**TABLE S1**. Bacterial strains and plasmids used in this study.

| Designation | Relevant characteristics | Source and/or reference |
|---|---|---|
| **Strains** | | |
| *Agrobacterium tumefaciens* C58 | | E. M. Lai, Taiwan |
| *Dickeya dadantii* CAS9 | | W.L. Deng, Taiwan |
| *Escherichia coli* | | |
| K-12 MG1655 | $F^-$, $\lambda^-$, *ilvG*$^-$, *rfb-50*, *rph-1* | |
| DH5α | $F^-$, φ80dl*acZ*Δ M15, Δ (*lacZYA* - *argF* )*U169*, *recA1*, *endA1*, *hsdR17* (rK$^-$, mK$^+$), *phoA*, *supE44*, $\lambda^-$, *thi-1*, *gyrA96*, *relA1* | Stratagen, Germany |
| S17-1 | *recA, thi, pro, hsdR* M$^+$ RP4: 2-Tc:Mu:Km-Tn7 λpir | Laboratory stock |
| *Pseudomonas putida* NLA7 | | Laboratory stock |
| *Pseudomonas syringe* pv. *tomato* (*Pst*) DC3000 | | |
| Wild type | Rifampicin-resistant derivative | Cupple, 1986 |
| ΔHSI-I | In frame-deletion of PSPTO_2542 to 2554, Rif$^R$ | This study |
| ΔHSI-II | In frame-deletion of PSPTO_5414 to 5427, Rif$^R$ | This study |
| ΔHSI-I/II | In frame-deletion of PSPTO_2542 to 2554 and 5414 to 5427, Rif$^R$ | This study |
| Δ5413 | In frame-deletion of PSPTO_5413, Rif$^R$ | This study |
| Δ5414 | In frame-deletion of PSPTO_5414, Rif$^R$ | This study |
| Δ5415 | In frame-deletion of PSPTO_5415, Rif$^R$ | This study |
| Δ5416 | In frame-deletion of PSPTO_5416, Rif$^R$ | This study |
| Δ5417 | In frame-deletion of PSPTO_5417, Rif$^R$ | This study |
| Δ5418 | In frame-deletion of PSPTO_5418, Rif$^R$ | Haapalainen et al., 2012 |
| Δ5419 | In frame-deletion of PSPTO_5419, Rif$^R$ | This study |
| Δ5420 | In frame-deletion of PSPTO_5420, Rif$^R$ | This study |
| Δ5421 | In frame-deletion of PSPTO_5421, Rif$^R$ | This study |
| Δ5422 | In frame-deletion of PSPTO_5422, Rif$^R$ | This study |
| Δ5423 | In frame-deletion of PSPTO_5423, Rif$^R$ | This study |
| Δ5424 | In frame-deletion of PSPTO_5424, Rif$^R$ | This study |
| Δ5425 | In frame-deletion of PSPTO_5425, Rif$^R$ | This study |
| Δ5426 | In frame-deletion of PSPTO_5426, Rif$^R$ | This study |

