Table S1: Amino acid, codons recognized, and scaled intra-cellular tRNA concentrations, within yeast as measured by Ikemura (1985) or estimated from gene copy number, as indicated by a *, after Percudani et al. (1997) and Akashi (2003). The translation rates of codons using the G-U wobble were reduced by 39% compared to their G-C wobble counter-parts (Thomas et al., 1988; Curran and Yarus, 1989). Similarly, the translation rates of codons using the I-G wobble were reduced by 36% relative to their I-U counterparts (Curran and Yarus, 1989). The entire set of translation rates were scaled so that their average value is 10 codons/sec.

Amino Acid	Anti-Codon	Codon	Translation Rate
ala	IGC	GCU	18.2
		GCC	11.7
	UGC	GCA	7.82
		GCG	7.82
arg	ICG	CGU	4.21
		CGC	2.70
		CGA	2.70
	CCG	CGG	1.56
	UCU	AGA	17.2
	CCU	AGG	1.72
asn	GUU	AAU	9.56
		AAC	15.6
asp	GUC	GAU	15.5
		GAC	25.3
cys	GCA	UGU	4.56
		UGC	7.47
gln	UUG	CAA	14.1
	CUG	CAG	1.56
	UUC	GAA	18.4
	CUC	GAG	3.13
gly	GCC	GGU	16.5
		GGC	27.0
	UCC	GGA	4.69
	CCC	GGG	3.13
his	GUG	CAU	8.43
		CAC	13.8
ile	IAU	AUU	20.3
		AUC	13.0
	UAU	AUA	3.13

Amino Acid	Anti-Codon	Codon	Translation Rate
leu	UAA	UUA	10.9
	CAA	UUG	19.2
	GAG	CUU	0.956
		CUC	1.56
	UAG	CUA	9.00
		CUG	9.00
lys	UUU	AAA	6.70
	CUU	AAG	15.1
met	CAU	AUG	7.82
phe	GAA	UUU	8.9
		UUC	14.6
pro	IGG	CCU	3.13
		CCC	2.01
	UGG	CCA	15.6
		CCG	15.6
ser	IGA	UCU	22.4
		UCC	14.4
	UGA	UCA	7.28
	CGA	UCG	1.56
	GCU	AGU	3.82
		AGC	6.26
thr	IGU	ACU	17.4
		ACC	11.2
	UGU	ACA	6.26
	CGU	ACG	1.56
trp	CCA	UGG	11.7
tyr	GUA	UAU	10.4
		UAC	17.0
val	IAC	GUU	19.3
		GUC	12.4
	UAC	GUA	3.13
	CAC	GUG	2.87