SUPPLEMENTARY DATA

TrmB, a tRNA m^7G46 methyltransferase, plays a role in hydrogen peroxide resistance and positively modulates the translation of *katA* and *katB* mRNAs in *Pseudomonas aeruginosa*

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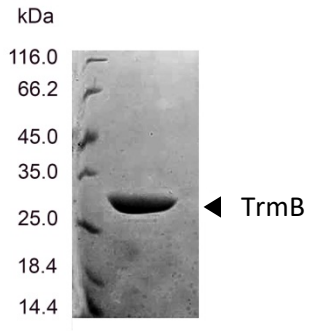

Figure S1 SDS-PAGE analysis of the purified PaTrmB protein (27 kDa). The purity of the PaTrmB was estimated to be >99% on a Coomassie blue stained SDS-polyacrylamide gel.

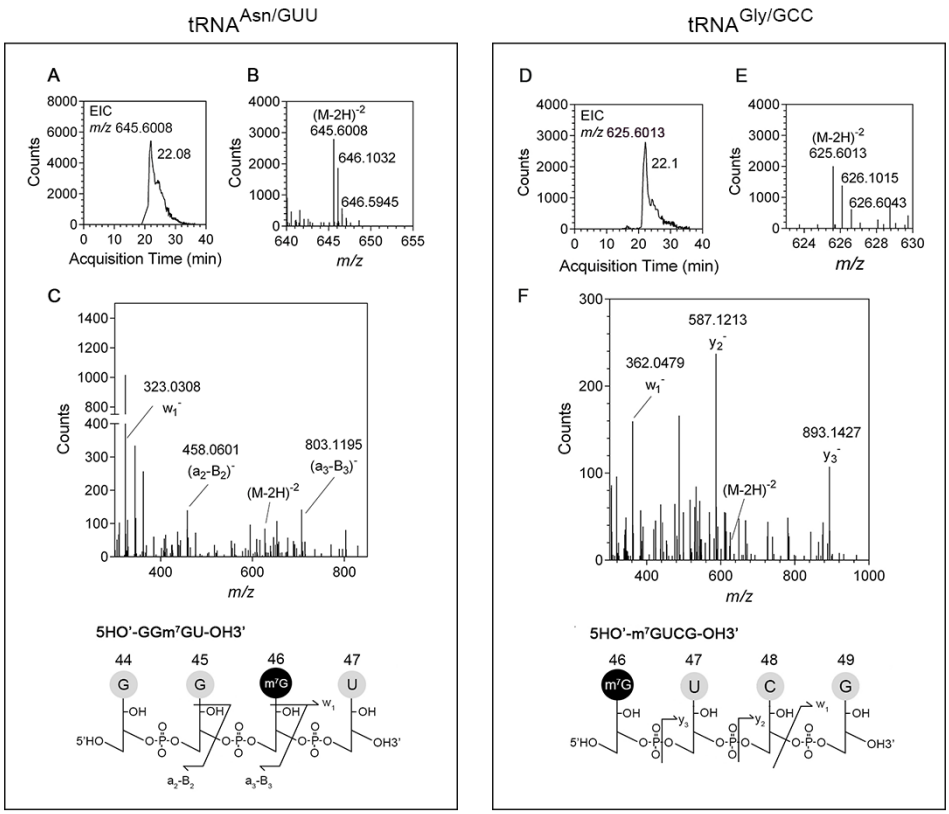

Figure S2 The PaTrmB catalyzes the formation of m^{7}G at position 46 in variable loop of tRNA$^{Asn/GUU}$ and tRNA$^{Gly/GCC}$ *in vitro*. (A) Extracted ion chromatogram of GGm^{7}GU with m/z 645.6008; this fragment is an RNase A digested product of tRNA$^{Asn/GUU}$. **(B)** The mass spectrum of GGm^{7}GU fragment shows a doubly-charged negative ion with m/z 645.6008. **(C)** CID spectrum and CID fragmentation pattern of m/z 645.6008 with w_1, a_2-B_2, and a_3-B_3 ion products. **(D)** Extracted ion chromatogram of m^{7}GUCG with m/z 625.6013; this fragment is an RNase T1 digested product of tRNA$^{Gly/GCC}$. **(E)** The mass spectrum of m^{7}GUCG fragment shows a doubly-charged negative ion with m/z 625.6013. **(F)** CID spectrum and CID fragmentation pattern of m/z 625.6013 with w_1, y_2, and y_3 ion products.

