Figure S1. Gene expression profiles of target genes

The expression levels of mRNAs analyzed by microarray hybridization at different stages of the life cycle (Miao et al. 2009) are plotted. Growing cells at three different concentrations: ~1 X 105 cells/mL, ~3.5 X 105 cells/mL and ~1 X 106 cells/mL (Ll, Lm, and Lh, respectively); cells starved for 0, 3, 6, 9, 12, 15 and 24 hrs (S0, S3, S6, S9, S12, S15 and S24, respectively); and conjugating cells at 2, 4, 6, 8, 10 and 12 hrs post-mixing (C2, C4, C6, C8, C10 and C12, respectively) are indicated. The data were obtained from the Tetrahymena Functional Genomics Database (http://tfgd.ihb.ac.cn/).
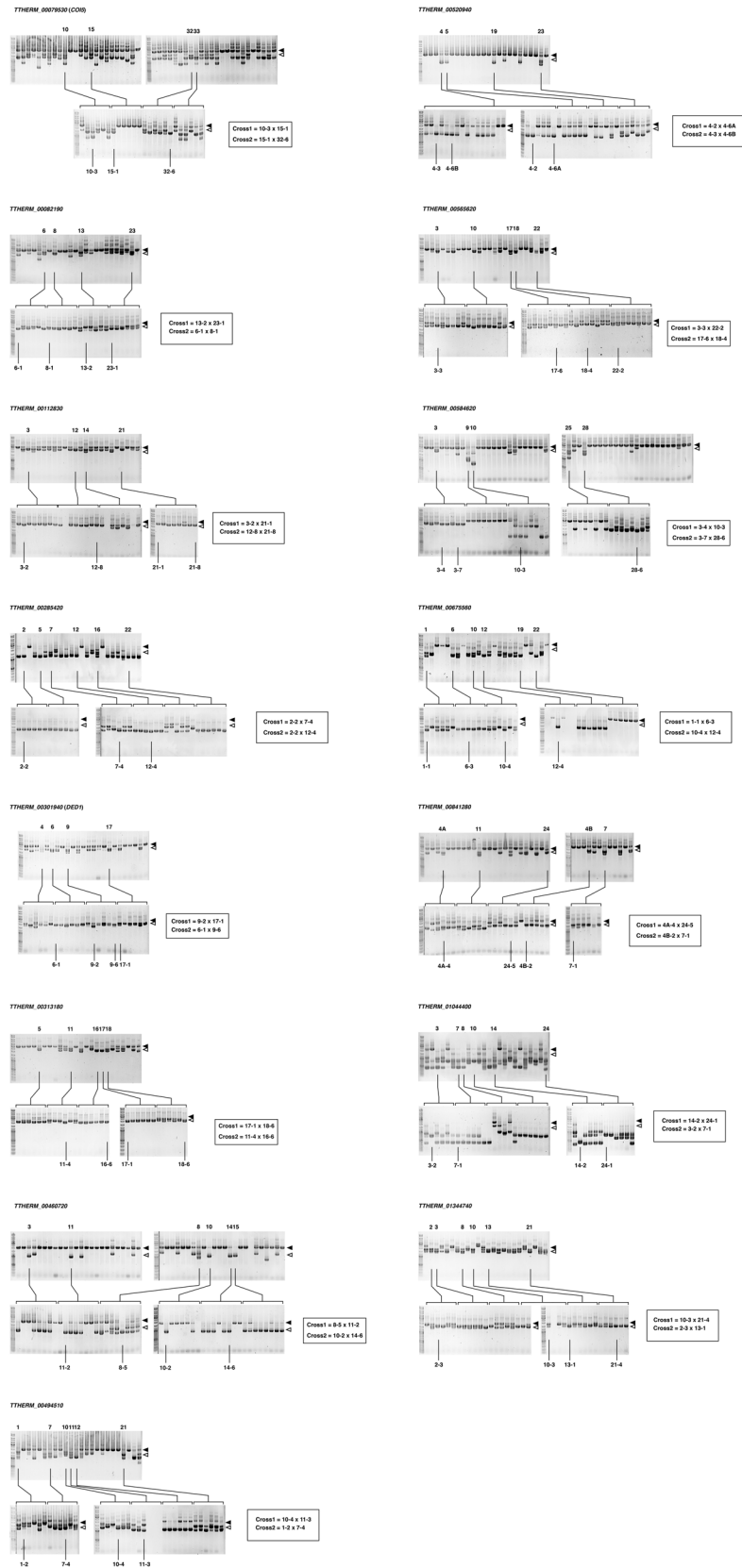
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Figure S2. Establishment of KO strains by coDel

Establishment of KO strains by coDel. Progeny lines with nearly complete deletion at the indicated gene loci by coDel (top) were cultured for 12 passages to allow random assortment of the loci and sexual maturation. Then, 6-8 clonal cell lines were established from each progeny and analyzed by genomic PCR (bottom). Indicated cells lines were chosen and used for a DNA elimination assay.

