Supplemental Material for:

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The *Bacillus subtilis* σ^M Regulon and its Contribution to Cell Envelope Stress Responses.

Table S1. Plasmids used in this work.

pJPM122	Vector for integration into SPβ	Slack et al. 1991
pWE01	pET16 carrying *NcoI*/*BamHI sigM* coding region	This work
pWE02	*PypbG-cat-lacZ* in pJPM122	This work
pWE03	*PyfnI-cat-lacZ* in pJPM122	This work
pWE04	*Pmaf-cat-lacZ* in pJPM122	This work
pWE05	*PyebC-cat-lacZ* in pJPM122	This work
pWE06	*ProdA-cat-lacZ* in pJPM122	This work
pWE07	*PypuD-cat-lacZ* in pJPM122	This work
pWE08	*PyngC-cat-lacZ* in pJPM122	This work
pWE09	*PywtF-cat-lacZ* in pJPM122	This work
pWE10	*PycgR-cat-lacZ* in pJPM122	This work
pWE11	*PydaH-cat-lacZ* in pJPM122	This work
pWE12	*PmurG-cat-lacZ* in pJPM122	This work
pWE13	*Psms-cat-lacZ* in pJPM122	This work
pWE14	*PypuA-cat-lacZ* in pJPM122	This work
pWE15	*Pspx-cat-lacZ* in pJPM122	This work
pWE16	*PrecU-cat-lacZ* in PJPM122	This work
pWE17	*PydbO-cat-lacZ* in pJPM122	This work
pWE18	*PsecDF-cat-lacZ* in pJPM122	This work
pWE19	*PmetA-cat-lacZ* in pJPM122	This work
pWE20	*PyacA-cat-lacZ* in pJPM122	This work
pWE21	*PytnA-cat-lacZ* in pJPM122	This work
pWE22	*PytpA-cat-lacZ* in pJPM122	This work

Table S2. Strains used in this study

Strain	Genotype	Reference
E. coli		
DH5α	*supE44* Δ*lacU169* (ϕ80 *lacZ*Δ*M15*) *hsdR17 recA1 endA1 gyrA96 thi-1 relA1 32*	Lab stock
BL21/DE3	BL21 with λ DE3 (T7 RNAp under *lac* control)	Lab stock
HE4600	*E. coli* BL21/DE3(pWE01)	This work
B. subtilis		
CU1065	W168 *att*SPβ *trpC2*	Lab stock
ZB307A	W168 SPβc2βΔ2::Tn917::pBSK10Δ6 (MLS^R)	Lab stock
HB0031	CU1065 *sigM::kan*	Lab stock
HB4715	CU1065 *sigM::tet sigW::mls sigX::spc*	This work
HB4728	CU1065 *spx::spc*	This work
HB0069	CU1065 SPβ (P*m-cat-lacZ*)	Lab stock
HB0070	HB0031 SPβ (P*m-cat-lacZ*)	Lab stock
HB4682	ZB307A with SPβ (P*ypbG-cat-lacZ*)	This work
HB4684	ZB307A with SPβ (P*yfnI-cat-lacZ*)	This work
HB4687	ZB307A with SPβ (P*maf-cat-lacZ*)	This work
HB4689	ZB307A with SPβ (P*yebC-cat-lacZ*)	This work
HB4681	ZB307A with SPβ (P*rodA-cat-lacZ*)	This work
HB4665	ZB307A with SPβ (P*ypuD-cat-lacZ*)	This work
HB4686	ZB307A with SPβ (P*yngC-cat-lacZ*)	This work
HB0078	ZB307A with SPβ (P*ywaC-cat-lacZ*)	Lab stock
HB4708	ZB307A with SPβ (P*ywtF-cat-lacZ*)	This work
HB7026	ZB307A with SPβ (P*yrhH-cat-lacZ*)	Lab stock
HB4664	ZB307A with SPβ (P*ycgR-cat-lacZ*)	This work
HB4710	ZB307A with SPβ (P*ydaH-cat-lacZ*)	This work
HB4736	ZB307A with SPβ (P*murG-cat-lacZ*)	This work
HB4683	ZB307A with SPβ (P*ytnA-cat-lacZ*)	This work
HB4738	ZB307A with SPβ (P*sms-cat-lacZ*)	This work
HB4734	ZB307A with SPβ (P*ypuA-cat-lacZ*)	This work
HB4762	ZB307A with SPβ (P*spx-cat-lacZ*)	This work
HB4730	ZB307A with SPβ (P*recU-cat-lacZ*)	This work
HB4733	ZB307A with SPβ (P*ydbO-cat-lacZ*)	This work
HB4737	ZB307A with SPβ (P*secDF-cat-lacZ*)	This work
HB4729	ZB307A with SPβ (P*metA-cat-lacZ*)	This work
HB4732	ZB307A with SPβ (P*yacA-cat-lacZ*)	This work
HB4735	ZB307A with SPβ (P*ytpA-cat-lacZ*)	This work
HB0075	ZB307A with SPβ (P*yjbC-cat-lacZ*)	Lab stock
HB4690	CU1065 SPβ (P*ypbG-cat-lacZ*)	This work
HB4696	CU1065 SPβ (P*yfnI-cat-lacZ*)	This work
HB4698	CU1065 SPβ (P*maf-cat-lacZ*)	This work
HB4700	CU1065 SPβ (P*yebC-cat-lacZ*)	This work
HB4702	CU1065 SPβ (P*rodA-cat-lacZ*)	This work
HB4670	CU1065 SPβ (P*ypuD-cat-lacZ*)	This work
HB4706	CU1065 SPβ (P*yngC-cat-lacZ*)	This work
HB4660	CU1065 SPβ (P*ywaC-cat-lacZ*)	This work
HB4711	CU1065 SPβ (P*ywtF-cat-lacZ*)	This work
HB7034	CU1065 SPβ (P*yrhH-cat-lacZ*)	Lab stock
HB4668	CU1065 SPβ (P*ycgR-cat-lacZ*)	This work
HB4717	CU1065 SPβ (P*ydaH-cat-lacZ*)	This work