**TABLE S1**. Bacterial strains and plasmids used in this study. (Continued)

| Designation | Relevant characteristics | Source and/or reference |
|---|---|---|
| **Strains** | | |
| Δ5427 | In frame-deletion of PSPTO_5427, $Rif^R$ | This study |
| Δ5645 | In frame-deletion of PSPTO_5645, $Rif^R$ | This study |
| Δ5430 | In frame-deletion of PSPTO_5430, $Rif^R$ | This study |
| Δ5431 | In frame-deletion of PSPTO_5431, $Rif^R$ | This study |
| Δ5432 | In frame-deletion of PSPTO_5432, $Rif^R$ | This study |
| Δ5433 | In frame-deletion of PSPTO_5433, $Rif^R$ | This study |
| Δ5434 | In frame-deletion of PSPTO_5434, $Rif^R$ | This study |
| Δ5435 | In frame-deletion of PSPTO_5435, $Rif^R$ | Haapalainen et al., 2012 |
| Δ5436 | In frame-deletion of PSPTO_5436, $Rif^R$ | This study |
| Δ5437 | In frame-deletion of PSPTO_5437, $Rif^R$ | This study |
| Δ5438 | In frame-deletion of PSPTO_5438, $Rif^R$ | This study |
| Δ5439 | In frame-deletion of PSPTO_5439, $Rif^R$ | This study |
| Δ5645/5646 | In frame-deletion of PSPTO_5645 and 5646, $Rif^R$ | This study |
| *P. s.* pv. *tomato* T1 | Wild type, $Rif^R$ | Laboratory stock |
| *P. s.* pv. *syringae* 61 | Wild type, $Rif^R$ | Laboratory stock |
| *P. savastanoi* pv. *phaseolicola* 1448a | Wild type, $Rif^R$ | Laboratory stock |
| *P. viridiflava* | Isolated from tomato leaves | W. L. Deng, Taiwan |
| *Xanthomonas euvescatoria* XvT147 | Isolated from diseased tomato plants | W. L. Deng, Taiwan |
| *Xanthomonas oryzae* pv. *oryzae* 20 | Isolated from diseased rice plants | W. L. Deng, Taiwan |
| **Plasmids** | | |
| pK18*mobsac* | Suicide vector, $Km^R$ | Schafer et al. 1994 |
| pCPP45 | Broad-host-range vector, $Tc^R$ | |
| pCHUB78 | Vector containing promoterless *uidA* gene, $Gm^R$ | W. L. Deng, Taiwan |
| pGFP-TIR | *gfp* gene under the control of a *lac* promoter, $Gm^R$ | W. L. Deng, Taiwan |

$Rif^R$, rifampicin resistant; $Km^R$, kanamycin resistant; $Gm^R$, gentamicin resistant; $Tc^R$, tetracycline resistant.

**TABLE S2.** Primers used for mutant construction.

| Primers | Sequence (5'→3')[1] | Feature |
|---|---|---|
| Pto_5413mt-1 | CCGGATCCCACCTAATAGCCCCGGTG | BamHI site |
| Pto_5413mt-2 | *TTCGACATACTTATAACTC*CAGATGCATATACAAGCT | |
| Pto_5413mt-3 | GAGTTATAAGTATGTCGAA | |
| Pto_5413mt-4 | CCTCTAGACACCCCCTTGAGCCAAAT | XbaI site |
| Pto_5414mt-1 | CCTCTAGATCGAAAACGACCAGAAAATC | XbaI site |
| Pto_5414mt-2 | *TCCCGCAAATTAATAGCA*CGCGAATACGCTATTTTTTT | |
| Pto_5414mt-3 | TGCTATTAATTTGCGGGATG | |
| Pto_5414mt-4 | CCTCTAGATTCCTCCGCATCAGTGAACT | XbaI site |
| Pto_5415mt-1 | CCGGATCCACCGAATACCTGACCGGACG | BamHI site |
| Pto_5415mt-2 | *TTTTTTTTGAAAACACGATTCAT*TGTTTGCTCCCTGTTCGGTT | |
| Pto_5415mt-3 | ATGAATCGTGTTTTCAAAAAAAA | |
| Pto_5415mt-4 | CCTCTAGAATATGAATACCACCGTGCCA | XbaI site |
| Pto_5416mt-1 | CCGGATCCATTCGTCAATGTCTGCACTGG | BamHI site |
| Pto_5416mt-2 | *GTTCGGTTGTCATCCGTT*GTTGCTGTCCTGCTCTTCGT | |
| Pto_5416mt-3 | AACGGATGACAACCGAACAG | |
| Pto_5416mt-4 | CCTCTAGATGGAAGTGGTAGTGAACCCC | XbaI site |
| Pto_5417mt-1 | CCGGATCCTAACTACATGCGTCCGTTCG | BamHI site |
| Pto_5417mt-2 | *GCACGAGCTCAGTCATTT*TACCAGCATCAAAGCTGCCC | |
| Pto_5417mt-3 | AAATGACTGAGCTCGTGCGC | |
| Pto_5417mt-4 | CCTCTAGACATGTGAATAAGCCAGTGCG | XbaI site |
| Pto_5418mt-1 | CCTCTAGAACACCCATGAACCGCTCGCC | XbaI site |
| Pto_5418mt-2 | *CAAGGGCTGGCTACCAGCAT*TTACGGCTGTGACTGCGGCTGGAC | |
| Pto_5418mt-3 | ATGCTGGTAGCCAGCCCTTGGCGC | |
| Pto_5418mt-4 | CCAAGCTTGCTGCGCCGACATCTGCTGA | HindIII site |
| Pto_5419mt-1 | CCGGATCCAAGAGTTGTATCGCACGCTG | BamHI site |
| Pto_5419mt-2 | *CCCTGTTTACGGCTGTGA*GCTCATGTCGGTCAGTTCCT | |
| Pto_5419mt-3 | TCACAGCCGTAAACAGGGAC | |
| Pto_5419mt-4 | CCTCTAGAATCGGCGAAGTACCAGTCAC | XbaI site |
| Pto_5420mt-1 | CCGGATCCTCCACACTCCACACTGACCA | BamHI site |
| Pto_5420mt-2 | *TGCTCATGTCGGTCAGTT*TTTCATGGTCAGTCATCTGC | |
| Pto_5420mt-3 | AACTGACCGACATGAGCAAG | |
| Pto_5420mt-4 | CCTCTAGATACATCAATTCCAGCATCGG | XbaI site |
| Pto_5421mt-1 | CCGGATCCTAAAGAAGCGTTGGCTTTGA | BamHI site |
| Pto_5421mt-2 | *TCATGGTCAGTCATCTGC*AGACATGCGCATCATCCTTG | |

