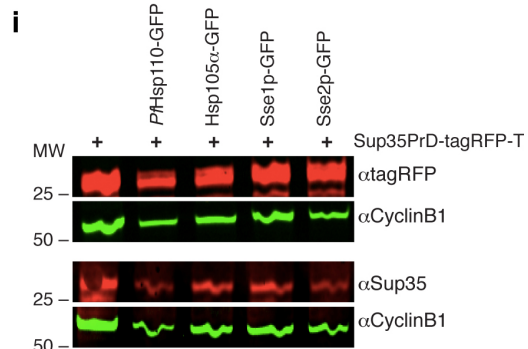
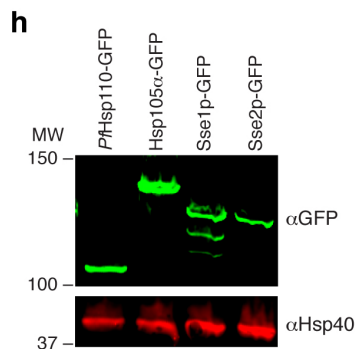
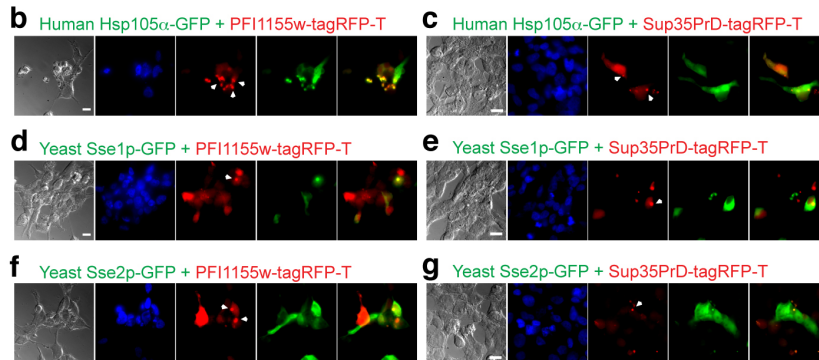
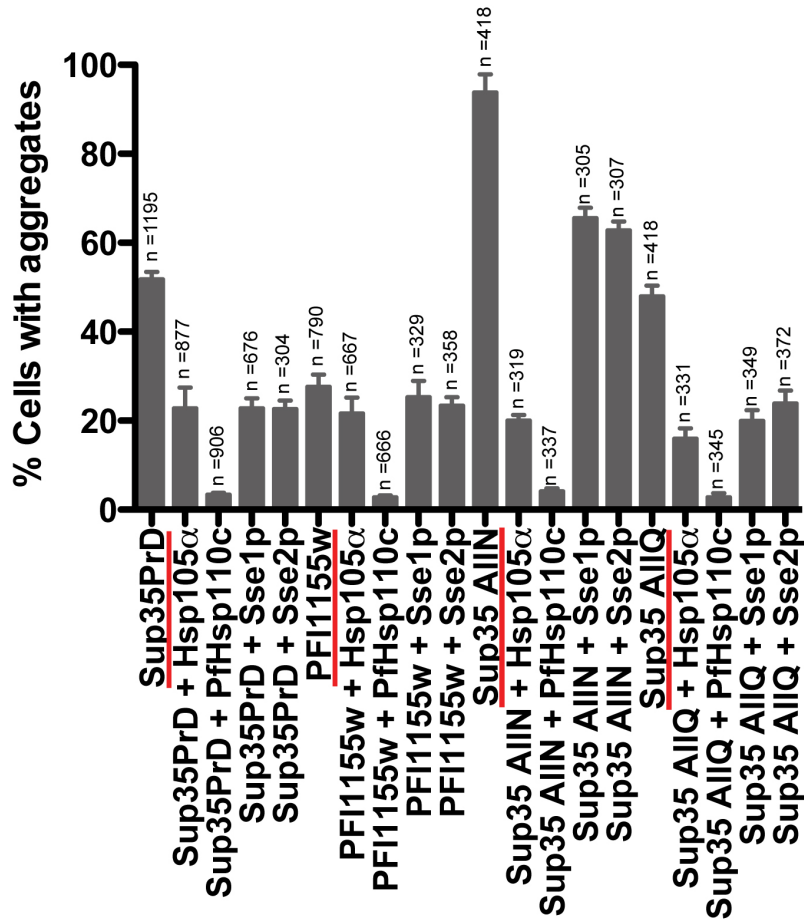
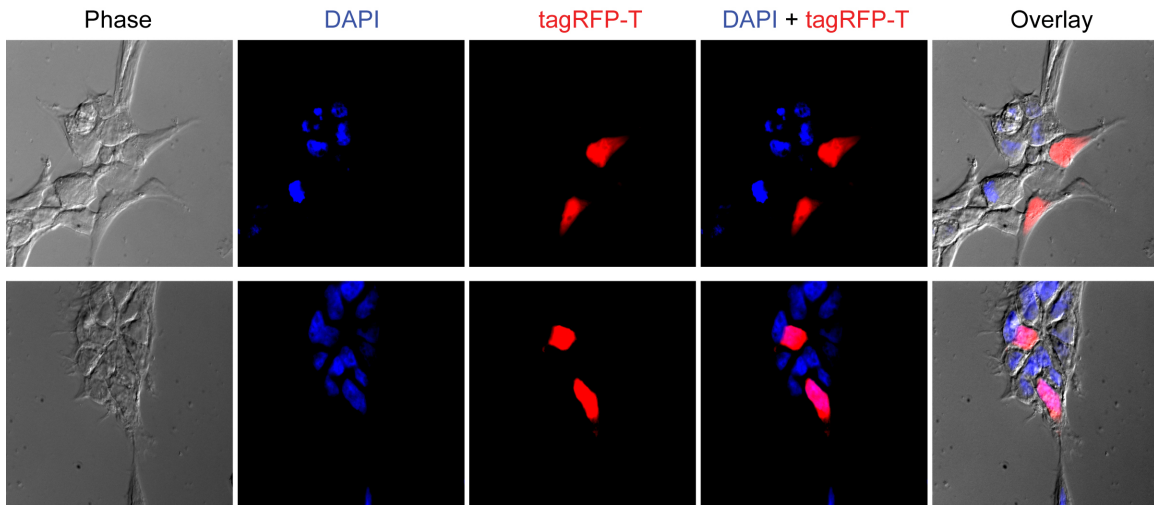


