1 Supplementary information

Supplementary Table 1. X-ray data collection, phase and structure refinement statistics.

	Tas1 _{tox} -Tis1 complex	PurF ^{EC} -nnAnn complex
	(60X6)	(60TT)
Data Collection		
Space group	P4 ₃ 2 ₁ 2	C2221
Cell dimensions		
<i>a, b, c</i> (Å)	66.4, 66.4, 147.9	115.2, 156.8, 107.5
$\alpha, \beta, \gamma(^{\circ})$	90.0, 90.0, 90.0	90.0, 90.0, 90.0
Wavelength (Å)	0.979	0.979
Resolution (Å)	50.00 - 2.17	47.6-2.55
$R_{\rm merge}^{\rm a}$	0.083 (0.243)*	0.106 (1.27)
$I / \sigma(I)$	33.4 (6.2)	9.0 (1.0)
Completeness (%)	98.0 (96.4)	99.8 (100)
Redundancy	9.2 (4.1)	5.8 (6.2)
Refinement		
Resolution (Å)	49.6 - 2.17	47.6 - 2.55
No. reflections		
Total	18200	186253
Unique	17596	32044
Free (%)	5.00	6.23
$R_{ m work}$ / $R_{ m free}$ (%) ^b	18.5/23.1	22.3/26.1
No. atoms		
Protein	2119	15508
Ligand/ion	28	28
Water	316	0
<i>B</i> -factors (Å ²)		
Protein	40.8	74.6
Ligand/ion	72.0	61
Water	53.7	-
r.m.s deviations		
Bond lengths (Å)	0.006	0.02
Bond angles (°)	0.993	0.547

6 Single crystals were used to collect data for each structure. *values in brackets value refer
7 to highest resolution shells.

 ${}^{a}R_{merge} = \sum_{hkl} \sum_{j} |I_{hkl,j} - \langle I_{hkl} \rangle| / \sum_{hkl} \sum_{j} I_{hk,j}$, where $I_{hkl,j}$ and $\langle I_{hkl} \rangle$ are the *j*th and mean measurement 9 of the intensity of reflection *j*.

 ${}^{b}R = \Sigma |F_{p}{}^{obs} - F_{p}{}^{calc}| / \Sigma F_{p}{}^{obs}$, where $F_{p}{}^{obs}$ and $F_{p}{}^{calc}$ are the observed and calculated structure 11 factor amplitudes, respectively.

Supplementary Table 2. ¹H and ³¹P NMR assignments for pApp. The chemical shifts (in ppm) for pApp. α -proton of the pyrophosphate group was identified from its ddd pattern with a characteristic J-coupling constant with the proximal ³¹P nuclei at 8.5Hz (0.014 ppm for protons or 0.036ppm for ³¹P). This proton was assigned to the 3' location by comparing proton chemical shifts to those observed for adenosine-5'-phosphate (AMP, BMRB database ID: BMSE000837) and a chemically synthesized adenosine-3', 5'-bisdiphosphate (ppApp) under the same condition¹. Note that compared to a free hydroxyl group, pyrophosphorylation increases the chemical shift of the α -proton by 0.3-0.4 ppm.

 NH_2

- 1'

		Base	e (¹ H)]	Ribose (¹ H)		Ph	osphate (³	¹ P)
	Position	2	8	1′	2′	3'	4′	5'a / 5'b	5'α	3'α	3′β
pApp	Chemical	8.15	8.59	6.16	4.88	4.93	4.55	4.02	3.75	-10.00	-5.06
	Shift (ppm)										
	Integration	1H	1H	1H	1H	1H	1H	2H	1P	1P	1P
	(multiplicity)	(s)	(s)	(d)	(dd)	(ddd)	(m)	(m)	(s)	(dd)	(d)
ppApp	Chemical	8.19	8.48	6.12	4.79	4.90	4.54	4.16	-	-	-
	Shift (ppm)										
	Integration	1H	1H	1H	$1\mathrm{H}$	1H	1H	2H	-	-	-
	(multiplicity)	(s)	(s)	(d)	(dd)	(ddd)	(m)	(m)			
AMP	Chemical	8.13	8.48	6.09	4.75	4.51	4.38	4.10	-	-	-
	Shift (ppm)										
	Integration	1H	1H	1H	$1\mathrm{H}$	1H	$1\mathrm{H}$	2H	-	-	-
	(multiplicity)	(s)	(s)	(d)	(dd)	(dd)	(m)	(m)			

"-" indicates assignment not clear or data not available.