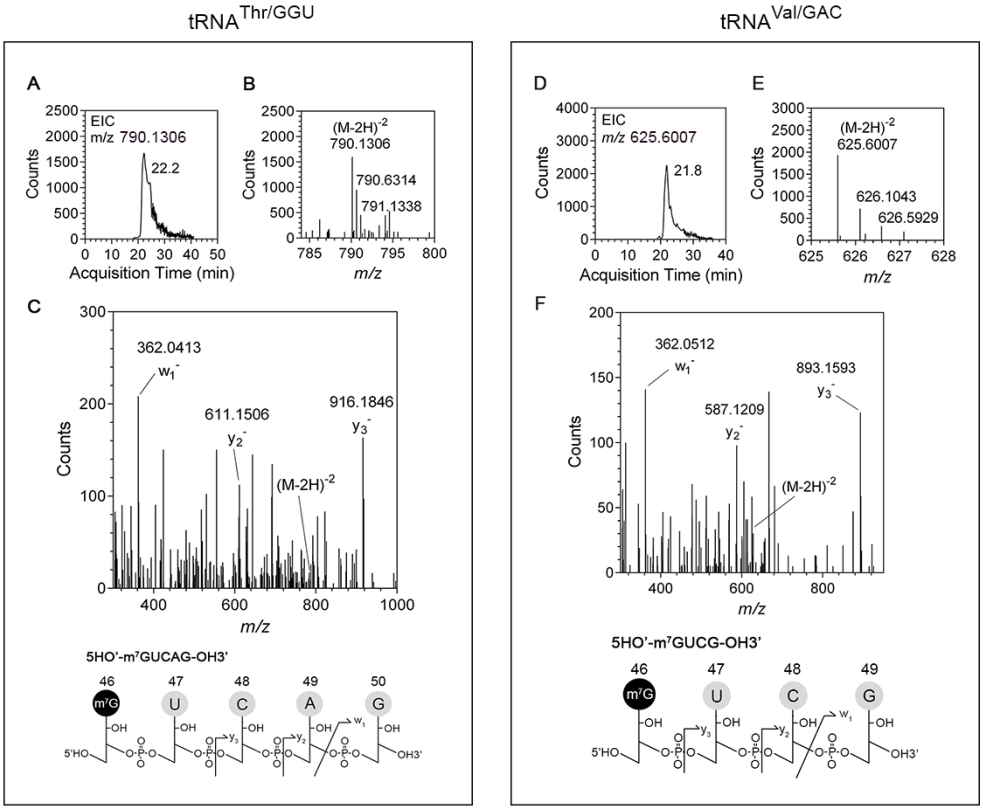

Figure S3 The PaTrmB catalyzes the formation of m^{7}G at position 46 in variable loop of tRNA$^{Thr/GGU}$, and tRNA$^{Val/GAC}$ *in vitro*. (A) Extracted ion chromatogram of m^{7}GUCAG with m/z 790.1306; this fragment is an RNase T1 digested product of tRNA$^{Thr/GGU}$. **(B)** The mass spectrum of m^{7}GUCAG fragment shows a doubly-charged negative ion with m/z 790.1306. **(C)** CID spectrum and CID fragmentation pattern of m/z 790.1306 with w_1, y_2, and y_3 ion products. **(D)** Extracted ion chromatogram of m^{7}GUCG fragment with m/z 625.6007; this fragment is an RNase T1 digested product of tRNA$^{Val/GAC}$. **(E)** The mass spectrum of m^{7}GUCG fragment shows a doubly-charged negative ion with m/z 625.6007. **(F)** CID spectrum and CID fragmentation pattern of m/z 625.6007 with w_1, y_2, and y_3 ion products.

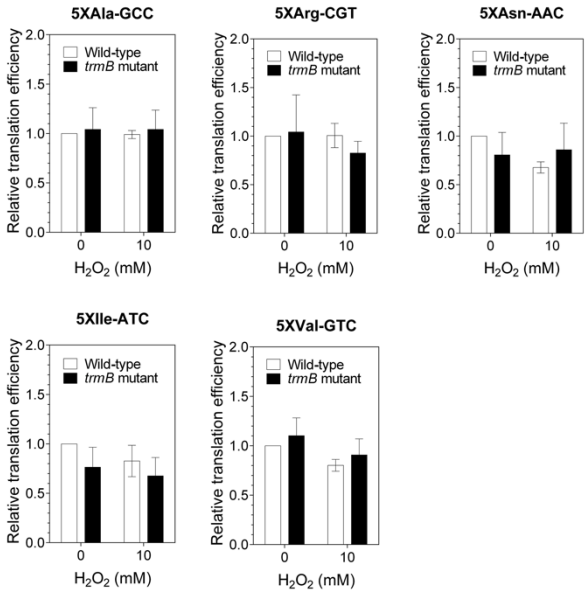

Figure S4 Relative translation efficiency of 5XAla-GCC, 5XArg-CGT, 5XAsn-AAC, 5XIle-ATC, and 5XVal-GTC reporter in the wild type and *trmB* mutant strains upon H_2O_2 exposure. Data represent the mean ± SD for four biological replicates.

