**Supplementary file 1: mutator genes and used primers**

**Supplementary file 1A**: Selected genes conferring a mutator phenotype and their corresponding Keio collection number

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| **Gene** | **Function** | **Keio Collection Number84** |
| *xthA* | Abasic lesion (AP-site) endonuclease | JW1738 |
| *mutM* | DNA glycosylase, base excision repair | JW3610 |
| *mutY* | Adenine glycosylase, GA mismatch | JW2928 |
| *mutT* | 8-oxo-dGTP diphosphatase | JW0097 |
| *mutS\** | Methyl directed mismatch repair | JW2703 |
| *mutL* | Methyl directed mismatch repair | JW4128 |
| *mutH* | Methyl directed mismatch repair | JW2799 |
| *uvrD* | Helicase involved in MMR and BER | JW3786 |
| *dnaQ* | Proofreading subunit of DNA polymerase III | JW0205 |

*\*∆*mutS *was found to be inaccurate in the Keio collection and was therefore separately constructed using the Red-mediated homologous recombination technique (see Methods).*

**Supplementary file 1B**: Overview of used primer sequences in the construction of the mutator mutants

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| **Primer sequence** | **Function** |
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| GAAATTACTGCGCCATTCTGAC | Forward primer to check *xthA* deletion |
| GTGGTCAGACAACTAAAAACGC | Reverse primer to check *xthA* deletion |
| AATCGCCACTTAATGCCGGA | Forward primer to check *mutM* deletion |
| AAACGTACTAAGCCGGAAAAACT | Reverse primer to check *mutM* deletion |
| GGCCAAAAAGCGCGGGG | Forward primer to check *mutY* deletion |
| GGGGTACAGCTGAAAATCCTGAC | Reverse primer to check *mutY* deletion |
| **AATAAAAACCATCACACCCCATTTAATATCAGGGAACCGGACATAACCCC**GTGTAGGCTGGAGCTGCTTC | Forward primer for ∆*mutS* construction*\** |
| **GTCAGTTGTCGTTAATATTCCCGATAGCAAAAGACTATCGGGAATTGTTA**CATATGAATATCCTCCTTA | Reverse primer for ∆*mutS* construction*\** |
| GCGCCTTATGTGATTACAACG | Forward primer to check *mutS* deletion |
| GATAGCGTGTAGATGGCATGG | Reverse primer to check *mutS* deletion |
| AGTACGCTGAGCAAAGTTC | Forward primer to check *mutT* deletion |
| ACGAATCCCCAGCAGTG | Reverse primer to check *mutT* deletion |
| AACCGGCATTTGTGTTGTATC | Forward primer to check *mutL* deletion |
| CTTGCTCTGCCGCCTGT | Reverse primer to check *mutL* deletion |
| GTACTTTTTGGCTGCGGAAAAAC | Forward primer to check *uvrD* deletion |
| GTCGAGCGGAAAGGTTAAAACG | Reverse primer to check *uvrD* deletion |
| TCAAGGTATCATGACATGTCCC | Forward primer to check *mutH* deletion |
| GGAAAGCGGCAGGTCAAA | Reverse primer to check *mutH* deletion |
| CGCTAAAGGTTTTCTCGCGT | Forward primer to check *dnaQ* deletion |
| CGGATTGCCTCGACCTTC | Reverse primer to check *dnaQ* deletion |
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*\* Bold part of the primer shows the part homologous to the genomic region up- and downstream of the* mutS *gene; Underlined part shows the priming part binding on the pKD4 plasmid to amplify the kanamycin resistance cassette flanked by FRT sites (see methods).*