SUPPLEMENTARY INFORMATION

a



**Supplementary Figure S1.** Proportion of HEK293T transfectants showing fluorescent foci after heat shock. Blinded slides were counted for the appearance of fluorescent foci of tagRFP-T fusions (underlined in red) transfected transiently into HEK293T cells that were incubated at 40°C for 6 hours prior to fixation. In cells that were also co-transfected with Hsp110 homologs fused to GFP, only cells expressing both GFP and tagRFP-T fusions were counted. Data is shown as the percent of total cells counted where fluorescent foci of tagRFP-T fusions were observed and the total number of cells counted is indicated above the columns. Each transfection was performed and counted a minimum of three times and at least 100 cells were counted for each transfection. Data is shown as mean  $\pm$  S.E.M. **(b-g)** Hsp110 orthologs from human: Hsp105 $\alpha$  **(b,c)** and yeast: Sse1p **(d,e)** and Sse2p **(f,g)** were fused to GFP and co-expressed with PFI1155w-tagRFP-T **(b,d,f)** or Sup35PrD-tagRFP-T **(c,e,g)** in HEK293T cells. The cells were fixed and observed by fluorescence microscopy. The arrowheads point to fluorescent foci of tagRFP-T fusion protein, indicating aggregation. Images from left to right are phase, DAPI, RFP, GFP and RFP-GFP merge. Scale bar represents 10  $\mu$ m. **(h)** Western blot of total cell lysates from HEK293T cells expressing Hsp110 homologs (indicated at top). The Hsp110-GFP fusions were detected by immunoblotting whole cell lysates with anti-GFP antibodies (JL8). After incubation with the transfection reagent for 40 hours, the cells were heat shocked for 6 hours. Hsp40 (Ydj1) was the loading control. **(i)** Western blot of total cell lysates from HEK293T cells expressing Sup35PrD-tagRFP-T alone or with Hsp110 homologs (indicated at top). Sup35PrD-tagRFP-T was detected by immunoblotting whole cell lysates with anti-tagRFP antibodies (top panel) or with anti-Sup35 antibodies (bottom panel). After incubation with the transfection reagent for 40 hours, the cells were heat shocked at 40°C for 6 hours. CyclinB1 was the loading control.



**Supplementary Figure S2.** Expression of tagRFP-T in HEK293T cells. HEK293T cells were transfected with pcDNA3.1 vector that expresses tagRFP-T alone. Prior to fixation, transfected cells were heat shocked at 40°C for 6 hours. The fluorescence of tagRFP-T was uniformly distributed throughout the cytoplasm of transfected cells and foci of tagRFP-T fluorescence were never observed. Images from left to right are phase, DAPI, tagRFP-T, DAPI-tagRFP-T merge and overlay of all images.

Majority -----MSVLGIDLGNXNSVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD-----

10 20 30 40 50 60 70 80 90 100

PF07\_0033 -----MSVLGIDLGNNSVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD----- 79  
MAL13P1.540 -----MRFRFFLFLFFIYYNSLRKKS-----SGIDFGNRYKTSIVSPKFFLLNCKKTKITNSISANFITYDEESIYSTKYPOLLLSNNTIYNLFLSKN 105  
PvHsp110 -----MSVLGIDLGNNSVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD----- 80  
TgHsp110 -----MAIGIDLGLSIVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD----- 81  
ScSse1p -----MSTPFLDLGNNSVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD----- 80  
ScSse2p -----MSTPFLDLGNNSVAVARXG-GINXVXNEVSRXRTSPSLVGFKEKNRLIGXSAKXKQXSNARNTXRNXKNIIGXXFXDPD----- 80  
HsHsp105 -----MSVLELVVQSQCYLAVARXG-GIETIANFESDCTPSVISGSKNHTLGVANQOITHTNNTVSLFRFHRANRDF----- 79

Majority -----XDIENEFFXSDLVPLX-NNXXG-----VEVEYK-----EKKVFSAEKVTAAXLLKLLKTAEKLLKXIT-----XVVISVPPWFTXX

110 120 130 140 150 160 170 180 190 200 210

PF07\_0033 -----DITIHAYGDTLCE-YNYLC-----VEVEYK-----EKKVFSAEKVTAAXLLKLLKTAEKLLKXIT-----EILSYPTGKNC 151  
MAL13P1.540 -----KEMFVIENYENEBEYSHINNYDFSDFSKYYSYDVVDHGRGTINIKLKNMISSEBVTNIDGYIKLLAYTHNIDYKVRNINLNIGCVLHFCNSQR 210  
PvHsp110 -----DITVLSFGNLLVCE-HNYLC-----EKKVFSAEKVTAAXLLKLLKTAEKLLKXIT-----EILSYPTGKNC 152  
TgHsp110 -----LKKMLSLNMAAVSPNNVMC-----KVRQRE-----KEVFSAEKVTAAXLLKLLKTAEKLLKXIT-----EILSYPTGKNC 154  
ScSse1p -----FDESKHTEKLEED-DKTKC-----AVRFAF-----EKKVFSAEKVTAAXLLKLLKTAEKLLKXIT-----EILSYPTGKNC 152  
ScSse2p -----FTEKTEKLEKLVK-KGKVC-----VEVDFG-----KTHVFSAEKVTAAXLLKLLKTAEKLLKXIT-----EILSYPTGKNC 152  
HsHsp105 -----IQEKELNSYDLVPLK-NGGVC-----IKRMMME-----EHLPSVQITMLTKLKEFAENSLLKPV-----DCVIVSSESDA 151

Majority -----QRXXLLDAAKIAGLNKLRINDVTAXALDYGMYXMDLXK-EKKPRIVVFDIGHSNXVXIAAFKFGK-----LKVLTGATXDKNLGGRXFDNELKEHFAKXF

220 230 240 250 260 270 280 290 300 310

PF07\_0033 -----KCECIAATKINAVRRTSNNVAVLDYGMRRKKEFDNGLSLLVYVNGYANICVVRFSN-----CEIICDIAISNLGGRNLDNEIKYITNIE 247  
MAL13P1.540 -----KQQAISNKAIGELGINGVTANLHN-VHDIPINT-----TKLIMYLDICSKINIGLITISFVEKDKVRSRVSQYACESLNSNKIMLAEHLRKK 310  
PvHsp110 -----KCEIAATKINAVRRTSNNVAVLDYGMRRKKEFDNGLSLLVYVNGYANICVVRFSN-----CEIICDIAISNLGGRNLDNEIKYITNIE 248  
TgHsp110 -----NSALDAAQIAGLQKRTISMAATCLDYGMRRRHOFA-ADRHRIVAVGVGHSSSACTAAWADR-----RIAEVSCGLGGRMDVIMKHFSAF 250  
ScSse1p -----KYNIAADAAQIAGLQKRTISMAATCLDYGMRRRHOFA-ADRHRIVAVGVGHSSSACTAAWADR-----RIAEVSCGLGGRMDVIMKHFSAF 249  
ScSse2p -----KYNIAADAAQIAGLQKRTISMAATCLDYGMRRRHOFA-ADRHRIVAVGVGHSSSACTAAWADR-----RIAEVSCGLGGRMDVIMKHFSAF 249  
HsHsp105 -----ERSVDAEQVGLNCLMLNMAVAVNYGIRKQDIPSLDEKPRIVVFDIGHSNXVXIAAFKFGK-----LKVLTGATXDKNLGGRXFDNELKEHFAKXF 248