**TABLE S2.** Primers used for mutant construction. (Continued)

| Primers | Sequence (5'→3') | Feature |
|---|---|---|
| Pto_5421mt-3 | GCAGATGACTGACCATGAAATC | |
| Pto_5421mt-4 | CCTCTAGATGTCGAGTACTTCGCAAACC | XbaI site |
| Pto_5422mt-1 | CCGGATCCTATACGTTTCCCGGCAATGT | BamHI site |
| Pto_5422mt-2 | *ACATGCGCATCATCCTTG*TTCCATGATGATGCTCCTTG | |
| Pto_5422mt-3 | CAAGGATGATGCGCATGTCT | |
| Pto_5422mt-4 | CCTCTAGACCTTCCTGCCAAATGACTTT | XbaI site |
| Pto_5423mt-1 | CCGAATTCACCGTCTTGCGCAATTTCC | EcoRI site |
| Pto_5423mt-2 | *TGATGCTCCTTGCGGTCA*AAAGCGCCACCCCTTTCG | |
| Pto_5423mt-3 | TGACCGCAAGGAGCATCA | |
| Pto_5423mt-4 | CCTCTAGAACGCTGCTTGCCATCATC | XbaI site |
| Pto_5424mt-1 | CCTCTAGACCGAGTTTCAGGAGAAGCA | XbaI site |
| Pto_5424mt-2 | *ATTGCTTTTGCCTAACCATT*CTGCGGCATCTGAGTGAA | |
| Pto_5424mt-3 | AATGGTTAGGCAAAAGCAAT | |
| Pto_5424mt-4 | CCAAGCTTTGCCATCATCCAAGGAGA | HindIII site |
| Pto_5425mt-1 | CCGGATCCGATCTGGAAGAAATATCGC | BamHI site |
| Pto_5425mt-2 | *ACATTCACCTCAGGCAAA*GCTCATCAGTCATTGATC | |
| Pto_5425mt-3 | TTTGCCTGAGGTGAATGT | |
| Pto_5425mt-4 | CCTCTAGACAACACAGTGTACGGGCT | XbaI site |
| Pto_5426mt-1 | CCGGATCCAAACCCTGTCGATCGAGTTG | BamHI site |
| Pto_5426mt-2 | *AGTCATTGATCCTTAATG*CGTGGTGTCCATTGGTACAC | |
| Pto_5426mt-3 | CATTAAGGATCAATGACTGATGAG | |
| Pto_5426mt-4 | CCTCTAGATGAGTGAAACGCTCCAACAG | XbaI site |
| Pto_5427mt-1 | CCGAATTCCTGAGTGGCTGCTTTGGC | EcoRI site |
| Pto_5427mt-2 | *GAGGCCCATACGTGGTGT*ACTGAACGCAGGCAACGG | |
| Pto_5427mt-3 | ACACCACGTATGGGCCTCC | |
| Pto_5427mt-4 | CCTCTAGATGAGCAAGCCCAGGTAGG | XbaI site |
| Pto_5430mt-1 | CCGAATTCTCAGCCTGAACGTGCGC | EcoRI site |
| Pto_5430mt-2 | *TCATAATCAACCGATCAC*TGCTGCGGGTTTTCCA | |
| Pto_5430mt-3 | GTGATCGGTTGATTATGATTCTAA | |
| Pto_5430mt-4 | CCTCTAGACTCATCCAGCTCACCCCC | XbaI site |
| Pto_5431mt-1 | CCGAATTCATCCCTACCGAGGTTCTGGT | EcoRI site |
| Pto_5431mt-2 | *TCCTTAATTAACCTTCAC*TCCAGTCATGAGTGAGCTCC | |
| Pto_5431mt-3 | GTGAAGGTTAATTAAGGAGATTCG | |
| Pto_5431mt-4 | CCTCTAGACTGACTGAGGCTCGATGATAA | XbaI site |

