

**Table S5.** Genes required for maintenance of [ARG8<sup>m</sup>] mtDNA and expression of Arg8<sup>m</sup> in mitochondria. This table contains the systematic gene name according to SGD, the standard gene name according to SGD, the *pet* score, the results of the ARG8<sup>m</sup> screen, and for dubious ORFs a list of overlapping genomic features according to SGD. The table indicates how many independent biological replicates could be analyzed for each mutant and whether these behaved identically. 22 mutants that are either defective in arginine biosynthesis or mating or carry deletions of dubious ORFs are listed at the end of the table. They were excluded from further analysis.

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ORF	standard name	<i>pet</i> score	replicates	screen result	reproduced	overlapping ORFs
<b>mtDNA metabolism</b>						
<i>YCR028C-A</i>	<i>RIM1</i>	1.00	2	no rescue	yes	
<i>YJR144W</i>	<i>MGM101</i>	1.00	2	no rescue	yes	
<i>YOR330C</i>	<i>MIP1</i>	1.00	2	no rescue	no	
<b>Mitochondrial transcription</b>						
<i>YFL036W</i>	<i>RPO41</i>	0.75	2	no rescue	yes	
<i>YMR228W</i>	<i>MTF1</i>	1.00	2	no rescue	yes	
<b>Mitochondrial translation and RNA maturation</b>						
<i>YBL038W</i>	<i>MRPL16</i>	0.75	2	ambiguous	yes	
<i>YBL080C</i>	<i>PET112</i>	0.75	2	rescue	yes	
<i>YBL090W</i>	<i>MRP21</i>	1.00	2	no rescue	yes	
<i>YBR251W</i>	<i>MRPS5</i>	0.75	2	rescue	yes	
<i>YBR268W</i>	<i>MRPL37</i>	0.75	2	ambiguous	yes	
<i>YBR282W</i>	<i>MRPL27</i>	1.00	2	ambiguous	yes	
<i>YCR003W</i>	<i>MRPL32</i>	1.00	2	rescue	yes	
<i>YCR024C</i>	<i>SLM5</i>	1.00	2	no rescue	yes	
<i>YCR046C</i>	<i>IMG1</i>	1.00	2	no rescue	yes	
<i>YCR071C</i>	<i>IMG2</i>	1.00	2	rescue	yes	
<i>YDL202W</i>	<i>MRPL11</i>	0.75	2	no rescue	yes	
<i>YDR175C</i>	<i>RSM24</i>	1.00	2	no rescue	yes	
<i>YDR268W</i>	<i>MSW1</i>	0.75	2	no rescue	yes	
<i>YDR296W</i>	<i>MHR1</i>	0.75	2	rescue	yes	
<i>YDR322W</i>	<i>MRPL35</i>	0.50	2	ambiguous	no	
<i>YDR350C</i>	<i>ATP22</i>	0.75	2	ambiguous	yes	
<i>YDR405W</i>	<i>MRP20</i>	0.75	2	ambiguous	no	
<i>YEL050C</i>	<i>RML2</i>	0.75	2	ambiguous	yes	
<i>YER050C</i>	<i>RSM18</i>	1.00	2	no rescue	yes	
<i>YER087W</i>	<i>AIM10</i>	1.00	2	rescue	yes	