Majority -----KTKYKMXLXKX-----KARXKLXDAEKLKVLKLSAN-TEAXFHVECLMDXDXSGLSREEFEELCKP-LLEXXKTPPL

320 330 340 350 360 370 380 390 400 410 420

PF07\_0033 -----VNNYKCNFYVNNTPELCPMGTGRMLKPLVTSTASDQONGINNVHILKQEVHITKVLISAN-NEISIVPQYVELLCCSINRTEELGKSNFFTKLHHL 351  
MAL13P1.540 -----EENSVSLENDK-----KMRKIVANNAKLLSAK-KSDVFIISYNNKSLNESVGRQDPEIQE-VLNNLII 382  
PvHsp110 -----IISHQNKIIVIRSDLCMGTGKLNPHFVTS-NNETSQIDNIVLQVYVMTKVLISAN-NEISIVPQYVELLCCSINRTEELGKSNFFTKLHHL 350  
TgHsp110 -----EKTKMNPSSL-----KMRKIVANNAKLLSAK-KSDVFIISYNNKSLNESVGRQDPEIQE-VLNNLII 382  
ScSse1p -----KRRHLDIRENP-----KAYNRILLKAEKLVKLSAN-NEISIVPQYVELLCCSINRTEELGKSNFFTKLHHL 321  
ScSse2p -----KRYLDIRENP-----KAYNRILLKAEKLVKLSAN-NEISIVPQYVELLCCSINRTEELGKSNFFTKLHHL 321  
HsHsp105 -----KTKYKLDKAKSI-----RLLRLYQCEKLRKMLMSNSDLPLNIECFNMLKVSCKMNSQFELGAE-LIKVTEVE 321

Majority -----KXALXQSKLXEDXSVETIIGGXTRIPFIKXKISXXFG-KPLSXTLNDAEAVARGCALIXAXHSPKFKVKEXXFFEDIVPXPISXTWXX

430 440 450 460 470 480 490 500 510 520

PF07\_0033 -----DTLHCISVNICIHEIIVLSCSRVETIQNFLQOYQ-KDPEKTIHAPESITARGVYSAAMVVKHYKVEYECVEKTHNVEHNN----- 438  
MAL13P1.540 -----NKALKEGFGQKLEALGLGSGWRVVKLNEVTEFNPLKVGMLNLSOEAATVMSLYIAYNANRILDLDYKLSNEYHILVNTDDEE-----E 474  
PvHsp110 -----NKAMQVSNLNIIVOCITLSCSRVETIQNFLQOYQ-DKPEKTIHAPESITARGVYSAAMVVKHYKVEYECVEKTHNVEHNN----- 437  
TgHsp110 -----QSLTKGKKBLEFVEVGGGRITVWOCISNAGLLEHRSYTADEAVARGCALIQAAMASFKVNEYSGERTLFLCIVTDGSDSPVKVQPLSASGHP 427  
ScSse1p -----TKALAKKLSAEVDFVEITGGTRITLTKOSISDVAEG-KPLSXTLNDAEAVARGCALIQAAMASFKVNEYSGERTLFLCIVTDGSDSPVKVQPLSASGHP 427  
ScSse2p -----TKALAKKLSAEVDFVEITGGTRITLTKOSISDVAEG-KPLSXTLNDAEAVARGCALIQAAMASFKVNEYSGERTLFLCIVTDGSDSPVKVQPLSASGHP 427  
HsHsp105 -----YSLDEPHTKVEIVVSAVTEVGGTRITVWOCISNAGLLEHRSYTADEAVARGCALIQAAMASFKVNEYSGERTLFLCIVTDGSDSPVKVQPLSASGHP 427

Majority -----QXEDX-EDVEELFPANSPXPKXKTIKLRXKGFKLXAXYEDDPLSPXXXXLXGCVX--XNPKXXXVFEVVKVXKXDPDPSGXFTXXGAXTVKIX

530 540 550 560 570 580 590 600 610 620 630

PF07\_0033 -----INDASKNSVFKIYTRDELKKVKRIVIPKCHIKITVYNTDPLSPNCIKELGSLIK--IENDKIVESHMTTFSNYDTPLFGAQTIVTSV 532  
MAL13P1.540 -----NNTNT-EKVNIKKEIVNYSRYHNINVIITYDNLFVS-VYNGDPIINEVLGNDNAKRS--KYEHLGTPKLNLPFHICGILSLDKVLVYEEQ 569  
PvHsp110 -----ISDPSKFKVRIYDDELKKVKRIVIPKCHIKITVYNTDPLSPNCIKELGSLIK--IENDKIVESHMTTFSNYDTPLFGAQTIVTSV 531  
TgHsp110 -----EAESEGLETHEDTPAGEQCITIPAGDTNTRITKIPLESCTPIKQADLII--AGAPEAQDACHS--LP-PAEAPFOIOWVHLLNFFGLLRPARVQKVRRE 527  
ScSse1p -----LVED--RHHVEVPAGSFTSTLITNTGCTSMASADITDLPQESIANWEITGVQFEGQDSVPLVIRLRCDDPGGPHIEEYVTEDE 502  
ScSse2p -----LVED--RHHVEVPAGSFTSTLITNTGCTSMASADITDLPQESIANWEITGVQFEGQDSVPLVIRLRCDDPGGPHIEEYVTEDE 502  
HsHsp105 -----LVED--RHHVEVPAGSFTSTLITNTGCTSMASADITDLPQESIANWEITGVQFEGQDSVPLVIRLRCDDPGGPHIEEYVTEDE 502

Majority -----XEXXXXX--D-X-----X-X-X-X-XX-----X-XXPXXXXAPE-----DEXXGXGXKXVXVXKXKXLPXIAEAX

640 650 660 670 680 690 700 710 720 730

PF07\_0033 -----IKSKDEKKAADKTED-KG-----EKKDAKQEQNDKDDQNTNNMNEKDTNDKKEKNETNSI-----NKTLLKKEEGKQTCYTTIPITLL-- 616  
MAL13P1.540 -----KDAGAGDTI--NNKKEGDE-----ENNNNNNEIINKDDTNNKSDDEQINKSDENKSDENKENG-----ENKQNEKKNDIHNIPFQTRN 653  
PvHsp110 -----IKPKDEKKAADKTED-KG-----EKKDAKQEQNDKDDQNTNNMNEKDTNDKKEKNETNSI-----NKTLLKKEEGKQTCYTTIPITLL-- 616  
TgHsp110 -----EKTVEAP-----EVAQGGEEAG-----ATAPEVVKLRVVDVYVQVQVE----- 570  
ScSse1p -----VEDP-----ILPEDEAP-----EAEQFKKVKTKVDDDTIV----- 537  
ScSse2p -----VQPP-----VELPEDEAP-----EAEQFKKVKTKVDDDTIV----- 537  
HsHsp105 -----TENEMSSAEMCLNQRPPENPDTKNVQDNEAGTQPOVQDAQQTQSPSPPELSTSEENKLEADKKNK-----KVQOPPEAKKPIKVVNVEPTAN-- 601

