Table S1. Strains and plasmids used in this study. $Trmp^R$, trimethoprim resistance; $Spec^R$, spectinomycin resistance; Ery^R, erythromycin resistance; Tet^R, tetracycline resistance; Cm^R, chloramphenicol resistance; Amp^R, ampicillin resistance.

Strain/plasmid	Description	Reference or source
S. pneumoniae		
D39	Serotype 2 strain, *cps2*	(1), lab. Pab. Of P. Hermans
D39*nisRK*	D39 *ΔbgaA::nisRK*; $Trmp^R$	(2)
AS1	D39 *ΔargR1*	This work
AS2	D39 *ΔahrC*	This work
AS3	D39 *ΔargR1ΔahrC*	This work
AS4	D39 *ΔabpA*	This work
AS5	D39 *ΔartP*	This work
AS6	D39 *ΔaapA*; $Spec^R$	This work
AS7	D39 *ΔabpB*; $Spec^R$	This work
AS8	D39 *ΔaliB*; Ery^R	This work
AS9	D39 *ΔabpA ΔartP*	This work
AS10	D39 *ΔabpA ΔabpB*; $Spec^R$	This work
AS11	D39 *ΔabpB ΔartP*; $Spec^R$	This work
AS12	D39 *ΔabpA ΔartP ΔabpB*; $Spec^R$	This work
AS13	D39 *ΔabpA ΔartP ΔabpB*; $Spec^R$ *ΔaliB*; Ery^R	This work
AS14	D39 *ΔartP* D39 *ΔaapA*; $Spec^R$	This work
AS15	D39 *ΔbgaA*::P*abpA-lacZ*; Tet^R $Spec^R$	This work
AS16	D39 *ΔargR1 ΔbgaA*::P*abpA-lacZ*; Tet^R $Spec^R$	This work
AS17	D39 *ΔahrC ΔbgaA*::P*abpA-lacZ*; Tet^R $Spec^R$	This work
AS18	D39 *ΔargR1 ΔahrC ΔbgaA*::P*abpA-lacZ*; Tet^R $Spec^R$	This work
AS19	D39 *ΔbgaA*::P*artP-lacZ*; Tet^R $Spec^R$	This work
AS20	D39 *ΔargR1 ΔbgaA*::P*artP-lacZ*; Tet^R $Spec^R$	This work
AS21	D39 *ΔahrC ΔbgaA*::P*artP-lacZ*; Tet^R $Spec^R$	This work
AS22	D39 *ΔargR1ΔahrC ΔbgaA*::P*artP-lacZ*; Tet^R $Spec^R$	This work
AS23	D39 *ΔbgaA*::P*aapA-lacZ*; Tet^R $Spec^R$	This work
AS24	D39 *ΔargR1 ΔbgaA*::P*aapA-lacZ*; Tet^R $Spec^R$	This work
AS25	D39 *ΔahrC ΔbgaA*::P*aapA-lacZ*; Tet^R $Spec^R$	This work
AS26	D39 *ΔargR1ΔahrC ΔbgaA*::P*aapA-lacZ*; Tet^R $Spec^R$	This work
AS27	D39 *ΔbgaA*::P*abpB-lacZ*; Tet^R $Spec^R$	This work
AS28	D39 *ΔargR1 ΔbgaA*::P*abpB-lacZ*; Tet^R $Spec^R$	This work
AS29	D39 *ΔahrC ΔbgaA*::P*abpB-lacZ*; Tet^R $Spec^R$	This work
AS30	D39 *ΔargR1ΔahrC ΔbgaA*::P*abpB-lacZ*; Tet^R $Spec^R$	This work
AS31	D39 *ΔbgaA*::P*aliB-lacZ*; Tet^R $Spec^R$	This work
AS32	D39 *ΔargR1 ΔbgaA*::P*aliB-lacZ*; Tet^R $Spec^R$	This work
AS33	D39 *ΔahrC ΔbgaA*::P*aliB-lacZ*; Tet^R $Spec^R$	This work
AS34	D39 *ΔargR1ΔahrC ΔbgaA*::P*aliB-lacZ*; Tet^R $Spec^R$	This work
AS35	D39 *ΔbgaA*::P*abpA-mut-lacZ*; Tet^R $Spec^R$	This work
AS36	D39 *ΔargR1 ΔbgaA*::P*abpA-mut-lacZ*; Tet^R $Spec^R$	This work
AS37	D39 *ΔbgaA*::P*artP-mut-lacZ*; Tet^R $Spec^R$	This work
AS38	D39 *ΔargR1 ΔbgaA*::P*artP-mut-lacZ*; Tet^R $Spec^R$	This work
AS39	D39 *ΔbgaA*::P*abpB-mut-lacZ*; Tet^R $Spec^R$	This work
AS40	D39 *ΔargR1 ΔbgaA*::P*abpB-mut-lacZ*; Tet^R $Spec^R$	This work
AS41	D39 *ΔbgaA*::P*aliB-mut-lacZ*; Tet^R $Spec^R$	This work
AS42	D39 *ΔargR1 ΔbgaA*::P*aliB-mut-lacZ*; Tet^R $Spec^R$	This work
AS43	D39 *ΔbgaA*::P*arcA-lacZ*; Tet^R $Spec^R$	This work
AS44	D39 *ΔargR1 ΔbgaA*:: P*arcA-lacZ*; Tet^R $Spec^R$	This work
AS45	D39 *ΔahrC ΔbgaA*:: P*arcA-lacZ*; Tet^R $Spec^R$	This work
AS46	D39 *ΔargR1ΔahrC ΔbgaA*:: P*arcA-lacZ*; Tet^R $Spec^R$	This work
AS47	D39 *ΔbgaA*::P*arc-mut-lacZ*; Tet^R $Spec^R$	This work
AS48	D39 *ΔargR1 ΔbgaA*::P*arcA-mut-lacZ*; Tet^R $Spec^R$	This work
AS49	D39 *ΔahrC ΔbgaA*::P*arcA-mut-lacZ*; Tet^R $Spec^R$	This work
AS50	D39 *ΔargR1ΔahrC ΔbgaA*::P*arAc-mut-lacZ*; Tet^R $Spec^R$	This work
L. lactis		
NZ9000	MG1363 *ΔpepN*::*nisRK*	(3)
E. coli		

