

Supplementary Table 1: Strains and plasmids

Name	Description	Related figures	Strain
yIF198	pMSP3535-P ₄₈ -sp0297-Amylase-T _{nis}	2b,c	Lp WCFS1
yIF199	pMSP3535-P ₄₈ -sp2598-Amylase-T _{nis}	2b,c	Lp WCFS1
yIF200	pMSP3535-P ₄₈ -sp2588-Amylase-T _{nis}	2b,c	Lp WCFS1
yIF201	pMSP3535-P ₄₈ -spAmyL-Amylase-T _{nis}	2b-d; Extended Data 4b,c	Lp WCFS1
yIF202	pMSP3535-P ₄₈ -spAmyA-Amylase-T _{nis}	2b,c	Lp WCFS1
yIF163	pMSP3535-PhIF-P ₄₈ -P _{phfO12} -mCherry-T _{nis}	2e,f; Extended Data 5a	Lp WCFS1
yIF167	pMSP3535-PhIF-P ₄₈ -P _{phfO12} -mCherry-T _{nis}	2e,f; Extended Data 5a	Lp WCFS1
yIF159	pMSP3535-GFP-P ₄₈ -P _{phfO12} -mCherry-T _{nis}	2e,f; Extended Data 5a	Lp WCFS1
swF219	pSIP403-P _{sspA} -sp0297-Nanoluc-T _{pepT}	2g	Lp NC8
swF220	pSIP403-P _{sspA} -sp2598-Nanoluc-T _{pepT}	2g	Lp NC8
swF221	pSIP403-P _{sspA} -sp2588-Nanoluc-T _{pepT}	2g; 3d-3i	Lp NC8
swF222	pSIP403-P _{sspA} -sp3050-Nanoluc-T _{pepT}	2g	Lp NC8
swF223	pSIP403-P _{sspA} -sp0373-Nanoluc-T _{pepT}	2g	Lp NC8
swF340	pSIP403-P _{sspA} -P _{phfO12} -mCherry-T _{pepT}	2h-2j; Extended Data 5c,d; Extended Data 6	Lp NC8
swF115	pSIP403-phIF-P ₄₈ -P _{sspA} -mCherry-T _{pepT}	3b,c; Extended Data 5b	Lp NC8
swY008	P _{TDH3} -mfa-IP673-T _{ENO1} -URA3	3b,c	Sc BY4741
swY016	P _{REV1} -Z3E-VP16AD-T _{TDH1} -P _{GAL1&Z3BS} -mfa-IP673-T _{TDH1} -URA3	3d-f; Extended Data 6a	Sc BY4741
swY014	P _{REV1} -LexABD-CRY2-T _{TDH1} -P _{LEXA} -mfa-IP673-NanoLuc-Sed1-T _{TDH1} -P _{TDH3} -VP16-CIB1-T _{TDH1} -URA3	3g-i; Extended Data 6b	Sc BY4741
swY018	LexO(6x)-P _{LEU2m} -mfa-IP673-T _{TDH1} -P _{CCW12} -STE2-T _{SSA1} -P _{PGK1} -GPA1-T _{ENO2} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	3j-l; Extended Data 6c	Sc yWS677
swF314	pSIP403-P ₄₈ -mCherry-T _{pepT}	4a,b; Extended Data 7	Lp NC8
swY002	P _{TDH3} -mTurquoise2-T _{ENO1} -URA3	4a; Extended Data 7a,b	Sc BY4741
swY020	P _{TDH3} -sfGFP-T _{ENO1} -URA3	4b; Extended Data 7c,d	Sc BY4741
	pVE6007-P _{trfA} -orfA/B-T _{pepT} +IS1223 (P _{U1} -CmR-mCherry)	4c-4i; Extended Data 8	Lp NC8
swY032	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(human)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	5b,c; Extended Data 9a	Sc yWS677
swY039	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	5b,c; Extended Data 9a	Sc yWS677
swY041	LexO(6x)-P _{LEU2m} -mfa-IP673-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	5c	Sc yWS677
swY047	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	5b,c; Extended Data 9a	Sc yWS677
swY048	LexO(6x)-P _{LEU2m} -mfa-IP673-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	5d-5f	Sc yWS677
swF414	pSIP403-P _{sspA} -sp0297-mIL-10-T _{pepT}	6b	Lp NC8
swF415	pSIP403-P _{sspA} -sp2598-mIL-10-T _{pepT}	6b	Lp NC8
swF416	pSIP403-P _{sspA} -sp2588-mIL-10-T _{pepT}	6b	Lp NC8
swF417	pSIP403-P _{sspA} -sp3050-mIL-10-T _{pepT}	6b	Lp NC8
swF418	pSIP403-P _{sspA} -sp0297-hElafin-T _{pepT}	6b	Lp NC8
swF419	pSIP403-P _{sspA} -sp2598-hElafin-T _{pepT}	6b	Lp NC8
swF420	pSIP403-P _{sspA} -sp2588-hElafin-T _{pepT}	6b	Lp NC8
swF421	pSIP403-P _{sspA} -sp3050-hElafin-T _{pepT}	6b	Lp NC8
swF422	pSIP403-P _{sspA} -sp0297-mSLPI-T _{pepT}	6b	Lp NC8
swF423	pSIP403-P _{sspA} -sp2958-mSLPI-T _{pepT}	6b	Lp NC8