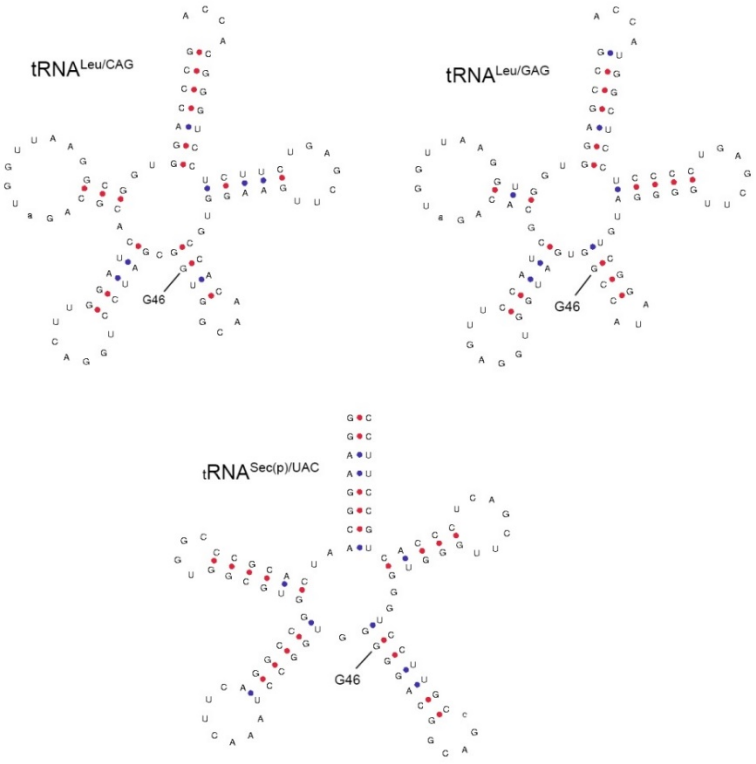

Figure S5 Predicted secondary structure of $tRNA^{Leu/CAG}$, $tRNA^{Leu/GAG}$, and $tRNA^{Sec(p)/UAC}$. tRNA database: http://gtrnadb2009.ucsc.edu/

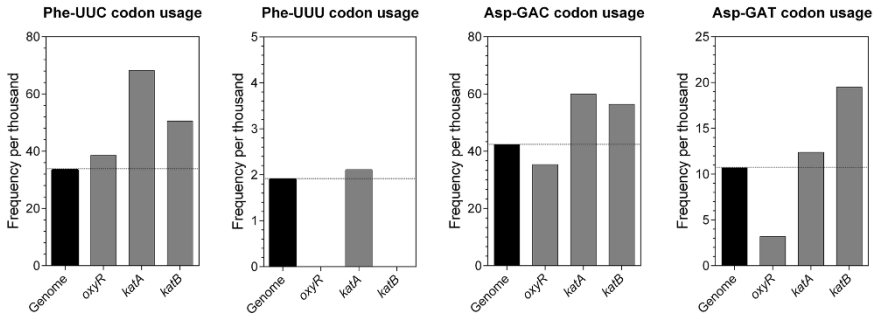

Figure S6 *katA* and *katB* are enriched in codons decoded by tRNA$^{Phe/GAA}$ and tRNA$^{Asp/GUC}$ compared to the full genome. **(A)** Usage of the Phe-UUC codon in H_2O_2-defense genes. **(B)** Usage of the Phe-UUU codon in H_2O_2 defensive genes. **(C)** Usage of the Asp-GAC codon in H_2O_2 defensive genes. **(D)** Usage of the Asp-GAU codon in H_2O_2 defensive genes. Codon usage database: https://www.kazusa.or.jp/codon/

Table S1 Strains and plasmids used in this study

Strain/plasmid	Characteristic	Reference/source
P. aeruginosa PA14		
Wild type	*P. aeruginosa* UCBPP-PA14 wild type strain	ATCC
trmB mutant	*trmB* mutant::pKNOCK-Gm,Gm^r	This study
trmB complemented	*trmB* harboring pBBR1MCS-4/*trmB*_FL	This study
E. coli		
BW20767	*leu-63*::IS*10recA1creC510 hsdR17 endA1zbf-5uidA*(Δ*MluI*)::pir$^+$*thi* RP4-2-tet::Mu-1kan::Tn7	Metcalf, *et al*., 1996
DH5α	λ$^-$ ϕ80d*lacZ*ΔM15 *recA*1 *endA*1*gyrA96thi-1hsdR17*($r_K^-m_K^+$) *supE44relA1deoR* Δ(*lacZYA-argF*)*U169*	Stratagene Inc. (USA)
DE3 (BL21)	*E. coli* B F- *dcm ompT hsdS* ($r_{B-}m_{B-}$) *galλ* (DE3)	Stratagene Inc. (USA)
Plasmids		
pKNOCK-Gm	Suicide plasmid for insertional inactivation of *trmB*	(22)
pKN-*trmB*	pKNOCK-Gm with internal 215-bp fragment of *trmB*	This study
pBBR1MCS-4	Broad-host-range plasmid for *trmB* expression	(23)
pBB-*trmB*-FL	pBBR1MCS-4 expressing PA14 TrmB	This study
pBB-*katB*-6XHis	pBBR1MCS-4 expressing His-tagged KatB	This study
pETBLUE-2	Vector for protein expression	This study
pET-*trmB*-FL	pETBLUE-2 expressing C-terminal His tagged TrmB	This study
pET-*katB*-FL	pETBLUE-2 carrying C-terminal His tagged KatB	This study
pPR9TT	*lacZ* translational fusion vector	Novagen
pPR-ATG-control	pPR9TT expressing β-galactosidase	This study
pPR-5XGln-CAA	pPR9TT expressing 5XGln fragment fused in-frame with *lacZ*	This study
pPR-5XAla-GCC	pPR9TT expressing 5XAla fragment fused in-frame with *lacZ*	This study
pPR-5XArg-CGU	pPR9TT expressing 5XArg fragment fused in-frame with *lacZ*	This study
pPR-5XAsn-AAC	pPR9TT expressing 5XAsn fragment fused in-frame with *lacZ*	This study
pPR-5XAsp-GAC	pPR9TT expressing 5XAsp fragment fused in-frame with *lacZ*	This study
pPR-5XIle-AUC	pPR9TT expressing 5XIle fragment fused in-frame with *lacZ*	This study
pPR-5XPhe-UUC	pPR9TT expressing 5XPhe fragment fused in-frame with *lacZ*	This study
pPR-5XThr-ACC	pPR9TT expressing 5XThr fragment fused in-frame with *lacZ*	This study
pPR-5XVal-GUC	pPR9TT expressing 5XVal fragment fused in-frame with *lacZ*	This study
pPR-5XPhe-UUU	pPR9TT expressing 5XPhe-UUU fragment fused in-frame with *lacZ*	This study