**TABLE S2.** Primers used for mutant construction. (Continued)

| Primers | Sequence (5'→3') | Feature |
|---|---|---|
| Pto_5432mt-1 | CCGAATTCCGCATCAACGTCACTTTTAAA | EcoRI site |
| Pto_5432mt-2 | *CTCCGTTTACTCTTTGTC*GCTTGGCATGAATTTGACTT | |
| Pto_5432mt-3 | GACAAAGAGTAAACGGAGCTCA | |
| Pto_5432mt-4 | CCTCTAGAGTTGCTGGAGCCAGCAAC | XbaI site |
| Pto_5433mt-1 | CCGAATTCCATCATCGAATTGCGCTATC | EcoRI site |
| Pto_5433mt-2 | *GCTGATAGGGACTCAAGC*GGCCATGGCTTTTCTCCT | |
| Pto_5433mt-3 | GCTTGAGTCCCTATCAGCCA | |
| Pto_5433mt-4 | CCTCTAGAGGCGAGCTTGGAGACATG | XbaI site |
| Pto_5434mt-1 | CCGAATTCGGCGATATATCCACAGGTTACTAA | EcoRI site |
| Pto_5434mt-2 | *TGGCCCTAAGGCCTATTC*GGACATCCATGACCTTCG | |
| Pto_5434mt-3 | GAATAGGCCTTAGGGCCAC | |
| Pto_5434mt-4 | CCTCTAGAGCTTTCAGGCCCAGTTCA | XbaI site |
| Pto_5435mt-1 | CCGGATCCTTCCAGCTCGACCAAGAGATC | BamHI site |
| Pto_5435mt-2 | *TGATTGGCCGGCGCGAACAT*GGAGGTGCTCCTTGCTGGAT | |
| Pto_5435mt-3 | ATGTTCGCGCCGGCCAATCA | |
| Pto_5435mt-4 | CCTCTAGATCAGATCGCACACGCACCGT | XbaI site |
| Pto_5436mt-1 | CCGGATCCTCACGAAGACCAAGTGATGGTT | BamHI site |
| Pto_5436mt-2 | *AGGCCTGCGGAGtCAAAAGA*CCCTTGTTCCTCGTGCAGTG | |
| Pto_5436mt-3 | TCTTTTGACTCCGCAGGCCT | |
| Pto_5436mt-4 | CCTCTAGAGCCAGTCTTTCACCACTGGC | XbaI site |
| Pto_5437mt-1 | CCGGATCCAACGAACGACACGACACAG | BamHI site |
| Pto_5437mt-2 | *CAACGCGATCCATCAGCC*GAGATGCTCACCCACCTG | |
| Pto_5437mt-3 | GGCTGATGGATCGCGTTG | |
| Pto_5437mt-4 | CCTCTAGAAAGCGCTTTGATTGGACC | XbaI site |
| Pto_5438mt-1 | CCGGATCCTACGATACCTGGCAGCCG | BamHI site |
| Pto_5438mt-2 | *TATTCATTAATTTTAGGT*ATCCATCAGCCTTGCTCC | |
| Pto_5438mt-3 | ACCTAAAATTAATGAATAGGGCA | |
| Pto_5438mt-4 | CCTCTAGAGCGATACCGGTCGGTG | XbaI site |
| Pto_5439mt-1 | CCGAATTCGGCATAAAATGTTTTCAGACG | EcoRI site |
| Pto_5439mt-2 | *ATCGCCCACAGATTTTGT*ATACCGGTCGGTGGTTTT | |
| Pto_5439mt-3 | ACAAAATCTGTGGGCGAT | |
| Pto_5439mt-4 | CCTCTAGATCTCGATGAGAAAGCGCT | XbaI site |
| Pto_5645mt-1 | CCGAATTCAGGAGATTCGTATGTCTGGAAA | EcoRI site |
| Pto_5645mt-2 | *ACATTATCCCCTCACAAA*TGTCATAAATGTGCTCGCTATC | |
| Pto_5645mt-3 | TTTGTGAGGGGATAATGTTTTC | |
| Pto_5645mt-4 | CCTCTAGACAAATCAGGAAACCTTTTTCAG | XbaI site |