*

Supplementary Table 3. Absolute nucleotide quantification of *P. aeruginosa* cells undergoing Tas1-mediated intoxication. 2 3

Metabolite	Concer (nmol/	ntration ir OD)	tration in Tis1 depleted cells			Concentration in Tis1 expressing cells (nmol/OD)		
		time	(min)		time (min)			
	0	30	60	120	0	30	60	
AMP								
R1	0.179	0.193	0.238	0.315	0.253	0.323	0.317	
R2	0.151	0.172	0.207	0.236	0.369	0.326	0.342	
R3	0.218	0.213	0.170	0.284	0.365	0.350	0.490	
ADP								
R1	0.547	0.441	0.387	0.330	0.631	0.747	0.652	
R2	0.507	0.407	0.379	0.232	0.700	0.634	0.644	
R3	0.731	0.537	0.340	0.346	0.707	0.681	0.667	
АТР	01,01	0.000	0.0 10	010 10	01,01	01001	0.007	
 R1	2.716	2.091	1.462	0.939	2.648	2.484	2.096	
R2	3.212	2.054	1.299	0.614	2.042	2.281	2.000	
R3	3.191	1.992	1.264	0.916	2.495	2.221	1.641	
ppApp	5.171	1.//2	1.201	5.710	2.170		1.0.11	
R1	0.128	1 020	1 186	1 1 5 4	n d	n d	n d	
R2	0.126	1.020	1.100	0 773	n d	n d	n d	
R3	0.120	1.023	1 105	1 226	n d	n d	n d	
nnnAnn	0.154	1.225	1.105	1.220	n.u.	11. u .	n. u .	
R1	0 355	3 588	3 964	3 768	n d	n d	n d	
R2	0.555	3 986	3 763	2 609	n d	n d	n d	
R2 R3	0.578	1 628	3 18/	3 909	n.u.	n d	n d	
GMP	0.500	7.020	5.104	5.707	n.u.	11. u .	11. u .	
R1	0.077	0.021	0.032	0.034	0.072	0.093	0.080	
R1 R2	0.077	0.021	0.032	0.003	0.072	0.095	0.000	
R2 R3	0.040	0.017	0.022	0.005	0.090	0.074	0.000	
GDP	0.050	0.074	0.051	0.040	0.070	0.070	0.071	
R1	0 132	0.113	0.096	0 102	0 197	0 233	0 184	
R7	0.132	0.115	0.020	0.102	0.127	0.233	0 173	
	0.141 0.171	0.113	0.003	0.003	0.205	0.219	0.173	
GTP	0.171	0.171	0.002	0.075	0.210	0.220	0.105	
R1	0.874	0 748	0 7 00	0 340	1 095	0 977	0 7/10	
	1 060	0.740 0.742	0.490	0.340	0.785	0.972	0.749	
	0 0 2 8	0.742 0.702	0.410	0.249	0.705	0.907	0.052	
η Γίτρ	0.928	0.703	0.433	0.335	0.910	0./99	0.520	
D11 D1	1 5/18	1 1/0	0 710	0 303	2 1 1 1	2 225	1 780	
	1.340	1.140	0.719	0.393	2.111 1 7 / 5	2.235	1.700	
	1.700	1.172	0.390	0.204	1.745	2.040 1 771	1.//9	
L) AATD	1.490	1.134	0.042	0.411	1.0/0	1.//4	1.239	
uA11 D1	0 147	0 1 2 4	0 000	0.062	0.114	0 100	0 002	
	0.14/	0.120	0.088	0.003	0.114	0.108	0.082	
K2	0.164	0.120	0.078	0.041	0.093	0.090	0.080	