Majority -----APGSLXTKXNLXFEKEXNXXQDKLEAERXDRKNELEEYIYELRXLKNG-YXKDFAXXEERDXLXLLXNENWLYDEGDXX--XKXAYTAKKEELXKLGX

740 750 760 770 780 790 800 810 820 830 840

PF07\_0033 -----IQCYSSDFINSGQINNQHSHLIGCEELKHLNELIYHYSRSLRNG-IRKRVMDDERRLLSDDYENWLYN-IEE--NENMFKKEKIRDTKN 715  
MAL13P1.540 -----IKLFTPEEIKKELKILKLNDEHIDFLKSEKTLDFSPFYVNSMKQDLYKQVTKETINEYKNEEYDLYTKDEP-----LENSVNIHIDQIVDP 754  
PvHsp110 -----APGYSYLDIYTSAAINNQHSHLIGCEELKHLNELIYHYSRSLRNG-IRKRVMDDERRLLSDDYENWLYN-IEE--NENMFKKEKIRDTKN 715  
TgHsp110 -----APGRPTLQIRDRDLDLNNDEPRITREKMDLNELESILVADDDISE-KMRDPEPPEERLEALLESSOQVVDLALVISTVAASVVMLEBIAVAGK 673  
ScSse1p -----HTFGDAAKINLEIKNELEADKLVTEDEKRTLEBYVYVYKKEE-EAPASDAAKTKLQGMNKAELXDEGFS--IRAKYIAYEELASGNI 637  
ScSse2p -----KTFANPVEVDLIEKNELRNADKLVTEDEKRTLEBYVYVYKKEE-EAPASDAAKTKLQGMNKAELXDEGFS--IRAKYIAYEELASGNI 637  
HsHsp105 -----LVWQIGKDLNMYIETGKIMADKLEKNAKAVSEVYVYKKEE-EAPASDAAKTKLQGMNKAELXDEGFS--IRAKYIAYEELASGNI 637

Majority -----IXGRXXYEERKXXXXXX-XXLX-I-XX-X-XXX-----TXXXK-X-KE-XX-NXXXEXX-XXXNXX-XFXEQDQARXXXXXXELAKKXKXVX

850 860 870 880 890 900 910 920 930 940

PF07\_0033 -----IVOKFDVNSKQONLGIINHNINNIQCSNKPSPDESQNIINRTKFLNINSLQVQKNKPLYPVYTLIDIEANVTLQKFFSLEVEPLQALQAE 826  
MAL13P1.540 -----IKELARLQVLDIIEETNKKIQEMEKIKDLEKFP--WAATIKMVKDSLQVQKNKPLYPVYTLIDIEANVTLQKFFSLEVEPLQALQAE 826  
PvHsp110 -----IYYDTSKAEKLNGLNHN-NNVACQEKRPSEESQKISRTKLLDNLAMQKEMKQPLYAPLYTLKDIENE-NDVTAQAQKHSLEAEELAKQAEK 827  
TgHsp110 -----VSRFESLQQAQQLLHAAVSESVAQSQ-DE-----AYAHIPVEEKRVMDMAETEAWSEMMAKQSGLPPHVPIVYVLDLHMNRDALRRTQAF 769  
ScSse1p -----IKRSLYAKG-----EKKKLSQASQAMAE-----ECLA 670  
ScSse2p -----IKRSLYAKG-----EKKKLSQASQAMAE-----ECLA 670  
HsHsp105 -----KVKVQAEKRPSEESQKISRTKLLDNLAMQKEMKQPLYAPLYTLKDIENE-NDVTAQAQKHSLEAEELAKQAE 827

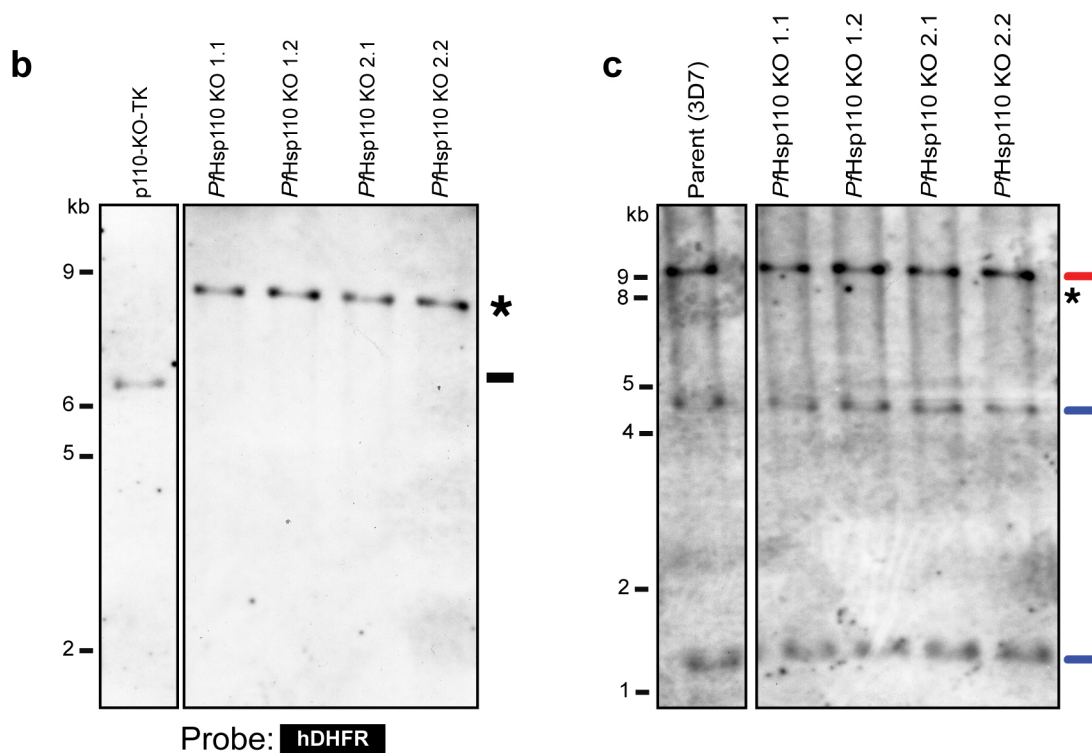
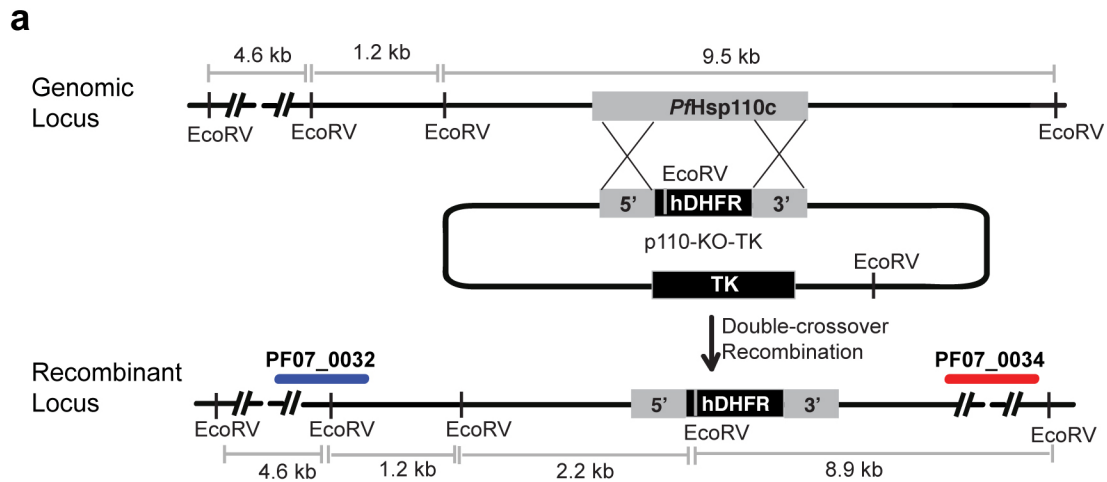
Majority -----KQXXXKAEKXXXXXX--X-KXKDXNXXEEX--X--E-ENXXN-NX-NXXXD-----