**TABLE S2.** Primers used for mutant construction. (Continued)

| Primers | Sequence (5'→3') | Feature |
|---|---|---|
| Pto_5646mt-1 | CCGAATTCCGTTAGATTTAATGGTAAGGGG | EcoRI site |
| Pto_5646mt-2 | *TTCACTGTTCCGCTACTC*AGAAAACATTATCCCCTCACAA | |
| Pto_5646mt-3 | GAGTAGCGGAACAGTGAATCG | |
| Pto_5646mt-4 | CCTCTAGAATAGCCATTGATGACCTGCA | XbaI site |

[1]Sequences underlined are sites recognized by restriction endonucleases indicated. Characters of each Pto_XXXXmt-2 primer in italic are sequences complementary to corresponding Pto_XXXXmt-3 primer ("XXXX" indicates the gene ID).

**Table S3.** Primers used for semi-quantitative RT-PCR to determine the extent of HSI-II gene cluster.

| Primers | Sequence (5'→3') | Feature[1] |
|---|---|---|
| Pto_HSI-II-i-1F | CTGCTGGCGATGGGAG | To amplify the intergenic region 'e' |
| Pto_HSI-II-i-1R | ATCTCCAGGCGCAGGC | (1724 bp) |
| Pto_HSI-II-i-2F | GGGTGACTTAAATGGTTAGGC | To amplify the intergenic region 'd' |
| Pto_HSI-II-i-2R | CGAATTGCTTGGTGTTCA | (304 bp) |
| Pto_HSI-II-i-3F | AATGCACCGCCTGAGAAA | To amplify the intergenic region 'c' |
| Pto_HSI-II-i-3R | GCATACGCACGGTCAAGA | (145 bp) |
| Pto_HSI-II-i-4F | CGACGTTTCAACAGCTGG | To amplify the intergenic region 'b' |
| Pto_HSI-II-i-4R | AGGTGTTTCTGCAGGTGA | (992 bp) |
| Pto_HSI-II-i-5F | CGATACAATCACTTGAAGGC | To amplify the intergenic region 'a' |
| Pto_HSI-II-i-5R | TTTCTCGACTTTGGCGTC | (1950 bp) |
| Pto_HSI-II-ii-2F | CATCATCGAATTGCGCTATC | To amplify the region 'h' (1584 bp) |
| Pto_HSI-II-ii-2R | GGCGAGCTTGGAGACATG | |
| Pto_HSI-II-ii-3F | GTGAAGGTTAATTAAGGAGATTCG | To amplify the region 'g' (611 bp) |
| Pto_HSI-II-ii-3R | CAAACTGGAAGCTACTGT | |
| Pto_HSI-II-ii-4F | AGCAATACTCCATATGAAGTGA | To amplify the intergenic region 'f' |
| Pto_HSI-II-ii-4R | CGAAGGTCATCTGTTTCA | (224 bp) |
| Pto_HSI-II-iii-1F | TTCGGGTTCCGATGACTG | To amplify the intergenic region 'i' |
| Pto_HSI-II-iii-1R | GTGAGTCTGATTGGCCGG | (198 bp) |
| Pto_HSI-II-iii-2F | GAGAAGTGCAAGGACGGT | To amplify the intergenic region 'j' |
| Pto_HSI-II-iii-2R | CCGCACTCACAACCAGAT | (110 bp) |
| Pto_HSI-II-iii-3F | GCCGAAGATATAATGCCA | To amplify the intergenic region 'k' |
| Pto_HSI-II-iii-3R | GGGTACCCAAATGGTCAA | (757 bp) |

[1]The region amplified by each primer pair is in Figure 3A.