EC1000	Km^R; MC1000 derivative carrying a single copy of the pWV01 *repA* gene in *glgB*	(4)
Plasmids		
pNZ8048	Cm^R; Nisin-inducible P*nisA*	(5)
pNG8048E	Cm^R Ery^R; Nisin-inducible P*nisA*, pNZ8048 derivative containing e*ry*^{R} gene to facilitate cloning	Laboratory collection
pORI280	Em^R; *ori*$^+$ *repA*$^-$; deletion derivative of pWV01; constitutive *lacZ* expression from P32 promoter	(4)
pPP2	Amp^R Tet^R; promoter-less *lacZ*. For replacement of *bgaA* (*spr0565*) with promoter-*lacZ* fusions. Derivative of pTP1.	(6)
pAS1	pORI280 *ΔargR1*	This work
pAS2	pORI280 *ΔahrC*	This work
pAS3	pORI280 *ΔabpA*	This work
pAS4	pORI280 *ΔartP*	This work
pAS5	pPP2 P*abpA-lacZ*	This work
pAS6	pPP2 P*artP-lacZ*	This work
pAS7	pPP2 P*aapA-lacZ*	This work
pAS8	pPP2 P*abpB-lacZ*	This work
pAS9	pPP2 P*aliB-lacZ*	This work
pAS10	pPP2 P*abpA-mut-lacZ*	This work
pAS11	pPP2 P*artP-mut-lacZ*	This work
pAS12	pPP2 P*abpB-mut-lacZ*	This work
pAS13	pPP2 P*aliB-mut-lacZ*	This work
pAS13	pPP2 P*arcA-lacZ*	This work
pAS14	pPP2 P*arcA-mut-lacZ*	This work
pAS15	pNG8048E carrying *strep-ahrC* downstream of P*nisA*	This work
pAS16	pNG8048E carrying *strep-argR1* downstream of P*nisA*	This work

Table S2. Oligonucleotide primers used in this study.