950 960 970 980 990 1000 1010 1020

PF07\_0033 -----REKEREKEREKEREKNEE-TNLAEENNN--EAKNNEKENTKNEKSAPEE 873  
MAL13P1.540 -----KEDKANTDNONENTSKODAGADINHTTENEQNEQAQONNENDDONQNEHDANQSDNEQNKNDGASDKDEL 932  
PvHsp110 -----QEQEREREKEREKEREKNEE-TNLAEENNN--EAKNNEKENTKNEKSAPEE 873  
TgHsp110 -----SAPRPPAAPPASEQPAQEDVNMNNEGEQALP-----EAPAAPVGEPPQQA 818  
ScSse1p -----AKRBAEK-----KEEKDTEG-----DVGMD 693  
ScSse2p -----ERRRNAS-----DSDNDN-----MDL 693  
HsHsp105 -----TKPKRTSPRLERTPNPNIDKREEDLDRKNNFAPPPHQGECYRPEKNSVMDL 858

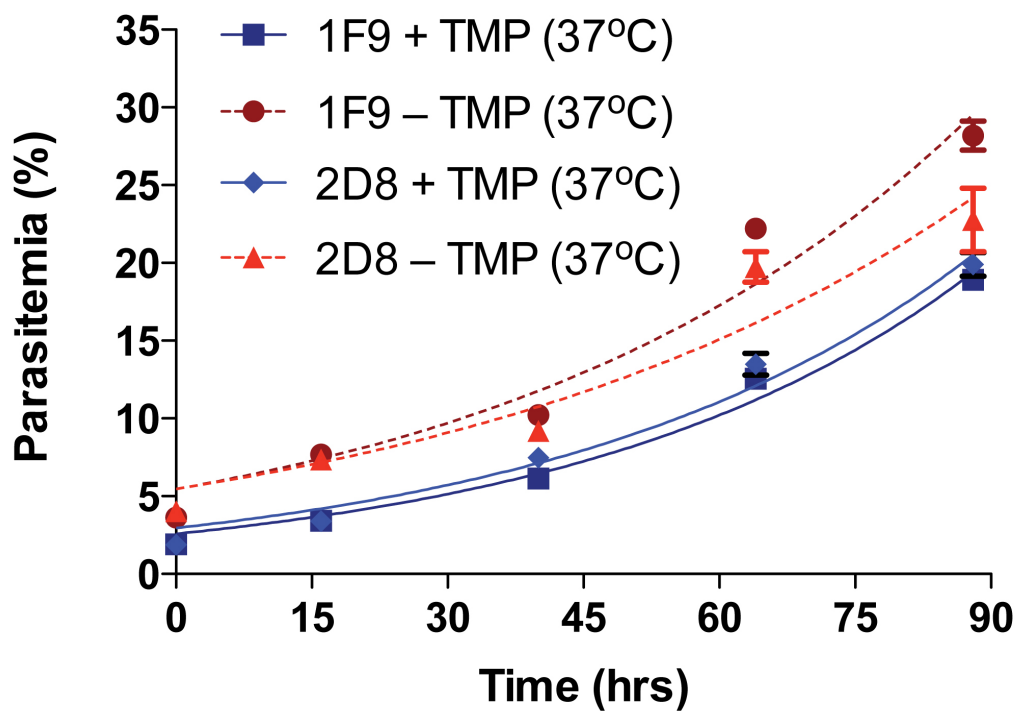


**Supplementary Figure S3.** Sequence homology of Hsp110. Sequence alignment of the two *Plasmodium falciparum* Hsp110 proteins (PF07\_0033 and MAL13P1.540) with homologs from *Plasmodium vivax* (Pv), *Toxoplasma gondii* (Tg), *Saccharomyces cerevisiae* (Sc) and *Homo sapiens* (Hs). The predicted signal peptide and ER-retention signal in the ER-targeted PfHsp110 are boxed in blue. The alignment was generated using ClustalW and the conserved residues are highlighted in red.