**Table S4.** Summary of the effect of each mutant in the HSI-II gene cluster

| strain | Hcp2 accumulation[1] | Hcp2 secretion[2] | Competition assay[3] | |
|---|---|---|---|---|
| | | | *E. coli* MG1655 | *Psph* 1448a |
| Wild type | + | + | ++ | ++ |
| ΔHSI-II | - | - | - | - |
| Δ5413 | + | + | - | + |
| Δ5414 | + | + | ++ | ++ |
| Δ5415 | + | + | ++ | + |
| Δ5416 | + | - | - | + |
| Δ5417 | + | + | ++ | ++ |
| Δ5418 | + | - | - | - |
| Δ5419 | + | - | - | - |
| Δ5420 | + | - | - | - |
| Δ5421 | + | (+) | - | - |
| Δ5422 | + | - | - | - |
| Δ5423 | + | - | - | - |
| Δ5424 | - | - | - | - |
| Δ5425 | + | - | - | - |
| Δ5426 | + | + | ++ | ++ |
| Δ5427 | (+) | - | - | - |
| Δ5645 | + | + | ++ | ++ |
| Δ5430 | + | + | ++ | ++ |
| Δ5431 | + | - | - | - |
| Δ5432 | + | - | - | - |
| Δ5433 | + | - | - | - |
| Δ5434 | + | - | - | - |
| Δ5435 | - | - | - | - |
| Δ5436 | + | (+) | - | - |
| Δ5437 | + | + | ++ | ++ |
| Δ5438 | + | + | ++ | ++ |

[1]Based on the results presented in "Cell pellet" of Figure 4. +, Hcp2 accumulated; (+), reduced Hcp2 amount; -, no Hcp2 accumulation.

[2]Based on the results presented in "Secreted proteins" of Figure 4. +, Hcp2 secreted; (+) reduced Hcp2 amount; -, no Hcp2 secretion.

[3]Based on the bacterial growth in the competition assays. For assays using *E. coli* K-12 MG1655 and *P. savastanoi* pv. *phaseolicola* 1448a as competitors (Figure 5): ++, strong reduction; +, reduction; -, weak/no reduction of competitor growth (compared to no co-inoculation control, "*E. coli* only" or "*Pph* only"), ++, strong reduction; +, reduction; -, weak/no reduction of *Pst*DC3000 growth (compared to no co-inoculation control, "*E. coli* only" or "*Psph* only").