R3	0.163	0.116	0.073	0.057	0.102	0.088	0.065
dCTP							
R1	0.233	0.152	0.100	0.057	0.206	0.189	0.146
R2	0.258	0.159	0.082	0.040	0.167	0.168	0.143
R3	0.224	0.157	0.087	0.057	0.189	0.158	0.108
dTTP							
R1	0.264	0.220	0.168	0.090	0.241	0.228	0.222
R2	0.306	0.224	0.150	0.072	0.202	0.199	0.216
R3	0.297	0.222	0.143	0.106	0.228	0.195	0.178
NAD^+							
R1	0.676	0.896	0.814	0.746	0.572	0.577	0.554
R2	0.675	0.837	0.841	0.628	0.542	0.531	0.562
R3	0.760	0.868	0.787	0.677	0.583	0.543	0.598
$NADP^+$							
R1	0.272	0.359	0.309	0.331	0.241	0.216	0.196
R2	0.292	0.328	0.310	0.264	0.213	0.222	0.210
R3	0.308	0.355	0.310	0.338	0.223	0.199	0.185
UDP-GlcNAc							
R1	0.313	0.215	0.154	0.121	0.364	0.394	0.372
R2	0.353	0.204	0.135	0.117	0.326	0.390	0.354
R3	0.432	0.187	0.140	0.108	0.343	0.404	0.389
IMP							
R1	0.010	0.008	0.007	0.004	0.024	0.024	0.017
R2	0.011	0.010	0.007	n.d.	0.031	0.016	0.014
R3	0.011	0.015	0.008	n.d.	0.028	0.015	0.007
dGTP/pApp							
R1	0.129	0.156	0.130	0.108	0.169	0.096	0.089
R2	0.140	0.159	0.119	0.084	0.105	0.088	0.119
R3	0.105	0.203	0.137	0.132	0.124	0.086	0.108

*NADH and NADPH were not detected due to instability during extraction procedure and storage conditions for extracts. 2 3 4

Supplementary Table 4. Genotypes of *P. aeruginosa* and *E. coli* strains used in this study. 2 3

Organism	Genotype		Description	Reference
P. aeruginosa PAO1	wild-type			2
11101	ΔPA4856		retS deletion strain	This study
	$\Delta PA4856 \text{ attB}::lac.$	Ζ	retSdeletionstrain,constitutive $lacZ$ expressionstrain,Tet ^R	This study
	ΔΡΑ4856 ΔΡΑ0093	3	<i>retS tse6</i> deletion strain	This study
P. aeruginosa PA14	wild-type			3
	$\Delta PA14$			
	ΔPA14_52570		rsmA deletion strain	This study
	ΔΡΑ14_52570 ΔΡΑ	A14_68450	<i>rsmA rsmF</i> deletion strain	This study
	$\Delta PA14_52570 \Delta PA attB::lacZ$	A14_68450	rsmA rsmF deletion strain, constitutive lacZ expression strain Tet ^R	This study
	ΔPA14_52570 Δ	ΔPA14_68450	<i>rsmA rsmF clpV1</i> deletion strain	This study
	ΔPA14_52570 Δ ΔPA14_01140	ΔPA14_68450	<i>rsmA rsmF tas1</i> deletion strain	This study
	$\Delta PA14_52570$	ΔPA14_68450	rsmA rsmF tsi6	This study
	$\Delta PA14_01120$	ADA 14 69450	rsm A rsm E tas 1 tis 1	This study
	$\Delta PA14_{52570}$ $\Delta PA14_{01140}$ $\Delta PA14_{01140}$	ΔPA14_08450 ΔPA14_01130	deletion strain	This study
	APA14 52570	APA 14 68450	rsmA rsmF tasl tisl	This study
	ΔPA14_01140 /	APA14_01130	<i>tsi6</i> deletion strain	1 mb blady
	ΔPA14 01120 attB	$\mathbf{B}::lacZ$		
	ΔPA14 52570	APA14 68450	rsmA rsmF eagT6	This study
	ΔPA14_01150	—	deletion strain	
	$\Delta PA14_52570$ APA14_01110	ΔPA14_68450	<i>rsmA rsmF vgrG1</i> deletion strain	This study
	ΔPA14_52570 Δ	ΔPA14_68450	rsmA rsmF vgrG2	This study
	ΔPA14_01160		deletion strain	T 1 · · 1
	ΔPA14_52570 Δ ΔPA14_29390	ΔPA14_68450	<i>rsmA rsmF vgrG4</i> deletion strain	This study
	ΔPA14_64230		retS deletion strain	This study