Name	**Nucleotide sequence (5' to 3'); restriction enzyme sites underlined**	**Restriction site**
ahrC_D39_KO1	TGCTCTAGATAAGGAAAGAGTGGATGTAC	XbaI
ahrC_D39_KO2	CTCTTTTTTATTCATTTTTAAATTG	-
ahrC_D39_KO3	TTAAAAATGAATAAAAAAGAGGAACAAGTAAAAAATTGGTAGG	-
ahrC_D39_KO4	GAAGATCTACTCTTCGACACTTTCCATG	BglII
argR_KO-1	TGCTCTAGACCATTCGCGCGCTTCTTCATCC	XbaI
argR_KO-2	CGGGATCCTTTATTAACTGATGACGATCTC	BamHI
argR_KO-3	CATGCCATGGGTAAGGTCTTGGGAGTTGC	NcoI
argR_KO-4	GAAGATCTGGTCGCATAATCCATCTGC	BglII
Pspd_0109_1	CGGAATTCCATTGAATTGGGCGAGGG	EcoRI
Pspd_0109_2	CGGGATCCAGCATCACTAAACCAAAC	BamHI
SPD_0109_KO1	TGCTCTAGAGATTTTAGAGAGAGTAGG	XbaI
SPD_0109_KO2	CCCCAGACTCCTTCAACTTCATCGTCATCAACACCTTC	-
SPD_0109_KO3	AAGTTGAAGGAGTCTGGGG	-
SPD_0109_KO4	CGGAATTCCACGAACTGGAGCAATCAC	EcoRI
Pspd_0109_mut1	GGGTAAAAAAGAATAAACATAAAG	-
Pspd_0109_mut2	CTTTATGTTTATTCTTTTTTACCCTATAAATAATACTCCTATAC	-
Pspd_0109_2.2	CGGGATCCGATGGCTTCAATTCCAGCC	BamHI
Pspd_0719_1	CGGAATTCCGCCATCGTTTGCCATTGC	EcoRI
Pspd_0719_2	CGGGATCCCCCAAAAAGATAACACAG	BamHI
Pspd_0719_mut1	GGGAACATGTTATAATCATACAG	-
Pspd_0719_mut2	CTGTATGATTATAACATGTTCCCAATTAAAATTTAAATTTTTTATCC	-
SPD_719KO_1	TGCTCTAGACTCATTATAACAGGATTGG	XbaI
SPD_719KO_2	CCCCATAGTTAAAATAAGG	-
SPD_719KO_3	CCTTATTTTAACTATGGGGCCTCTATTCTGACAGTAGC	-
SPD_719KO_4	GAAGATCTCAAGGTCTTGCATAACAGCC	BglII
Pspd_0887-1	CGGAATTCCTTGATATATAAGGGTTC	EcoRI
Pspd_0887-2	CGGGATCCCCATGGCTCCAATACC	BamHI
SPD_0887-KO1	TCCTACAGAATATTTAATTG	-
SPD_0887-KO2	TCCTCCTCACTATTTTGATTAGCTGTTTTATCTAAACTAAC	-
SPD_0887-KO3	CGTTTTAGCGTTTATTTCGTTTAGTGGCTATAAGCATTCTACC	-
SPD_0887-KO4	CAGAAGCCTCTAAGACC	-

Pspd_1226_1	CGGAATTCAAACAGGTAAGATTGTCG	EcoRI
Pspd_1226_2	CGGGATCCCTAAGAAGAAACTTGCAAG	BamHI
Pspd_1226_mut1	GGGAATTAACAGAGAGGTTGTTTATTTATG	EcoRI
Pspd_1226_mut2	AACAACCTCTCTGTTAATTCCCTATAATTATAACGATATC	-
Pspd_1226_2.2	CGGGATCCAATGGCCTCAACAGCTGAC	BamHI
SPD_1226_KO1	TGCTCTAGAGCATCCCAGCTGTAGAGG	-
SPD_1226_KO2	TCCTCCTCACTATTTTGATTAGGAAACTTGCAAGAAAATTAC	-
SPD_1226_KO3	CGTTTTAGCGTTTATTTCGTTTAGTCTAACTGAAGTTGAAGAATAAG	-
SPD_1226_KO4	CAAACCTTCCACTATCTTG	-
Pspd_1357_1	CGGAATTCAATCTTTTAGGAGAACTTG	EcoRI
Pspd_1357_2	CGGGATCCCCAAGGTTAGATATTTGC	BamHI
Pspd_1357_mut1	GGGATATTTAAAGCAGGAGG	-
Pspd_1357_mut2	CCTGCTTTAAATATCCCTTTTATTATACAACTCTGGG	-
Pspd_1357_2.2	CGGGATCCCAGTGCTAGAATTTCCAC	BamHI
SPD_1357_KO-1	TTTAATCAGTTTGCTGACC	-
SPD_1357_KO-2	GAGATCTAATCGATGCATGCGCCAAGGTTAGATATTTGC	-
SPD_1357_KO-3	AGTTATCGGCATAATCGTTAAGCTAGAGAAAAATGGTTG	-
SPD_1357_KO-4	AGAAGTCAACTCCCC	-
AhrC_OX_1_strep	CGAGCCATCATGAGCGCTTGGAGCCATCCACAATTTGAAAAAAATAAAAAAGAGAGACTTG	RcaI
AhrC_OX_2	TGCTCTAGACAAGTAACATATAGACCTACC	XbaI
ArgR1_OX_1_strep	CGAGCCATCATGAGCGCTTGGAGCCATCCACAATTTGAAAAAAGAAAAAGAGATCGTCATCAG	RcaI
ArgR1_OX_2	TGCTCTAGAGAGCAACTCCCAAGACCTTAC	XbaI
Pspd_1049-1	CGGGATCCATCACCTCTTCTCCC	BamHI
Pspd_1049-2	TGCTCTAGATGAAGCAGCAGCTCGCG	XbaI
RNlacZ-fw	GGTTTTCCCAGTCACGACGTTGTAA	-
Eryfor	TAACGATTATGCCGATAACT	-
Eryrev	GCATGCATCGATTAGATCTC	-
Spec_Fp	CTAATCAAAATAGTGAGGAGG	-
Spec_Rp	ACTAAACGAAATAAACGC	-
ParcA_ccpA_mut-1	CGGAATTCGCGGTTTGATTTTCTTCATC	EcoRI
ParcA_ccpA_mut-2	GGCACCATTTTGGGTAC*AAA*TTACATGTATATTATAACGC	-
ParcA_ccpA_mut-3	TTTGTACCCAAAATGGTGCCAAGTC	-
ParcA_ccpA_mut-4	CGGGATCCCTGGACGGTGCAACATAAC	BamHI
qRT-PCR		***gene***
metG_D39-1	ATCCGTACAACTGATGAC	*metG*
metG-D39-2	TTCTGCCAGCTGGCTTTC	
Spd_0109-qRT-1	GACAATGTACTGGCTAGCG	*abpA*
Spd_0109-qRT-2	TTTGCAGTATAGTAGGGAGTTG	
Spd_0719-qRT-1	GCTCCGACTATTCAGATTGG	*artP*
Spd_0719-qRT-2	CGGCACGAACAATCTCC	
Spd_0887-qRT-1	CTGCCTTGTGTGTGGG	*aapA*
Spd_0887-qRT-1	TAACCAACCAGCCAACC	
Spd_1226-qRT-1	GGTTAAGTTGGAAATCTCAAGC	*abpB*
Spd_1226-qRT-2	CAAAGACTTCTTTTCTCTCGTC	
Spd_1357-qRT-1	CATCATTAGCAGAGGATTGG	*aliB*
Spd_1357-qRT-2	GCATATTCTTCTCCCTCAGAAG	