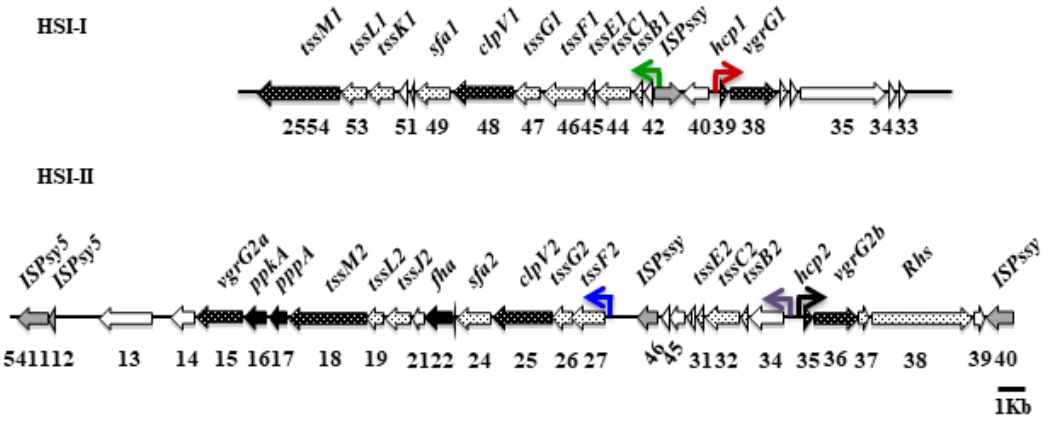



**Figure S1.** The predicted promoters in the HSI-I and HSI-II gene clusters. Schematic diagram of 22 (*PSPTO_2533 to PSPTO_2554)* and 27 genes (*PSPTO_5413* to *PSPTO_5439*) of the HSI-I and HSI-II gene clusters, respectively. Black arrows are open reading frames (ORFs) orthologous to the core T6SS components (names are given above and gene ID numbers are below) and genes coding for putative transposases are shaded gray. Dotted arrows represent ORFs found in both HSI-I and HSI-II gene clusters. Arrows with diagonal lines represent ORFs orthologous to the regulatory T6SS components, including PpkA, PppA and Fha. Colored arrows designate five predicted promoters, P*HSI-I* (green), P*hcp1*(red), P*HSI-I-i* (blue), P*HSI-II-ii* (grey) and P*HSI-II-iii* (black), and the direction of transcription.

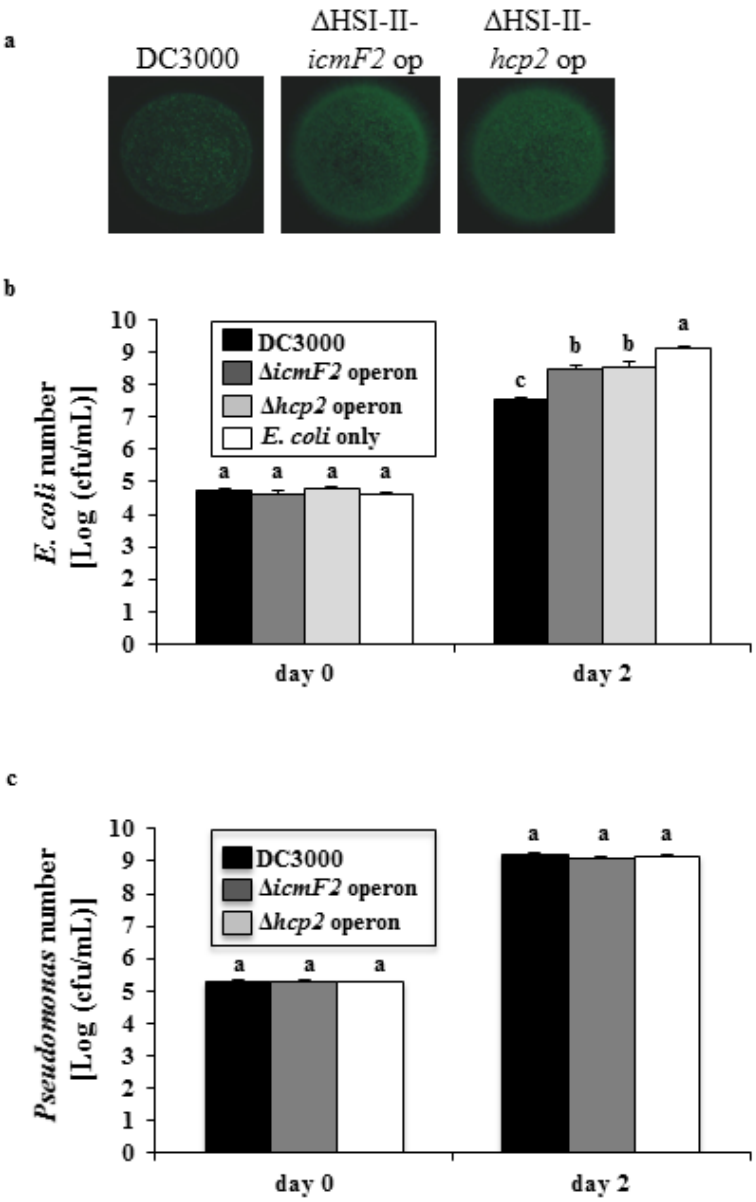
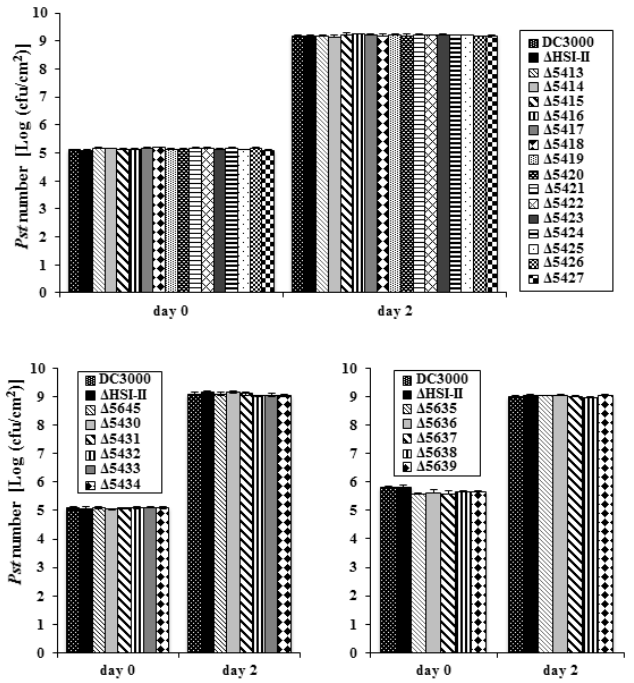



