**S2 Table**. Strains and plasmids used in this study.

|  |  |  |
| --- | --- | --- |
|  | Characteristics\* | References |
| *S. pneumoniae* strains |  |  |
| D39 | Serotype 2 strain | [1] |
| DLA3 | D39, *ΔbgaA*::(P*ssbB-luc*, *tet*R) | [2] |
| D-PEP23 | D39, *Δcep::(P3-luc, spcR*) | [3] |
| FB121 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpA-LGZ, spcR*) | This study |
| FB123 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpU-LGZ, spcR*) | This study |
| FB125 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*) | This study |
| FB127 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpS-LGZ, spcR*) | This study |
| FB129 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpV1-LGZ, spcR*) | This study |
| FB131 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpA-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB133 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpU-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB135 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB137 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpS-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB139 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpV1-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB141 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpSRHC::eryR* | This study |
| FB151 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔcomCDE::camR* | This study |
| FB153 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔcomA::eryR* | This study |
| FB155 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpSRHC::eryR*, *ΔbgaA*::(P*blpS*-*blpSRH, tetR)* | This study |
| FB194 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpSRHC::eryR*, *ΔcomCDE::camR* | This study |
| FB197 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔcomB::eryR* | This study |
| FB200 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔcomAB::eryR* | This study |
| FB204 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(PZn-*comA, tetR)* | This study |
| FB207 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(PZn-*comB, tetR)* | This study |
| FB210 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(PZn-*comAB, tetR)* | This study |
| FB213 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(PZn-*comAB, tetR), ΔcomAB::eryR* | This study |
| FB216 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(PZn-*comAB, tetR), ΔcomCDE::camR* | This study |
| FB219 | D39, *Δcep::*(*PblpT-LGZ, spcR*) | This study |
| FB231 | D39, *Δcep::*(*PblpT-LGZ, spcR*), *ΔbgaA*::(P*ssbB-rfp, tetR*) | This study |
| MK110 | D39, *comCDE*, *ery*R | [2] |
| MK303 | D39, *ΔbgaA::tetR* | This study |
| MK304 | D39, *ΔbgaA::tet*R, *ΔblpSRHC::eryR* | This study |
| MK436 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpK-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
| MK437 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
| MK438 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpS-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
| MK439 | D39, *ΔbgaA::tet*R, *Δcep::*(*PpncW-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
| MK440 | D39, *ΔbgaA::*(PZn-*comAB*, tetR), *Δcep::*(*PblpT-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
| MK441 | D39, *ΔbgaA::tet*R, *Δcep::*(*PblpA-LGZ, spcR*), *ΔblpA’B’*::*ery* | This study |
|  |  |  |
| Plasmids |  |  |
| pJWV25 | *ampR, bgaA’, tetR, PZn-gfp, ’bgaA* | [4] |
| pJWV100 | *ampR, bgaA’, tetR,* (no promoter) *gfp, ’bgaA* | [5] |
| pPEP1 | *camR*, *cep’*, *spcR*-MCS,*‘cep* | [3] |
| pPEP1-LGZ | *camR*, *cep’*, *spcR*, (no promoter)-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pPEP1-P*blpT*-LGZ | *camR*, *cep’*, *spcR*-P*blpT*-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pPEP1-P*blpU*-LGZ | *camR*, *cep’*, *spcR*-P*blpU*-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pPEP1-P*blpS*-LGZ | *camR*, *cep’*, *spcR*-P*blpS*-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pPEP1-P*blpA*-LGZ | *camR*, *cep’*, *spcR*-P*blpA*-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pPEP1-P*blpV1*-LGZ | *camR*, *cep’*, *spcR*-P*blpV1*-*luc*-*gfp*-*lacZ*,*‘cep* | This study |
| pMK11 | *ampR*, *bgaA’*, *tetR*, PZn, *’bgaA* | This study |
| pMK11-P*Zn*-*comA* | *ampR*, *bgaA’*, *tetR*, PZn-*comA*, *’bgaA* | This study |
| pMK11-P*Zn*-*comB* | *ampR*, *bgaA’*, *tetR*, PZn-*comB*, *’bgaA* | This study |
| pMK11-P*Zn*-*comAB* | *ampR*, *bgaA’*, *tetR*, PZn-*comAB*, *’bgaA* | This study |
| pLA21 | *ampR*, *bgaA’*, *tetR*, P*ssbB*-rfp, *’bgaA* | [6] |

\* In the constructs description, “LGZ” is short for the tripartite reporter cassette containing firefly luciferase, *luc* (L), *gfp* (G) and β-galactosidase , *lacZ* (Z).

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