Table S3. Results of qRT-PCRs for *abpA*, *abpB*, *aapA*, *aliB* and *artP* on RNA (isolated as described in the Experimental Procedures) from D39 wild-type grown in CDM containing either 0.05 mM or 10 mM arginine, and from the *argR*, *ahrC* and *argR1ahrC* mutants grown in CDM containing 10 mM arginine. The procedure as described by Carvalho *et al.* (7) was followed. The data were normalized to the level of *metG* (*spd_0689*), which was unchanged across all microarray conditions. Primers used are listed in Table S2. Values are the averages of three measurements. Standard deviations are in parentheses.

ratio	gene				
	abpA	*artP*	*aapA*	*abpB*	*aliB*
D39 0.05 mM/D39 10 mM	**8.9** (1.1)	**1.7** (0.2)	**1.6** (0.1)	**2.2** (0.1)	**2.1** (0.2)
argR1/D39	**33.7** (1.1)	**1.9** (0.1)	**1.9** (0.1)	**3.0** (0.3)	**3.2** (0.3)
ahrC/D39	**36.2** (4.9)	**2.1** (0.3)	**2.2** (0.1)	**5.5** (0.7)	**3.3** (0.1)
argR1-ahrC/D39	**39.4** (5.5)	**2.0** (0.1)	**2.1** (0.2)	**5.8** (0.3)	**3.7** (0.2)

Table S4. Specific activity (Miller Units) of the indicated promoter-*lacZ* fusions in different media. Fig. 4A presents a bar diagram of these data. See legend of Fig. 4A for more details.

	Miller Units			Standard Deviation		
strain	**GM17**	**CDM 10**	**CDM 0.025**	**GM17**	**CDM 10**	**CDM 0.025**
wt abpA	0.6	0.8	3.5	0.1	0.2	0.5
R abpA	101.0	93.0	127.0	14.0	17.0	21.0
C abpA	112.0	109.0	136.0	16.0	12.0	17.0
RC abpA	129.0	112.0	116.0	17.0	11.0	13.0
wt artP	13.0	19.0	38.0	2.0	2.5	4.0
R artP	76.0	74.0	80.0	10.0	8.0	11.0
C artP	82.0	92.0	91.0	12.0	11.0	9.0
RC artP	74.0	90.0	104.0	14.0	9.0	16.0
wt aapA	4.2	7.0	12.5	0.8	1.0	1.5
R aapA	32.0	33.0	29.0	4.0	5.0	3.0
C aapA	38.0	32.0	30.0	6.0	4.0	5.0
RC aapA	43.0	42.0	38.0	5.0	4.0	7.0
wt abpB	14.0	23.0	62.0	2.5	4.0	4.0
R abpB	374.0	363.0	389.0	29.0	32.0	43.0
C abpB	401.0	430.0	480.0	34.0	57.0	77.0
RC abpB	438.0	395.0	405.0	63.0	50.0	41.0
wt aliB	51.0	76.0	119.0	8.0	5.0	11.0
R aliB	197.0	170.0	182.0	28.0	22.0	20.0
C aliB	245.0	183.0	193.0	34.0	17.0	17.0
RC aliB	171.0	190.0	168.0	18.0	26.0	19.0

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