCTTTAACAAGTTGGAGATATAGTCTGCTCTGCATG GTGACATGCAGCTGGATATAATTCCGGGGTAAGATTAACGACCTTATCTGAAC ATAATGCTACCGTTTAATATTATGTTTTCTTGGGTTAATTGAGGCCTGAGTATA AGGTGACTTATACTTGTAATCTATCTAAACGGGGAACCTCTCTAGTAGACAATC CCGTGCTAAATTGTAGGACT		for *in vitro* transcription by T7 promoter and circularization
C-T7-E1-F	TGTAATACGACTCACTATAGGTTCTACA TAAATGCCTAA		

C-E2-R	AGTCCTACAATTTAGCACGG		
L-T7-E1-F	TGTAATACGACTCACTATACTACCGTTT AATATT		
L-E2-R	ACCCAAGAAAACAT		
SP6_EcoRI_FLAG_F	GCCGCCAGTGTGCTGGAATTC TTActtgtcatcgtcatc		plamids for in vitro transcription by SP6 promoter and in vitro translation
SP6_RPA2_XbalI_R	TATAGAATAGGGCCCTCTAGAGCCACCA TGTGGAACAGT		
SP6_ HNRNPA1_XbalI_R	TATAGAATAGGGCCCTCTAGAGCCACCA TGTCTAAGTCA		
oligos and probes			
Bio-scramble-oligo	TTCTCCGAACGTGTCACGTTCGAACGTG TC		probe for Biotin oligo pull down
Bio-mecciND1-oligo	CTAGAATAAATAGGAGATTGTTTGG GCTAC		
biotin_mecciND5_probe	AGGTAGTTGAGGTCTAGGGGGAGTAGGG GC		
mecciND1-s	TGTAATACGACTCACTATAGGGTGA GCATCAAACTCAAACTAC	CTAGGCTAGAGGTGGCTAGAA	primer for Northern blot or FISH probe
mecciND1-as	TGAGCATCAAACTCAAACTAC	TGTAATACGACTCACTATAGGG CTAGGCTAGAGGTGGCTAGAA	
ND1_out_as	CTCGTTGTACCCATTCTAATCG	TGTAATACGACTCACTATAGGGGTC AGCGAAGGGTTGTAGTAGC	
mecciND5_s	TGTAATACGACTCACTATAGGGCCGC ACAATCCCCTATCTAG	TGTGTGATGCTAGGGTAGAA	
mecciND5_as	CCGCACAATCCCCTATCTAG	TGTAATACGACTCACTATAGGGT GTGTGATGCTAGGGTAGAA	
mecci-CYB	CCGATCCGTCCCTAACAAAC	GAATTGTGTAGGCGAATAGG	
si-NC	UUCUCCGAACGUGUCACGU	ACGUGACACGUUCGGAGAA	siRNA for mecciRNA knockdown
mecciND1-siRNA	CCAAACAAUCUCCUAUUUAU	AUAAAUAGGAGAUUGUUUGG	
mecciND5-siRNA-2	CUCCAACAUACUCGGAUUCU	AGAAUCCGAGUAUGUUGGAG	
mecciND5-siRNA-1	CUACUCCCCCUAGACCUCAA	UUGAGGUCUAGGGGGAGUAG	
ND1mRNA siRNA	AACGUUGGGGCCUUUGCGUAGUU	AACUACGCAAAGGCCCCAACGUU	
si-PNPASE	GCAGGUAGAAUUCCCACAA	UUGUGGGAAUUCUACCUGC	
mecciND1-AMO	TATGAGATTGTTTGGGCTACTGCTC		
mecciND5-AMO	TTTTGGCTCGTAAGAAGGCCTAGAT		
qPCR primers for mecciRNA in 293T cells			
293Tmecci1_F	CAGCGCAATCCTATTCTAGA		Top 50 mecciRNAs from 293T mitochondrial RNA-seq data, and 28 mecciRNA primers are suitable for qPCR detection. These primers are used for checking mecciRNA enrichment in FLAG-RIP experiments (Fig. 5F)
293Tmecci1_R	GTAACTTGTTCCGTTGGTCA		
293Tmecci2_F	ACCTGGCGCAATAGATATAG		
293Tmecci2_R	GGGTAAATGGTTTGGCTAAG		
293Tmecci3_F	GCTGGTTGTCCAAGATAG		
293Tmecci3_R	TTGCTACATAGACGGGTG		
293Tmecci5_F1	CAATCCTACCTCCATCGCTA		
293Tmecci5_R1	AGGAGTAGGGTTAGGATGAG		
293Tmecci6_F	CTGTTAGTCCAAAGAGGAACAGC		