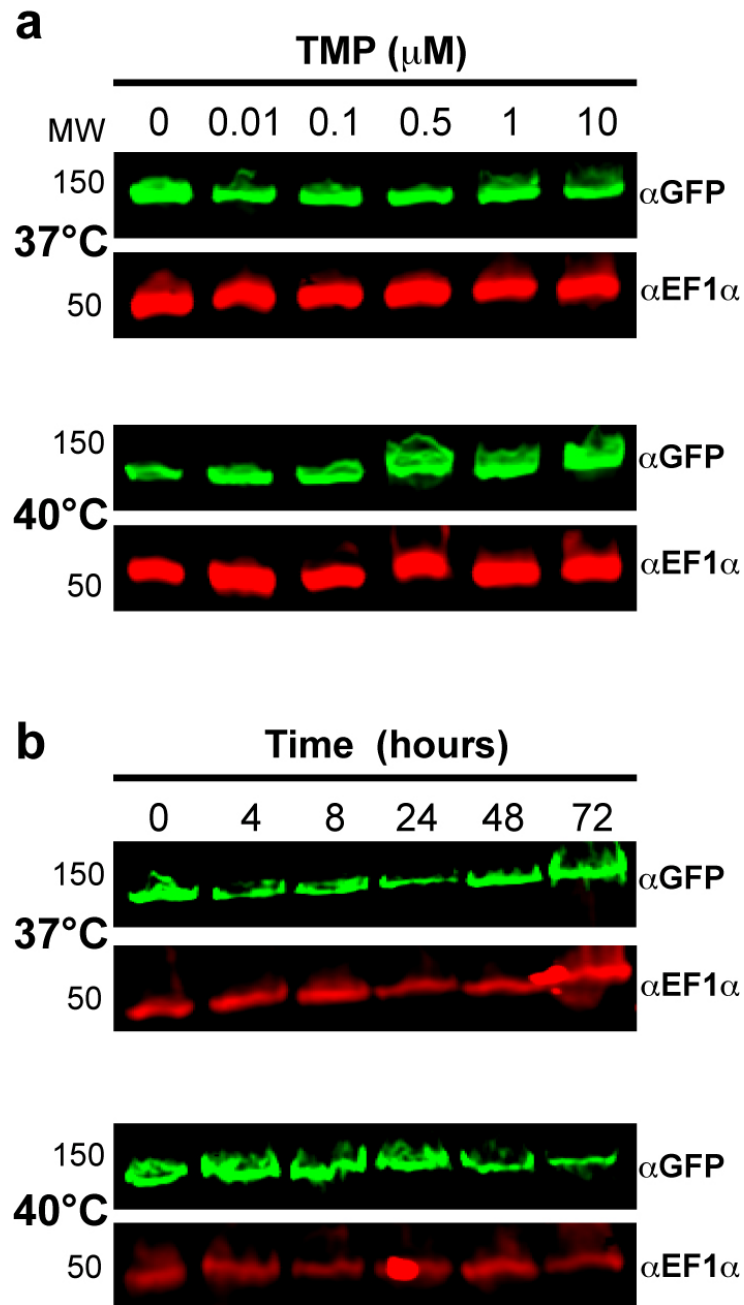
**Supplementary Figure S4.** Gene duplication in the *PfHsp110c* locus. **(a)** Scheme showing the strategy to knock out the *PfHsp110* gene via double crossover homologous recombination. Plasmid (p110-KO) containing a positive drug selection marker, human dihydrofolate reductase (hDHFR) and a negative drug selection marker, thymidine kinase (TK) was transfected into the parent strain, 3D7. EcoRV restriction sites used to detect integration along with the expected sizes are indicated. The probes used for detection in the Southern blot, the genes 5' (PF07\_0032, blue bar) and 3' (PF07\_0034, red bar) of the *PfHsp110c* gene, are indicated **(b)** Southern blot of genomic and plasmid DNA digested with EcoRV and detected with the hDHFR probe. Bands expected from a double crossover integration of the hDHFR drug selection marker into the *PfHsp110c* gene were observed in two clones each isolated from the two independent transfection pools (indicated by \*). The band expected for the digested plasmid (—) was not seen in any of the clones. **(c)** Southern blot of genomic and plasmid DNA

digested with EcoRV. Bands expected from a double crossover integration (indicated by \*) into the *PfHsp110c* gene were not observed in two clones when probed against the PF07\_0034 gene (—). The band expected for the PF07\_0032 (—) was seen in all of the clones. If the duplication event had encompassed both genes, then we should have observed two bands, one for the integration copy and the other for the wild type gene, for PF0\_0034.

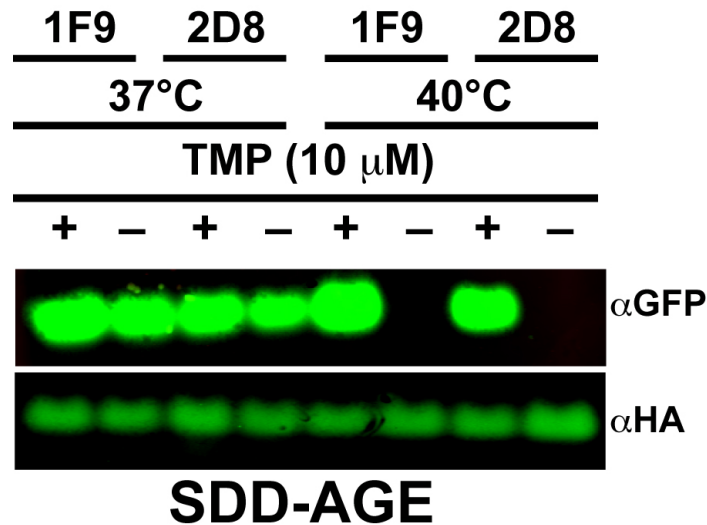


**Supplementary Figure S5.** *PfHsp110c-RFA* parasite lines briefly incubated with or without TMP at 37°C. Asynchronous *PfHsp110c-RFA* parasite lines, 1F9 and 2D8, were incubated at 37°C for 6 hours with or without 10 $\mu$ M TMP. All parasites were transferred to fresh medium with 10  $\mu$ M TMP and their growth was monitored over 5 days via flow cytometry. Data were fit to exponential growth curve equation and are represented as mean  $\pm$  S.E.M. (n=3).