	ΔPA14_64230 ΔPA14_57520	<i>retS</i> sspB deletion strain	This study
	ΔPA14_64230 ΔPA14_57520 PA14_01130-DAS+4	<i>retS sspB</i> deletion strain expressing	This study
	ΔPA14 52570 ΔPA14 68450	terminal DAS+4 tag rsmA rsmF deletion	This study
	PA14_01140-VSV-G	strain expressing Tas1 with a C- terminal VSV-G tag	
	ΔΡΑ14_52570 ΔΡΑ14_68450 ΡΑ14_01140-E382A	<i>rsmA rsmF</i> deletion strain expressing Tas1 ^{E382A}	This study
E. coli MG1655	wild-type		4
<i>E. coli</i> SM10 λpir	Km ^R , <i>thi-1 thr leu tonA lac Y</i> <i>supE recA</i> ::RP4-2-Tc::Mu, pir	Conjugation strain	BioMedal LifeScience
<i>E. coli</i> XL-1 Blue	recA1 endA1 gyrA96 thi-1 hsdR17 supE44 relA1 lac $[F' proAB lacI^{q} Z \land M15 Tn 10 (Tet^{R})]$	Cloning strain	Agilent
<i>E. coli</i> BL21 (DE3)	$\begin{array}{c} F^{-} ompT gal dcm lon \\ hsdS_B(\mathbf{r}_B^{-}\mathbf{m}_B^{-}) \qquad \lambda(DE3) \end{array}$	Protein expression strain	Novagen

2

Supplementary Table 5. Plasmids used for allelic exchange, protein expression and toxicity assays. 2 3

