

Additional file 20. List of primers used in the study, their sequence and their purpose

Primer Name	Name in the figure	Primer Sequence (5'-3')	Purpose
zmr1 disruption mutants (S5 Fig)			
u1_Zmr1	U1	TTCGAGTGTAAGCGTCATGC	Verification of the integration (with Hyg_pES6_seq_UF)
u2_Zmr1_Inf	U2	GATTACGAATTCTTAATTAAGAATTCAATG TGGACGATGGCCCA	Amplification of up-flanking region (with u3_Zmr1_Inf)
u3_Zmr1_inf	U3	ATCAAAGCATGTGCAGAAGACCATCTTCG C	Amplification of up-flanking region (with u2_Zmr1_Inf)
k1_Zmr1_inf	Not indicated	TGCACATGCTTTGATATTGAAGGAGCATT TTTTGGG	Amplification of Hygromycin resistance cassette (with k2_Zmr1_inf)
k2_Zmr1_inf	Not indicated	CCCGCAATGGCTAGCAGATCTCTATTCCT TTGC	Amplification of Hygromycin resistance cassette (with k2_Zmr1_inf)
d1_Zmr1_inf	D1	GCTAGCCATTGCGGGCAGTCATTCACT	Amplification of down-flanking region (with d2_Zmr1_inf)
d2_Zmr1_inf	D2	CCAAGCTTGCATGCCTGCAGGAATCATA GCGGGCATTTCATTGC	Amplification of down-flanking region (with d2_Zmr1_inf)
d3_Zmr1	D3	ACGGAATTGGCGTAGTTGAC	Verification of right Integration (with Hyg_pES6_seq_DF)
Hyg_pES6_seq_UF	Hyg UF	GAACCATCTTGTCAAACGACAC	Verification of the integration (with u1_Zmr1)
Hyg_pES6_seq_DF	Hyg DF	ACTGTCGGGCGTACACAAATC	Verification of the integration (with d3_Zmr1)
TE_ knockout mutants (S6 Fig)			
TE_KO_U1	TE_U1	Same as 3D7 insitu_U1	Verification of the integration (with Hyg_pES6_seq_UF)
TE_KO_U2	TE_U2	GATTACGAATTCTTAATTAACCAAGTGCG GAGAATATG	Amplification of up-flanking region (with TE_U3)

TE_KO_U3	TE_U3	TCAATATCTACGAGGTACTATATCCGCAC A	Amplification of up-flanking region (with TE_U2)
TE_KO_K1	TE_K1	TAGTACCTCGTAGATATTGAAGGAGCATT TTTTGGG	Amplification of Hygromycin resistance cassette (with TE_K2)
TE_KO_K2	TE_K2	GGAATGGAGGGCTAGCAGATCTCTATTC CTTTGC	Amplification of Hygromycin resistance cassette (with TE_K3)
TE_KO_D1	TE_D1	ATCTGCTAGCCCTCCATTCCACGTTTCG	Amplification of down-flanking region (with TE_D2)
TE_KO_D2	TE_D2	CCAAGCTTGCATGCCTGCAGGCCGCGAC AAGATTTGACTT	Amplification of down-flanking region (with TE_D3)
TE_KO_D3	TE_D3	Same as u3_Zmr1_inf	Verification of the integration (with Hyg_pES6_seq_DF)
<i>In locus complementation of Zmr1 in 3D7Δzmr1 (Fig 7)</i>			
Zmr1ect_F1	<i>Zmr1</i> F	GATTACGAATTCTTAATTAATCTCCATTCC ACGTTTCGC	Amplification of <i>Zmr1</i> gene (including promoter and terminator, with Zmr1ect_R1)
Zmr1ect_R1	<i>Zmr1</i> R	ACGATTCTGAAGCCGCTACAGCGGGATGG GTGCT	Amplification of <i>Zmr1</i> gene (including promoter and terminator, with Zmr1ect_F1)
g418ect_F1	Gen F	GCGGCTTCGAATCGTGGC	Amplification of geneticin resistance cassette (with g418ect_R1)
g418ect_R1	Gen R	CCAAGCTTGCATGCCTGCAGGCCCTAGG TCGACGCCA	Amplification of geneticin resistance cassette (with g418ect_F1)
3D7_ insitu_U1	U1	GCTTACGTCGGAGCAGGTAC	Verification of the integration (with Zmr1_insitu_P2)
3D7_ insitu_U2	UF_F	GATTACGAATTCTTAATTAATATGTGTGGC TGGCTGAGAC	Amplification of up-flanking region (with 3D7_ insitu_U3)
3D7_ insitu_U3	UF_R	AAACGTGGAATGGAGTACGAGGTACTATA TCCGCACA	Amplification of up-flanking region (with 3D7_ insitu_U2)
3D7_ insitu_D1	DF_F	TGGCGTCGACCTAGGGTGACATCCCTC CAACA	Amplification of down-flanking region (with 3D7_ insitu_D2)
3D7_ insitu_D2	DF_R	CCAAGCTTGCATGCCTGCAGGTGACGGT GATCTTCTTGTCG	Amplification of down-flanking region (with 3D7_ insitu_D1)

3D7_ insitu_D3	P4	TCTCGCCATTGGGAATGTAC	Verification of the integration (with Zmr1_insitu_P3)
Zmr1_F	<i>Zmr1</i> in locus F	same as Zmr1ect_F1	Amplification of <i>Zmr1</i> - geneticin resistance cassette (with Zmr1_R)
Zmr1_R	<i>Zmr1</i> in locus R	same as g418ect_R1	Amplification of <i>Zmr1</i> - geneticin resistance cassette (with Zmr1_F)
Zmr1_insitu_ P2	P2	same as u3_Zmr1_inf	Verification of the integration (with 3D7_insitu_U1)
Zmr1_insitu_ P3	P3	same as Zmr1ectgen_F	Verification of the integration (with 3D7_insitu_D3)
Primers used for qPCR			
Zt18Sq_F	NA	CGCAGCAAATCCCACGG	qRT-PCR reference gene (with Zt18S_R)
Zt18Sq_R	NA	GCGCAGCTTCTTCCACTTTGAC	qRT-PCR reference gene (with Zt18S_F)
FL_TFIIC1_ F	NA	TGCTCAGATTGTGCGAAGAC	qPCR reference gene (with FL_TFIIC1_R)
FL_TFIIC1_ R	NA	TCGTAGTCCGATACCATGAGG	qPCR reference gene (with FL_TFIIC1_F)
GenR_q_F	NA	CTGTGCTCGACGTTGTCACT	qPCR for copy number detection (with GenR_q_R)
GenR_q_R	NA	ATACTTTCTCGGCAGGAGCA	qPCR for copy number detection (with GenR_q_F)
HygR_q_F	NA	CGTCTGCTGCTCCATACA AG	qPCR for copy number detection (with HygR_q_R)
HygR_q_R	NA	CTCGATGAGCTGATGCTT TG	qPCR for copy number detection (with HygR_q_F)
Zmr1_SI1_F	NA	CCATATTCTCACACATACCAATG	qRT-PCR for expression analysis (with Zmr1_SI1_R)
Zmr1_SI1_R	NA	CGCATTTCGTCTTCGTCTTC	qRT-PCR for expression analysis (with Zmr1_SI1_F)