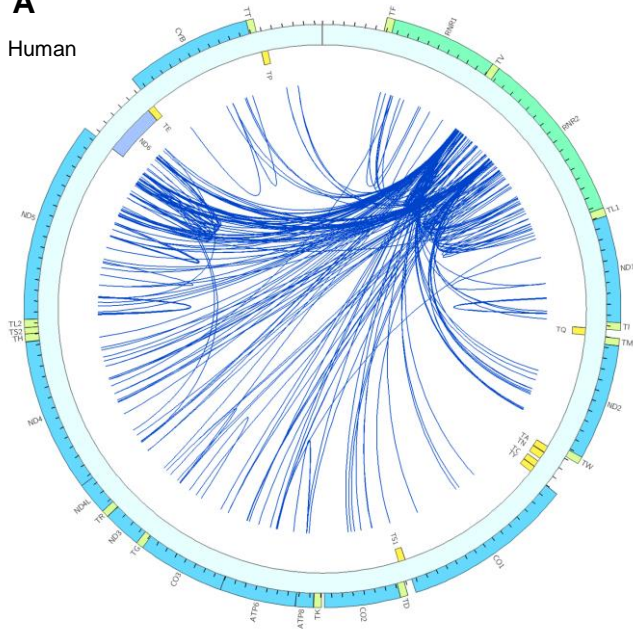


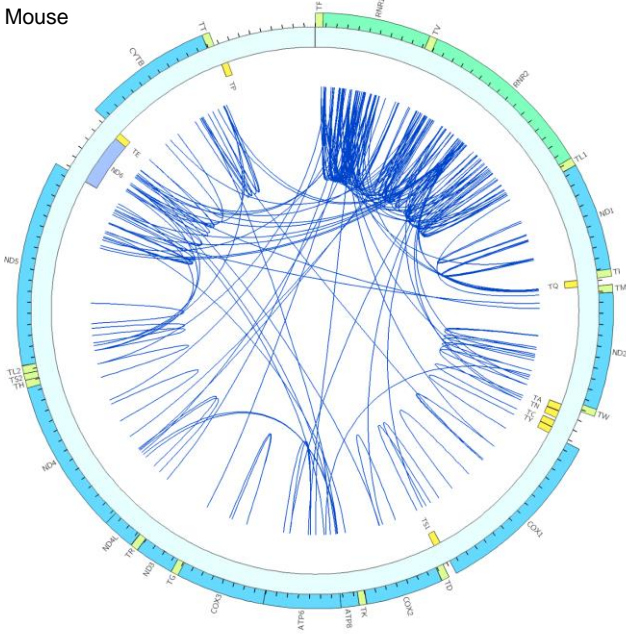
Figure S1

A

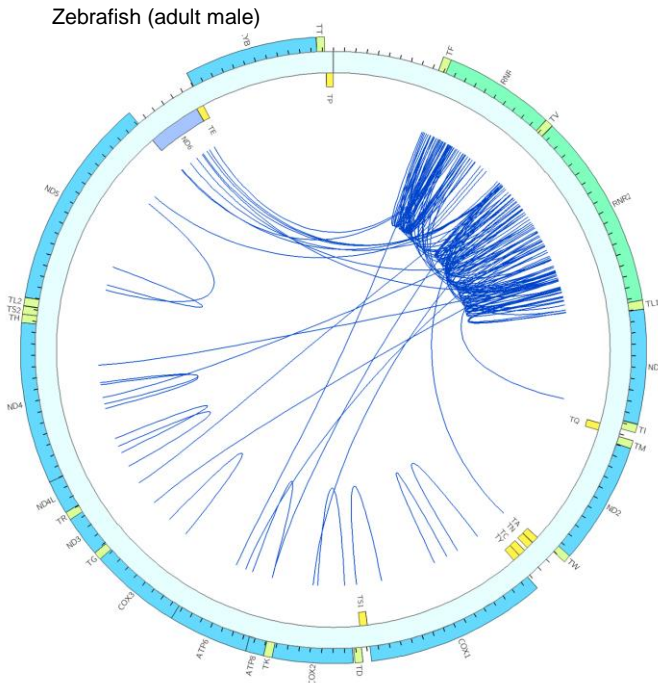
Human



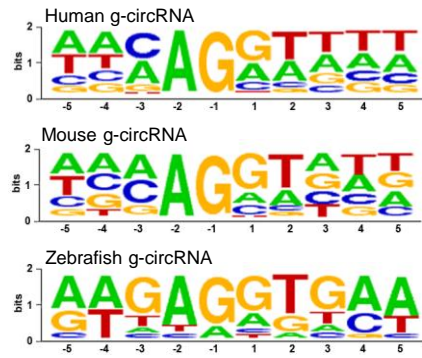
Mouse



Zebrafish (adult male)



B



C

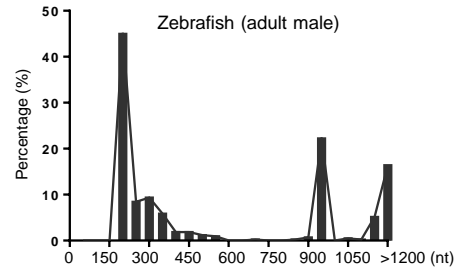
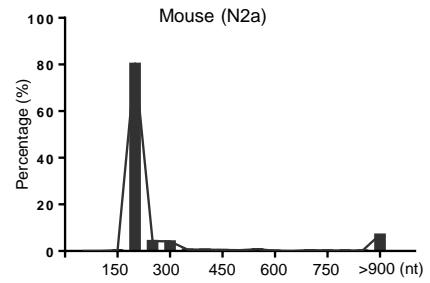
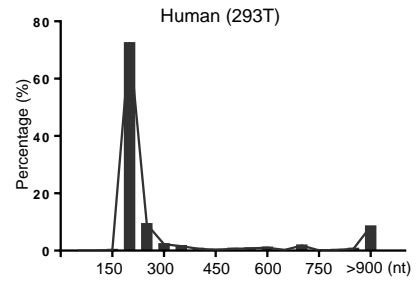


Figure S2

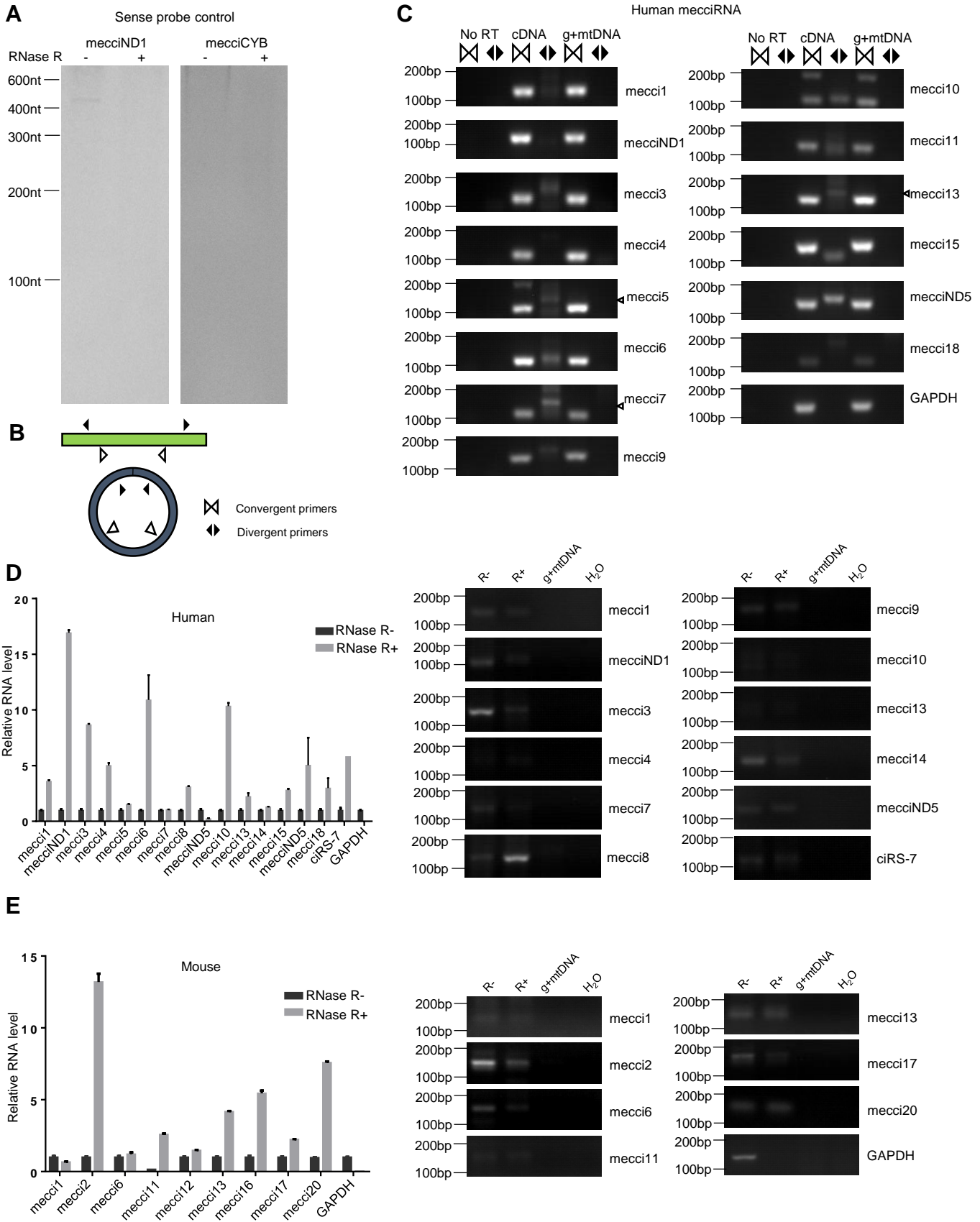


Figure S3

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

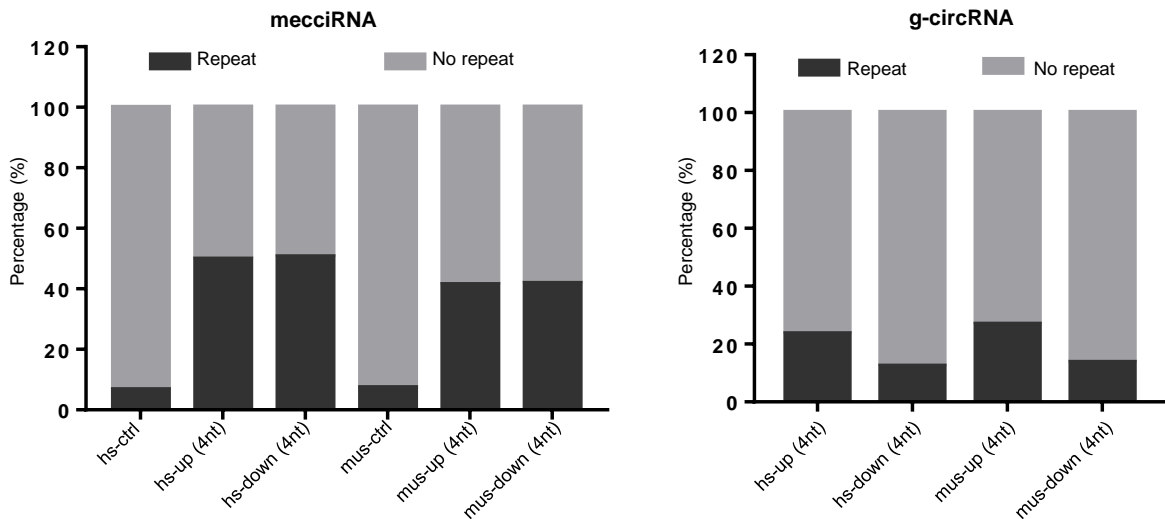
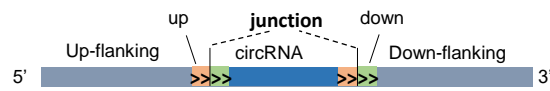