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Table S1. The genomic locations of the coDel targets and the names of the primers used for target amplification and for genomic PCR checking coDel

Target gene	Corresponding Figs/Tables	MAC genomic position of target			Primer set used for target amplification		Primer set used for deletion check	
		MAC SC#	start	end	Primer 1	Primer 2	Primer 1	Primer 2
TTHERM_00079530 (COI5)	Fig. 1; Table 1	3828	1004795	1005509	cDelSa1_FW	cDelSa1_RV	THERM_00079530_DelCheck_FW	THERM_00079530_DelCheck_RV
TTHERM_00082190	Fig. 1; Table 1	3836	1201352	1201965	cDelSa3_FW	cDelSa3_RV	THERM_00082190_DelCheck_FW	THERM_00082190_DelCheck_RV
TTHERM_00112830	Fig. 1; Table 1	3812	682512	683218	cDelSa4_FW	cDelSa4_RV	THERM_00112830_DelCheck_FW	THERM_00112830_DelCheck_RV
TTHERM_00285420 (DED2)	Fig. 1, 3; Table 1	3688	58874	59545	cDelSa17_FW	cDelSa17_RV	THERM_00285420_DelCheck_FW	THERM_00285420_DelCheck_RV
TTHERM_00285420 (DED2)	Fig. 3	3688	58525	59196	cDelSa17_FW5	cDelSa17_RV2	Sa17_DelCheck_FW	Sa17_DelCheck_RV2
TTHERM_00285420 (DED2)	Fig. 3	3688	58525	59545	cDelSa17_FW2	cDelSa17_RV2	Sa17_DelCheck_FW	Sa17_DelCheck_RV2
TTHERM_00285420 (DED2)	Fig. 3	3688	58067	59545	cDelSa17_FW3	cDelSa17_RV3	Sa17_DelCheck_FW	Sa17_DelCheck_RV3
TTHERM_00285420 (DED2)	Fig. 3	3688	57524	59545	cDelSa17_FW4	cDelSa17_RV4	Sa17_DelCheck_FW	Sa17_DelCheck_RV4
TTHERM_00301940 (DED1)	Fig. 1, 2, 6; Table 1	3691	710271	710862	cDelSa2_FW	cDelSa2_RV	THERM_00301940_DelCheck_FW	THERM_00301940_DelCheck_RV
TTHERM_00399200	Fig. 1; Table 1	3713	73945	74523	cDelSa7_FW	cDelSa7_RV	THERM_00399200_DelCheck_FW	THERM_00399200_DelCheck_RV1
TTHERM_00313180	Fig. 1; Table 1	3810	469974	470526	cDelSa19_FW	cDelSa19_RV	Sa19_DelCheck_FW	Sa19_DelCheck_RV
TTHERM_00460720	Table 1	3823	98721	99339	cDelSa15_FW	cDelSa15_RV2	THERM_00460720_DelCheck_FW1	THERM_00460720_DelCheck_RV
TTHERM_00460720	Fig. 1	3823	98677	99568	cDelSa15_FW2	cDelSa15_RV2	THERM_00460720_DelCheck_FW2	THERM_00460720_DelCheck_RV
TTHERM_00494510	Fig. 1; Table 1	3711	398243	398863	cDelSa12_FW	cDelSa12_RV	THERM_00494510_DelCheck_FW	THERM_00494510_DelCheck_RV
TTHERM_00520940	Fig. 1; Table 1	3717	18388	18999	cDelSa13_FW	cDelSa13_RV	THERM_00520940_DelCheck_FW	THERM_00520940_DelCheck_RV
