Supplementary data

1. Nature and properties of Rfc1 C-terminal domain mutants

Two types of rfc1 mutant were generated in this study: single amino acid substitutions created by PCR-based *in vitro* mutagenesis (*rfc1-33 – rfc1-41*) and pentapeptide insertions (*rfc1-43 – rfc1-54*, with the inserted amino acids shown in single letter code). The viable alleles marked with the asterisks displayed mild sensitivity to MMS and HU at 32°C.

Mutant allele	Mutant type	Mutation	Phenotype
rfc1-33	Substitution	Asp739 > Ala739	Viable *
rfc1-34	Substitution	Lys745 > Ala745	Viable
rfc1-35	Substitution	Arg748 > Ala748	Viable
rfc1-36	Substitution	Glu807 > Ala807	Viable
rfc1-37	Substitution	Asp808 > Ala808	Viable
rfc1-38	Substitution	Glu814 > Ala818	Viable
rfc1-39	Substitution	Lys834 > Ala834	Viable
rfc1-40	Substitution	Arg839 > Ala839	Viable
rfc1-41	Substitution	Asp842 > Ala842	Viable
rfc1-43	Insertion	Ile753-QGVPL-Gln754	Lethal
rfc1-44	Insertion	Ser811-IRGTP-Ile812	Temperature-sensitive
rfc1-45	Insertion	Ala601-VRGTP-Val602	Viable
rfc1-46	Insertion	Gly852-SRGTP-Ser853	Viable *
rfc1-47	Insertion	Lys677-HLGAP-Leu678	Viable
rfc1-48	Insertion	Leu622-HGGVP-His623	Viable
rfc1-49	Insertion	Lys638-LGVPQ-Leu639	Viable *
rfc1-50	Insertion	Glu870-VGVPH-Val871	Viable
rfc1-51	Insertion	Pro858-MKGYP-Met859	Viable
rfc1-52	Insertion	Met880-LGVPL-Leu881	Viable *
rfc1-53	Insertion	Tyr650-LMGVP-Leu651	Viable *
rfc1-54	Insertion	Leu780-PVGVP-Pro781	Temperature-sensitive

2. Peptide coverage of Elg1-RLC components

The amino acids sequences of Elg1 and the four small RFC subunits are shown, with the peptides identified by mass spectrometry underlined. Note that peptides corresponding to the first four sequences underlined in Elg1 were only found when the upper Elg1 band was analysed, suggesting that the predominant purified form (marked by an asterisk in Figure 3B) is N-terminally degraded.

Elg1

MQIVGYLSAD SQSNPDLKSE NEAKEEKPIG RRHTMSPVPA TSENKYFGKS
PLSGSRKPRR SRSLHKERSY MRKFFDMDME ESKDFENDQS LLVTLKVSTS
LGQKIENILH PKLSNDTNST AFPPAKSSGE ASDTNILVEN INSQETVNSS
PLVSELHYSN LADSPSNLRN TVTSMHPFFM SKSVKKNSEI KFVSEERGGT
KPERLLDPLW PTPDSQSMLE YAGSIEPSVF WFPKKHLEEA ILEETSHLSF
KEVLSSTTAN MITPLAEKNK TEVLQVTPSK LHTFALESLC FSPAPFIQKV
LSRLLPSDPN VEMPMIPQIL EKGLWVSKYA PSKTQDCCAF SQCLSKIADW
LRSCRLTKPE SSSVPPSSSI SRSSTIHSCT SSKRNEDSLS ESDFEPDIIE
EEDDSDEFNP SVSRKKAKLT SSQFSNWMLV TGVTGIGKTS CLYAICRELN
FEVVEIHPGM RRSGKELLER IGELTQSHIV DKSRLNNTPD ILILLEEVDI
LFQDDRGFWQ AVSTLIEKSK RPVVMTCNET DFLPSAFLQE DHIVQFQSIS
SALLTDYISS VLYADRCIIS RNVVESISYR YGSDLRGILM QLNFWSLVNF
PSLPSKDKQD DSHEPFIEAT ISAFDEGVGV YNPRIQTSED LLQTYSEEQM
GDIGLLFMPN LVNWRKVCVP KSEMEEKEAI MEKLIYSHQY ADSLSYVDYR
FSSQPTIYET YELMNDSASF EDMSLECRDN CANAFQDNLV GFPTISNPFH
ANAPPEPHEL KLQYHSFCFI NNLFSKSSLK AISSNDSIVP KALNNRELQL
SALASTIGYK LDPDDVYNIL SFLSFANSQV TSYTPPNSID RPNDILILEV
APFVRCMRRY DRIRLNSYKL LLSSKGRSAS HISRRGAASI LRSAGYNYGR
LQYLEGSDRI LSTWFSTTLD