Figure S4

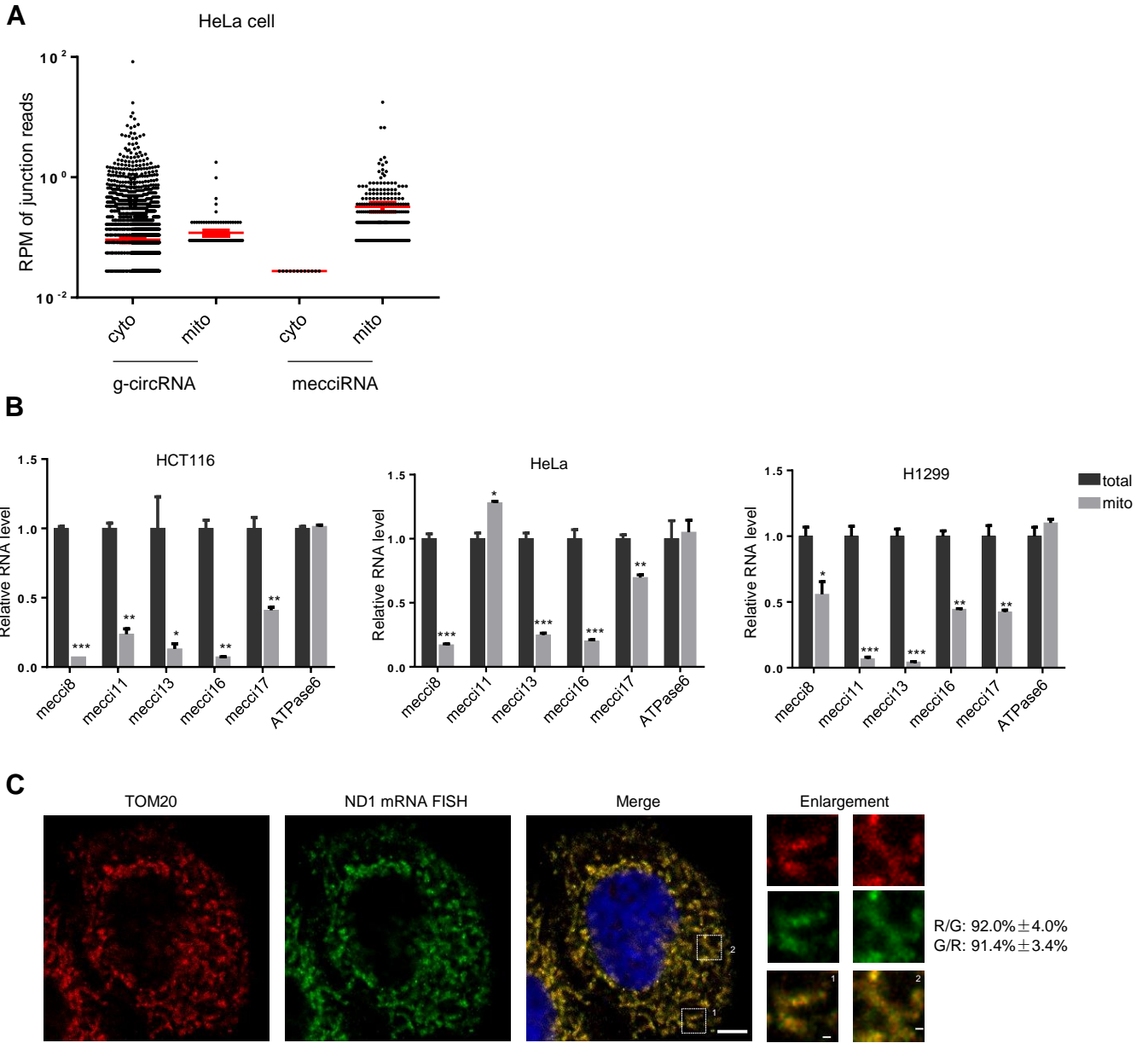


Figure S5

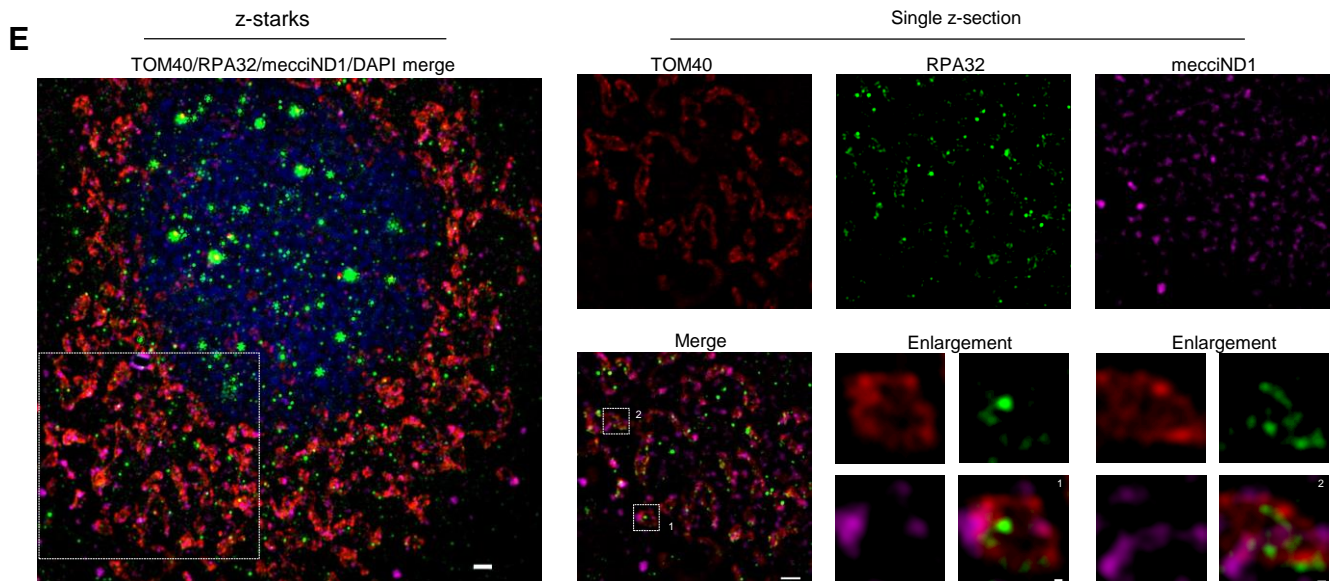
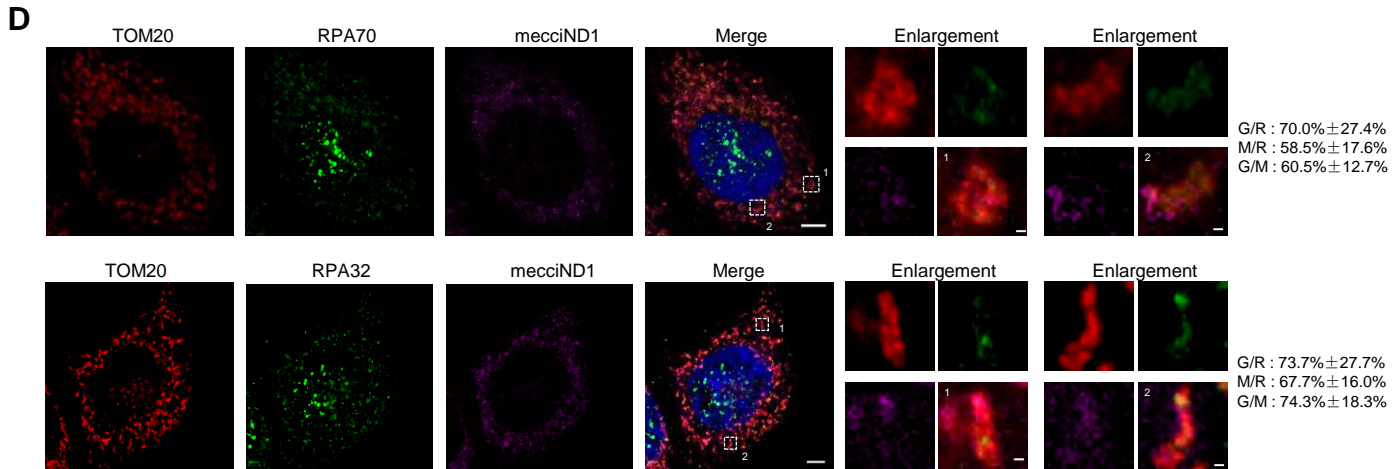
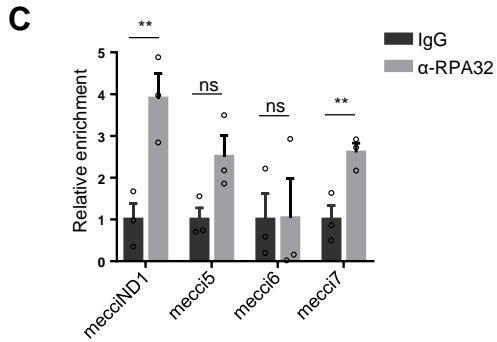
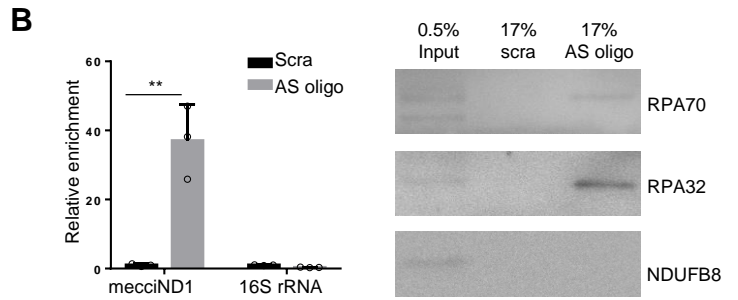
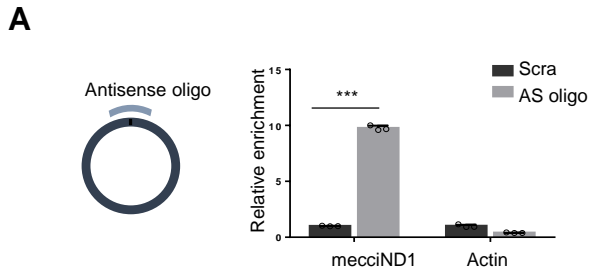