TTHERM_00556620	Fig. 1; Table 1	3721	288798	289473	cDelSa6_FW	cDelSa6_RV	THERM_00556620_DelCheck_FW	THERM_00556620_DelCheck_RV
TTHERM_00584620	Fig. 1; Table 1	3675	48731	49313	cDelSa5_FW	cDelSa5_RV	Sa5_DelCheck_FW	Sa5_DelCheck_RV
TTHERM_00675560	Fig. 1	101	212542	213240	cDelSa16_FW	cDelSa16_RV	THERM_00675560_DelCheck_FW	THERM_00675560_DelCheck_RV1
TTHERM_00675560	Table 1	101	212542	213580	cDelSa16_FW	cDelSa16_RV2	THERM_00675560_DelCheck_FW	THERM_00675560_DelCheck_RV2
TTHERM_00841280	Fig. 1; Table 1	3741	38458	39065	cDelSa18_FW	cDelSa18_RV	Sa18_DelCheck_FW	Sa18_DelCheck_RV
TTHERM_01044400	Fig. 1; Table 1	3760	14886	15592	cDelSa11_FW	cDelSa11_RV	THERM_01044400_DelCheck_FW	THERM_01044400_DelCheck_RV1
TTHERM_01347740	Fig. 1; Table 1	336	36510	37116	cDelSa10_FW	cDelSa10_RV	THERM_01347740_DelCheck_FW	THERM_01347740_DelCheck_RV
TTHERM_00388160	Fig. 1; Table 1	41	199509	200155	Log1_cDelFW	Log1_cDelRV	Log1_DelCheckFW	Log1_DelCheckRV
TTHERM_00408840	Fig. 1; Table 1	3714	89022	89690	Log2_cDelFW	Log2_cDelRV	Log2_DelCheckFW	Log2_DelCheckRV
TTHERM_00935580	Fig. 1; Table 1	169	58015	58654	Stv1_cDelFW	Stv1_cDelRV	Stv1_DelCheckFW	Stv1_DelCheckRV
TWI2	Fig. 4	scf_8254654	64114	65135	TWi2_cDelFW	TWi2_cDelRV	TWi2_DelCheckFW2	TWi2_DelCheckRV2
TWI2	Fig. 4	scf_8254654	64114	65135	TWi2_cDelFW	TWi2_cDelRV	TWi6_DelCheckFW	TWi6_DelCheckRV
TWI2	Fig. 4	scf_8254654	64114	65135	TWi2_cDelFW	TWi2_cDelRV	TWi7_DelCheckFW2	TWi7_DelCheckRV2
TWI2	Fig. 4	scf_8254654	64114	65135	TWi2_cDelFW	TWi2_cDelRV	TWi2_DelCheckFW2	TWi2_DelCheckRV2
XRN2	Fig. 5	3702	598484	599481	XRN2_cDelFW	XRN2_cDelRV_XRN4c	XRN2_DelCheck_FW	XRN2_DelCheck_RV
XRN2	Fig. 5	3702	598484	599481	XRN2_cDelFW	XRN2_cDelRV	XRN2_DelCheck_FW	XRN2_DelCheck_RV2
XRN4	Fig. 5	3813	329272	330354	XRN4_cDelFW_XRN2c	XRN4_cDelRV	XRN4_DelCheck_FW	XRN4_DelCheck_RV

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Table S2. The sequences of the primers used in this study

target	primer name	sequence (5' to 3')
TTHERM_00079530 (COI5)	cDelSa1_FW	CTTTATTGTTATCATCTTATGACCGCTGTTCAGCTCTAATTACTCG
	cDelSa1_RV	CTCATCAAGTTGTAATGCTAAAATGCTAATCATTACCATTCTTCTACAGGC
	TTHERM_00079530_DelCheck_FW	ATGAACGATAGTAAACAGCTACTCAC
	TTHERM_00079530_DelCheck_RV	AGCTTGATGAGCAATTTCACGACAG
TTHERM_00082190	cDelSa3_FW	CTTTATTGTTATCATCTTATGACCGCTTGTATGGTCTGTTCCATCCCTC
	cDelSa3_RV	CTCATCAAGTTGTAATGCTAAAATGCTTCTGTTTTTAGGATATCTAGTGG