**Figure S2.** Deletion of the first and third operons in the HSI-II gene cluster decreases growth fitness on co-incubation with *E. coli* MG1655. The competition ability of operon mutants ΔHSI-II-i and ΔHSI-II-iii was assessed on co-incubation with *E. coli* MG1655 expressing GFP in a ratio of 10:1. (a) The GFP signal was captured two days after co-incubation on King's media B. Bacterial numbers of *E. coli* MG1655 (expressing GFP) (b) and each *Pst* DC3000 strain (c) was measured on day 0 and day 2 during co-incubation. Data are mean ± SD and were analyzed by one-way ANOVA followed by Tukey's HSD test. Bars with different letters above indicate significant difference at $p<0.05$. This experiment was performed three times with similar results.

**a**




**b**

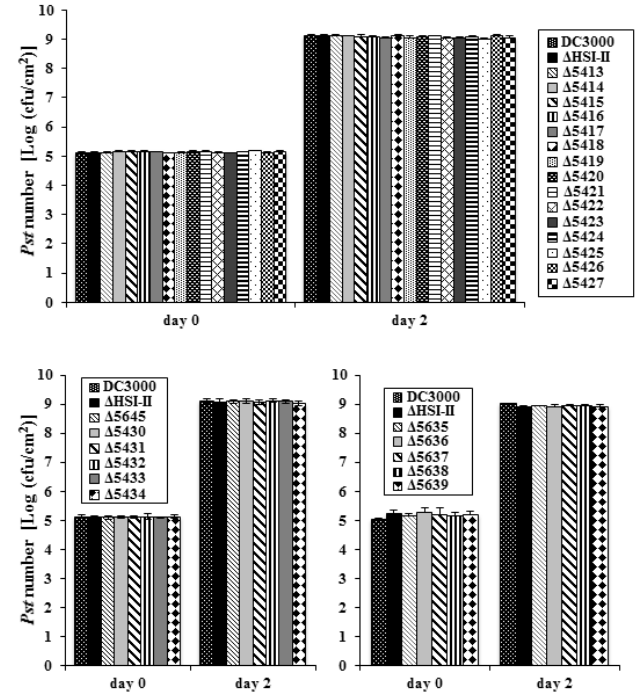



**Fig. S3.** Deletion of each gene in the HSI-II gene cluster did not affect the bacterial number of each *Pst*DC3000 strain in the interbacterial competition assay. After co-incubation with GFP-expressing *E. coli* MG1655 (a) or *Psph* 1448a (b) for 2 days, the bacterial number of each *Pst* DC3000 strain was measured. Data are mean± SD (n=3), and analyzed by ANOVA test. This experiment was conducted three times with similar results.