<i>YGL107C</i>	<i>RMD9</i>	0.75	1	no rescue	nd	
<i>YGL129C</i>	<i>RSM23</i>	1.00	2	no rescue	yes	
<i>YGL143C</i>	<i>MRF1</i>	1.00	1	rescue	nd	
<i>YGR150C</i>	<i>CCM1</i>	1.00	2	ambiguous	no	
<i>YGR165W</i>	<i>MRPS35</i>	0.50	2	no rescue	yes	
<i>YGR215W</i>	<i>RSM27</i>	1.00	2	no rescue	yes	
<i>YGR220C</i>	<i>MRPL9</i>	1.00	2	rescue	yes	
<i>YHL004W</i>	<i>MRP4</i>	1.00	2	no rescue	yes	
<i>YHR011W</i>	<i>DIA4</i>	1.00	2	no rescue	no	
<i>YHR091C</i>	<i>MSR1</i>	1.00	2	no rescue	no	
<i>YHR147C</i>	<i>MRPL6</i>	1.00	2	rescue	yes	
<i>YJL023C</i>	<i>PET130</i>	0.50	1	no rescue	nd	
<i>YJL096W</i>	<i>MRPL49</i>	1.00	2	ambiguous	yes	
<i>YJR113C</i>	<i>RSM7</i>	1.00	2	rescue	yes	
<i>YKL003C</i>	<i>MRP17</i>	1.00	1	ambiguous	nd	
<i>YKL155C</i>	<i>RSM22</i>	1.00	2	no rescue	no	
<i>YKL170W</i>	<i>MRPL38</i>	1.00	1	rescue	nd	
<i>YKL194C</i>	<i>MST1</i>	1.00	2	no rescue	yes	
<i>YKR006C</i>	<i>MRPL13</i>	1.00	2	rescue	no	
<i>YKR085C</i>	<i>MRPL20</i>	0.75	1	no rescue	nd	

ORF	standard name	<i>pet</i> score	replicates	screen result	reproduced	overlapping ORFs
<i>YLR139C</i>	<i>SLS1</i>	1.00	2	ambiguous	no	
<i>YLR204W</i>	<i>QRI5</i>	0.50	1	rescue	nd	
<i>YMR097C</i>	<i>MTG1</i>	0.75	2	rescue	yes	
<i>YMR257C</i>	<i>PET111</i>	1.00	2	rescue	yes	
<i>YMR286W</i>	<i>MRPL33</i>	1.00	2	no rescue	no	
<i>YMR293C</i>	<i>HER2</i>	1.00	2	rescue	yes	
<i>YNL005C</i>	<i>MRP7</i>	1.00	2	no rescue	no	
<i>YNL073W</i>	<i>MSK1</i>	1.00	2	no rescue	yes	
<i>YNL081C</i>	<i>SWS2</i>	1.00	2	no rescue	yes	
<i>YNL177C</i>	<i>MRPL22</i>	1.00	2	rescue	yes	
<i>YNL252C</i>	<i>MRPL17</i>	0.75	2	no rescue	yes	
<i>YNL284C</i>	<i>MRPL10</i>	0.75	1	no rescue	nd	
<i>YNR036C</i>	<i>MRPS12</i>	0.75	1	no rescue	nd	
<i>YNR037C</i>	<i>RSM19</i>	1.00	2	no rescue	yes	
<i>YOL023W</i>	<i>IFM1</i>	0.75	2	rescue	no	
<i>YOL033W</i>	<i>MSE1</i>	1.00	2	rescue	no	
<i>YOR150W</i>	<i>MRPL23</i>	1.00	2	ambiguous	no	
<i>YOR158W</i>	<i>PET123</i>	1.00	2	no rescue	yes	
<i>YOR187W</i>	<i>TUF1</i>	1.00	2	no rescue	yes	
<i>YOR201C</i>	<i>MRM1</i>	0.50	2	rescue	yes	
<i>YOR205C</i>	<i>GEP3</i>	0.75	2	rescue	yes	
<i>YPL005W</i>	<i>AEP3</i>	0.75	2	no rescue	yes	
<i>YPL013C</i>	<i>MRPS16</i>	1.00	1	no rescue	nd	
<i>YPL097W</i>	<i>MSY1</i>	1.00	2	no rescue	yes	