Figure S6

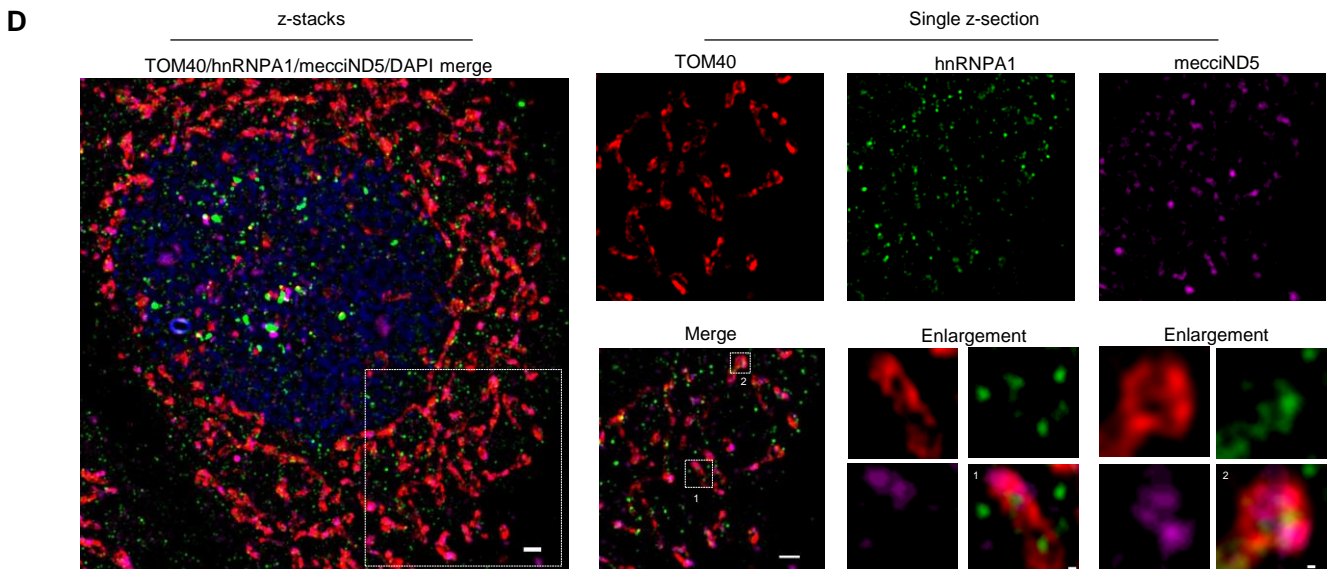
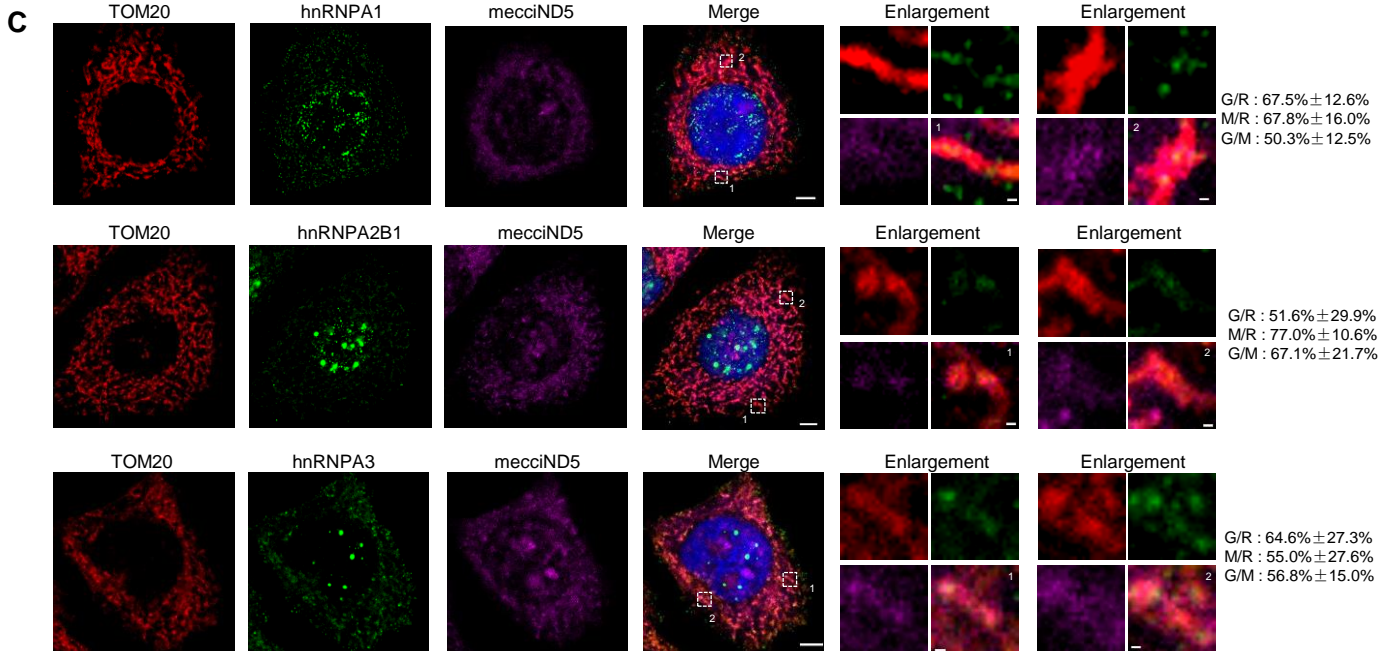
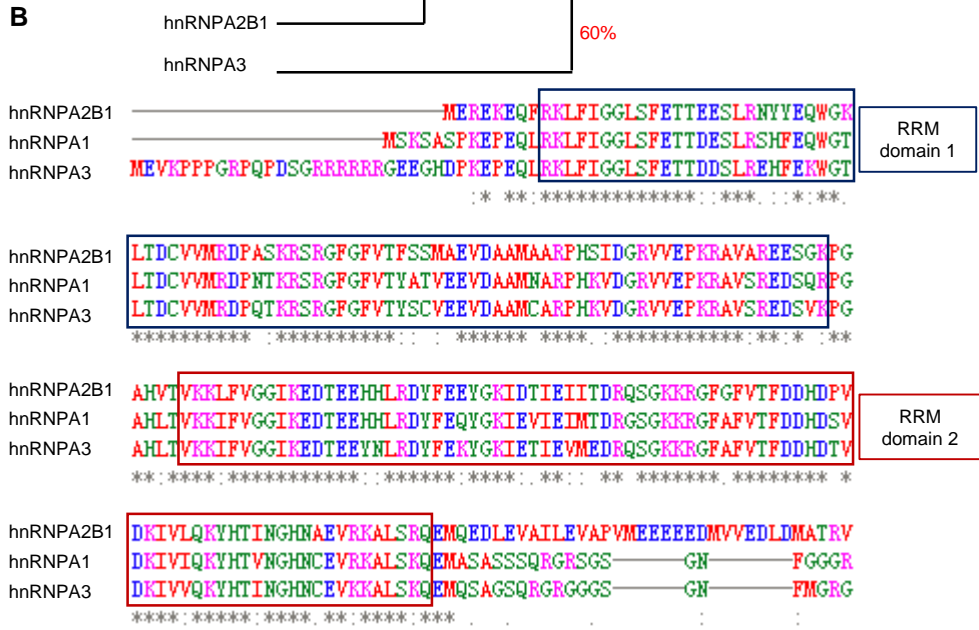
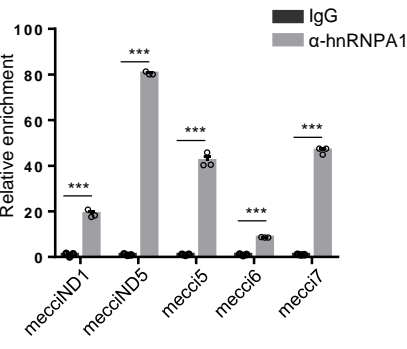
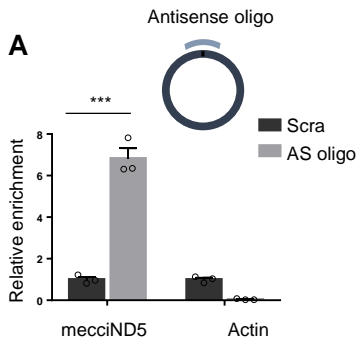


