

A

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S. pneumoniae 1 . L V F L A L L S A G G Y F G Y Q V L D S L P T D A N S K K Y V T V G I P E G S N V Q E I G T T L E K A G L V K H G
S. suis 1 M S I V V V A V L V T G V T G Y M W V K S S L E P V N A K A T E T I Q V E I P E G S S T L E I G K I L V D N K L L R N A

S. pneumoniae 60 L I F S F Y A K Y K N V T D L K A G Y N L Q K S M S T E D L L R A L Q K G G T D E P Q E P V L A T T L E E G Y T L D
S. suis 61 T I F N Y Y S K K S N N F Q S G E Y N L K Q N M S V D D I A R A L Q E S G T P T A Q K E A A G K W L L V E G Y T L T

S. pneumoniae 120 Q I A Q T V G Q L Q G . . . D F K E S L T A E A F T A K V Q D E T F I S Q A V A K Y F T L E S L P V K D S G A R V R
S. suis 121 Q I A Q A I T D N T N T K D K N D K T P F T A E Q F M A T V I N Q D F I N R M V A T Y P K L F A S L P A A D S G W I Y Q

S. pneumoniae 176 L E G Y L F P A V Y S I K R S T T I E S L I D E M T A A M D K N L S P Y S T I K S K N L T V N E L T L A S L V E K E
S. suis 181 L E G Y L F P A V Y E Y S D E T T I E S L V E Q M T A A M D N R L P Y H E T I T A K N L T V N E L T L A S L V E K E

S. pneumoniae 236 G A K T E D R R K I T A S V F V N R L N R D M P L O S N I A I L Y A O G K L G O N I S L A E D V A I D T N I S P Y N V Y
S. suis 241 G S T D E D R R N I A S V F E N R L N A A M P L O S N I A I L Y A O G K L G O E T I L A E D A A I D T S I E S P Y N I Y

S. pneumoniae 296 K N V G L M P G P V D S P S L A I E S S I N Q T K S D N L Y F V A D V T E G K V Y T A N N Q E E H D R N V A E H V N S
S. suis 301 W I F G L M P G P V D S P S L A I E S V I N A N T I D Y L Y F V A D V T I G N V Y E T N N T D E H N Q N V A K T V N A

S. pneumoniae 356 K L N . .
S. suis 361 E L N N E

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B

S. pyogenes 1 MRRKLSKRQQTERRAAKKISTVLISIIITLAVTLAGAVVYSALNPVDKNSDAFVQVEI
S. suis 1MSIVVVAIVYTGVTGYMWRSSLEPVENAKATETIQVEI

S. pyogenes 61 PSGSGNKLIGQILQKKGLIKNSIVPSPFYTRKKNFTNFQSGYYNLQKSMSEELASALQEG
S. suis 39 PEGSSILEIGKRLVDNKLKNAATIPNYYSKIKSYNMFQSGEYNLQKQMSVDDIAKALQES

S. pyogenes 121 GTAEPTKPSGKILIPEGYTLKQIAKAVEHNSKGRTKKAKTFFNEKDFDLDVDEAFIQD
S. suis 99 GTPTAQRKSAAGKVLIVEGYTLKQIAQALIDNINTKDKNDKTFPIAEQFMATVQNDPINR

S. pyogenes 181 MVKHYPKLAIITPTKFKAIYRLEGYLFPAVYNYKETTNRRLVEGMIAAMDATLVPPYD
S. suis 159 MVATYPKLFAIIPAADSGVIYOLEGYLFPAVYRYSDETTIRLVEGMIAAMDNRLOPYE

S. pyogenes 240 KTAASGKTVNEVLTLASLVEKEGSTDIDRRNIASVFNRLNSGMALOSNTAILYAMCKLG
S. suis 219 TIAKNLTVNEVLTLASLVEKEGSTDIDRRNIASVFNRLNAAMPLOSNTAILYACKLG