HB4739	CU1065 SPβ (P*murG-cat-lacZ*)	This work
HB4704	CU1065 SPβ (P*ytnA-cat-lacZ*)	This work
HB4745	CU1065 SPβ (P*sms-cat-lacZ*)	This work
HB4749	CU1065 SPβ (P*ypuA-cat-lacZ*)	This work
HB4763	CU1065 SPβ (P*spx-cat-lacZ*)	This work
HB4754	CU1065 SPβ (P*recU-cat-lacZ*)	This work
HB4756	CU1065 SPβ (P*ydbO-cat-lacZ*)	This work
HB4741	CU1065 SPβ (P*secDF-cat-lacZ*)	This work
HB4752	CU1065 SPβ (P*metA-cat-lacZ*)	This work
HB4743	CU1065 SPβ (P*yacA-cat-lacZ*)	This work
HB4760	CU1065 SPβ (P*ytpA-cat-lacZ*)	This work
HB4758	CU1065 SPβ (P*yjbC-cat-lacZ*)	This work
HB4691	HB0031 SPβ (P*ypbG-cat-lacZ*)	This work
HB4697	HB0031 SPβ (P*yfnI-cat-lacZ*)	This work
HB4699	HB0031 SPβ (P*maf-cat-lacZ*)	This work
HB4701	HB0031 SPβ (P*yebC-cat-lacZ*)	This work
HB4703	HB0031 SPβ (P*rodA-cat-lacZ*)	This work
HB4671	HB0031 SPβ (P*ypuD-cat-lacZ*)	This work
HB4707	HB0031 SPβ (P*yngC-cat-lacZ*)	This work
HB4661	HB0031 SPβ (P*ywaC-cat-lacZ*)	This work
HB4712	HB0031 SPβ (P*ywtF-cat-lacZ*)	This work
HB4718	HB0031 SPβ (P*yrhH-cat-lacZ*)	This work
HB4669	HB0031 SPβ (P*ycgR-cat-lacZ*)	This work
HB4716	HB0031 SPβ (P*ydaH-cat-lacZ*)	This work
HB4740	HB0031 SPβ (P*murG-cat-lacZ*)	This work
HB4705	HB0031 SPβ (P*ytnA-cat-lacZ*)	This work
HB4746	HB0031 SPβ (P*sms-cat-lacZ*)	This work
HB4750	HB0031 SPβ (P*ypuA-cat-lacZ*)	This work
HB4764	HB0031 SPβ (P*spx-cat-lacZ*)	This work
HB4755	HB0031 SPβ (P*recU-cat-lacZ*)	This work
HB4757	HB0031 SPβ (P*ydbO-cat-lacZ*)	This work
HB4742	HB0031 SPβ (P*secDF-cat-lacZ*)	This work
HB4753	HB0031 SPβ (P*metA-cat-lacZ*)	This work
HB4744	HB0031 SPβ (P*yacA-cat-lacZ*)	This work
HB4761	HB0031 SPβ (P*ytpA-cat-lacZ*)	This work
HB4759	HB0031 SPβ (P*yjbC-cat-lacZ*)	This work
HB4708	HB4715 SPβ (P*ypuD-cat-lacZ*)	This work
HB4709	HB4715 SPβ (P*ycgR-cat-lacZ*)	This work
HB4710	HB4715 SPβ (P*rodA-cat-lacZ*)	This work
HB4711	HB4715 SPβ (P*maf-cat-lacZ*)	This work
HB4712	HB4715 SPβ (P*yebC-cat-lacZ*)	This work
HB4713	HB4715 SPβ (P*ywtF-cat-lacZ*)	This work
HB4765	HB4715 SPβ (P*secDF-cat-lacZ*)	This work
HB4767	HB4715 SPβ (P*ypuA-cat-lacZ*)	This work
HB4768	HB4715 SPβ (P*yjbC-cat-lacZ*)	This work
HB4769	HB4715 SPβ (P*metA-cat-lacZ*)	This work

