**Table S3: Primers**

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| Primer Name | Sequence (5’-3’) | Function | Source |
| YDR369C-A | gtattgaagcaatttgtaagctggt | Cloning pRK1009 | Winzeler et al. 1999 |
| YDR369C-D | tccaattttaagattttcactctgc | Cloning pRK1009 | Winzeler et al. 1999 |
| YNL250W-A | ataaccatgcatcttgcaatacttt | Cloning pRK1006 | Winzeler et al. 1999 |
| YNL250W-D | atatgatgggtatcaaaggtgctta | Cloning pRK1006 | Winzeler et al. 1999 |
| RW 18 | atgctgtacaaaagaccccataatatct | Cloning pRK1000 | This Study |
| RW 19 | atgcgacgtcttacatataaatatattt | Cloning pRK1000 | This Study |
| RW 54 | gaagcgcaactagtagagcacgtggctcttttggg | Xrs2 S825A Site-directed Mutagenesis | This Study |
| RW 55 | cccaaaagagccacgtgctctactagttgcgcttc | Xrs2 S825A Site-directed Mutagenesis | This Study |
| RW 56 | gcaagtatttcccctcgcccaggaatttcaaag | Rad50 T568A Site-directed Mutagenesis | This Study |
| RW 57 | ctttgaaattcctgggcgaggggaaatacttgc | Rad50 T568A Site-directed Mutagenesis | This Study |
| RW 58 | gaagaagtgtctgaaattgaagctcaattgaatgaaatcactg | Rad50 S245A Site-directed Mutagenesis | This Study |
| RW 59 | cagtgatttcattcaattgagcttcaatttcagacacttcttc | Rad50 S245A Site-directed Mutagenesis | This Study |
| RW 60 | ctcaagtaaatcacgaaatggcacagttcaaggctttcatc | Rad50 S395A Site-directed Mutagenesis | This Study |
| RW 61 | gatgaaagccttgaactgtgccatttcgtgatttacttgag | Rad50 S395A Site-directed Mutagenesis | This Study |
| RW 62 | cacagttcaaggctttcatcgctcaggatttaactgacac | Rad50 S402A Site-directed Mutagenesis | This Study |
| RW 63 | gtgtcagttaaatcctgagcgatgaaagccttgaactgtg | Rad50 S402A Site-directed Mutagenesis | This Study |
| RW 64 | ccgacttgataaaatcaataaccgtcgatgcacagaatttggaatataataaaaaggac | Rad50 S434A Site-directed Mutagenesis | This Study |
| RW 65 | gtcctttttattatattccaaattctgtgcatcgacggttattgattttatcaagtcgg | Rad50 S434A Site-directed Mutagenesis | This Study |
| RW 66 | catttaaaagtttgtctgctcaagatagcctcaatc | Rad50 T466A Site-directed Mutagenesis | This Study |
| RW 67 | gattgaggctatcttgagcagacaaacttttaaatg | Rad50 T466A Site-directed Mutagenesis | This Study |
| RW 68 | gcaagtatttcccctcgcccaggaatttcaaag | Rad50 T388A Site-directed Mutagenesis | This Study |
| Primer Name | Sequence | Function | Source |
| RW 69 | ctttgaaattcctgggcgaggggaaatacttgc | Rad50 T388A Site-directed Mutagenesis | This Study |
| RW 70 | gaaaagattgataatgcacagaagtgccttg | Rad50 S753A Site-directed Mutagenesis | This Study |
| RW 71 | caaggcacttctgtgcattatcaatcttttc | Rad50 S753A Site-directed Mutagenesis | This Study |
| RW 74 | ctaattgaattgaaagcacaacttcagcac | Rad50 S1036A Site-directed Mutagenesis | This Study |
| RW 75 | gtgctgaagttgtgctttcaattcaattag | Rad50 S1036A Site-directed Mutagenesis | This Study |
| RW 76 | gagatgataggcaaaaagcacaaattgagtgggtc | Rad50 S1300A Site-directed Mutagenesis | This Study |
| RW 77 | gacccactcaatttgtgctttttgcctatcatctc | Rad50 S1300A Site-directed Mutagenesis | This Study |
| RW 80 | tagggataggcttacctgatccacctccgcccgatccacctccgccagatccacctccgccataagtgactctgtta | Cloning pRK1006 | This Study |
| RW 81 | ggtggtggtggtggtggtggtaagcctatccctaac | Cloning pRK1006 | This Study |
| RW 85 | gcttatcgataccgtcgacctcgagataaccatgcatcttgcaatacttt | Cloning pRK1006 | This Study |
| RW 92 | aaagtattgcaagatgcatggttatctcgaggtcgacggtatcgataagc | Cloning pRK1006 | This Study |