Figure S7

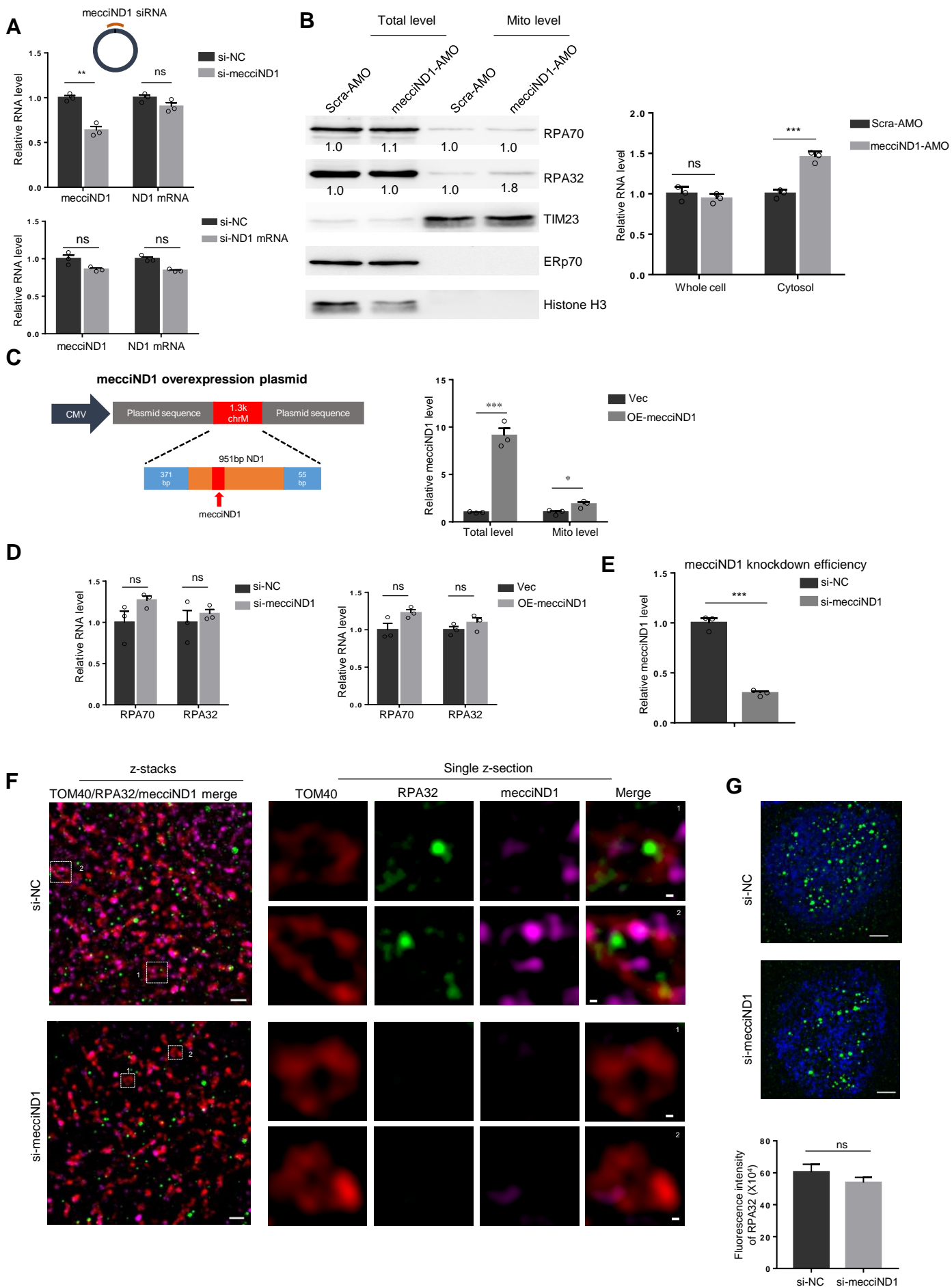


Figure S8

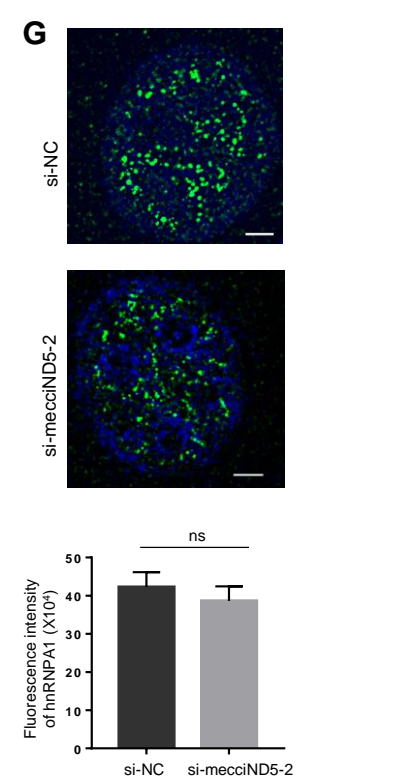
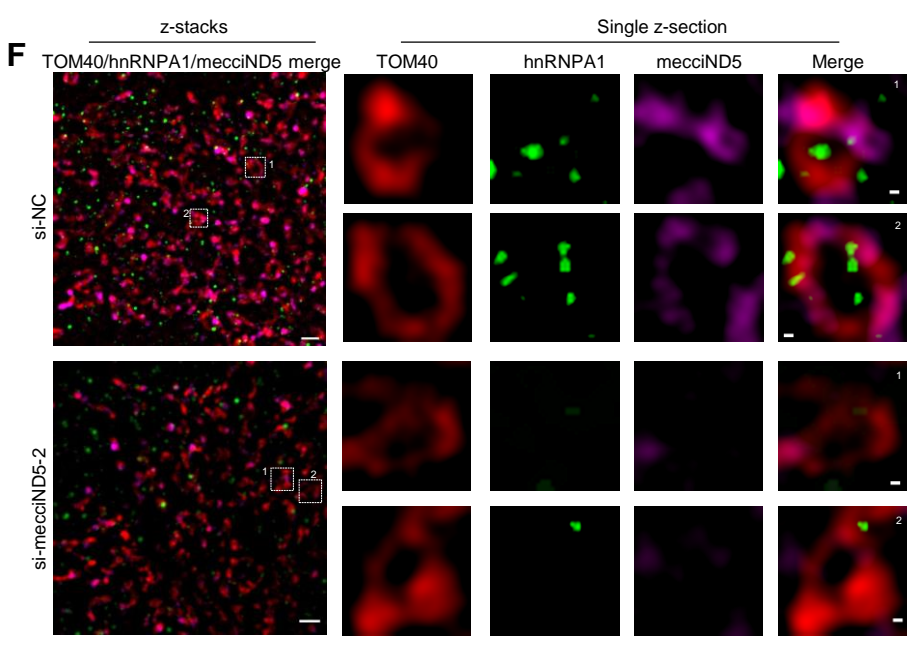
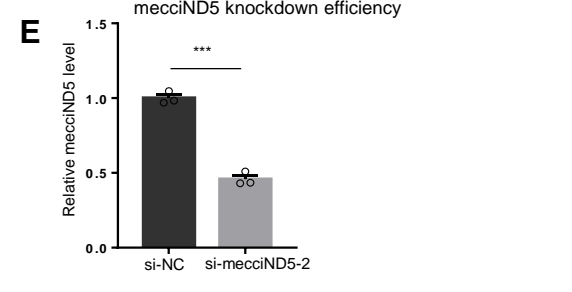
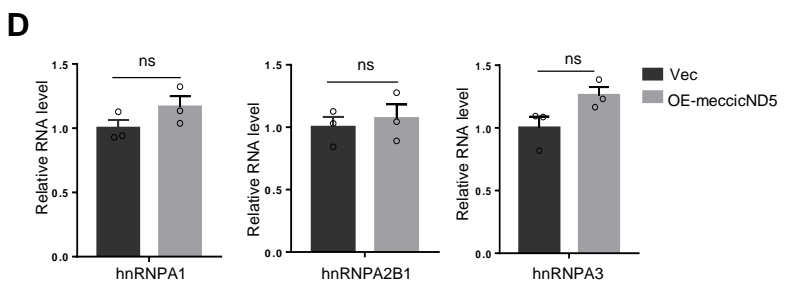
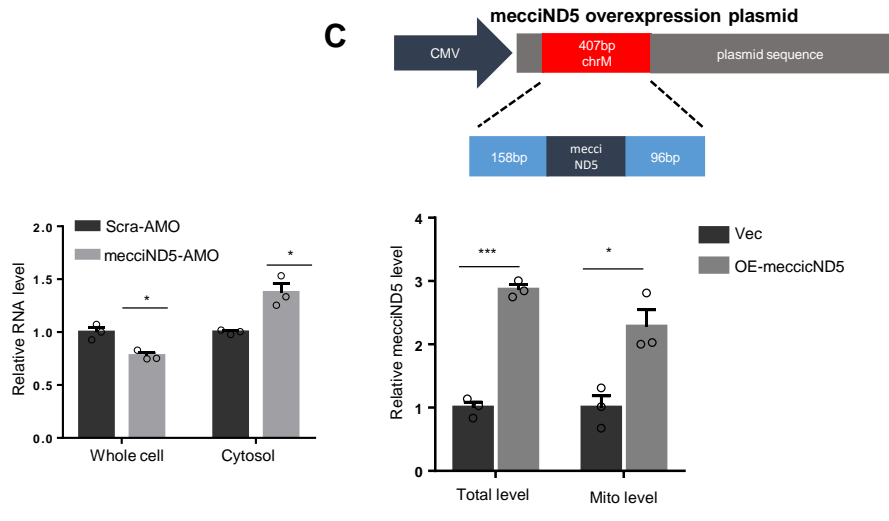
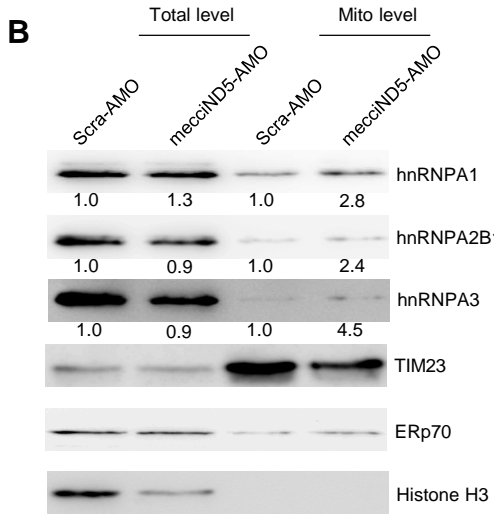
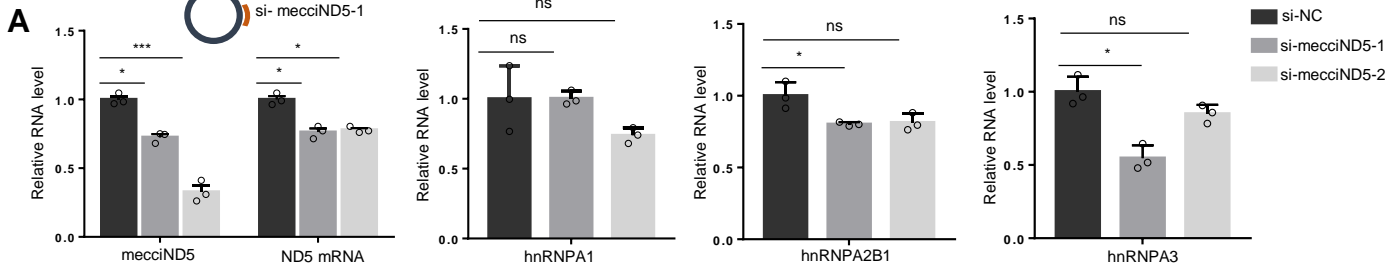
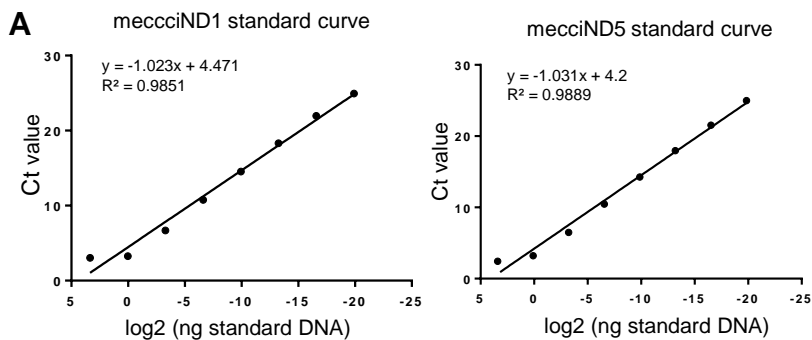


Figure S9



| RNA copy number per cell | | | | |
|--------------------------|------|------|-------|-------|
| | 293T | HeLa | RPE-1 | HepG2 |
| meccciND1 | ~74 | ~61 | ~52 | ~109 |
| meccciND5 | ~195 | ~330 | ~118 | ~222 |