Table S2 Primers and synthesized oligonucleotides used in this study

Name	Sequence	Application
BT4381_F BT4382_R	ACTGAGCGATGAGGTTCAGG AGCTATACACCCGCACGTTG	Amplification of *trmB* fragment for pKN-*trmB* cloning and semi-qRT PCR fo *trmB*
BT4767_F BT4768_R	TTTCCATGAGCGATACCCCG GGAAACGTGCAGCTTGAAGG	Amplification of *trmB* full-length for pBB-*trmB*_FL clonnig
BT5330_F BT5331_R	GGCCCATGGGCACCGTGAAGAGCT GGTCTCGAGGTCGATGCGCTCGAA	Amplification of *trmB* full-length for pET-*trmB*_FL clonnig
BT5468	GGATCCTAATACGACTCACTATAGGGGGGGCTATAGCTCAGCTGGGAGAGCG CTTGCATGGCATGCAAGAGGTCGACGGTTCGATCCCGTCTAGCTCCACCA	PCR template for the amplification of dsDNA encoded for tRNA$^{Ala/GGC}$
BT6974	GGATCCTAATACGACTCACTATAGGGGGGGCCATAGCTCAGCTGGGAGAGC GCCTGCTTTGCACGCAGGAGGTCAGGAGTTCGATCCTCCTTGGCTCCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ala/TGC}$
BT5469	GGATCCTAATACGACTCACTATAGGGGGTTCGATAGCTCAGCCTGGTAGAGC AACCATCCACGAAATGGTCTGTCGCGGGTTCGACTCCCGCTCGAACGT	PCR template for the amplification of dsDNA encoded fortRNA $^{Arg/ACG}$
BT6948	GGATCCTAATACGACTCACTATAGGGGCATCCGTAGCTCAGCTGGATAGAGT ACTGCCCTCCGAAGGCAGGGGTCGTGGGTTCGAATCCCGCCGGATGCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Arg/CCG}$
BT6949	GGATCCTAATACGACTCACTATAGGGGTCCCGGTAGCTCAATTGGATAGAGC ATCCCCCTCCTAAGGGGAAGGTTGGAGGTTCGACCCCTCTCCGGGACGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Arg/CCT}$
BT6950	GGATCCTAATACGACTCACTATAGGGGCGCCCGTAGCTCAGCTGGATAGAGC ATCCGCCTTCTAAGCGGATGGTCGCAGGTTCGAGTCCTGCCGGGTGCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Arg/TCT}$
BT5470	GGATCCTAATACGACTCACTATAGGGTCCGCGATAGCTCAGTCGGTAGAGCA AATGACTGTTAATCATTGGGTCCCTGGTTCGAGTCCAGGTCGCGGAGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Asn/GTT}$
BT5471	GGATCCTAATACGACTCACTATAGGGGCAGCGGTAGTTCAGTCGGTTAGAAT ACCGGCCTGTCACGCCGGGGGTCGCGGGTTCGAGTCCCGTCCGCTGCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Asp/GTC}$
BT6951	GGATCCTAATACGACTCACTATAGGGGGCTGAGTAGCAGAGTGGTTATGCAC CGGATTGCAAATCCGTGAACGCCGGTTCGATTCCGACCTCAGCCTCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Cys/GCA}$
BT7242	GGATCCTAATACGACTCACTATAGGGAGGGGCGTCGCCAAGCGGTAAGGCA GCAGGTTTTGATCCTGCCATGCGTTGGTTCGAATCCAGCCGCCCCTGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Gln/TTG}$
BT5089	GGATCCTAATACGACTCACTATAGGGGTCCCCTTCGTCTAGTGGCCTAGGAC ACCGCCCTTTCACGGCGGTAACAGGGGTTCGAGTCCCCTAGGGGACGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Glu/TTC}$
BT6952	GGATCCTAATACGACTCACTATAGGGGCGGGCGTCGTATAATGGCATTACCT GAGCTTCCCAAGCTCATGACGAGGGTTCGATTCCCTTCGCCCGCTCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Gly/CCC}$
BT5472	GGATCCTAATACGACTCACTATAGGGGCGGGAATAGCTCAGTTGGTAGAGCA CGACCTTGCCAAGGTCGGGGTCGCGAGTTCGAGTCTCGTTTCCCGCTCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Gly/GCC}$
BT6953	GGATCCTAATACGACTCACTATAGGGGCGGGTATAGTTCAGTGGTAGAGCCT CAGCCTTCCAAGCTGATGATGCGGGTTCGATTCCCGCTACCCGCTCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Gly/TCC}$
BT7244	GGATCCTAATACGACTCACTATAGGGGTGGGCGTAGCTCAGTTGGTAGAGCA CAGGATTGTGGCTCCTGGTGTCGTGGGTTCGATTCCCATCGTCCACCCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{His/GTG}$

Table S2 Primers and synthesized oligonucleotides used in this study (cont.)