| RW 99 | ctgagtattcccacagttccatggtcacgtagaatcgagaccgag | Cloning pRK1006 | This Study |
| RW 100 | ctcggtctcgattctacgtgaccatggaactgtgggaatactcag | Cloning pRK1006 | This Study |
| RW 101 | gttggcgggtgtcggggctgggcatgcattccttgctatacgaacaa | Cloning pRK1012 | This Study |
| RW 102 | gtatagcaaggaatgcatgcccagccccgacaccc | Cloning pRK1012 | This Study |
| RW 103 | aatatagggatcaagtacaattcaattcatcattttttttttattcttttttttgatttcgg | Cloning pRK1012 | This Study |
| RW 104 | aaaaaaaatgatgaattgaattgtacttgatccctatattatattatatcctatttataaccaaggg | Cloning pRK1012 | This Study |
| RW 105 | ccagtgagcgcgcgtaatacctaagcgtaatctggaacgtcatatggatagg | Cloning pRK1012 | This Study |
| RW 106 | acgttccagattacgcttaggtattacgcgcgctcactgg | Cloning pRK1012 | This Study |
| RW 107 | ttacaggcttgcttgtgaacaagcttgatatcgaattcctgcagc | Cloning pRK1012 | This Study |
| RW 108 | aggaattcgatatcaagcttgttcacaagcaagcctgtaaataatatatatgcaa | Cloning pRK1012 | This Study |
| RW 109 | cgcatagtcaggaacatcgtatgggtattttcttttcttagcaaggag | Cloning pRK1012 | This Study |

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| Primer Name | Sequence | Function | Source |
| RW 110 | ctccttgctaagaaaagaaaatacccatacgatgttcctgactatgcg | Cloning pRK1012 | This Study |
| RW 172 | tgggatggtcacctttttattaatcatgtaattagttatgtcacgcttac | Cloning pRK1065 | This Study |
| RW 173 | gcaaattaaagccttcgagc | Cloning pRK1065 | This Study |
| RW 175 | ttaataaaaaggtgaccatcccatata | Cloning pRK1065 | This Study |
| RW 180 | gctcgaaggctttaatttgcgcatgcttactcttggcctcctctagtaca | Cloning pRK1065 | This Study |
| RW 195 | ttattgaccacacctctaccggcagatccgctagggataaatgggtaaaaagcctgaactcacc | Cloning pRK1009 | This Study |
| RW 196 | tggaaatactcggaaaatttatcagaattcgagctcgtttcagtatagcgaccagcattcaca | Cloning pRK1009 | This Study |
| RW 223 | ccatggaacgacattactatatatataatataggaagcatttaatagacagca | Cloning pRK1033 | This Study |
| RW 244 | ctttagcacagaaacaaaatattgatgattc | Rad50 T890A Site-directed Mutagenesis | This Study |
| RW 245 | gtttctgtgctaaagatgattcaatttcag | Rad50 T890A Site-directed Mutagenesis | This Study |
| RW 266 | gaattattgagcgatcccgcacaagtttttcactac | Mre11 S94A Site-directed Mutagenesis | This Study |
| RW 267 | gtagtgaaaaacttgtgcgggatcgctcaataattc | Mre11 S94A Site-directed Mutagenesis | This Study |
| RW 268 | gtgcaccctccaatgcacaatccccaatag | Mre11 T377A Site-directed Mutagenesis | This Study |
| RW 269 | ctattggggattgtgcattggagggtgcac | Mre11 T377A Site-directed Mutagenesis | This Study |
| RW 270 | gatctccagacattgcccaatcacatgttg | Mre11 T564A Site-directed Mutagenesis | This Study |
| RW 271 | caacatgtgattgggcaatgtctggagatc | Mre11 T564A Site-directed Mutagenesis | This Study |
| RW 272 | gaatcaagaataacccatattgctcaagcggaaagcagtaagc | Mre11 S578A Site-directed Mutagenesis | This Study |
| RW 273 | gcttactgctttccgcttgagcaatatgggttattcttgattc | Mre11 S578A Site-directed Mutagenesis | This Study |
| RW 274 | cgtagatattatggggtctttctatttcttagcatttttgacgaaatttgctattttgt | Cloning pRK1033 | This Study |
| RW 275 | tcaaaaatgctaagaaatagaaagaccccataatatctacgaagggatag | Cloning pRK1033 | This Study |
| RW 276 | gacgtcttacatataaatatatttgtatcttggaatttttatcatttcagacaaaa | Cloning pRK1033 | This Study |
| RW 296 | cattcctcctcatttggcacaattcaggacgatg | Xrs2 T128A Site-directed Mutagenesis | This Study |
| Primer Name | Sequence | Function | Source |