S. pyogenes 300 EKTTLAEDAIDTINSPYNIYNTGLMPGPVASSGVSIAEATLNPASTDYLYFVANVHT
S. suis 279 QETTLAEDAIDTISESPYNIYNTGLMPGPVDSGVSIAEAVLNANIDYLYFVADVTT

S. pyogenes 360 GEVYIARKTFEHSANVQKYVNSQIQ..
S. suis 339 GNVYETNMIERNONVAKYVNAHLNNE

C

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Staphylococcus aureus 1 .....GAGTVVYVSA LNPV DKNK E F V O V E I P S G S G N K L I G Q I L Q K E G L I K N S
S. suis 1 MSIVVVAIVLTGWTGYMVKSSLEPVNAKATETIQVEIPEGSSITLEIGRTLVYDNRLIKNA

Staphylococcus aureus 50 TVPSRYTKKKNFTNFQSGVYNDQKNMSLEETAKALQESGTAEP TKPAIIGKLLIPEGYT K
S. suis 61 TIFNYYSKTKSYNMFQSGFYNDKQKNMSVDDIAKALQESGTPTAQKPAAGKLLIVEGYT L T

Staphylococcus aureus 110 QIAKAVERNKSGKDQKAKTPPEHEKDEINLVADET SIQRMVKKYPRLLGSLIETKFA AVYR
S. suis 121 QIACAITDNTNTKDKNDKTPETAEOEMATVTNQD F INRMVATYPKLFASLEAADSGVIVQ

Staphylococcus aureus 169 LEGYLPPAVYNYVEETTESLIDDMIAATDATALPYDQTAASGKSVNDEVLTASLVEKE
S. suis 181 LEGYLPPAVYEYSDEETTESLVEQOMIAAMDNRLOPYEETITAKNLEVNEVLTASLVEKE

Staphylococcus aureus 229 GSTDIDRRQIASVFYNRLNNGMALOSNIAIILYAGKLGQKTTLAEDAIDTINSPYNIY
S. suis 241 GSTDIDRRQIASVFENRLNAMPLOSNIILYAGKLGQETTLAEDAIDTIE SPYNIY

Staphylococcus aureus 289 TITGLMPGPVDS SGLSAIEAIVINPAITDYLFFVANVHTGCVYVAKTFEHEHNVKRYVNS
S. suis 301 WITGLMPGPVDS P SLSAIEAVINANITDYLFFVADVITGNVYVITNITFEHEHNVKRYVNA

Staphylococcus aureus 349 QI...
S. suis 361 HLNNE
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D

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Bacillus 1 .SIIVLLLIIG..GAFLYGKTTLEPVKDKSKATVDINIFSGSSVSAIASILKKNDVIKSE
S. suis 1 MSIVVAVLVITGVITGMNVKSSLEPVNAKATEITIQVEIPEGSSTLEITGKILLVDNRLIKNA

Bacillus 58 KAFQYYVFKKGAISGFQAGFYRLNKGMDVDAIIRKLTSGAT.....SYAFQITVTEGAKLT
S. suis 61 TIFNYYSKIKSYNNFQSGFYNLKQNMVVDIARALQESCTPTAQKEAAGKVLIVEGYTLT

Bacillus 113 QIAAATADETKYSKK.....QVMAKLDDETFIHQTKKEFSDIVTKDVFNKI.IKHP
S. suis 121 QIAQAITDNRNWKDKNDKTPPTAEQFMATVITNQDFINRIVATVEKLFASLPAADSGVIYQ

Bacillus 163 LEGYLFPAIVPFDPTSLLEDMTAMVKQTNISYVETVKAEMKKNKLSVHKLLTASLIEE
S. suis 181 LEGYLFPAIVVEVSD.PETIEELVEQMI AAMDNRLLQPYVETITAKNLIIVNEVLTASLVEK

Bacillus 223 EATEKVDRRKIASVFYNRLKKKMPLOTDPTVLYAGKH.KDRVYKDIIDS....PYNIT
S. suis 240 EGSTDEDRRNIASVFENRLNAAMPLOENIALIYAGKLGQETTAEADAIDTISIESPYNIT