Name	Sequence	Application
BT5473	GGATCCTAATACGACTCACTATAGGGGGGTCTGTAGCTCAGTTGGTTAGAGC GCACCCCTGATAAGGGTGAGGTCGGCAGTTCGAATCTGCCCAGACCCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ile/GAT}$
BT6954	GGATCCTAATACGACTCACTATAGGGGCCTCGGTGGCGGAATCGGTAGACGC GGCGGATTCAAAATCCGTTTCTGGCGACAGAGTGAGAGTTCGAGTCTCTCCC GAGGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Leu/CAA}$
BT7246	GGATCCTAATACGACTCACTATAGGGGCCCAGGTGGCGGAATTGGTAGACGC ACTAGGTTCAGGTCCTAGCGGTGGCAACACCGTGGAAGTTCGAGTCTTCTCC TGGGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Leu/CAG}$
BT6955	GGATCCTAATACGACTCACTATAGGGGCCGAGGTGGTGGAATTGGTAGACAC GCTACCTTGAGGTGGTAGTGGCCATAGGCTGTAGGGGTTCGAGTCCCCTCCT CGGTACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Leu/GAG}$
BT7248	GGATCCTAATACGACTCACTATAGGGGCGGACGTGGTGGAATTGGTAGACAC ACTGGATTTAGGTTCCAGCGCCGCAAGGCGTGAGAGTTCGAGTCTCTCCGTC CGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Leu/TAG}$
BT5091	GGATCCTAATACGACTCACTATAGGGGGGTCGTTAGCTCAGTCGGTAGAGCA GTTGGCTTTTAACCAATTGGTCGTAGGTTCGAATCCTACACGACCCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Lys/TTT}$
BT5092	GGATCCTAATACGACTCACTATAGGGCGCGGGATGGAGCAGTCTGGTAGCTC GTCGGGCTCATAACCCGAAGGTCGTTGGTTCAAATCCAGCTCCCGCAACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Met/CAT}$
BT5474	GGATCCTAATACGACTCACTATAGGGGCCCAGGTAGCTCAGTTGGTAGAGCA GGGGATTGAAAATCCCCGTGTCGGCGGTTCGATTCCGTCCCTGGGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Phe/GAA}$
BT7250	GGATCCTAATACGACTCACTATAGGGCGGAGCGTAGCGCAGCTTGGTAGCGC GTCTCGTTCGGGACGAGAAGGTCGCTGGTTCGAATCCAGTCGCTCCGACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Pro/CGG}$
BT7252	GGATCCTAATACGACTCACTATAGGGCGGGGCGTAGCGCAGCCTGGTAGCG CACTTGCATGGGGTGCAAGGGGTCGAGTGTTCGAATCACTCCGTCCCGACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Pro/GGG}$
BT7254	GGATCCTAATACGACTCACTATAGGGCGGGGTATAGCGCAGTCCGGTAGCGC GCCTGCTTTGGGAGCAGGATGTCGGGAGTTCGAATCTCTCTACCCCGACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Pro/TGG}$
BT6956	GGATCCTAATACGACTCACTATAGGGGGAAGGCAATCACGCCCGGTGGCGTG GCCGGACTTCAAATCCGGTGGGGGACGGCAGCCGTTCCTGGGTGGGTTCGA CTCCCACTGCCTTCC	PCR template for the amplification of dsDNA encoded fortRNA $^{Sec(p)/TCA}$
BT6957	GGATCCTAATACGACTCACTATAGGGGGAGAGATGCCGGAGTGGTCGAACG GGACGGATTCGAAATCCGTTGAGTCAGCAATGGCTCCTAGGGTTCAAATCCC TATCTCTCCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ser/CGA}$
BT6958	GGATCCTAATACGACTCACTATAGGGGGAGAGGTGGCCGAGTGGCCGAAGG CGCTCCCCTGCTAAGGGAGTACACCTCAAAAGGGTGTCGGGGGTTCGAATCC CCCCCTCTCCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ser/GCT}$

Table S2 Primers and synthesized oligonucleotides used in this study (cont.)