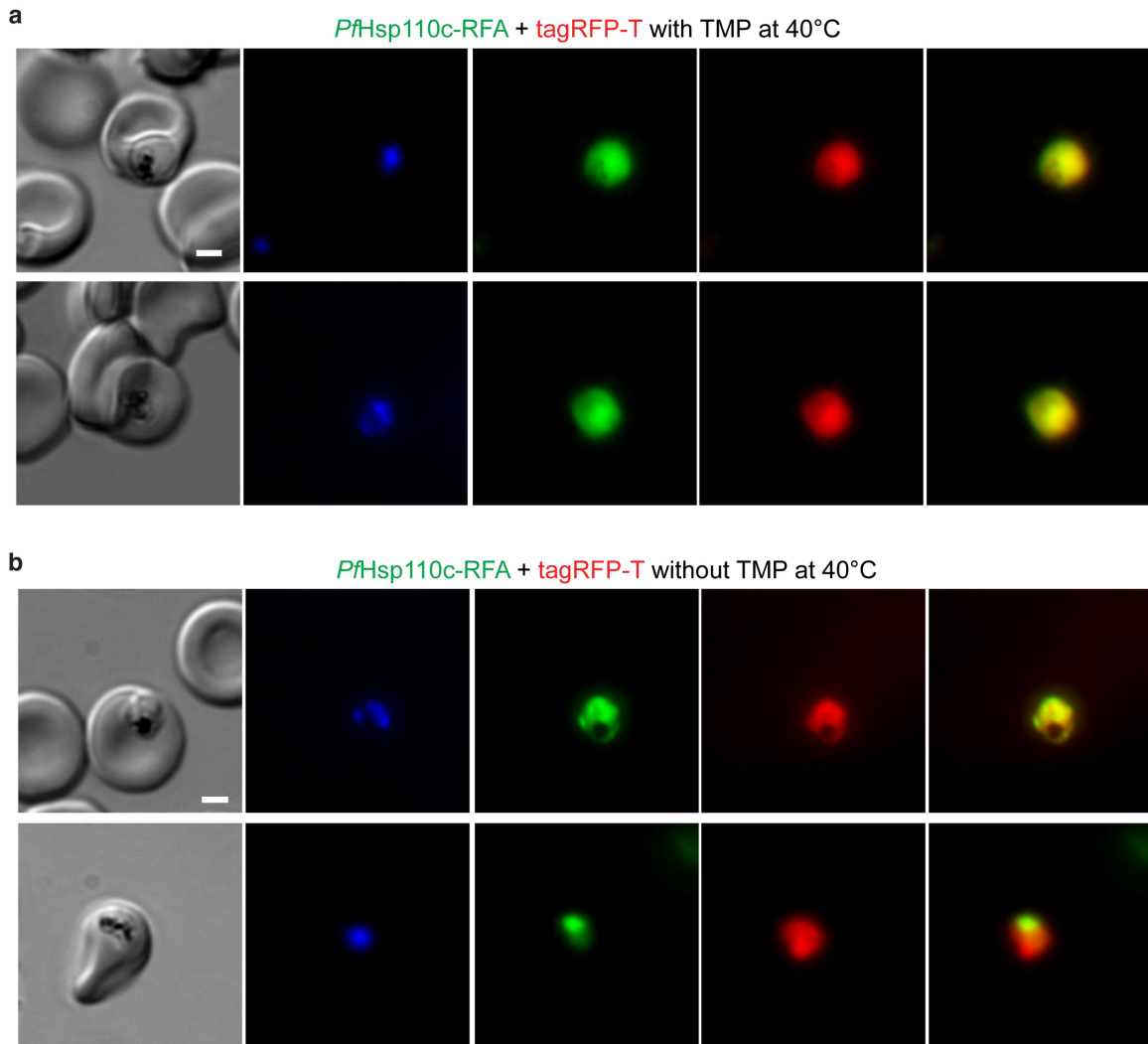




**Supplementary Figure S6.** *PfHsp110c*-RFA is not degraded in the absence of TMP. (**a, b**) *PfHsp110c* parasites were incubated at 37°C or 40°C in different TMP concentrations for 24 hours (**a**) or without TMP for varying times (**b**). Degradation of *PfHsp110c*-RFA was monitored by immunoblotting parasite lysates (using monoclonal  $\alpha\text{GFP}$ , JL8) after SDS-PAGE. EF1 $\alpha$  is the loading control.



**Supplementary Figure S7.** SDD-AGE fractionated lysates of *PfHsp110c*-RFA parasites, incubated at 37°C or 40°C with or without 10  $\mu$ M TMP for 6 hours, were probed with JL8 monoclonal anti-GFP antibody as well as with anti-HA antibody since the RFA-tag has a HA sequence at the C-terminus. JL8 was unable to recognize its epitope within *PfHsp110c*-RFA in SDD-AGE-separated lysates of parasites that had been incubated at 40°C for 6 hours without TMP, even though the same antibody recognized the protein on denaturing SDS-PAGE (**Fig. 4a-c** and **Fig. S6**). The anti-HA antibody, however, was able to recognize *PfHsp110c*-RFA in all samples. In all cases, both 1F9 and 2D8 *PfHsp110c*-RFA parasite clones behaved similarly. Thus, two monoclonal antibodies, 3E6 (**Fig. 4c**) and JL8 were unable to recognize GFP in destabilized *PfHsp110c*-RFA unless the protein was fully denatured.



**Supplementary Figure S8.** Expression of tagRFP-T in *PfHsp110c-RFA* parasites. Live fluorescent images of *PfHsp110c-RFA* parasites expressing tagRFP-T under the control of the *hsp86* promoter. The parasites were heat shocked either with (a) or without (b) 10  $\mu$ M TMP. Aggregation of the fluorescent tagRFP-T alone was never observed. Scale bar represents 2  $\mu$ m. Images from left to right are phase, DAPI, GFP, RFP and GFP-RFP merge.

**Supplementary Table S1.** Primers used to generate constructs utilized in this study.

Primer Name	Sequence (5' to 3')	Restriction Site	PCR Purpose	Comments
5'Sac2-5'cg4KOinF	caatgccccttccgcggatgctgggt ttaggtatagatataggaaatgacaat tctgtgtagc	SacII	Forward primer for 5' homologous region of <i>PfHsp110c</i>	Used in making p110-KO-TK
3'Bgl2-5'cg4KOinF	tttcttataagatctccttgacaatctaa atcttcataaaacattcaacatgtatg gacgc	BglII	Reverse primer for 5' homologous region of <i>PfHsp110c</i>	Used in making p110-KO-TK
5'Cla1-3'cg4KOinF	ctagaattcatatcgatcggaggataa gggagaaaaaaagatgcaaaag atcaagaac	ClaI	Forward primer for 3' homologous region of <i>PfHsp110c</i>	Used in making p110-KO-TK
3'Nco1-3'cg4KOinF	cctaggagttccatggttattcctctgga ttagctgaattttcatttttggtagttctc c	NcoI	Reverse primer for 3' homologous region of <i>PfHsp110c</i>	Used in making p110-KO-TK
5'cg4-GFP-xho1	gcgccctcggggtgcacagacagta accaagtctgttattaagtcc	XhoI	Forward primer for 1kb homologous region in the 3' end of <i>PfHsp110c</i> ORF	Used in making p110-GDB
3'cg4-GFP-avr2	gcgcccttaggttctctggattagctga attttcatttttggtag	AvrII	Reverse primer for 1kb homologous region in the 3' end of <i>PfHsp110c</i> ORF	Used in making p110-GDB
5'Avr2-tRT-inF	gaccggtatgcctaggatggtgtctaa gggcgaagagctgattaaggagaac atgc	AvrII	Forward primer for tagRFP-T	Used in making episomal tagRFP-T parasite vectors
5' Xho1-tRT-inF	tttgaaaagctcgagatggtgtctaa gggcgaagagctgattaaggagaac atgc	XhoI	Forward primer for tagRFP-T	Used in making episomal tagRFP-T alone parasite vector
3'Eag1-tRT-inF	taactcgacggccggtatttgcgtc gtcgtctttgtagctttgctgctgctctt ttagctcctgtacagctcg tccatgccattaagtttgcc	EagI	Reverse primer for tagRFP-T	Used in making episomal tagRFP-T parasite vectors
5'Aat2-110prom-inF	gaaaagtgccacctgacgtccaaca ataagttctaataaggatatcaataa atttcatttatatatcaatcc	AatII	Forward primer for <i>PfHsp110c</i> promoter	Used in making episomal parasite vectors with <i>PfHsp110c</i> promoter
3'Xho1-110prom-inF	gcataccggtctcgagctttccaaaa atttgatatatatatatataaatttatat atatg	XhoI	Reverse primer for <i>PfHsp110c</i> promoter	Used in making episomal parasite vectors with <i>PfHsp110c</i> promoter
5'Xho1-Cg4all-inF	acgatttttctcgagatgctggtttagg tatagatataggaaatgacaattctgtt gtagc	XhoI	Forward primer for <i>PfHsp110c</i> ORF	Used in making episomal <i>PfHsp110c</i> ORF parasite vector
3'Avr2-Cg4all-inF	ctgcacctggcctagggtcctctggatt agctgaattttcatttttggtagttctcc	AvrII	Reverse primer for <i>PfHsp110c</i> ORF	Used in making episomal <i>PfHsp110c</i> ORF parasite vector
5'Xho1-Sse1p/2p-inF	tttgaaaagctcgagatgagtactcc atttggtttagatttagtaacaataact c	XhoI	Forward primer for Sse1p and Sse2p ORF	Used in making episomal Sse1p and Sse2p ORF parasite vector
3'Avr2-Sse1p-inF	tagacaccatcctagggtccatgtcaa catcacctcagtgctcttctttctcc	AvrII	Reverse primer for Sse1p ORF	Used in making episomal Sse1p ORF parasite vector