<i>YPL118W</i>	<i>MRP51</i>	0.75	2	no rescue	yes	
<i>YPL173W</i>	<i>MRPL40</i>	1.00	2	no rescue	no	
<i>YPL183W-A</i>	<i>RTC6</i>	0.50	2	no rescue	no	
<i>YPR047W</i>	<i>MSF1</i>	0.75	2	rescue	yes	
<i>YPR100W</i>	<i>MRPL51</i>	0.75	2	no rescue	no	
<i>YPR116W</i>	<i>RRG8</i>	1.00	1	no rescue	nd	
<b>Respiratory chain components and assembly factors</b>						
<i>YDR178W</i>	<i>SDH4</i>	0.25	2	rescue	yes	
<i>YDR377W</i>	<i>ATP17</i>	1.00	1	rescue	nd	
<i>YJL166W</i>	<i>QCR8</i>	0.75	2	no rescue	no	
<i>YKL016C</i>	<i>ATP7</i>	1.00	1	rescue	nd	
<i>YNL052W</i>	<i>COX5A</i>	1.00	2	no rescue	no	
<i>YPL271W</i>	<i>ATP15</i>	1.00	1	rescue	nd	
<b>Mitochondrial fusion</b>						
<i>YBR179C</i>	<i>FZO1</i>	0.75	2	no rescue	yes	
<i>YDR470C</i>	<i>UGO1</i>	0.25	2	no rescue	yes	
<i>YGR101W</i>	<i>PCP1</i>	0.50	2	no rescue	yes	
<i>YOR211C</i>	<i>MGM1</i>	1.00	2	no rescue	no	
<b>Other mitochondrial function</b>						
<i>YBL022C</i>	<i>PIM1</i>	0.50	1	rescue	nd	
<i>YBR084W</i>	<i>MIS1</i>	0.00	1	rescue	nd	
<i>YDL198C</i>	<i>GGC1</i>	0.75	2	rescue	no	
<i>YER057C</i>	<i>HMF1</i>	0.00	2	no rescue	no	
<i>YER154W</i>	<i>OXA1</i>	1.00	2	rescue	yes	
<i>YFL016C</i>	<i>MDJ1</i>	1.00	2	no rescue	yes	

ORF	standard name	<i>pet</i> score	replicates	screen result	reproduced	overlapping ORFs
<i>YGR257C</i>	<i>MTM1</i>	0.50	2	rescue	yes	
<i>YJL200C</i>	<i>ACO2</i>	0.00	1	rescue	nd	
<i>YKL134C</i>	<i>OCT1</i>	1.00	2	no rescue	yes	
<i>YMR267W</i>	<i>PPA2</i>	1.00	2	ambiguous	no	
<i>YOR045W</i>	<i>TOM6</i>	0.00	2	rescue	no	
<i>YPL029W</i>	<i>SUV3</i>	0.75	2	rescue	yes	
<i>YPL059W</i>	<i>GRX5</i>	0.75	1	rescue	nd	
<i>YPL188W</i>	<i>POS5</i>	0.25	1	rescue	nd	
<i>YPL270W</i>	<i>MDL2</i>	0.00	2	rescue	yes	
<b>Vacuole-related function</b>						
<i>YCL005W-A</i>	<i>VMA9</i>	1.00	1	rescue	nd	
<i>YDR069C</i>	<i>DOA4</i>	0.25	1	rescue	nd	
<i>YDR136C</i>	<i>VPS61</i>	0.00	2	rescue	no	
<i>YEL027W</i>	<i>VMA3</i>	0.75	1	rescue	nd	
<i>YEL051W</i>	<i>VMA8</i>	0.75	2	ambiguous	no	
<i>YGL095C</i>	<i>VPS45</i>	0.50	2	ambiguous	yes	
<i>YGR105W</i>	<i>VMA21</i>	1.00	2	rescue	yes	
<i>YHR026W</i>	<i>VMA16</i>	0.75	1	rescue	nd	
<i>YKL002W</i>	<i>DID4</i>	0.75	1	rescue	nd	
<i>YKL041W</i>	<i>VPS24</i>	0.00	2	rescue	yes	