Name	Sequence	Application
BT6959	GGATCCTAATACGACTCACTATAGGGGGTGAGGTGTCCGAGTGGTTGAAGGA GCACGCCTGGAAAGTGTGTATACGGGAAACCGTATCGAGGGTTCGAATCCCT CCCTCACCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ser/GGA}$
BT7256	GGATCCTAATACGACTCACTATAGGGGGAGGTGTGGCCGAGTGGTTTAAGGC AACGGTCTTGAAAACCGTCGAAGGGGAGACTCTTCCGTGAGTTCGAATCTCA CCGCCTCCGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Ser/TGA}$
BT6960	GGATCCTAATACGACTCACTATAGGGGCCGGATTAGCTCAGTCGGTAGAGCA GCTCATTCGTAATGAGAAGGTCGGGGGTTCGATTCCTCTATCCGGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Thr/CGT}$
BT5475	GGATCCTAATACGACTCACTATAGGGGCTCATGTAGCTCAGTTGGTAGAGCA CACCCTTGGTAAGGGTGAGGTCAGCGGTTCAAATCCGCTCATGAGCTCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Thr/GGT}$
BT6961	GGATCCTAATACGACTCACTATAGGGGCCGGTATAGCTCAGCTGGTAGAGCA ACTGACTTGTAATCAGTAGGTCCCGGGTTCGACTCCTGGTGCCGGCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Thr/TGT}$
BT5090	GGATCCTAATACGACTCACTATAGGGAGGCCAGTAGCTCAATTGGCAGAGCG GCGGTCTCCAAAACCGCAGGTTGGGGGTTCGATTCCCTCCTGGCCTGCCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Trp/CCA}$
BT6962	GGATCCTAATACGACTCACTATAGGGGGAGGGATTCCCGAGTGGCCAAAGGG ATCAGACTGTAAATCTGACGTCATAGACTTCGAAGGTTCGAATCCTTCTCCCT CCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Tyr/GTA}$
BT5476	GGATCCTAATACGACTCACTATAGGGAGGCACGTAGCTCAGTTGGTTAGAGC ACCACCTTGACATGGTGGGGGTCGTTGGTTCGAATCCAATCGTGCCTACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Val/GAC}$
BT5477	GGATCCTAATACGACTCACTATAGGGGGGTGATTAGCTCAGCTGGGAGAGCA TCTGCCTTACAAGCAGAGGGTCGGCGGTTCGATCCCGTCATCACCCACCA	PCR template for the amplification of dsDNA encoded fortRNA $^{Val/TAC}$
BT5478	GGATCCTAATACGACTCACTATAGGG	Forward primer for amplification of all dsDNA templates
BT5501	TGGTGGAGCTAGACGGGATC	Reverse primer for amplification of tRNA$^{Ala/GGC}$
BT6963	TGGTGGAGCCAAGGAGGATC	Reverse primer for amplification of tRNA$^{Ala/TGC}$
BT5502	ACGTTCGAGCGGGAGTCGAA	Reverse primer for amplification of tRNA$^{Arg/ACG}$
BT6964	TGGCGCATCCGGCGGGATTC	Reverse primer for amplification of tRNA$^{Arg/CCG}$
BT6965	TGGCGTCCCGGAGAGGGGTC	Reverse primer for amplification of tRNA$^{Arg/CCT}$
BT6966	TGGCGCACCCGGCAGGACTC	Reverse primer for amplification of tRNA$^{Arg/TCT}$
BT5503	TGGCTCCGCGACCTGGACTC	Reverse primer for amplification of tRNA$^{Asn/GTT}$
BT5504	TGGCGCAGCGGACGGGACTC	Reverse primer for amplification of tRNA$^{Asp/GTC}$
BT6967	TGGAGGCTGAGGTCGGAATC	Reverse primer for amplification of tRNA$^{Cys/GCA}$
BT7243	TGGCAGGGGCGGCTGGATTC	Reverse primer for amplification of tRNA$^{Gln/TTG}$
BT5093	TGGCGTCCCCTAGGGGACTC	Reverse primer for amplification of tRNA$^{Glu/TTC}$
BT6968	TGGAGCGGGCGAAGGGAATC	Reverse primer for amplification of tRNA$^{Gly/CCC}$
BT5505	TGGAGCGGGAAACGAGACTC	Reverse primer for amplification of tRNA$^{Gly/GCC}$

Table S2 Primers and synthesized oligonucleotides used in this study (cont.)