3'Avr2-Sse2p-inF	tagacaccatcctaggatcaaggtcc atgtttcatcattgtgtcatcgc	XhoI	Reverse primer for Sse2p ORF	Used in making episomal Sse2p ORF parasite vector
5'Xho1-mHsp05-inF	tttgaaaagctcgagatgctcgggtg gggggtggacgtgggctgcagagc	XhoI	Forward primer for Hsp105 $\alpha$ ORF	Used in making episomal Hsp105 $\alpha$ ORF parasite vector
3'Avr2-mHsp105-inF	tagacaccatcctagggtccaagtc atattaacagaattttctcattaggg	AvrII	Reverse primer for Hsp105 $\alpha$ ORF	Used in making episomal Hsp105 $\alpha$ ORF parasite vector
5'Xho1-PFI1155w-inF	acgatttttctcgagatgaatgatcaa aaacgggcatcattaaacctatc	XhoI	Forward primer for PFI1155w	Used in making episomal parasite vector expressing PFI1155w
3'Avr2-PFI1155w-inF	ctgcacctggcctaggatgatttttgc atatgaactgccattcttaattatcctc	AvrII	Reverse primer for PFI1155w	Used in making episomal parasite vector expressing PFI1155w
5'Xho1-Sup35PrD-inF	acgatttttctcgagatgctggattcaa accaaggcaacaatcagc	XhoI	Forward primer for Sup35PrD	Used in making episomal parasite vector expressing Sup35PrD
3'Avr2-Sup35PrD-inF	tagacaccatcctaggagacatacctt gagactgtggttgaaacc	AvrII	Reverse primer for Sup35PrD	Used in making episomal parasite vector expressing Sup35PrD
5'Hind-Sup35PrD-inF	agggagacccaagcttatgtcggatt caaaccaaggcaacaatcagc	HindIII	Forward primer for Sup35PrD	Used for making pcDNA3.1 mammalian vector expressing Sup35PrD-tagRFP-T
3'Bam-Sup35PrD-inF	agacaccatcggatcccagacatac ctgagactgtggttgaaacc	BamHI	Reverse primer for Sup35PrD	Used for making pcDNA3.1 mammalian vector expressing Sup35PrD-tagRFP-T
5'Hind-83N-pcDNA	gtttaaacttaagcttatgaatgatcaa aaacgggcatcattaaacc	HindIII	Forward primer for PFI1155w	Used for making pcDNA3.1 mammalian vector expressing PFI1155w-tagRFP-T
3'Bam-83N-pcDNA	agacaccatcggatccccatgattttt gcatatgaactgccattcttaattatcc	BamHI	Reverse primer for PFI1155w	Used for making pcDNA3.1 mammalian vector expressing PFI1155w-tagRFP-T
5'Not-pLex-Cg4GFP	ctcatcgatgcggccgcatgctggttt aggtatagatataggaaatgacaattc tg	NotI	Forward primer for <i>Pf</i> Hsp110c	Used for making pLexm mammalian vector expressing <i>Pf</i> Hsp110c-GFP
3'Xho-pLex-Cg4GFP	cgatactagtctcgagttattttgtatag ttcatccatgccatgtgtaatcccagc	XhoI	Reverse primer for <i>Pf</i> Hsp110c-GFP	Used for making pLexm mammalian vector expressing <i>Pf</i> Hsp110c-GFP
5'Not-mHsp105-pLex-inF	ctcatcgatgcggccgcatgctggtgg tggggtggacgtgggctgcagagc tgc	NotI	Forward primer for Hsp105 $\alpha$	Used for making pLexm mammalian vector expressing Hsp105 $\alpha$ -GFP
3'Avr-mHsp105-pLex-inF	ctgcacctggcctagggtccaagtc atattaacagaattttctcattaggg	AvrII	Reverse primer for Hsp105 $\alpha$	Used for making pLexm mammalian vector

5'Not-Sse1- pLex-inF	ctcatcgatgcggccgcatgagtactc catttggttagatttagg	NotI	Forward primer for Sse1p	expressing Hsp105 $\alpha$ - GFP Used for making pLexm mammalian vector expressing Sse1p-GFP
3'Avr-Sse1- pLex-inF	ctgcacctggcctagggtccatgtcaa catcaccttcagtgcc	AvrII	Reverse primer for Sse1p	Used for making pLexm mammalian vector expressing Sse1p-GFP
5'Not-Sse2- pLex-inF	ctcatcgatgcggccgcatgagcact ccatttgcttagatttagg	NotI	Forward primer for Sse2p	Used for making pLexm mammalian vector expressing Sse2p-GFP
3'Avr-Sse2- pLex-inF	ctgcacctggcctaggatcaagggtcc atgtttcatcattgtgtcatcgc	AvrII	Reverse primer for Sse2p	Used for making pLexm mammalian vector expressing Sse2p-GFP