<i>YKL080W</i>	<i>VMA5</i>	1.00	1	rescue	nd	
<i>YLR261C</i>	<i>VPS63</i>	0.00	1	rescue	nd	
<i>YLR396C</i>	<i>VPS33</i>	0.75	2	no rescue	yes	
<i>YLR417W</i>	<i>VPS36</i>	0.00	2	ambiguous	yes	
<i>YOR106W</i>	<i>VAM3</i>	0.00	2	rescue	yes	
<i>YPL002C</i>	<i>SNF8</i>	0.00	2	rescue	yes	
<i>YPL084W</i>	<i>BRO1</i>	0.00	1	rescue	nd	
<b>Other function</b>						
<i>YBR019C</i>	<i>GAL10</i>	0.00	2	rescue	yes	
<i>YBR020W</i>	<i>GAL1</i>	0.00	1	no rescue	nd	
<i>YBR191W</i>	<i>RPL21A</i>	0.00	2	ambiguous	no	
<i>YBR270C</i>	<i>BIT2</i>	0.00	2	rescue	no	
<i>YDR005C</i>	<i>MAF1</i>	0.00	2	rescue	yes	
<i>YDR017C</i>	<i>KCS1</i>	0.00	2	rescue	no	
<i>YDR079C-A</i>	<i>TFB5</i>	0.33	2	rescue	no	
<i>YDR123C</i>	<i>INO2</i>	0.00	2	rescue	no	
<i>YDR138W</i>	<i>HPR1</i>	0.25	2	no rescue	yes	
<i>YDR244W</i>	<i>PEX5</i>	0.00	2	rescue	yes	
<i>YDR289C</i>	<i>RTT103</i>	0.00	1	rescue	nd	
<i>YDR349C</i>	<i>YPS7</i>	0.00	2	rescue	no	
<i>YDR477W</i>	<i>SNF1</i>	0.75	1	rescue	nd	
<i>YEL044W</i>	<i>IES6</i>	0.25	1	no rescue	nd	
<i>YEL062W</i>	<i>NPR2</i>	0.00	1	rescue	nd	
<i>YER070W</i>	<i>RNR1</i>	0.50	1	ambiguous	nd	
<i>YFL053W</i>	<i>DAK2</i>	0.00	2	rescue	no	
<i>YGL023C</i>	<i>PIB2</i>	0.00	2	rescue	no	
<i>YGL084C</i>	<i>GUP1</i>	0.25	2	no rescue	yes	
<i>YGL203C</i>	<i>KEX1</i>	0.00	2	rescue	no	
<i>YGR077C</i>	<i>PEX8</i>	0.00	2	rescue	no	

ORF	standard name	<i>pet</i> score	replicates	screen result	reproduced	overlapping ORFs
<i>YHL011C</i>	<i>PRS3</i>	0.00	2	no rescue	yes	
<i>YJL121C</i>	<i>RPE1</i>	0.50	1	rescue	nd	
<i>YJL157C</i>	<i>FAR1</i>	0.00	1	no rescue	nd	
<i>YJR073C</i>	<i>OPI3</i>	0.00	2	rescue	yes	
<i>YKL038W</i>	<i>RGT1</i>	0.00	1	ambiguous	nd	
<i>YKL179C</i>	<i>COY1</i>	0.00	2	rescue	no	
<i>YKR055W</i>	<i>RHO4</i>	0.00	1	rescue	nd	
<i>YLR182W</i>	<i>SWI6</i>	0.00	2	no rescue	no	
<i>YLR350W</i>	<i>ORM2</i>	0.25	2	no rescue	no	
<i>YLR351C</i>	<i>NIT3</i>	0.00	2	no rescue	no	
<i>YLR403W</i>	<i>SFP1</i>	0.00	1	rescue	nd	
<i>YMR180C</i>	<i>CTL1</i>	0.00	2	rescue	no	
<i>YMR285C</i>	<i>NGL2</i>	0.00	2	rescue	no	
<i>YNL064C</i>	<i>YDJ1</i>	0.25	2	no rescue	no	
<i>YNL286W</i>	<i>CUS2</i>	0.00	2	rescue	no	
<i>YNL323W</i>	<i>LEM3</i>	0.00	1	rescue	nd	
<i>YNL327W</i>	<i>EGT2</i>	0.00	2	rescue	no	