	TTHERM_00082190_DelCheck_FW	ATTTTCATTTTCGCTCGCTAAGCAGC
	TTHERM_00082190_DelCheck_RV	AGCATCATATAGAAGCATCGATAGAG
TTHERM_00112830	cDelSa4_FW	CTTTATTGTTATCATCTTATGACCGCTTAATGGAGTAATTAATTTCACATG
	cDelSa4_RV	CTCATCAAGTTGTAATGCTAAAATGCAGATTCCACGCCTTCAGTTGTTGC
	TTHERM_00112830_DelCheck_FW	TGTTAGTGTAAGTTTAGATACCAAG
	TTHERM_00112830_DelCheck_RV	ATCAGTGGAGTTAGATAATTCAGG
TTHERM_00285420 (DED2)	cDelSa17_FW	CTTTATTGTTATCATCTTATGACCGCTGAATACACTGAAATTCATTCAGAG
	cDelSa17_FW5	CTTTATTGTTATCATCTTATGACCGCCATAGAGAAAGATACCATTCTTAACCG
	cDelSa17_RV	CTCATCAAGTTGTAATGCTAAAATGCAGGACTGTTAGAAACTTAGTTC
	cDelSa17_RV2	CTCATCAAGTTGTAATGCTAAAATGCAATCCAAATGATGTCATATGTGAG
	cDelSa17_RV3	CTCATCAAGTTGTAATGCTAAAATGCTTGAGGATAATTCTTCTAAGCTAGCAG
	cDelSa17_RV4	CTCATCAAGTTGTAATGCTAAAATGCACTAGTTTACACTTTAATGCTCTGC
	TTHERM_00285420_DelCheck_FW	TCTCCGCAAAGAAGGAACTAATCCTC
	TTHERM_00285420_DelCheck_RV	TTGAGGATAATTCTTCTAAGCTAGCAG
	Sa17_DelCheck_RV2	TCAATCAATAAAAGAGTGAATACTTGTTC
	Sa17_DelCheck_RV3	TTATCTCAACTTGTTTTTTAATCCCTC
	Sa17_DelCheck_RV4	ATCTGTTTTTAATACATGCTAGCTGTC
TTHERM_00301940 (DED1)	cDelSa2_FW	CTTTATTGTTATCATCTTATGACCGCTGATTGGAGGATTGAATCAGAAGC
	cDelSa2_RV	CTCATCAAGTTGTAATGCTAAAATGCATATTTGATTTTTTAGCACATGGC
	TTHERM_00301940_DelCheck_FW	TCTTACGAATCCCATAGATCCCACTG
	TTHERM_00301940_DelCheck_RV	TGCTACGAAAGAAGTTAATTAGCTCC
TTHERM_00399200	cDelSa7_FW	CTTTATTGTTATCATCTTATGACCGCATTCAAAGACACCTATGATGATGC
	cDelSa7_RV	CTCATCAAGTTGTAATGCTAAAATGCTGGCTATTGTTGTATTCCCAAGTG
	cDelSa7_FW2	CTTTATTGTTATCATCTTATGACCGCCACATTTACTTAAGAAATACTCAAAGG
	cDelSa7_RV2	CTCATCAAGTTGTAATGCTAAAATGCTAAATAGTAAGTTATTGTTCCCACTG
	TTHERM_00399200_DelCheck_FW	ATATGCCAGTAACTACGTATTAAGAGG
	TTHERM_00399200_DelCheck_RV1	TAACCACTCGGCCAAAGTGTCC
	TTHERM_00399200_DelCheck_RV2	AAGTCAATCAATACCTTAATAAGTACAG
TTHERM_00313180	cDelSa19_FW	CTTTATTGTTATCATCTTATGACCGCTATAAACTTTCTAAAATGAGCTCC
	cDelSa19_RV	CTCATCAAGTTGTAATGCTAAAATGCGATTTTATACCAGAATTGAATCC
	Sa19_DelCheck_FW	TTAGTTAAAGCCCTCATTAAGATCAGC
	Sa19_DelCheck_RV	TGTATAAATTTTATTAATATTTAATGAGCTACC
TTHERM_00460720	cDelSa15_FW	CTTTATTGTTATCATCTTATGACCGCTGGAGAATAATTATATCGAAGAGCTG
	cDelSa15_RV	CTCATCAAGTTGTAATGCTAAAATGCTTGATATGTAATTCTATTTCATTTTCC
	cDelSa15_FW2	CTTTATTGTTATCATCTTATGACCGCCAGACAATTTAGATTGGTATAGCAG
	cDelSa15_RV2	CTCATCAAGTTGTAATGCTAAAATGCTTGCAAATTGAATTTCATTCCATC