Table S3. Oligonucleotides used in this study

Number	Name	Sequence (5′-3′)
3037	*sigM* fwd (pET16b)	ataccatggtgacgatcgatgaaatttacc
3038	*sigM* rev (pET16b)	ataggatcctttcctggtcgctcatttcc
3153	*sigM*-for -in	ggtatattccattgtgcc
3154	*sigM*-rev -in	gctgtgatcataggagtg
3251	ycgR fwd (pJPM122)	cccaagcttcacatgcacatcatgcaaaag
3252	ycgR rev (pJPM122)	cgggatccgaatggcttctattaaaatg
3253	ypuD fwd (pJPM122)	cccaagcttctacccgtttaacgaaatgc
3254	ypuD rev (pJPM122)	cgggatccgtacatataaccgcctgcaag
3388	yebC fwd (pJPM122)	cccaagcttgctgtttgtcgtatttatcc
3389	yebC rev (pJPM122)	cgggatccgcatctattctttcactctg
3390	ywtF fwd (pJPM122)	cccaagcttgcaatgacattgtctgtggg
3391	ywtF rev (pJPM122)	cgggatccgccgcaatgactaaaaaagc
3392	rodA fwd (pJPM122)	cccaagcttcaaattctattggtatggcg
3393	rodA rev (pJPM122)	cgggatccgcagcatatattgatactac
3448	ypbG fwd (pJPM122)	cccaagcttcgcagcccgataaatggaag
3349	ypbG rev (pJPM122)	cgggatccgctgttgcatacatttttgc
3850	murG fwd (pJPM122)	cccaagcttcacgaacaaaacagcctgcc
3851	murG rev (pJPM122)	cgggatcccttccgccgaaaattaagac
3442	yfnI fwd (pJPM122)	cccaagcttgttattcttatactcggtat
3443	yfnI rev (pJPM122)	cgggatcccagtataacagccagcacaa
3444	ytnA fwd (pJPM122)	cccaagcttctggcacagcatcaatattg
3445	ytnA rev (pJPM122)	cgggatccgaggaacaaccctactccta
3446	yngC fwd (pJPM122)	cccaagcttccgaaatgagatctcagctt
3447	yngC rev (pJPM122)	cgggatccgataacacccgcaataattg
3474	maf fwd (pJPM122)	cccaagcttcagctgccctactccattatt
3475	maf rev (pJPM122)	cgggatccgcagatcgtgtatgaccaag
3468	ydaH fwd (pJPM122)	cccaagcttgcctgacttggcggatgata
3558	ydaH rev (pJPM122)	cgggatccgtaatgacatgcacgttattc
3863	sms fwd	cccaagcttgctcatcaaacagtgtcctg
3864	sms rev	cgggatccctggagcagatgtaatatcg
3865	ypuA fwd	cccaagcttcaaaggagattatgtatagg
3866	ypuA rev	cgggatccggaaccatcagcagcaaaac
3852	spx fwd	cccaagcttgagaaatggtacggagaatc
3898	spx rev	cgggatcccagtatcctaagaaaaaaat
3867	recU fwd	cccaagcttcatgcagcagatgaaacagc
3878	recU rev	cgggatcccggattgagcggcagacaaa
3869	ydbO fwd	cccaagcttctgaagcgctgagagcagac
3870	ydbO rev	ccggatcccatgccgcgataagatttgg
3871	secDF fwd	cccaagcttcagataagaagtggaaaaag
3872	secDF rev	cgggatccccgatcaatagaacgaaaag
3873	metA fwd	cccaagcttgaactcataagaaacctaac
3874	metA rev	cgggatccgttcactttcaagcacctgt
3875	yacA fwd	cccaagcttctataaaagcatcaccgcag
3876	yacA rev	cgggatcccgcctacaatgattgtcgcc
3823	ytpA fwd	cccaagcttccgtctaaaatgattgagcc
3824	ytpA rev	cgggatccccgtgaatgattacaatcac
3364	ypbG-gsp1	gatgttttcctcgattctcg
3365	ypbG-gsp2	cctcagctaaatcaccgccg