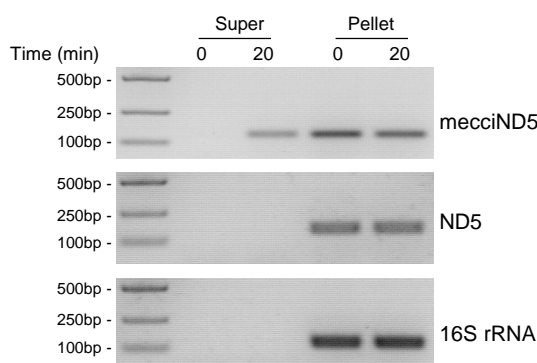
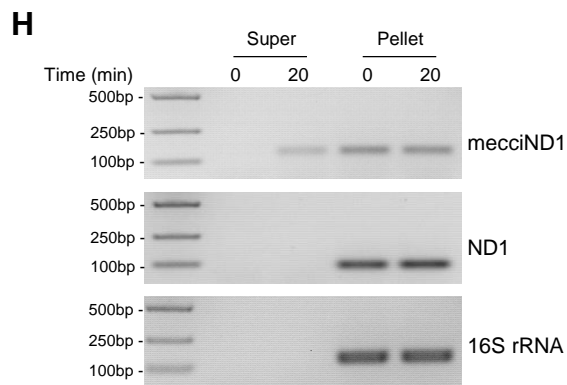
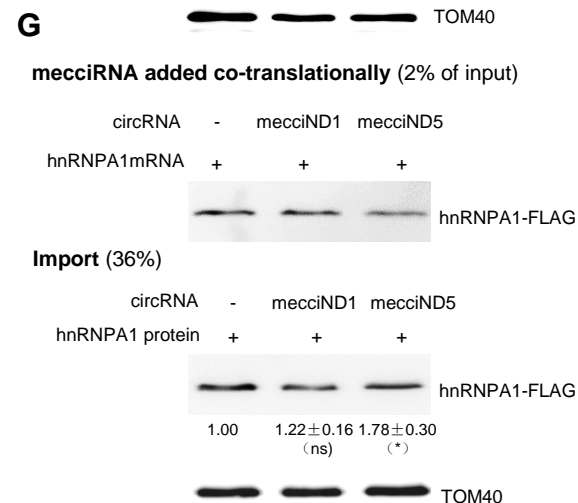
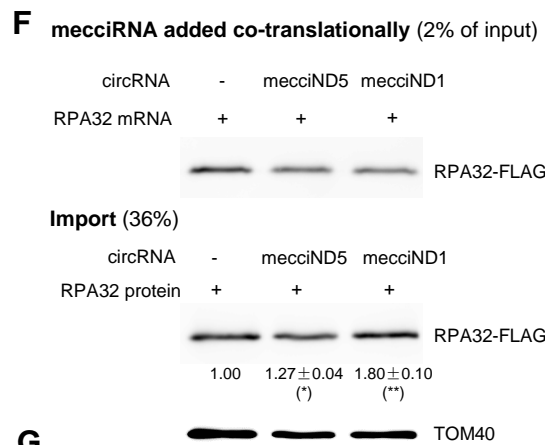
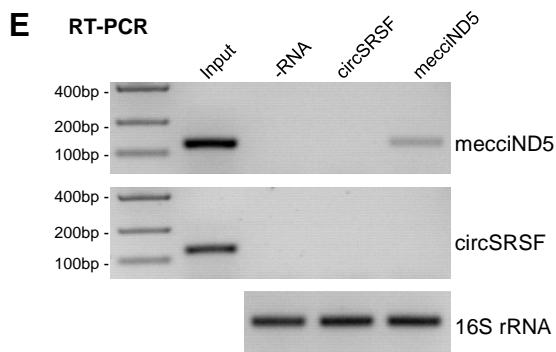
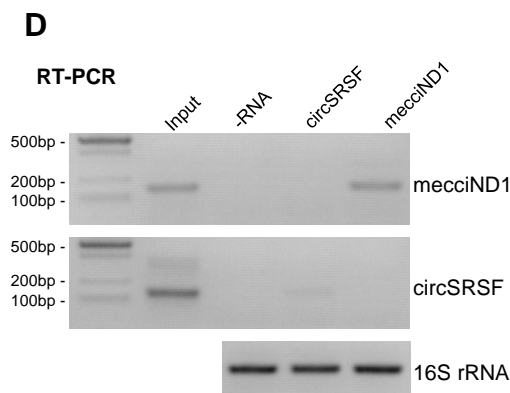
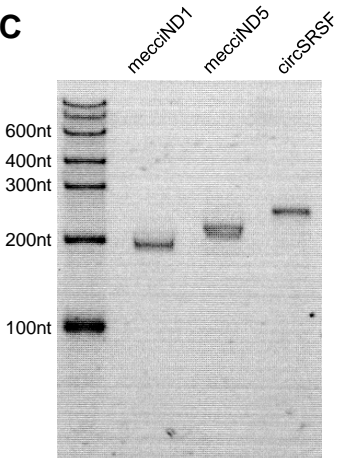
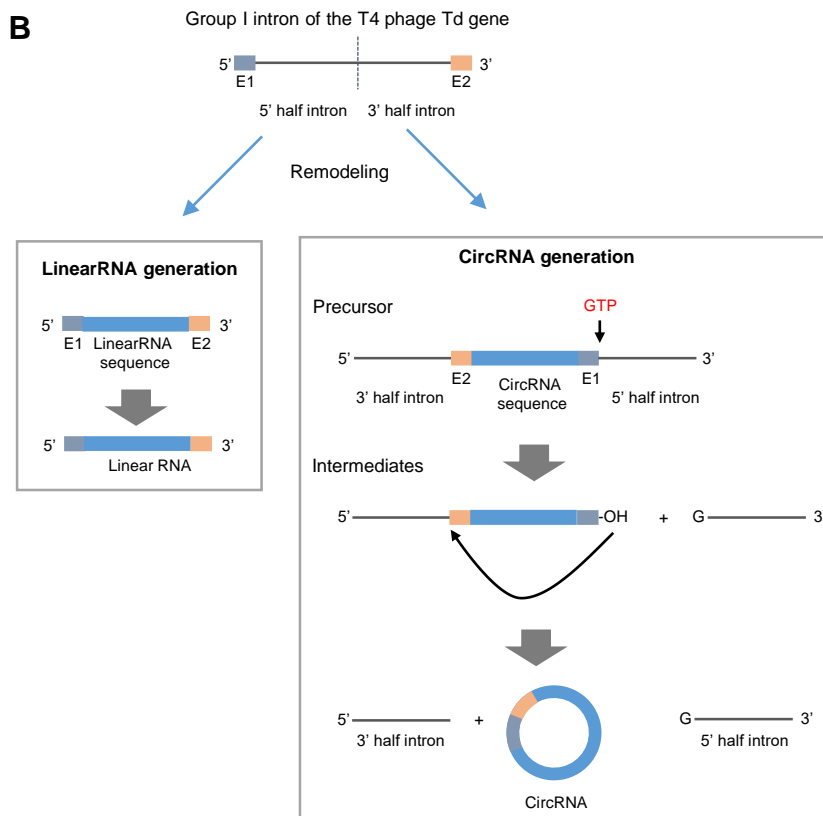


Figure S10

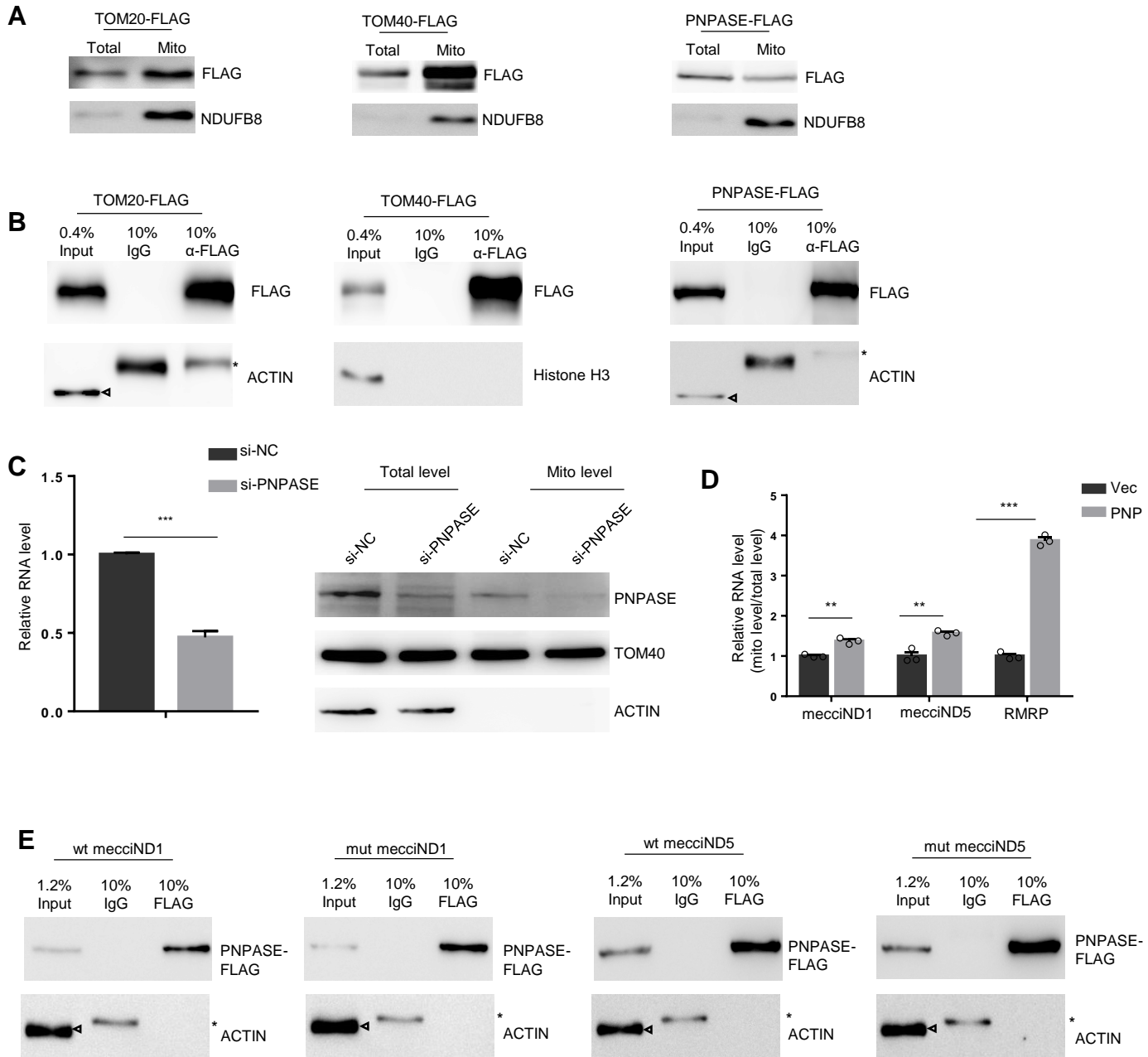
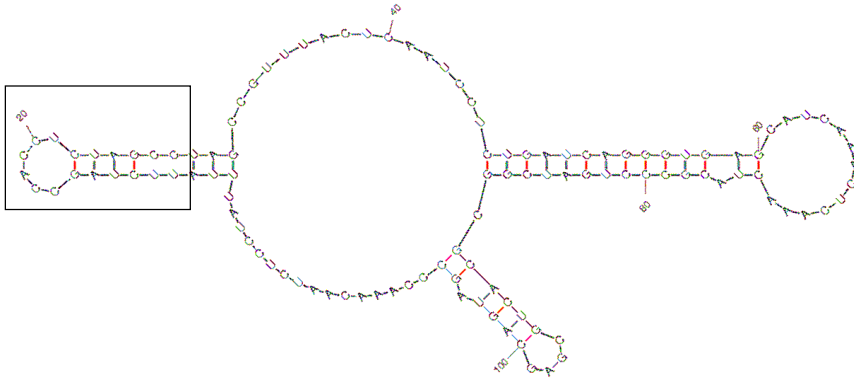