	TTHERM_00460720_DelCheck_FW2	TGGATGGATCCAAAAGCTATTCTCC
	TTHERM_00460720_DelCheck_FW1	TTAGTCACCTACAAAGCTTAAAGCAC
	TTHERM_00460720_DelCheck_RV	AGTTGCCATTTTCTTCATTTGGCATCC
TTHERM_00494510	cDelSa12_FW	CTTTATTGTTATCATCTTATGACCGCACAAATCATCAATGAAAACACCC
	cDelSa12_RV	CTCATCAAGTTGTAATGCTAAAATGCAGATTAAAACTTCTTTGTTTAAACTCC
	TTHERM_00494510_DelCheck_FW	TAAGAGCCAGAATGTCTTCCAGC
	TTHERM_00494510_DelCheck_RV	TAACTGTTTCCTGAGTTTTCGAGCTC
TTHERM_00520940	cDelSa13_FW	CTTTATTGTTATCATCTTATGACCGCAGGGGTAGAAGCTAAAATGACCGC
	cDelSa13_RV	CTCATCAAGTTGTAATGCTAAAATGCATCTTCTACATGAAGGATATCTCGC
	TTHERM_00520940_DelCheck_FW	TATGTTTACTATGATTTCTTCTTGCC
	TTHERM_00520940_DelCheck_RV	ATCGCATCATCAAATGCAAATGCACC
TTHERM_00565620	cDelSa6_FW	CTTTATTGTTATCATCTTATGACCGCAAACAAGTCTATATGGTAGC
	cDelSa6_RV	CTCATCAAGTTGTAATGCTAAAATGCAGGAGAATGATTCTGAGCTGTGC
	TTHERM_00565620_DelCheck_FW	TGACTCACTTAACAAGTACTGTTCG
	TTHERM_00565620_DelCheck_RV	TTTATTCATCCTAGCTGCTTAGGC
TTHERM_00584620	cDelSa5_FW	CTTTATTGTTATCATCTTATGACCGCTTATGTTGATAAAGCTGACCATCC
	cDelSa5_RV	CTCATCAAGTTGTAATGCTAAAATGCAGATTTTGTTCTTCTAATTATTCGATGCC
	Sa5_DelCheck_FW	ACCTCTGAAAATCAATGCCTTATAGCC
	Sa5_DelCheck_RV	AGCTTATTTATTGAATGCAGCTGGTTGG
TTHERM_00675560	cDelSa16_FW	CTTTATTGTTATCATCTTATGACCGCTTAATTCTGCTGCCACTTCAG
	cDelSa16_RV	CTCATCAAGTTGTAATGCTAAAATGCTTAAAGGACTCACTAAGATTTACAGG
	cDelSa16_RV2	CTCATCAAGTTGTAATGCTAAAATGCATAAACATCCATGTCTTCAAACGAG
	TTHERM_00675560_DelCheck_FW	TCATTTTCATCATTTTTCAATAGGTGTC
	TTHERM_00675560_DelCheck_RV1	TCTGTAAAATGTTTTAAGCTCCTCCAAGC
	Sa16_DelCheck_RV2	TGCTTAAGGATTCATCGCTGTTCTGC

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TTHERM_00841280	cDelSa18_FW	<u>CTTTATTGTTATCATCTTATGACCGC</u>GAATTGAAGTAGAAAGACGTGCGTG
	cDelSa18_RV	CTCATCAAGTTGTAATGCTAAAATGCAGGATCAAAATTTGAGAACTGCTG
	Sa18_DelCheck_FW	TGATTCAGCACCAATTTTATCTCCAGGC
	Sa18_DelCheck_RV	ACCATTAGAGTGGGGATCTTCAATAGC
TTHERM_01044400	cDelSa11_FW	<u>CTTTATTGTTATCATCTTATGACCGC</u>AAATGGAGAAATCGTTAGCTTACAC
	cDelSa11_RV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TGTATTTTGATTGTCTGCTTTCTGTGATG
	TTHERM_01044400_DelCheck_FW	AGATAAGATATTTCTCCTATTTCTCAGC
	TTHERM_01044400_DelCheck_RV1	ATGAATTCAAAAGGTTGGCATCATAG
TTHERM_01344740	cDelSa10_FW	<u>CTTTATTGTTATCATCTTATGACCGC</u>ATAGTAGAAATTAGAGATGGCCAG
	cDelSa10_RV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TGATGTGTTAGACTGTAAGTGTGACTAG