293Tmecci6_R	CAAGGGGATTTAGAGGGTTCTG		
293Tmecci7_F	TCACAGCACCAAATCTCCAC		
293Tmecci7_R	TTGTGCGGTGTGTGATGCTA		
293Tmecci8_F1	CACACCCGTCTATGTAGCAA		
293Tmecci8_R1	AGCTGTTCTTAGGTAGCTCG		
293Tmecci10_F1	TACTCTTTCACCCACAGCA		
293Tmecci10_R1	GAATCCGAGTATGTTGGAG		
293Tmecci15_F1	TAGCATCACACACCGCACAA		
293Tmecci15_R1	AGAATCCGAGTATGTTGGAG		
293Tmecci17_F1	GACGTTAGGTCAAGGTGTAG		
293Tmecci17_R1	AAGAGGTGGTGAGGTTGATC		
293Tmecci19_F	CACTCATCCTAACCCTACTC		
293Tmecci19_R	TTGGGTTGAGGTGATGATGG		
293Tmecci20_F	CCTAGACCTAACCTGACTAG		
293Tmecci20_R	GCTCGTAAGAAGGCCTAGAT		
293Tmecci22_F	CTCACTGTCAACCCAACACA		
293Tmecci22_R	TCTTAGGTAGCTCGTCTGGT		
293Tmecci23_F	CCAGACAACCTTAGCCAAAC		
293Tmecci23_R	CAAGAGGTGGTGAGGTTGAT		
293Tmecci24_F	CATGAGGTGGCAAGAAATGG		
293Tmecci24_R	CTTGCGCTTACTTTGTAGCC		
293Tmecci25_F	ATTCCGCTACGACCAACTCA		
293Tmecci25_R	AGAAGTAGGGTCTTGGTGAC		
293Tmecci26_F	ATTCTCCTCCGCATAAGC		
293Tmecci26_R	AGGGTGATAGATTGGTCC		
293Tmecci28_F	CACCAAATCTCCACCTCCATCAT		

293Tmecci28_R	CGGTGTGTGATGCTAGGGTA		
293Tmecci29_F	ATCTCGAACTGACACTGAGC		
293Tmecci29_R	CTTCTTGGTCTAGGCACATG		
293Tmecci30_F	CACTGTCAACCCAACACAG		
293Tmecci30_R	TCCTAGTGTCCAAAGAGCTG		
293Tmecci31_F	TCACAGCACCAAATCTCCAC		
293Tmecci31_R	CTAGTCAGGTTAGGTCTAGG		
293Tmecci32_F	CCGTACATAGCACATTACAG		
293Tmecci32_R	TGTACTACAGGTGGTCAAGT		
293Tmecci33_F	GGTCCATCATCCACAACCTT		
293Tmecci33_R	GTATGGCTTTGAAGAAGGCG		
293Tmecci34_F	CTCCTTACACTATTCCTCATCAC		
293Tmecci34_R	GGCATTTCACTGTAAAGAGGTGT		
293Tmecci35_F	ACCTTAGCTCTCACCATC		
293Tmecci35_R	CGTTCGGTAAGCATTAGG		
293Tmecci36_F	TCACACGATTAACCCAAGTCA		
293Tmecci36_R	CTGGCACGAAATTGACCAAC		
293Tmecci38_F	CCACAGGTCCTAAACTACCA		
293Tmecci38_R	AGAGCTGTTCCTCTTTGGAC		
293Tmecci39_F	CCTATCTAGGCCTTCTTACG		
293Tmecci39_R	TCTAGGGCTGTTAGAAGTCC		
L440-ApaI-mecci*ctc-1* _F1	GCGAATTGGGTACCGGGCCCCGTTTAG AATTAGCTAAACC		plasmids construction for *C.elegans* feeding RNAi
L440-BglII-mecci*ctc-1* _R1	ATAGGGAGACCGGCAGATCTCTAGTACC AACCATACCAGA		
L440-ApaI-mecci*nduo-5* _F	GCGAATTGGGTACCGGGCCCGAGGACAC TTTCACAAATAG		
L440-BglII-mecci*nduo-5* _R	ATAGGGAGACCGGCAGATCTGGCTACC ACCTTCTTCAA		
myo-3 -F1	AAGCTTGCATGCCTGCAGGCTTCCAACC AATTATCATTTC		primer for *myo-3 p::tomm20 (aa1-49)::GFP* plamid
myo-3 -R1	CCAAGAATTGTGTCCGACATTTCTAGAT GGATCTAGTGGT		
TOMM20-F1	ACCACTAGATCCATCTAGAAATGTCGGA CACAATTCTTGG		
TOMM20-R1	AGTTCTTCTCCTTTACTCATTCTCTTTTG CCTAATCTTGT		
GFP-F1	ACAAGATTAGGCAAAAGAGAATGAGTA AAGGAGAAGAACT		
GFP-R1	GTtGGCGTCGATCATCCGGATTATTTGTA TAGTTCATCCA		