

## SUPPLEMENTARY INFORMATION

### **Knockdown of the MAPK p38 pathway increases the susceptibility of *Chilo suppressalis* larvae to *Bacillus thuringiensis* Cry1Ca toxin**

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**Table S1**

Specific primers used in the experiments.

Primer Name	Orientation	Primer sequence (5'-3')
<b>5'RACE</b>		
<i>P38</i> -GSP1	Antisense	TGTGTTGAGGGTGAGGTTTGAACCTCCAC
<i>P38</i> -GSP2	Antisense	GACCGCAAGGGGGTTGGCACCTCGGAAGA
<i>JNK</i> -GSP1	Antisense	CTTCGCCACTATGTTGGACGGCTTCAGA
<i>JNK</i> -GSP2	Antisense	TTCCCCATAAATGCCAGTGGTTATTGTCAG
<i>ERK1</i> -GSP1	Antisense	GCCAGTGTCCCTCACTGATTGTTCCGCC
<i>ERK1</i> -GSP2	Antisense	CACCTTCTCGGCGTCCGCTTTGCGTATC
<i>ERK2</i> -GSP1	Antisense	AGTCGCAAATCTTCAAATCGCAGGTGGTG
<i>ERK2</i> -GSP2	Antisense	ACAACCATCCCATAGGCTCCTTCCCCAAT
<b>3'RACE</b>		
<i>P38</i> -GSP1	Sense	GGTGCCAACCCCTTGCGGTCAACTTGC
<i>P38</i> -GSP2	Sense	AGAGCTTCGAGGACATGGACCTGCCCGT
<i>JNK</i> -GSP1	Sense	GGAGTTCCAAGATGTGTACCTGGTGATG
<i>JNK</i> -GSP2	Sense	CTGAAGCCGTCCAACATAGTGGCGAAGAGT
<i>ERK1</i> -GSP1	Sense	ATGGATACGCAAAGCGGACGCCGAGAAGG
<i>ERK1</i> -GSP2	Sense	AAAGAGCGGGCGGAACAATCAGTGAGGAC
<i>ERK2</i> -GSP1	Sense	AGTTGGACGACCTGCCGAAGGAGACTCTT
<i>ERK2</i> -GSP2	Sense	GCTGTCTTCGATGACTTCGCCCCACGGC
<b>Performing the qPCR</b>		
<i>EF-1</i> -F	Sense	TGAACCCCATACAGCGAATCC
<i>EF-1</i> -R	Antisense	TCTCCGTGCCAACCAGAAATAGG
<i>P38</i> -F	Sense	TCATTTACGCGGTTTTGAGTGCAA
<i>P38</i> -R	Antisense	TGCAAACCTGTCGATCGCTGAA
<i>JNK</i> -F	Sense	GGCAGCTACGATACTGGCAT
<i>JNK</i> -R	Antisense	ACTCCCGATGTTTCTGCGTT
<i>ERK1</i> -F	Sense	TGCCTGCCTATATTTCCGGCAACTT
<i>ERK1</i> -R	Antisense	CCGGTGGAAAGGGTGAGGTTC
<i>ERK2</i> -F	Sense	CTGCGTCTGTACGGGAGTGTC
<i>ERK2</i> -R	Antisense	CGAACAGTTATTTGCCACCAGAAGT
<b>Primers for dsRNA Synthesizing</b>		
ds <i>Csp38</i> -F		atGAATTCCGAACAGGCACATTAACCTTCGGAA
ds <i>Csp38</i> -R		atGGTACCTTTCGAAAATTCGTTTCGTCCGAA
ds <i>CsJNK</i> -F		atGAATTCACAGTGACGTAGAGTG
ds <i>CsJNK</i> -R		taGAATTCTACGCCGCGCATAACGATACCCTGT
ds <i>CsERK1</i> -F		atGAATTCTGAAGAAGAATCCTGACGAAAGAG
ds <i>CsERK1</i> -R		atGGTACCTGGCGAGAAATGAACTAACG
ds <i>CsERK2</i> -F		atcGAATTCAAGGAGACTCTTAAGAAGTACA
ds <i>CsERK2</i> -R		tagGAATTCTATGTAATCTCGTTGAGAGAGAACT

**Table S2**

Protein sequences of MAPKs used to construct phylogenetic tree.