	TTHERM_01344740_DelCheck_FW	AGGTATTTCACTCTAGTTAATTAGGAG
	TTHERM_01344740_DelCheck_RV	TCTATAAAAAAACAGTATTGAGGAACTAC
TTHERM_00388160	Log1_cDelFW	<u>CTTTATTGTTATCATCTTATGACCGC</u>AGGTATTGTTGCTTCTTTTCTATGCC
	Log1_cDelRV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TACTCACTAAGTACTTGACTGC
	Log1_DelCheckFW	TCTAAGACTGCTGAAACAAAGAGTGAC
	Log1_DelCheckRV	ACATAATTGGATGTAAAACTACATTCCTC
TTHERM_00408840	Log2_cDelFW	<u>CTTTATTGTTATCATCTTATGACCGC</u>TTATCCTGATTGTACGATTATGACTC
	Log2_cDelRV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TACTTCTAATTTACATCCTGAGAGGAC
	Log2_DelCheckFW	ACCCTCAACAAATAACTTTAAGCAACC
	Log2_DelCheckRV	TATACAAATTTATTAAAATTCTGGAAGTC
TTHERM_00935580	Stv1_cDelFW	<u>CTTTATTGTTATCATCTTATGACCGC</u>AGATTTAGTGGTAGGCAATTCAGTTGC
	Stv1_cDelRV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>AACAGAATTACCAGGAGCAGCAGC
	Stv1_DelCheckFW	TTAGAAAGGCTGAATGACTTCCCATG
	Stv1_DelCheckRV	ATCATAGCTAATTAAAATTTCGCACATC
TWI2, TWI6 and TWI7	TWI2_cDelFW	<u>CTTTATTGTTATCATCTTATGACCGC</u>TGATGAACCTCAAGGATTTGTG
	TWI2_cDelRV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TTGTTTTGCTGCTTAAAAATCTG
	TWI2_DelCheckFW2	ATTTTAAGTTTTTAAGATCGCTGTTTGC
	TWI2_DelCheckRV2	AGTTATCAAGTAGTTAGTTCTGGCTGG
	TWI6_DelCheckFW	TGCTTTGTTAGCAGTATCTATTAATTGC
	TWI6_DelCheckRV	TTGTTAAAATAATAAAATTTCGATGAAGC
	TWI7_DelCheckFW2	TCAAGCTTCACTTATTGCCATTAATGCTC
	TWI7_DelCheckRV2	TCAAATCTATCTCTTTAGTCTCGCATGC
XRN2 and XRN4	XRN2_cDelFW	<u>CTTTATTGTTATCATCTTATGACCGC</u>TGTTCCAGCATTCTTTAGGTGGC
	XRN2_cDelRV_XRN4c	GCTGTGTATTGATGGAATTCTCTAGGGCTCATGAGTACTTAATCC
	XRN4_cDelFW_XRN2c	GGATTAAGTACTCATGAGCCCTAGAGAATTCCATCAATACACAGC
	XRN4_cDelRV	<u>CTCATCAAGTTGTAATGCTAAAATGC</u>TCCATTCAAGAAAGGATACATACGC
	XRN2_DelCheck_FW	TCCTATTTATTATTTAAATAAATCCTTAGTC
	XRN2_DelCheck_RV	ACTTTTTTCTCATCCTTTAATCTCCACTC
	XRN4_DelCheck_FW	TAATAAATAATGGCCCTTCTACACAG
	XRN4_DelCheck_RV	TGTTTAATAAGAAAAACACTCGCTTGC
complementation of DED1	Sa2_Res_5FW	CTCTAGAGCATGCGCTAGCGGATCCTGTTGATGAAATGTGCCATTCAGC
	Sa2_Res_5RV	GACCGATTCAGTTCGCTCAATCATTGCATATTTGATTTTTTAGCACATGGC
	Sa2_ResHA_5RV	CAGGAACATCATAAGGATAggaaccTTGCATATTTGATTTTTTAGCACATGGC
	Sa2_Res_3FW	GCTTATCGATACCGTCGACCTGATAATTTAGAAACTTTCAACAAGAG
	Sa2_Res_3RV	GGGTACCGGGCCCCCCCTCGAGAAGAGACTCGTTTCAATTCATCC

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