pEXG2Allelicreplacementvector 5 pPSV38-CVExpressionvectorwith $lacI$, 6 $lacUV5$ promoter,C-terminalVSV-G tag, Gm ^R pPSV39-CVExpressionvectorwith $lacI$, 7 $lacUV5$ promoter,C-terminalVSV-G tag, Gm ^R pSCrhaB2-CVExpressionvectorwith $lacI$, 7 $lacUV5$ promoter,C-terminalVSV-G tag, Gm ^R 8pSCrhaB2-CVExpression vectorwith $lacI$, 7 NovagenpETDuet-1Co-expression vector with $lacI$, 77 NovagenpET28bExpression vector with $lacI$, 77 NovagenpcfaExpression vector with $lacI$, 77 Novagenpromoter,C-terminalHis6tag,pKSV45-Amp ^R Expression vector with $lacI$, 77 9 promoter,C-terminalCfa-His610ptetpromoter, replaced kan^R with amp^R pALS13Expression vector for (p)pGpp11pEXG2::APA0905 $rsmA$ deletion construct for PAO1This studypEXG2::APA14_52570 $rsmA$ deletion construct for PAO1This studypEXG2::APA14_52570 $rsmF$ deletion construct for PA14This studypEXG2::APA14_01100 $clpVI$ deletion construct for PA14This studypEXG2::APA14_01100 $clpVI$ deletion construct for PA14This studypEXG2::APA14_01100 $clpVI$ deletion construct for PA14This study<	Plasmid	Relevant features	Reference
pPSV38-CVExpression vectorwith $lacl$,6 $lacUV5$ promoter,C-terminalVSV-G tag, Gm ^R pPSV39-CVExpression vectorwith $lacl$,7 $lacUV5$ promoter,C-terminalVSV-G tag, Gm ^R pSCrhaB2-CVExpression vector with $PrhaB$,8Tmp ^R pETDuet-1Co-expression vector with $lacl$,T7Novagenpromoter,N-terminal His6tag,pET28bExpression vector with $lacl$,T7Novagenpromoter,C-terminalHis6tag,Amp ^R pCfaExpression vector with $lacl$,T79promoter,C-terminalCfa-His6intein tag,10pKSV45-Amp ^R Expression vector for (p)ppGpp11 mp^R pALS13Expression vector for (p)ppGpp11 mp^R pSW196MiniCTX1 plasmid, Tet ^R 12pEXG2::APA0905 $rsmA$ deletion construct for PA01This studypEXG2::APA14_52570 $rsmA$ deletion construct for PA01This studypEXG2::APA14_68450 $rsmF$ deletion construct for PA14This studypEXG2::APA14_01100 $clpVI$ deletion construct for PA14This studypEXG2::APA14_01140 $tas1$ deletion construct for PA14This study	pEXG2	Allelic replacement vector containing <i>sacB</i> . Gm ^R	5
$lacUV5$ promoter, C-terminal VSV-G tag, Gm^R pPSV39-CVExpression vector with $lacI$, 7 $lacUV5$ promoter, C-terminal VSV-G tag, Gm^R pSCrhaB2-CVExpression vector with $PrhaB$, 8 TmpRpETDuet-1Co-expression vector with $lacI$, 77 Novagen promoter, N-terminal His6 tag in MCS-1, AmpRpET28bExpression vector with $lacI$, 77 Promoter, C-terminal His6 tag, AmpRpCfaExpression vector with $lacI$, 77 promoter, C-terminal Cfa-His6 intein tag, AmpRpKSV45-AmpRExpression vector with $lacI$, 77 promoter, c-terminal Cfa-His6 intein tag, AmpRpALS13Expression vector for (p)ppGpp synthetase fragment of RelA 1-455 (RelA')pSW196MiniCTX1 plasmid, TetRpEXQ2::APA0905rsmA deletion construct for PAO1 This studypEXG2::APA14_52570rsmA deletion construct for PAO1 This studypEXG2::APA14_68450rsmF deletion construct for PA14 This studypEXG2::APA14_01100 $clpVI$ deletion construct for PA14 This studypEXG2::APA14_01140 tas1 deletion construct for PA14 This study	pPSV38-CV	Expression vector with <i>lacI</i> ,	6
VSV-G tag, Gm^R pPSV39-CVExpression vector with <i>lacI</i> , 7 <i>lacUV5</i> promoter, C-terminal VSV-G tag, Gm^R pSCrhaB2-CVExpression vector with <i>PrhaB</i> , 8 TmpRpETDuet-1Co-expression vector with <i>lacI</i> , T7 promoter, N-terminal His6 tag in MCS-1, AmpRpET28bExpression vector with <i>lacI</i> , T7 promoter, C-terminal His6 tag, AmpRpCfaExpression vector with <i>lacI</i> , T7 promoter, C-terminal Cfa-His6 intein tag, AmpRpKSV45-AmpRExpression vector with <i>lacI</i> , T7 promoter, C-terminal Cfa-His6 intein tag, AmpRpALS13Expression vector for (p)ppGpp synthetase fragment of RelA 1-455 (RelA')pSW196MiniCTX1 plasmid, TetR synthetase fragment of RelA 1-455 (RelA')pEXG2::APA0905 <i>rsmA</i> deletion construct for PAO1 this studypEXG2::APA14_52570 <i>rsmA</i> deletion construct for PAO1 symF deletion construct for PAO1 This studypEXG2::APA14_68450 <i>rsmF</i> deletion construct for PAO1 this studypEXG2::APA14_01100 <i>clpV1</i> deletion construct for PA14 this studypEXG2::APA14_01140 <i>tasI</i> deletion construct tor PA14 This study	-	<i>lacUV5</i> promoter, C-terminal	