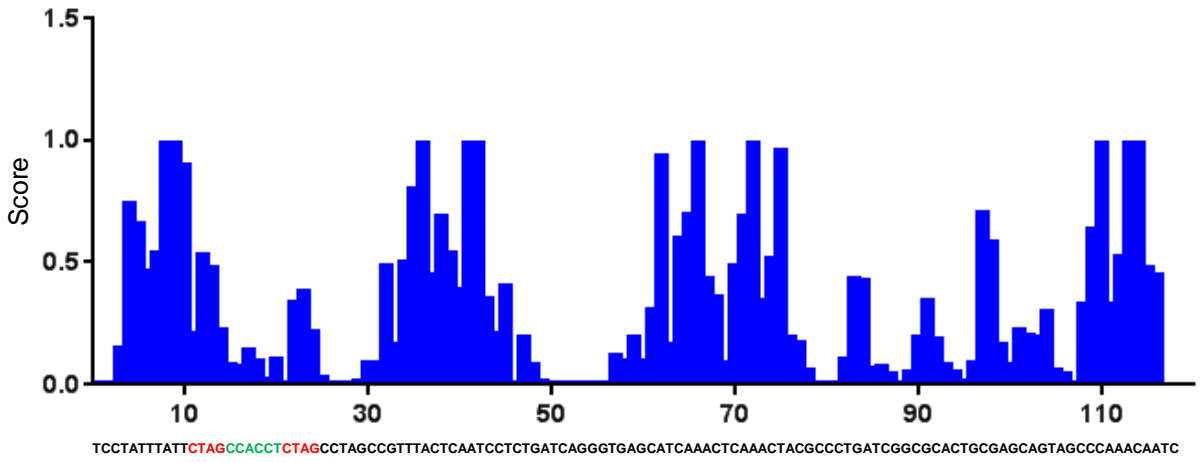
Figure S11

A

mecciND1

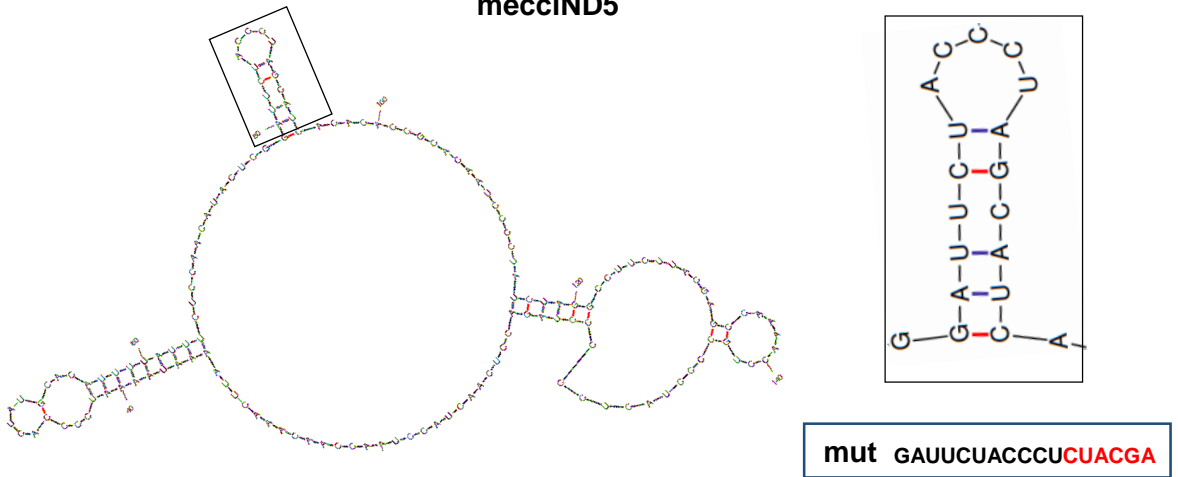


B



C

mecciND5



D

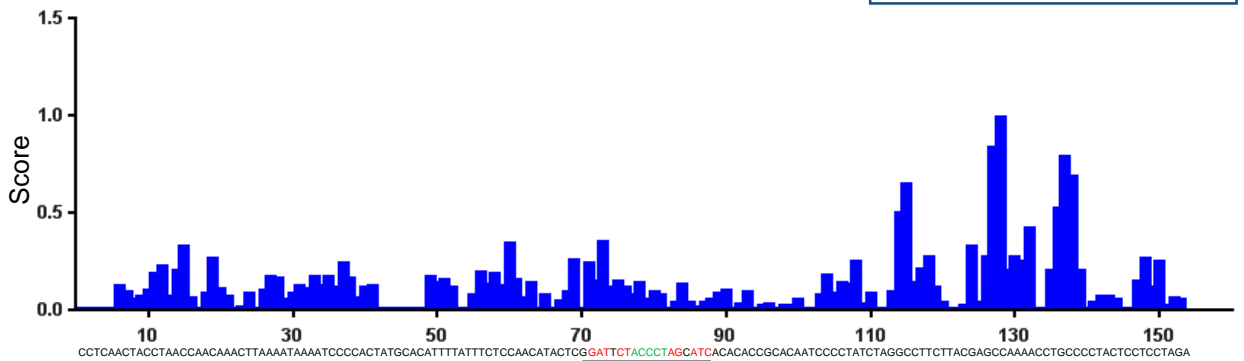


Figure S12

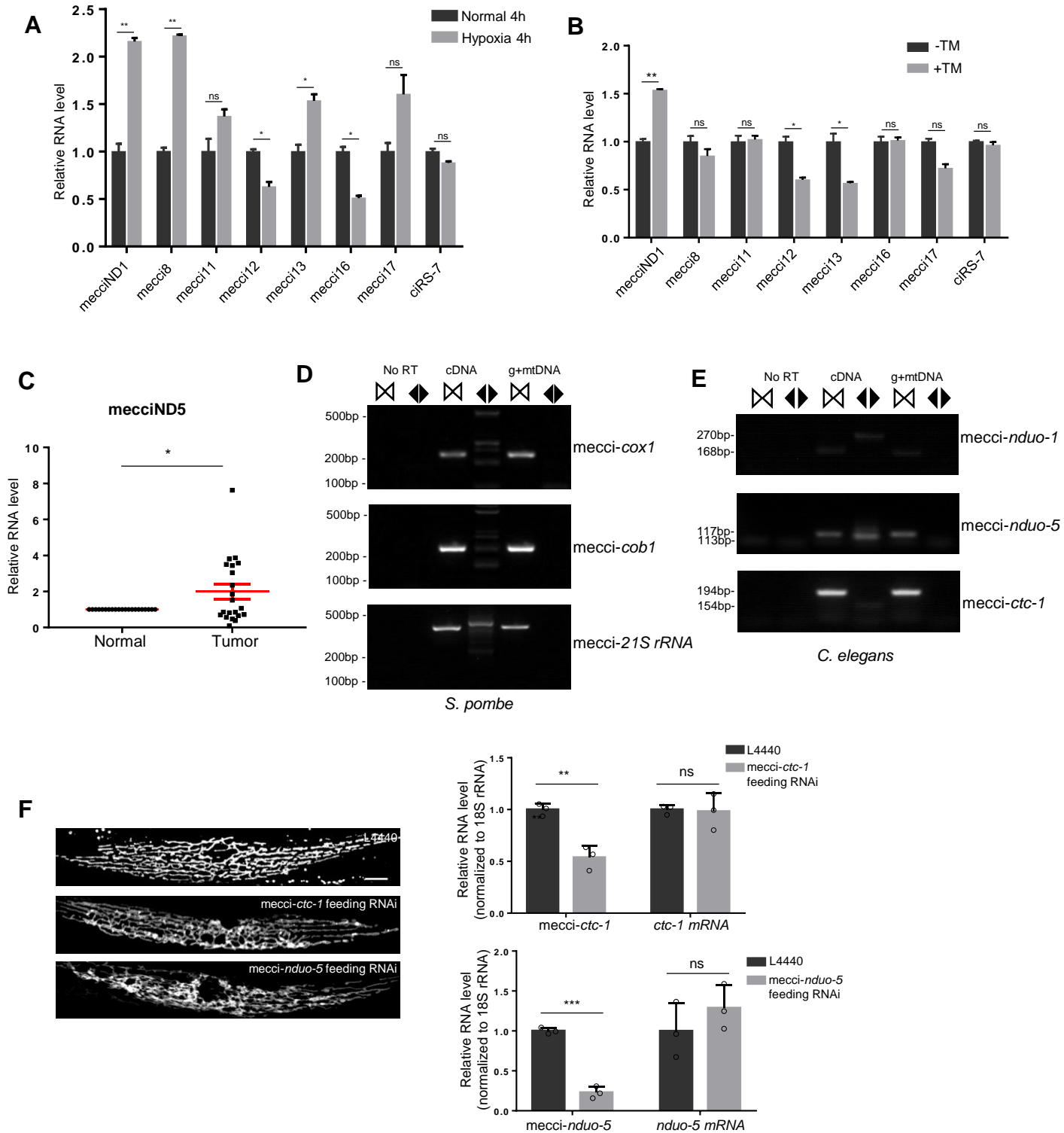


Table S1

| 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 | |

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|------|-------|---------|------------|----------|
| 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 |

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|------|-----|---------|------------------|
| 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 |

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|------|------|---------|------------------|
| 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 |
| chrM | 1225 | 1415 L | mt-Rnr2 |
| chrM | 1232 | 1732 L | mt-Rnr2 |
| chrM | 1234 | 2606 H | mt-Rnr2 |
| chrM | 1259 | 2029 L | mt-Rnr2 |
| chrM | 1266 | 1424 H | mt-Rnr2 |
| chrM | 1266 | 1562 H | mt-Rnr2 |
| 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 |

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|------|------|---------|---------------|
| 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 |
| chrM | 1498 | 1682 H | mt-Rnr2 |
| chrM | 1533 | 2029 L | mt-Rnr2 |
| 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 |
| chrM | 1884 | 3845 L | mt-Rnr2 |
| 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 |
| chrM | 2259 | 2427 H | mt-Rnr2 |
| chrM | 2294 | 2464 H | mt-Rnr2 |
| chrM | 2294 | 2663 H | mt-Rnr2 |
| chrM | 2323 | 2540 H | mt-Rnr2 |
| chrM | 2323 | 2544 H | mt-Rnr2 |