| RW 297 | catcgtcctgaattgtgccaaatgaggaggaatg | Xrs2 T128A Site-directed Mutagenesis | This Study |
| RW 298 | gtagcagggattggcgctcaaaccatatcttc | Xrs2 S480A Site-directed Mutagenesis | This Study |
| RW 299 | gaagatatggtttgagcgccaatccctgctac | Xrs2 S480A Site-directed Mutagenesis | This Study |
| RW 300 | ggtaaaaataacgctcaaagctcag | Xrs2 T661A Site-directed Mutagenesis | This Study |
| RW 301 | ctgagctttgagcgttatttttacc | Xrs2 T661A Site-directed Mutagenesis | This Study |
| RW 302 | cactatccagaaaagagctcaagctctaaacag | Xrs2 S729A Site-directed Mutagenesis | This Study |
| RW 303 | ctgtttagagcttgagctcttttctggatagtg | Xrs2 S729A Site-directed Mutagenesis | This Study |
| RW 398 | catatttcttgtaaatctaagacgtcaggtggcacttt | Cloning pRK1065 | This Study |
| RW 399 | tgaaagaaatcgacgtagatgcggccgcccgcggtggagctcc | Cloning pRK1065 | This Study |
| RW 400 | gtgttcttatgtagccatggttgctatgcagatgctttatacttcttttttttgtttatagaaatacg | Cloning pRK1065 | This Study |
| RW 401 | aagctggagctccaccgcgggcggccgcatctacgtcgatttctttcattttgccagg | Cloning pRK1065 | This Study |
| RW 402 | ataaagcatctgcatagcaaccatggctacataagaacacctttgg | Cloning pRK1065 | This Study |
| RW 403 | gaaaagtgccacctgacgtcttagatttacaagaaatatgtcaaatttctcttaaaataaaagagtt | Cloning pRK1065 | This Study |
| RW 498 | tgacataactaattacatgattacttgtcatcgtcatccttgtaatcgatatc | Cloning pRK1083 and pRK1084 | This Study |
| RW 499 | tccgtacttcgtgcggccgctccgggagctgcatgtgt | Cloning pRK1083 and pRK1084 | This Study |
| RW 500 | tgacacatgcagctcccggagcggccgcacgaag | Cloning pRK1083 and pRK1084 | This Study |
| RW 501 | ccaaaggtgttcttatgtagaaactagttaaccaaggacaaatacccatagaa | Cloning pRK1083 and pRK1084 | This Study |
| RW 502 | tgtccttggttaactagtttctacataagaacacctttggtggaggg | Cloning pRK1083 and pRK1084 | This Study |
| RW 503 | aggatgacgatgacaagtaatcatgtaattagttatgtcacgcttacattcacgc | Cloning pRK1083 and pRK1084 | This Study |
| RW 526 | ccctgggtcaatcagattgtgtcaaaaatatctatggag | Tel1 A2287V Site-directed Mutagenesis | This Study |

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| Primer Name | Sequence | Function | Source |
| RW 527 | ctccatagatatttttgacacaatctgattgacccaggg | Tel1 A2287V Site-directed Mutagenesis | This Study |
| RW 528 | ccaataaggacaccaacacatcccaaaaaattcaagc | Tel1 I2336T Site-directed Mutagenesis | This Study |
| RW 529 | gcttgaattttttgggatgtgttggtgtccttattgg | Tel1 I2336T Site-directed Mutagenesis | This Study |
| RW 544 | gcccttaaaggtgtagaagagcggcttatgggtaatggactaag | Tel1 K2751R Site-directed Mutagenesis | This Study |
| RW 545 | cttagtccattacccataagccgctcttctacacctttaagggc | Tel1 K2751R Site-directed Mutagenesis | This Study |
| RW 670 | gcagtgaaagataaatgatctgaaaaggacattagagctcgttttagagctagaaatagc | gRNA for rad50S knock-in | This Study |
| RW 671 | gcagtgaaagataaatgatccattagagctcaggtcaaacgttttagagctagaaatagc | gRNA for rad50S knock-in | This Study |
| RW 672 | agataactggtgaaaaggacattagagctcaagtcatactggcgtttacgagtgccaatggactcaatatgattgtcaccagaaatattc | RW 670 repair template oligo | This Study |
| RW 673 | agataactggtgaaaaggacattagagctcaggtcatactcgcgtttacgagtgccaatggactcaatatgattgtcaccagaaatattc | RW 671 repair template oligo | This Study |
| RW 674 | gagtattcattcatgacccgaagataactggtgaaaaggac | repair template amplification primer | This Study |
| RW 675 | agtagtctttttcattagcaactgaatatttctggtgacaatc | repair template amplification primer | This Study |