pPSV39-CVExpression vector with <i>lacl</i> , <i>i</i> $lacUV5$ promoter, C-terminalpSCrhaB2-CVExpression vector with <i>PrhaB</i> , 8TmpRpETDuet-1Co-expression vector with <i>lacl</i> , T7Novagenpromoter, N-terminal His ₆ tag in MCS-1, AmpRpET28bExpression vector with <i>lacl</i> , T7Novagenpromoter, C-terminal His ₆ tag, AmpRpCfaExpression vector with <i>lacl</i> , T7pKSV45-AmpRExpression vector with <i>lacl</i> , T7pKSV45-AmpRExpression vector with <i>lacl</i> , T7pALS13Expression vector for (p)ppGpppEXG2::\DPA0905prsmr deletion construct for PA01pEXG2::\DPA0905prsmr deletion construct for PA01pEXG2::\DPA14_52570pEXG2::\DPA14_68450pEXG2::\DPA14_01100clpV1 deletion construct for PA14pEXG2::\DPA14_01100clpV1 deletion constructpEXG2::\DPA14_01140tasl deletion constructtasl deletion constructtasl deletion constructto tasl deletion construct		VSV-G tag, Gm ^R	7
$\begin{array}{ccccc} label{eq:linear_product} label{eq:linear_product} label{eq:linear_product} VSV-G tag, Gm^R \\ VSV-G tag, Gm^R \\ Expression vector with PrhaB, & Tmp^R \\ pETDuet-1 & Co-expression vector with lacI, T7 Novagen \\ promoter, N-terminal His_6 tag in \\ MCS-1, Amp^R \\ pET28b & Expression vector with lacI, T7 Novagen \\ promoter, C-terminal His_6 tag, \\ Amp^R \\ pCfa & Expression vector with lacI, T7 & P \\ promoter, C-terminal Cfa-His_6 \\ intein tag, Amp^R \\ pKSV45-Amp^R & Expression vector with tetR and \\ ptet promoter, c-terminal Cfa-His_6 \\ intein tag, Amp^R \\ pALS13 & Expression vector for (p)ppGpp \\ pSW196 & MiniCTX1 plasmid, Tet^R \\ pEXG2::\DeltaPA0905 & rsmA deletion construct for PAO1 \\ pEXG2::\DeltaPA0093 & tse6 deletion construct for PAO1 \\ pEXG2::\DeltaPA0090 & clpVI deletion construct for PAO1 \\ pEXG2::\DeltaPA14_52570 & rsmA deletion construct for PA14 \\ This study \\ pEXG2::\DeltaPA14_01100 & clpVI deletion construct for PA14 \\ This study \\ pEXG2::APA14_01140 & tasI deletion construct \\ This study \\ pEXG2::APA14_01140 & tasI deletion construct \\ This study \\ pEXG2::APA14_01140 & tasI deletion construct \\ This study \\ tasI \\ tasI$	pPSV39-CV	Expression vector with <i>lacl</i> ,	1
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- IV (10., ADA 14, 01100 for data data a construct	pEXG2::\DPA14_01140	tas1 deletion construct	This study
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pEXG2::ΔPA14 64230	retS deletion construct	This study
pEXG2::ΔPA14_57520	sspB deletion construct	This study
pEXG2::PA14 01130 DAS+4	For generating strains encoding	This study
	Tis1 fused to a C-terminal DAS+4	-
	tag (AANDENYSENYADAS)	
pEXG2::PA14_01140-VSV-G	For generating strains encoding	This study
- –	Tas1 fused to a C-terminal VSV-G	-
	epitope tag (YTDIEMNRLGK)	
pEXG2::PA14_01140_E382A	For generating strains encoding Tas1 ^{E382A}	This study
pPSV39-CV::PA14_01130	Expression vector for <i>tas1</i>	This study
pPSV39-CV::PA14_01120	Expression vector for <i>tsi6</i>	This study
pPSV39-CV::PA14_57520	Expression vector for ssnB	This study
nPSV39-CV··PA5338	Expression vector for <i>spD</i>	This study
pSCrhaB2-	Expression vector for the C-	This study
CV::PA14 01140 251-CT	terminal toxin domain of Tasl	Tills study
	(Tas1 _{tox})	
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{K305A}	This study
PA14 01140 251-CT K305A		11112 20004
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{K313A}	This study
PA14 01140 251-CT K313A		11112 20004
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{K326A}	This study
PA14 01140 251-CT K326A		
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{D327A}	This study
PA14 01140 251-CT D327A	1	5
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{R330A}	This study
PA14 01140 251-CT R330A	-	2
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{E382A}	This study
PA14_01140_251-CT_E382A	-	
pSCrhaB2-CV::	Expression vector for Tas1 _{tox} ^{E382D}	This study
PA14_01140_251-CT_E382D		
A1-2	Expression vector for Tas1 _{tox} with	This study
	N-terminal His ₆ and C-terminal	
	VSV-G epitope	
pETDuet-	Co-expression vector for Tas1 _{tox}	This study
1::His ₆ _PA14_01140_251-CT ::	with N-terminal His ₆ and Tis1	
PA14_01130		
pETDuet-	Co-expression vector for Tas1 _{tox}	This study
1::His ₆ _PA14_01140_251-	with N-terminal His ₆ and C-	
CT_VSV-G:: PA14_01130	terminal VSV-G and Tis1	
pETDuet-1::PA5338_1-	Expression vector for the SpoT ₁₋₃₈₇	This study
387_His ₆	fragment with C-terminal His ₆	
pET28b:: D8B36_07150	Expression vector for PurF ^{EC}	9
pET28b:: D8B36_21350	Expression vector for PurD ^{EC}	9
pCfa:: D8B36_07150	Expression vector for PurF ^{EC}	9
pCfa:: D8B36_07150_R62A	Expression vector for PurF ^{EC R62A}	9

pCfa:: PA14_23290 pSW196:: *lacZ* Expression vector for PurF^{PA} lacZ in miniCTX1 plasmid

This study 13

1 2

1 2

Supplementary Figure 1. Source gels. Uncropped blots for Extended Data figures.



Extended Data Figure 2E





 α -VSV-G

1	Supp	olemental References
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