<b>Code name</b>	<b>Organism</b>	<b>Accession number</b>
<b>P38</b>		
Bmp38	<i>Bombyx mori</i>	NP_001036996.1
Dpp38	<i>Danaus plexippus</i>	EHJ76051.1
Lvp38	<i>Litopenaeus vannamei</i>	AGG82488.1
Dmp38b	<i>Drosophila melanogaster</i>	NP_477361.1
Nvp38	<i>Nasonia vitripennis</i>	NP_001136337.1
Acp38	<i>Apis cerana cerana</i>	ADT91683.1
Scp38	<i>Sarcophaga crassipalpis</i>	BAF75366.1
Aap38	<i>Aedes aegypti</i>	XP_001653240.1
Dmp38a	<i>Drosophila melanogaster</i>	AAC39031.1
Xlp38	<i>Xenopus laevis</i>	BAI67112.1
Drp38	<i>Danio rerio</i>	BAB11808.1
Rnp38	<i>Rattus norvegicus</i>	AAB51285.1
Mmmapk14	<i>Macaca mulatta</i>	AFI33384.1
Clp38	<i>Canis lupus familiaris</i>	AAC36131.1
Mpmapk14	<i>Mustela putorius furo</i>	AES01588.1
<b>JNK</b>		
NvsapkJNK	<i>Nasonia vitripennis</i>	XP_008212489.1
AaJNK	<i>Aedes albopictus</i>	AAO31950.1
CqJNK	<i>Culex quinquefasciatus</i>	XP_001842827.1
DmJNK	<i>Drosophila melanogaster</i>	AAB97094.1
AcJNK	<i>Aplysia californica</i>	NP_001191547.1
MjJNK	<i>Marsupenaeus japonicus</i>	BAI87826.1
HaJNK	<i>Helicoverpa armigera</i>	AEE81067.1
BmJNK	<i>Bombyx mori</i>	NP_001103396.1
ApsapkJNK	<i>Acyrtosiphon pisum</i>	XP_001945460.2
AesapkJNK	<i>Acromyrmex echinatio</i>	EGI62749.1
HssapkJNK	<i>Harpegnathos saltator</i>	EFN90159.1
BtsapkJNK	<i>Bombus terrestris</i>	XP_003402842.1
AfsapkJNK	<i>Apis mellifera</i>	XP_392806.3
<b>ERK</b>		
BmERK	<i>Bombyx mori</i>	NP_001036921.1
BtERK1/2	<i>Bemisia tabaci</i>	AEE81046.1
Ammapk1	<i>Apis mellifera</i>	XP_393029.2
PmERK1/2	<i>Penaeus monodon</i>	ADT80930.1
Mjmapk	<i>Marsupenaeus japonicus</i>	BAH86598.1
Tcmapk1	<i>Tribolium castaneum</i>	XP_966833.1
Btmapk1	<i>Bombus terrestris</i>	XP_003394197.1
Apmapk1	<i>Acyrtosiphon pisum</i>	XP_001952106.1

Hsmapk1	<i>Homo sapiens</i>	NP_002736.3
Drmapk1	<i>Danio rerio</i>	NP_878308.2
Xlmapk1	<i>Xenopus laevis</i>	NP_001083548.1
Fcmapk	<i>Fenneropenaeus chinensis</i>	AHA83424.1
Mmmapk1	<i>Mus musculus</i>	NP_001033752.1
DpERK	<i>Danaus plexippus</i>	EHJ76872.1
ScERK	<i>Sarcophaga crassipalpis</i>	BAF75365.1
RpERK	<i>Riptortus pedestris</i>	BAN20448.1

**Table S3**

Primer specifications for optimized qRT-PCR amplification of *Chilo suppressalis*.

Gene name	Efficiency	R <sup>2</sup>	Slope
<i>CsEF1</i>	99.8%	0.992	-3.326
<i>Csp38</i>	100.9%	0.994	-3.300
<i>CsJNK</i>	103.9%	0.995	-3.235
<i>CsERK1</i>	99.9%	0.992	-3.325
<i>CsERK2</i>	103.5%	0.980	-3.242