Name	Sequence	Application
BT6969	TGGAGCGGGTAGCGGGAATC	Reverse primer for amplification of $tRNA^{Gly/TCC}$
BT7245	TGGGGTGGACGATGGGAATC	Reverse primer for amplification of $tRNA^{His/GTG}$
BT5506	TGGTGGGTCTGGGCAGATTC	Reverse primer for amplification of $tRNA^{Ile/GAT}$
BT6970	TGGTGCCTCGGGAGAGACTC	Reverse primer for amplification of $tRNA^{Leu/CAA}$
BT7247	TGGTGCCCAGGAGAAGACTC	Reverse primer for amplification of $tRNA^{Leu/CAG}$
BT6971	TGGTACCGAGGAGGGGACTC	Reverse primer for amplification of $tRNA^{Leu/GAG}$
BT7249	TGGTGCGGACGGAGAGACTC	Reverse primer for amplification of $tRNA^{Leu/TAG}$
BT5095	TGGTGGGTCGTGTAGGATTCG	Reverse primer for amplification of $tRNA^{Lys/TTT}$
BT5096	TGGTTGCGGGAGCTGGATTT	Reverse primer for amplification of $tRNA^{Met/CAT}$
BT5507	TGGTGCCCAGGGACGGAATC	Reverse primer for amplification of $tRNA^{Phe/GAA}$
BT7251	TGGTCGGAGCGACTGGATTC	Reverse primer for amplification of $tRNA^{Pro/CGG}$
BT7253	TGGTCGGGACGGAGTGATTC	Reverse primer for amplification of $tRNA^{Pro/GGG}$
BT7255	TGGTCGGGGTAGAGAGATTC	Reverse primer for amplification of $tRNA^{Pro/TGG}$
BT6972	GGAAGGCAGTGGGAGTCGAA	Reverse primer for amplification of $tRNA^{Sec(p)/TCA}$
BT6973	TGGCGGAGAGATAGGGATTT	Reverse primer for amplification of $tRNA^{Ser/CGA}$
BT6974	TGGCGGAGAGGGGGGGATTC	Reverse primer for amplification of $tRNA^{Ser/GCT}$
BT6975	TGGCGGTGAGGGAGGGATTC	Reverse primer for amplification of $tRNA^{Ser/GGA}$
BT7257	TGGCGGAGGCGGTGAGATTC	Reverse primer for amplification of $tRNA^{Ser/TGA}$
BT6976	TGGTGCCGGATAGAGGAATC	Reverse primer for amplification of $tRNA^{Thr/CGT}$
BT5508	TGGAGCTCATGAGCGGATTT	Reverse primer for amplification of $tRNA^{Thr/GGT}$
BT6977	TGGTGCCGGCACCAGGAGTC	Reverse primer for amplification of $tRNA^{Thr/TGT}$
BT5094	TGGCAGGCCAGGAGGGAATC	Reverse primer for amplification of $tRNA^{Trp/CCA}$
BT6978	TGGTGGAGGGAGAAGGATTC	Reverse primer for amplification of $tRNA^{Tyr/GTA}$
BT5509	TGGTAGGCACGATTGGATTC	Reverse primer for amplification of $tRNA^{Val/GAC}$
BT5510	TGGTGGGTGATGACGGGATC	Reverse primer for amplification of $tRNA^{Val/TAC}$
BT7258	ATCCCCCGGGCTGCAGGAATTCGATATCAACATCTCGAGACTC	Control fragment without codon bias
BT7259	GAGTCTCGAGATGTTGATATCGAATTCCTGCAGCCCGGGGGAT	
BT7260	ATCCCCCGGGCTGCATTGTTGTTGTTGTTGCATCTCGAGACTC	Experimental fragment with 5XGln-CAA
BT7261	GAGTCTCGAGATGCAACAACAACAACAATGCAGCCCGGGGGAT	
BT5970	ATCCCCCGGGCTGCAGGCGGCGGCGGCGGCCATCTCGAGACTC	Experimental fragment with 5XAla-GCC
BT5971	GAGTCTCGAGATGGCCGCCGCCGCCGCCTGCAGCCCGGGGGAT	
BT5972	ATCCCCCGGGCTGCAACGACGACGACGACGCATCTCGAGACTC	Experimental fragment with 5XArg-CGU
BT5973	GAGTCTCGAGATGCGTCGTCGTCGTCGTTGCAGCCCGGGGGAT	
BT5974	ATCCCCCGGGCTGCAGTTGTTGTTGTTGTTCATCTCGAGACTC	Experimental fragment with 5XAsn-AAC
BT5975	GAGTCTCGAGATGAACAACAACAACAACTGCAGCCCGGGGGAT	
BT5976	ATCCCCCGGGCTGCAGTCGTCGTCGTCGTCCATCTCGAGACTC	Experimental fragment with 5XAsp-GAC
BT5977	GAGTCTCGAGATGGACGACGACGACGACTGCAGCCCGGGGGAT	

Table S2 Primers and synthesized oligonucleotides used in this study (cont.)

Name	Sequence	Application
BT5980 BT5981	ATCCCCCGGGCTGCAGATGATGATGATGATCATCTCGAGACTC GAGTCTCGAGATGATCATCATCATCATCTGCAGCCCGGGGGAT	Experimental fragment with 5XIle-AUC
BT5982 BT5983	ATCCCCCGGGCTGCAGAAGAAGAAGAAGAACATCTCGAGACTC GAGTCTCGAGATGTTCTTCTTCTTCTTCTGCAGCCCGGGGGAT	Experimental fragment with 5XPhe-UUC
BT5984 BT5985	ATCCCCCGGGCTGCAGGTGGTGGTGGTGGTCATCTCGAGACTC GAGTCTCGAGATGACCACCACCACCACCTGCAGCCCGGGGGAT	Experimental fragment with 5XThr-ACC
BT5986 BT5987	ATCCCCCGGGCTGCAGACGACGACGACGACCATCTCGAGACTC GAGTCTCGAGATGGTCGTCGTCGTCGTCTGCAGCCCGGGGGAT	Experimental fragment with 5XVal-GUC
BT7224 BT7225	ATCCCCCGGGCTGCAAAAAAAAAAAAAAAAACATCTCGAGACTC GAGTCTCGAGATGTTTTTTTTTTTTTTTTGCAGCCCGGGGGAT	Experimental fragment with 5XPhe-UUU
BT5515 BT5755	ATGAACCCTTCCCTGAACGC GTTGCTCGAGATCCTGGAGCTTCGC	Amplification of *katB*-FL for pET-*katB*-FL cloning
BT2781_F BT2782_R	GCCCGCACAAGCGGTGGAG ACGTCATCCCCACCTTCCT	Primer pair of 16s gene for semi-qRT PCR
BT5637_F BT5638_R	TCTCCATGCGTTTCTACACC CGCATTGATGAAGCTGAAGG	Semi-qRT PCR of *katA*
BT5639_F BT5640_R	CGACGCTTCGATTTCTTCTC TTCGGATCGAGGTTCTTCTG	Semi-qRT PCR of *katB*
BT5679_F BT5680_R	GATACGGTGCGTGACGTACG CACATGACCATGTGCGCCGA	Semi-qRT PCR of *katE*
BT5627_F BT3112_R	GGTGGACAGCCACCACTACGCC CTCTCGAGTGCTATTTGCGGTT	Semi-qRT PCR of *oxyR*
BT5687_F BT5688_R	GCAGCATTTCCTCAACTTCA CAAGGCGCTTGAATTTCACT	Semi-qRT PCR of *recG*
BT5671_F BT5672_R	GGTTGCGCGACTACTTCTTC CCTCCAGCAATTGTTCCACC	Semi-qRT PCR of *ankB*
BT5641_F BT5642_R	CTACGGCGAGTTCCAGAAAG AGTGGATCTCGACGGTCTTG	Semi-qRT PCR of *ahpC*
BT5643_F BT5644_R	CAACCGCATGGATAAGTTCC TCGTGCTCGATACCGTAGG	Semi-qRT PCR of *ahpB*
BT527_F BT5697_R	GATCGGCATAACCACCACGC CGGCATTTTCCGTGACGTCT	Semi-qRT PCR of *lacZ*
BT7437F pET-Down	GCTTTCCTACTTCTACAAGG GTTAAATTGCTAACGCAGTC	Semi-qRT PCR of *katB*-His