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|------|-------|---------|-----------|
| 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 Peptides | 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 Peptides | 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 Peptides | Sequence | Link | Relative Abundance | Probability |
| 1 | 35936.89 | 2 | >sp P00201 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 | CCGATCCGTCCTAACAAAC | GAATTGTGTAGGCGAATAGG | |
| h_con_mecci3 | CCTAACCCCTGACTTCCCTAA | AGGTGGATGCGACAATGGAT | |
| h_div_mecci3 | CCATTGTCGCATCCACCT | GTTAACGAGGGTGGTAAGGA | |
| h_con_mecci4 | CAAGTATTGACTCACCCATC | GGTGGTCAAGTATTTATGGT | |
| h_div_mecci4 | TACTGCCAGCCACCATGAAT | GAAATACATAGCGTTGTTG | |
| h_con_mecci5 | CTATTCGCCTACACAATTCTC | AAAGTGATTGGCTTAGTGG | |
| h_div_mecci5 | CCACTAAGCCAATCACTTT | GAGAATTGTGTAGGCGAATAG | |
| h_con_mecci6 | CTAGCCACCTCTAGCCTAGC | GTTTGGGCTACTGCTCGCAG | |
| h_div_mecci6 | GCATCAAACCTCAAACCTAC | ATCAGAGGATTGAGTAA | |
| h_con_mecci8 | TCCATTGTCGCATCCACCTT | TGGCTCAGTGCAGTTCGA | |
| h_div_mecci8 | TCGAACTGACACTGAGCCA | AAGGTGGATGCGACAATGGA | |
| h_con_mecci9 | AACAACAACCTATTTAGC | CGTGATAGTGGTTCGCTGG | |
| h_div_mecci9 | CAGGCACATACTTCTTATTC | GCTAAATAGGTTGTTGTTG | |
| h_con_mecci10 | ATAACCCAATACCAAACGCC | TTAGTAGTATAGTGATGCC | |
| h_div_mecci10 | CAGTCCCTAGCTGCTGGCATC | AGTAGGACTGCTGTGATTAG | |
| h_con_mecci11 | CTCCAACATACTCGGATTCT | GATTTGGTCTGTGAAATTG | |
| h_div_mecci11 | CTACTCCTCTAGACCTAAC | TGTGCGGTGTGTGATGCTAG | |
| h_con_mecci13 | CACCTACTCATGCACCTAAT | GACAGCGATTCTAGGATAG | |
| h_div_mecci13 | CTATCCTAGAAATCGCTGTC | GAAGATGATAAGTGTAGAGG | |
| h_con_mecci14 | CCTATACTCCCTCTACATAT | AGGAGAATGGGGGATAGGTG | |
| h_div_mecci14 | AACCTCATTACACGAGA | TTAATGTGGTGGGTGAGTGAG | |
| h_con_mecci15 | CATGTGCCTAGACCAAGAAG | CTATGATGGACCATGTAACG | |
| h_div_mecci15 | CGTTACATGGTCCATCATAG | GCTTCTTGGTCTAGGCACAT | |
| h_con_mecci18 | ACTCCACCTCAATCACAATA | TAGGTAGGAGTAGCGTGGT | |
| h_div_mecci18 | ACCACGCTACTCCTACCTA | TAGTGTGATTGAGGTGGAGT | |
| h_con_mecciND1 | ACCTCAACCTAGGCCTCTA | CATATGAGATTGTTGGGCT | |
| h_div_mecciND1 | TGAGCATCAAACCTCAAACCTAC | CTAGGCTAGAGGTGGCTAGAA | |
| h_con_mecciND5 | CTCAACTACCTAAACCAACAA | TAAGAAGGCCTAGATAGGGG | |
| h_div_mecciND5 | CATCACACACCCGACAAATC | AGAATCCGAGTATGTTGGAG | |
| h_ciRS-7 | AACTACCCAGTCTTCCATCA | AGACTTGAAGTCGCTGGAAG | |
| mouse mecciRNA detection primer | | | |
| name | forward primer 5'-3' | reverse primer 5'-3' | |
| m_div_mecci1 | GCTTAAGACACCTTGCCTA | TACACCGTCTATGGAGGTT | for mouse mecciRNA PCR and realtime-PCR |
| m_div_mecci2 | TTTAGATTATAGCCAAAAGAGGGACA | TTTTTGGGTAACCGCTATCAC | |
| m_div_mecci6 | AGCTAGAAACCCCGAAACCA | TTCATTATGCAAAAAGGTACAAGG | |
| m_div_mecci11 | GTGGGCAATTGATGAATAGGC | TCTTCTTACAACCCATCCCT | |
| m_div_mecci12 | CAGGCAAGTGCCTCTAATACT | 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 | GAATCGAACCTGATTCGCCGTC | |
| q_Actin | GAGTACTTGGCTCAGGAG | CCAACACAGTCTGCTGCTGG | |
| h_q_ND1 | CCCTAAAACCCGCCACATCTA | GAGCGATGGTGAAGGTAAGGT | |
| h_q_mecciND5 | ATCTAGGCCTTCTTACGAGC | ATTGTGCGGTGTGTGATGCT | |
| h_q_ND5 | GCAGCCATTCAAGCAATCCTA | AGGCGAGGATGAAACCGATA | |
| h_q_ATP6 | TCGGTTGTTGATGAGATATTGGA | CGCCGCACTACTGATCATTCT | |
| h_q_12s rRNA | TAGAGGAGCCTGTTCTGTAATCGAT | CGACCCTTAAAGTTTCATAAGGGCTA | |
| h_q_RPA70 | GGGGATACAAACATAAAGCCCA | CGATAACCGCGCGGACTATT | |
| h_q_RPA32 | GGTAGCCTTAAAGATCATGCC | CTGTTGGCTTGTCTAGTACCA | |
| qh_mtDNA_UUR | CACCAAGAACAGGGTTTGT | TGGCCATGGGTATGTTGTTA | used for mtDNA copy number |
| qh_nucDNA_B2M | TGCTGTCTCCATGTTGATGTATCT | TCTCTGCTCCCCACCTCTAAGT | |
| h_q_hnRNPA1 | CCACGAAACCAAGGTGGCTA | TCCCTGCTACTTCTTGGCT | |
| h_q_hnRNPA2B1 | AGAGGCTTTGGCTTTGTTAC | CCACTCCTAGAACTCTGAAC | |
| h_q_hnRNPA3 | TGGAAGAAGCTCGGCAGT | ACCTGCAGCTTTCCTGACAA | |
| h_q_PNPASE | CTGCCTACTCAGGTTTCTCCTC | GACCCATTTGACTCTAGGAC | |
| h_q_RMRP | CAGAGAGTGCCACGTGCATA | CTAGAGGGAGCTGACGGATG | |
| h_16S | ACCAGACGAGCTACCTAAGA | CTTGACAACCAGCTATCAC | |
| E1-linear ND1-E2 | CTACCGTTTAAATATTCTCCT | ACCAAGAAAACATATTGTTG | |
| E1-linear ND5-E2 | CTACCGTTTAAATATTCCTAG | CCCAAGAAAACATGGAGTAG | |
| div_E2-mecciND1-E1 | CTAGCCTAGCCGTTTACTC | GGAGAATATTAACCGGTAGACC | used for <i>in vitro</i> assay |
| div_E2-mecciND5-E1 | CTCCAACATACTCGGATTCT | CTAGGGAAATATTAACCGGTAGAC | |
| div_E2-circSRSF-E1 | GGATGGAACCTGAAGTCAATG | AATCAATATTAACCGGTAGACCC | |
| q-4mut-mecciND1 | CTCTGATCAGGGTGCATC | TGAGTAAACCGCTAGGGATC | |