3368	ywaC-gsp1	cggcaatgtcgtgaatatgc
3369	ywaC-gsp2	cacagccctttctcattaac
3378	rodA-gsp1	ctgtaatggctacagccccc
3379	rodA-gsp2	caatccgtgttcccatactg
3486	yfnI-gsp1	ccagcaaagccagtcctaaa
3487	yfnI-gsp2	ggcgcttgagaatgggttaa
3488	ypuD-gsp1	gatactctgagccgtcaatt
3489	ypuD-gsp2	gccgtcaattttcgtcactt
3490	maf-gsp1	ctcttccttggatgccgtat
3491	maf-gsp2	gccgtatgcacctgctttat
3492	yngC-gsp1	cttcccgtatttgtccagaa
3493	yngC-gsp2	gcgaccgatccagtaaataa
3494	ydaH-gsp1	ccgactgtcgatccgaaaat
3495	ydaH-gsp2	ctacaatcgccagtgcgttt
3406	ytnA-gsp1	ggccatttccccaagcgctc
3407	ytnA-gsp2	ccgcttgcggcatacgctac
3848	murG-gsp1	ggctctggccacaatgacat
3849	murG-gsp2	ctcaggcatttgatgaagaa
3410	ycgR-gsp1	gcaacgcccgcatgcagagg
3411	ycgR-gsp2	gcctcgtaatcgggatgatg
3374	yebC-gsp1	cgcaagcttgtctttaacag
3375	yebC-gsp2	gttcctggcgcggtttctgc
3376	ywtF-gsp1	gcgtgcaaggctgacatgag
3377	ywtF-gsp2	ctttacaaaagcataggcgc
3846	yacA-gsp1	cctctgaaccgatggtcaac
3847	yacA-gsp2	cggccgcataacgtatgcaa
3836	recU-gsp1	gtcattccgcgattactgta
3837	recU-gsp2	ctgactgttttgggatgaaa
3842	ytpA-gsp1	ggcaacaggtctgtctgctt
3843	ytpA-gsp2	ccacatgatcttcacctcat
3840	secDF-gsp1	ctgaacgcgaatccggttat
3841	secDF-gsp2	gttcgctgacaccgagaaca
3838	ydbO-gsp1	gatatcccacgcagttttgc
3839	ydbO-gsp2	ggatcaacccacggcagtt
3844	metA-gsp1	cgtgtgtgtgcttgggatta
3845	metA-gsp2	gcgaatttccaagcaatctg
3819	spx-up-fwd	cgagtactttccaattgaag
3820	spx-up-rev (spec)	cgttacgttattagcgagccagtcgcatgaagtacagcttggtg
3821	spx-do-for (spec)	caataaacccttgccctcgctacggagaagcacagcgtttggca
3822	spx-do-rev	cttcatggagcatgactatc

Table S4. Pixel intensities for transcripts generated by Eσ^M vs. "core" alone

All genes with a >30 pixel increase are shown; sorted by signal intensity; **bold**=σ^M regulon; *italic*=readthrough from upstream σ^M-dependent promoter.