Table S3 Ribonucleosides identified by LC-MS/MS analysis of *P. aeruginosa* PA14 tRNA

rN Name	Precursor ion (*m/z*)	Product ion (*m/z*)	Fragment (V)	Collision (*V*)	Retention time (min)	Signal intensity normalized to ΣAUCG					
						Wild type		*trmB* mutant		*trmB* complemented	
						Mean	SD	Mean	SD	Mean	SD
Cm	258	112	380	8	5.1	0.004845966	0.0002401	0.005756626	0.0002153	0.006072198	0.000335
m^3C	258	126	380	8	2.2	-	-	-	-	-	-
m^5C	258	126	380	8	2.7	1.90826E-05	1.294E-06	2.04589E-05	4.996E-06	2.72853E-05	1.58E-05
Um	259	113	380	4	9.1	8.39385E-05	8.333E-05	0.000204017	6.115E-05	0.000155449	4.409E-05
m^5U	259	127	380	8	6.3	0.010569546	0.0007471	0.008096794	0.0006416	0.007937585	0.0003169
s^2U	261	129	380	8	6.3	5.70115E-05	3.272E-06	4.35724E-05	3.862E-06	4.28974E-05	1.043E-06
s^4U	261	129	380	8	7.9	0.001973445	0.0003525	0.002042688	0.000128	0.001758821	0.0001094
I	269	137	380	12	6.2	0.002223452	2.898E-05	0.037350303	0.0011602	0.036179178	0.0011242
mo^5U	275	143	380	4	7.3	1.70892E-06	3.513E-07	9.76926E-07	1.841E-07	9.98527E-07	2.321E-07
Am	282	136	380	16	12.4	0.000851609	0.0002882	0.000748527	0.0002474	0.000797983	0.0001581
m^1A	282	150	380	16	2.9	3.51548E-05	3.796E-05	1.60471E-05	1.578E-06	1.43217E-05	7.197E-06
m^2A	282	150	380	16	11.5	0.03199429	0.00093568	0.033155675	0.0019178	0.029919588	0.0034706
m^6A	282	150	380	16	16.2	0.011258614	0.0007696	0.009094374	0.0002814	0.007364891	0.001638
mnm^5U	288	156	380	10	1.6	3.21294E-05	1.801E-06	3.09328E-05	4.002E-06	3.01965E-05	3.889E-06
$m^{6\,2}A$	296	164	380	16	20.4	6.7303E-05	1.306E-05	4.94945E-05	6.018E-06	6.52538E-05	5.463E-05
Gm	298	152	380	8	15	0.003787192	0.0002225	0.003011863	0.0002998	0.003073118	0.0004603
m^7G	**298**	**166**	**380**	**12**	**5.1**	**0.038565559**	**0.0003676**	**0.001360776**	**0.0005876**	**0.018155591**	**0.0018724**
m^1G	298	166	380	12	15	0.009522496	0.0014462	0.006761964	0.0008228	0.007100262	0.0016468
$m^2{}_2G$	312	180	380	8	19.5	-	-	-	-	-	-
cmo^5U	319	187	380	8	6.5	-	-	-	-	-	-
$cmnm^5U$	332	125	380	18	1.6	6.62787E-06	2.861E-06	4.31408E-06	3.235E-07	1.08442E-05	4.697E-06
i^6A	336	204	380	16	22.4	0.000653115	0.0001341	0.000476001	4.662E-05	0.000548744	3.849E-05
$cmnm^5s^2U$	348	216	380	20	3.7	-	-	-	-	-	-
t^6A	413	136	380	8	21.9	0.004719937	0.0001347	0.002769214	0.000313	0.002728713	0.0002978