| | | | | |
|---------------------------------------|--|---------------------------|--|--|
| q-6mut-mecciND5 | CTAGGCCTTCTTACGAGCCA | ATTGTGCGGTGTGTTTCGTA | and mecciND5 | |
| C. elegans mecciRNA PCR primer | | | | |
| Name | forward primer 5'-3' | reverse primer 5'-3' | | |
| con_mecci-ctc-1 | TCATAAAGATATCGGAACTC | CGATTATAGTAGGTATTACC | used for <i>C.elegans</i> mecciRNA identification | |
| div_mecci-ctc-1 | CGTTTAGAATTAGCTAAAAC | CCAACCATACCAGATCAAAG | | |
| con_mecci-nudo-5 | GGCCTATTTACTATATTTTT | CAAAGTAACTATTGAAAAAC | | |
| div_mecci-nudo-5 | CAATAGTTACTTTGGGCCTA | CTATTTGTGAAAGTGTCTC | | |
| con_mecci-nudo-1 | GGGCCACCAAGGTTACA | GGTATAATTGGGGCCATC | | |
| div_mecci-nudo-1 | ACTTGTACCAGGAATTC | CCCATCCAATAAAGCTTG | | |
| q_div_mecci-ctc-1 | GTATAGATTGGATTACGTC | CTAGTACCAACCATACCAGATC | <i>C. elegans</i> mecciRNA real-time PCR primer | |
| q_ctc-1_out | GGTATTGTCAGACAATCTACAC | GTGAGCTCATACTACACAACC | | |
| q_div_mecci-nudo-5 | GGCACTTTACAAAATAGGTTTTTC | GGCTACCACCTTCTCAAATC | | |
| q_nudo-5 out | TTGGTTACAGTTTTCTGCTTTGA | GAAAAGTCTTGGGATGTTAAGAAGA | | |
| S. pombe mecciRNA PCR primer | | | | |
| Name | forward primer 5'-3' | reverse primer 5'-3' | | |
| con-pombe-mecci-cox1 | AATAGGCCTCTTAACGTTGCT | TTGTTGIGATTTTCGTTGCGTA | used for <i>S. pombe</i> mecciRNA identification | |
| div-pombe-mecci-cox1 | CCTCAGAGACTTTACGCAACG | CAAGTAGTTCAGCATATAGC | | |
| con-pombe-mecci-21SrRNA | GTTTCAGTATAGAGGTTAGTCG | TAACCTCGCTCATTGAGCACA | | |
| div-pombe-mecci-21SrRNA | CTCTGTTTGACACCTCGATG | CGACTAACCTCTATACTGAAC | | |
| con-pombe-mecci-cob1 | GAGCTGTATTGCCCGAATTC | GACCGCATAGTCATTAGACC | | |
| div-pombe-mecci-cob1 | AGGATACACACCAGGAGAAG | CAGCTAAGACAATCACCTATC | | |
| primers for plasmids | | | | |
| mecciND1-OE-F | ATTCTGCAGTCGACGGTACCGGATCAGGACATCCCGATGG | | mecciND1 overexpression plasmid | |
| mecciND1-OE-R | TATCTAGATCCGGTGGATCCGTTTAAGCTCCTATTATTTA | | | |
| mecciND1-mut4-F | TATTCTAGCCACCTGATCCCTAGCCGTTTACTCAATCC | | stem-loop mutant (mut) mecciND1 overexpression plasmid | |
| mecciND1-mut4-R | GAGTAAACGGCTAGGGATCAGGTGGCTAGAATAAATAGG | | | |
| mecciND5-OE-F | GATCCGCTAGCGCTACCGGTACCCTACTAAACCCATTA | | mecciND5 overexpression plasmid | |
| mecciND5-OE-R | TTATCTAGATCCGGTGGATCCTTATGCCTTTTGGGTTGAG | | | |
| mecciND5-mut6-F | CTCGGATTCTACCCTACGAACACACCCGCACAAATCCCT | | stem-loop mutant (mut) mecciND5 overexpression plasmid | |
| mecciND5-mut6-R | GATTGTGCGGTGTGTTTCGTAGAGGGTAGAATCCGAGTATG | | | |
| BglII-EcoRI-3xflag-F | GATCTATGGACTACAAAGACCATGACGGTGATTATAAAGATCATGACATCGATTACAAGGATGACGATGACAAGTAAG | | C-terminal FLAG-tagged human TOM20, TOM40, PNPASE plasmid construction | |
| BglII-EcoRI-3xflag-R | AATCTTACTTGTTCATCGTCATCCTTGTAATCGATGTCATGATCTTTATAATCACCGTCATGGTCTTTGTAGTCCATA | | | |
| AgeI-TOM20-F | GTCAGATCCGCTAGCGTACCGGTATGGTGGGTCGGAACAGCGC | | | |
| TOM20-BglII-R | GAATTCGAAGCTTGAGCTCGAGATCTTCCACATCATCTTCAGCCA | | | |
| AgeI-TOM40-F | GTCAGATCCGCTAGCGTACCGGTATGGGGAACGTGTTGGCTGC | | | |
| TOM40-BglII-R | GAATTCGAAGCTTGAGCTCGAGATCTGCGATGGTGAGGCCAAAGC | | | |
| BglII-BamHI-3xflag-F | GATCTATGGACTACAAAGACCATGACGGTGATTATAAAGATCATGACATCGATTACAAGGATGACGATGACAAGTAAG | | | |
| BglII-BamHI-3xflag-R | GATCCTTACTTGTTCATCGTCATCCTTGTAATCGATGTCATGATCTTTATAATCACCGTCATGGTCTTTGTAGTCCATA | | | |
| AgeI-PNPASE-F | GTCAGATCCGCTAGCGTACCGGTATGGCGGCCGTCAGGTAAGT | | | |
| PNPASE-BglII-R | CGAAGCTTGAGCTCGAGATCTCTGAGAAATAGATGATGAC | | | |
| Group I intron sequence of Td g | GGTCTACATAAATGCCTAACGACTATCCCTTTGGGGAGTAGGGTCAAGTGACTCGAAACGATAGACAACCTTGTCTTAACAAGTTGGAGATATAGTCTGCTCTGCATGTGACATGCAGCTGGATATAAATCCGGGGTAAGATTAACGACCTTATCTGAACATAATGCTACCGTTAATATTTATGTTTCTTGGGTTAATTGAGGCCTGAGTATAAGGTGACTTAACTTGTAATCTATCTAAACGGGGAACCTCTCTAGTAGACAATCCCGTGCTAAATTTGATAGGACT | | | for <i>in vitro</i> 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 TTActtgtcatgctcatc | | |
| SP6_RPA2_XbaII_R | TATAGAATAGGGCCCTCTAGAGCCACCA TGTGGAACAGT | | plamids for in vitro transcription by SP6 promoter and in vitro translation |
| SP6_HNRNPA1_XbaII_R | TATAGAATAGGGCCCTCTAGAGCCACCA TGTCTAAGTCA | | |
| | | | |
| oligos and probes | | | |
| Bio-scramble-oligo | TTCTCCGAACGTGTGCACGTTCGAACGTG TC | | |
| Bio-mecciND1-oligo | CTAGAATAAAATAGGAGATTGTTGG GCTAC | | probe for Biotin oligo pull down |
| biotin_mecciND5_probe | AGGTAGTTGAGGTC TAGGGGAGTAAAGG GC | | |
| mecciND1-s | TGTAATACGACTCACTATAGGGTGA GCATCAAAC TCAAAC TAC | CTAGGCTAGAGGTGGCTAGAA | |
| mecciND1-as | TGAGCATCAAAC TCAAAC TAC | TGTAATACGACTCACTATAGGG CTAGGCTAGAGGTGGCTAGAA | |
| ND1_out_as | CTCGTTGTACCCATTCTAATCG | TGTAATACGACTCACTATAGGGGTC AGCGAAGGGTTGTAGTAGC | primer for Northern blot or FISH probe |
| mecciND5_s | TGTAATACGACTCACTATAGGGCCGC ACAATCCCCTATCTAG | TGTGTGATGCTAGGGTAGAA | |
| mecciND5_as | CCGCACAATCCCCTATCTAG | TGTAATACGACTCACTATAGGGT GTGTGATGCTAGGGTAGAA | |
| mecci-CYB | CCGATCCGTCCTAACAAAC | GAATTGTGTAGGCGAATAGG | |
| si-NC | UUCUCCGAACGUGUCACGU | ACGUGACACGUUCGGAGAA | |
| mecciND1-siRNA | CCAAACAAUCUCCUAUUUUU | AUAAAUAGGAGAUUGUUUGG | siRNA for mecciRNA knockdown |
| mecciND5-siRNA-2 | CUCCAACAUACUCGGAUUCU | AGAAUCCGAGUAUGUUGGAG | |
| mecciND5-siRNA-1 | CUACUCCCCUAGACCUCUA | UUGAGGUCUAGGGGGAGUAG | |
| ND1mRNA siRNA | AACGUUGGGGCCUUUGCGUAGUU | AACUACGCAAAGGCCCAACGUU | |
| si-PNPASE | GCAGGUAGAAUCCCAAA | UUGUGGGAAUUCUACCUGC | |
| mecciND1-AMO | TATGAGATTGTTGGGCTACTGCTC | | |
| mecciND5-AMO | TTTTGGCTCGTAAGAAGCCCTAGAT | | |
| | | | |
| qPCR primers for mecciRNA in 293T cells | | | |
| 293Tmecci1_F | CAGCGCAATCCTATTCTAGA | | |
| 293Tmecci1_R | GTAACCTGTTCCGTTGGTCA | | |
| 293Tmecci2_F | ACCTGGCGCAATAGATATAG | | |
| 293Tmecci2_R | GGGTAAATGGTTTGGCTAAG | | |
| 293Tmecci3_F | GCTGGTTGTCCAAGATAG | | |
| 293Tmecci3_R | TTGCTACATAGACGGGTG | | |
| 293Tmecci5_F1 | CAATCCTACCTCCATCGCTA | | |
| 293Tmecci5_R1 | AGGAGTAGGGTTAGGATGAG | | |
| 293Tmecci6_F | CTGTTAGTCCAAGAGGAACAGC | | |
| 293Tmecci6_R | CAAGGGGATTTAGAGGGTTCTG | | |
| 293Tmecci7_F | TCACAGCACCAAATCTCCAC | | |
| 293Tmecci7_R | TTGTGCGGTGTGTGATGCTA | | |
| 293Tmecci8_F1 | CACACCCGTCTATGTAGCAA | | |
| 293Tmecci8_R1 | AGCTGTTCTTAGGTAGCTCG | | |
| 293Tmecci10_F1 | TACTCTTTCACCCACAGCA | | |
| 293Tmecci10_R1 | GAATCCGAGTATGTTGGAG | | |
| 293Tmecci15_F1 | TAGCATCACACCCGCACAA | | |
| 293Tmecci15_R1 | AGAATCCGAGTATGTTGGAG | | |
| 293Tmecci17_F1 | GACGTTAGGTCAAGGTGTAG | | |
| 293Tmecci17_R1 | AAGAGGTGGTGAGGTTGATC | | |
| 293Tmecci19_F | CACTATCCTAACCTACTC | | |
| 293Tmecci19_R | TTGGGTTGAGGTGATGATGG | | |
| 293Tmecci20_F | CCTAGACCTAACCTGACTAG | | |
| 293Tmecci20_R | GCTCGTAAGAAGCCTAGAT | | |
| 293Tmecci22_F | CTCACTGTCAACCCAACACA | | |
| 293Tmecci22_R | TCTTAGGTAGCTCGTCTGGT | | |
| 293Tmecci23_F | CCAGACAACCTTAGCCAAAC | | |
| 293Tmecci23_R | CAAGAGGTGGTGAGGTTGAT | | |
| 293Tmecci24_F | CATGAGGTGGCAAGAAATGG | | |
| 293Tmecci24_R | CTTGCCTTACTTTGTAGCC | | |
| 293Tmecci25_F | ATTCCGCTACGACCAACTCA | | |
| 293Tmecci25_R | AGAAGTAGGGTCTTGGTGAC | | |
| 293Tmecci26_F | ATTCTCCTCCGCATAAGC | | |
| 293Tmecci26_R | AGGGTGATAGATTGGTCC | | |
| 293Tmecci28_F | CACCAAATCTCCACCTCCATCAT | | |
| | | | 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) |

| | | |
|--------------------------|---|--|
| 293Tmecci28_R | CGGTGTGTGATGCTAGGGTA | |
| 293Tmecci29_F | ATCTCGAACTGACACTGAGC | |
| 293Tmecci29_R | CTTCTTGGTCTAGGCACATG | |
| 293Tmecci30_F | CACTGTCAACCCAACACAG | |
| 293Tmecci30_R | TCCTAGTGTCCAAGAGCTG | |
| 293Tmecci31_F | TCACAGCACAAATCTCCAC | |
| 293Tmecci31_R | CTAGTCAGGTTAGGCTAGG | |
| 293Tmecci32_F | CCGTACATAGCACATTACAG | |
| 293Tmecci32_R | TGTACTACAGGTGGTCAAGT | |
| 293Tmecci33_F | GGTCCATCATCCACAACCTT | |
| 293Tmecci33_R | GTATGGCTTTGAAGAAGGCG | |
| 293Tmecci34_F | CTCCTTACACTATTCCTCATCAC | |
| 293Tmecci34_R | GGCATTTCAGTAAAGAGGTGT | |
| 293Tmecci35_F | ACCTAGCTCTCACCATC | |
| 293Tmecci35_R | CGTTCGGTAAGCATTAGG | |
| 293Tmecci36_F | TCACACGATTAACCCAAGTCA | |
| 293Tmecci36_R | CTGGCACGAAATTGACCAAC | |
| 293Tmecci38_F | CCACAGGTCCTAAACTACCA | |
| 293Tmecci38_R | AGAGCTGTTCCCTCTTTGGAC | |
| 293Tmecci39_F | CCTATCTAGGCCTTCTTACG | |
| 293Tmecci39_R | TCTAGGGCTGTTAGAAGTCC | |
| L440-ApaI-meccictc-1_F1 | GCGAATTGGGTACCGGGCCCCGTTTAG AATTAGCTAAACC | |
| L440-BglII-meccictc-1_R1 | ATAGGGAGACCGGCAGATCTCTAGTACC AACCATACCAGA | |
| L440-ApaI-meccinduo-5_F | GCGAATTGGGTACCGGGCCCCGAGGACAC TTTCACAAATAG | |
| L440-BglII-meccinduo-5_R | ATAGGGAGACCGGCAGATCTGGCTACC ACCTTCTCAA | |
| myo-3 -F1 | AAGCTTGCATGCCTGCAGGCTCCAACC AATTATCATTTT | |
| myo-3 -R1 | CCAAGAATTGTGTCCGACATTTCTAGAT GGATCTAGTGGT | |
| TOMM20-F1 | ACCACTAGATCCATCTAGAAATGTCGGA CACAATTCTTGG | |
| TOMM20-R1 | AGTTCTTCTCCTTTACTCATTCTTTTG CCTAATCTTGT | |
| GFP-F1 | ACAAGATTAGGCAAAAAGAGAATGAGTA AAGGAGAAGAACT | |
| GFP-R1 | GTtGGCGTCGATCATCCGGATTATTTGTA TAGTTCATCCA | |
| | | plasmids construction for <i>C.elegans</i> feeding RNAi |
| | | primer for <i>myo-3 p::tomm20 (aa1-49)::GFP</i> plamid |