Rfc2

MSFFAPRNKK TEQEAKKSIP WVELYRPKTL DQVSSQESTV QVLKKTLLSN
NLPHMLFYGS PGTGKTSTIL ALSRELFGPQ LMKSRVLELN ASDERGISII
REKVKSFAKT TVTNKVDGYP CPPFKIIILD EADSMTQDAQ AALRRTMESY
ARITRFCLIC NYMTRIIDPL SSRCSKYRFK PLDNENMVKR LEFIAADQAV

SMEPGVVNAL VECSGGDMRK AITFLQSAAN LHQGTPITIS SVEELAGAVP
YNIIRSLLDT AYTKNVSNIE TLSRDVAAEG YSTGIILSQL HDVLLKEETL
SSPVKYKIFM KLSEVDKRLN DGADETLQLL DLLSSISVVC

Rfc3

MSIEKGKGRA MDIDLPLGSE STLPWVEKYR PANLEDVVSH KDIISTLEKF
ISSNRVPHML FYGPPGTGKT STILACARKI YGPNYRNQLM ELNASDDRGI
DAVREQIKNF ASTRQIFAST FKMIILDEAD AMTLAAQNAL RRVIEKYTKN
VRFCIICNYI NKISPAIQSR CTRFRFQPLP PKEIEKTVDH VIQSEHCNID
PDAKMAVLRL SKGDMRKALN ILQACHAAYD HIDVSAIYNC VGHPHPSDID
YFLKSIMNDE FVIAFNTISS IKQQKGLALQ DILTCIFEAL DELEIKPNAK
IFILDQLATI EHRMSFGCSE KIQLSAMIAS IKTGVDLAAK VN

Rfc4

MSNAVSSSVF GEKNNSVAYE LPWVEKYRPI VLDDIVGNEE TIDRLKVIAK
EGNMPHLVIS GMPGIGKTTS ILCLAHALLG PAYKEGVLEL NASDERGIDV
VRNRIKAFAQ KKVILPPGRH KIIILDEADS MTAGAQQALR RTMEIYSNTT
RFALACNQSN KIIEPIQSRC AILRYSRLTD QQVLQRLLNI CKAEKVNYTD
DGLAALIMTA EGDMRQAVNN LQSTVAGFGL VNGENVFRVA DQPSPVAIHA
MLTACQSGNI DVALEKLQGI WDLGFSAVDI VTNMFRVVKT MDSIPEFSRL
EMLKEIGQTH MIILEGVQTL LQLSGLVCRL AKSQMKPESF II

Rfc5

MLWLDQYRPK TLASLDYHKQ LSERLISLSS TNEFPHLLVY GPSGAGKKTR
VVAILRELYG PGSEKLKIDQ RTFLTPSSKK LQINIVSSLH HLEITPSDVG
NYDRVIMQEL LKDVAQSAQV DLQAKKIFKV VVINVADELT RDAQAALRRT
MEKYSNNIRL ILIANSTSKI IEPIRSRTLM VRVAAPTPEE IILVMSKILT
AQGLEAPDSL LNNIANNCDR NLRKAILLLE TVHAKSPGNK QLIDTGAQLP
LPDWQTFIQQ VGDSMLQEQS PARILAVRSM LYDLLSHCIP PTTILKELLS
FFLSKVDTKL HPYLIQAAAN YEHRTRMGNK SIFHLEAFVA YFMKVYAMLQ
LGMELPSY