swF424	pSIP403-P _{sspA} -sp2588-mSLPI-T _{pepT}	6b	Lp NC8
swF425	pSIP403-P _{sspA} -sp3050-mSLPI-T _{pepT}	6b	Lp NC8
swF454	pSIP403-P _{sspA} -sp3050-mIL-10-T _{pepT} -tetM	6c	Lp NC8
swF455	pSIP403-P _{sspA} -sp0297-hElafin-T _{pepT} -tetM	6c	Lp NC8
swY006	P _{TDH3} -mfa-Amylase-T _{ENO1} -URA3	Extended Data 4	Sc BY4741
swF319	pSIP403-P _{phfO12} -P _{sspA} -mCherry-T _{pepT}	Extended Data 5c,d	Lp NC8
swY023	P _{FUS1} -mfa-sfGFP-T _{TDH1} -P _{PGK1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(human)-T _{SSA1} -P _{RAD27} -STE12-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY024	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{PGK1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(human)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY036	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(mouse)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY037	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(olive baboon)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY038	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(green monkey)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY045	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, Q165H)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY046	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, Q165H)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9a,b	Sc yWS677
swY058	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{ALD6} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY059	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{RNR1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY055	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{HFE1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY052	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{HFE2} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY051	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{PGK1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY057	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{RPL18B} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY054	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{TEF2} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY053	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{TEF1} -Gpa1-Gai3-T _{ENO2} -P _{TDH3} -P2Y2(cat, F58I)-T _{SSA1} -P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9c	Sc yWS677
swY042	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{TEF1} -Gpa10-T _{ENO2} -P _{TDH3} -HCA2-P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9d	Sc yWS677
swY043	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{TEF2} -Gpa10-T _{ENO2} -P _{TDH3} -HCA2-P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9d	Sc yWS677
swY035	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{PGK1} -Gpa10-T _{ENO2} -P _{TDH3} -HCA2-P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9d	Sc yWS677
swY044	LexO(6x)-P _{LEU2m} -sfGFP-T _{TDH1} -P _{RPL18B} -Gpa10-T _{ENO2} -P _{TDH3} -HCA2-P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9d	Sc yWS677
swY049	LexO(6x)-P _{LEU2m} -mfa-IP673-T _{TDH1} -P _{PGK1} -Gpa10-T _{ENO2} -P _{TDH3} -HCA2-P _{RAD27} -LexA-PRD-T _{ENO1} -URA3	Extended Data 9e,f	Sc yWS677