<i>YOL039W</i>	<i>RPP2A</i>	0.00	2	no rescue	no	
<i>YOL081W</i>	<i>IRA2</i>	0.00	1	rescue	nd	
<i>YOL108C</i>	<i>INO4</i>	0.00	1	rescue	nd	
<i>YOL145C</i>	<i>CTR9</i>	0.00	1	rescue	nd	
<i>YOR014W</i>	<i>RTS1</i>	0.00	1	rescue	nd	
<i>YOR021C</i>	<i>SFM1</i>	0.00	2	rescue	no	
<i>YOR027W</i>	<i>STI1</i>	0.00	2	no rescue	no	
<i>YOR171C</i>	<i>LCB4</i>	0.00	2	rescue	no	
<i>YOR295W</i>	<i>UAF30</i>	0.25	1	no rescue	nd	
<i>YOR307C</i>	<i>SLY41</i>	0.00	2	rescue	no	
<i>YPL031C</i>	<i>PHO85</i>	0.50	1	ambiguous	nd	
<i>YPL069C</i>	<i>BTS1</i>	0.00	2	ambiguous	no	
<b>Unknown function</b>						
<i>YDR065W</i>	<i>RRG1</i>	1.00	2	rescue	yes	
<i>YDR114C</i>		1.00	2	rescue	no	<i>MRX14</i>
<i>YLR255C</i>		0.00	2	no rescue	no	
<i>YMR066W</i>	<i>SOV1</i>	0.75	2	no rescue	yes	
<i>YNL133C</i>	<i>FYV6</i>	0.25	2	rescue	yes	
<i>YNL184C</i>		1.00	1	no rescue	nd	<i>MRPL19</i>
<i>YNL213C</i>	<i>RRG9</i>	1.00	1	rescue	nd	
<i>YPL056C</i>	<i>LCL1</i>	0.00	1	no rescue	nd	
<i>YPL205C</i>		0.00	2	rescue	no	
<b>Arginine biosynthesis</b>						
<i>YER069W</i>	<i>ARG5,6</i>	0.00	2	rescue	yes	
<i>YHR018C</i>	<i>ARG4</i>	0.00	2	rescue	yes	
<i>YJL088W</i>	<i>ARG3</i>	0.00	2	rescue	yes	
<i>YJR109C</i>	<i>CPA2</i>	0.00	2	rescue	yes	
<i>YOL058W</i>	<i>ARG1</i>	0.00	2	rescue	yes	
<i>YOR303W</i>	<i>CPA1</i>	0.00	2	rescue	yes	
<b>Dubious ORF</b>						
<i>YCL007C</i>		1.00	2	rescue	no	<i>VMA9</i>
<i>YER068C-A</i>		0.00	2	rescue	yes	<i>ARG5,6</i>

ORF	standard name	<i>pet</i> score	replicates	screen result	reproduced	overlapping ORFs
<i>YGL218W</i>		0.75	2	rescue	no	<i>MDM34</i>
<i>YGR219W</i>		0.75	2	rescue	yes	<i>MRPL9</i>
<i>YJL120W</i>		0.75	2	ambiguous	no	<i>RPE1</i>
<i>YJL175W</i>		0.25	1	no rescue	nd	<i>SWI3</i>
<i>YJR114W</i>		1.00	2	no rescue	yes	<i>RSM7</i>
<i>YKL076C</i>	<i>PSY1</i>	0.00	1	no rescue	nd	<i>YKL075C</i>
<i>YKL169C</i>		1.00	2	rescue	yes	<i>MRPL38</i>
<i>YKL177W</i>		0.00	2	no rescue	yes	<i>STE3</i>
<b>Mating</b>						
<i>YCR020W-B</i>	<i>HTL1</i>	0.25	1	no rescue	nd	
<i>YGL032C</i>	<i>AGA2</i>	0.00	2	rescue	no	
<i>YHL007C</i>	<i>STE20</i>	0.00	1	no rescue	nd	
<i>YKL178C</i>	<i>STE3</i>	0.00	2	no rescue	yes	
<i>YLR452C</i>	<i>SST2</i>	0.00	2	no rescue	no	
<i>YML008C</i>	<i>ERG6</i>	0.00	2	no rescue	yes	