Name	gene position	E-sigM	core	Difference in pixel intensities
spx	1227169	2513	137	2376
mecA	1228540	2290	113	2177
ywaC	3948746	1665	6	1659
yebC	695704	1574	13	1561
divIC	69166	1711	182	1529
abh	1517270	1062	23	1039
sigM	1029057	1024	2	1022
rodA	3911128	1019	4	1015
ywtE	3694420	1007	5	1002
maf	2861833	828	6	821
ywtF	3693296	767	7	760
rapA	1315338	9233	8493	740
yqjL	2476198	712	6	705
abrB	44846	626	61	565
yycD	4158213	543	7	536
yhdL	1027991	529	1	528
yrhI	2776340	499	2	497
yfnI	795780	454	8	445
ywbO	3924592	433	6	427
yhdK	1027713	432	21	411
ydaH	474284	398	2	396
yebG	697601	391	4	386
ysxA	2861101	373	0	373
ywbN	3925478	389	23	366
mreB	2859997	324	11	313
nfrA	3910273	306	17	289
divIB	1593100	348	72	275
minD	2857038	293	19	274
yycC	4158785	293	19	274
dltA	3951069	282	21	261
ywcH	3909098	231	2	229
ykqB	1519936	243	17	226
gspA	3943354	252	35	217
ugtP	2305756	224	8	216
murAA	3777004	328	113	214
yhdI	1025735	208	1	207
yebE	697050	203	1	202
yrhJ	2773160	211	10	201
spoIID	3775777	285	84	201
bcrC	3757601	228	28	200
yebD	696666	192	2	190
kinC	1517738	196	8	189
yngC	1946923	174	9	165
metA	2304619	165	1	165
pbpX	1765226	170	12	158
mreC	2859094	159	8	151
purC	701106	149	7	142
yceC	311713	187	51	137
ykqA	1519040	135	4	131
ywcD	3920687	140	14	126
ytpA	3121743	128	8	120
ymdA	1766678	434	317	117
murB	1592058	153	40	113
ytnA	3123331	114	5	109
nth	2343997	115	6	109
minC	2857846	114	8	107
ftsA	1595870	145	39	106
topB	476111	103	2	101
recU	3796140	101	2	99
yycB	4158998	111	14	97
ydaJ	478497	96	1	95
yocL	2096948	95	4	91
lrpC	475612	90	-1	91
yocK	2096382	115	25	90
murG	1590940	111	22	89
dnaD	2344675	89	0	89
ydbR	510663	120	32	88
asnS	2345466	90	3	87
ywcC	3921088	85	-1	85
ywbC	3935929	126	41	85
purK	698602	87	4	83
purB	699738	81	-2	83
ypmB	2348106	85	2	83
ylxX	1594606	112	31	82
ftsZ	1597228	196	114	82
yceG	314437	99	19	80
ddl	507805	88	9	79
yycA	4160311	81	3	78
yceD	312334	165	91	74
ywaF	3944324	72	-1	74
mobA	1494910	75	4	71
fdhD	3772421	102	31	71
ywmC	3774708	101	32	70
sbp	1595331	89	20	69
ywsB	3706201	205	138	68
ywcI	3905808	104	38	66
phoA	1016366	67	2	65
galK	3919434	69	5	64
ytxJ	3045831	344	281	63
sacT	3904938	146	86	60
lysC	2908623	62	2	60
ask	2910025	291	232	59

dltB	3952577	65	7	58
yrrS	2788190	119	61	58
yqzJ	2756759	66	10	56
yceE	312950	171	115	56
murF	508941	63	7	56
adeC	1520756	59	5	54
yfnH	797977	55	2	54
ywmD	3773710	82	29	53
yocM	2097572	60	7	53
yrhP	2767312	59	6	53
yacA	74927	79	27	52
spoIIE	70536	71	19	52
yfhB	922125	55	3	51
ybfN	249584	54	4	50
yjbG	1230738	59	9	50
ywnH	3759748	54	5	50
yxjJ	3995621	370	324	47
purS	701824	47	1	46
yfnG	798811	55	9	46
ysmB	2903144	53	8	45
yheE	1049923	99	54	45
mreD	2858579	50	6	44
spoIVFA	2856093	46	2	44
purL	702075	45	2	43
ybfM	248257	59	17	42
ymdB	1768309	55	13	42
yrvD	2825111	50	9	41
secDF	2826129	42	1	40
yrvE	2822684	44	4	40
disA	107473	118	79	40
yabS	73104	175	136	39
cotF	4166318	62	23	39
yabT	73930	46	7	39
ponA	2340686	53	15	38
yqjG	2483133	47	9	38
rplU	2854779	82	45	38
yceH	316066	49	13	37
ydaL	480428	35	-1	36
rapK	2061405	53	17	36
moaA	3771380	63	27	36
psd	248738	44	8	36
yrvC	2825510	38	3	35
spoIVFB	2855234	38	3	35
ydaM	482130	35	1	35
acoR	883264	93	59	34
ftsH	76982	76	43	33
ypbG	2403483	36	3	33
rpmA	2854141	696	663	33
ysxB	2854438	300	267	33
purF	704946	35	3	33
rbsD	3702328	52	19	33
dltE	3955286	44	11	33
dltD	3954017	40	8	32
yqhH	2549051	40	8	32
ytzC	3118646	56	24	32
ywsA	3706893	38	6	32
dltC	3953781	41	10	32
yhdE	1012867	61	30	31
purQ	702742	33	2	31
ypdP	2308972	32	1	31
ypdQ	2309661	34	3	31
ymaC	1862690	34	4	31