Bacillus 278 YKNPGLTPGPTANAGMSSWEAALHPEQTDYLYFIAKSS.GEVVFTKTLKEHNKAKEKYI.
S. suis 300 YWTPGLMPGPTDSSPSAISAEAVLNANITDYLYFVADVITGNVFTNNIDEHNQNVAKYVN

Bacillus
S. suis 360 .....
AHLNNE

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E

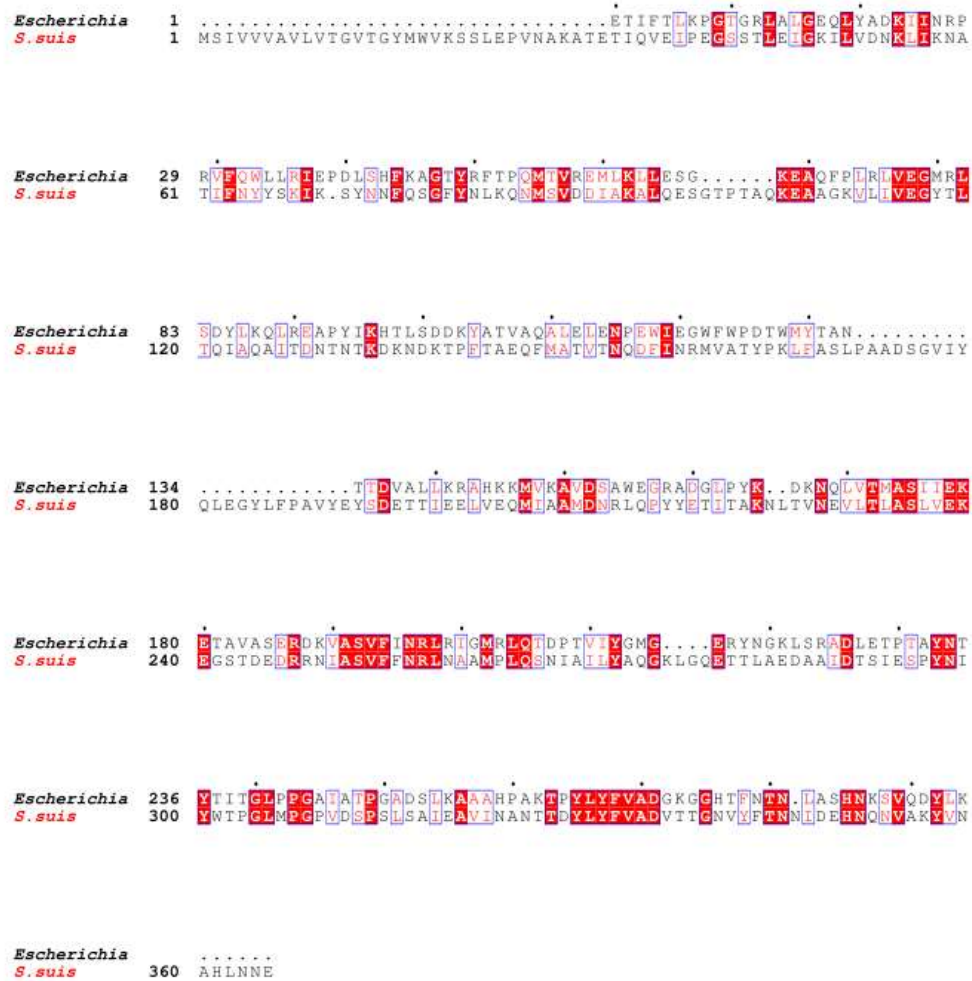


Figure S1. Homology comparison between HP1717 and different bacterial homologous proteins. HP1717 is shown in red font.(A) *Streptococcus pneumoniae* (A0A0H2ZLQ1.1)(B) *Streptococcus pyogenes* (SQF37078.1) (C) *Staphylococcus aureus* (SUL86689.1) (D) *Bacillus vallismortis* (WP_121642973.1) (E) *Escherichia coli* (NP_415615.1). The image was generated using the program ESPript 3.0 after the raw data were processed using ClustalW2.

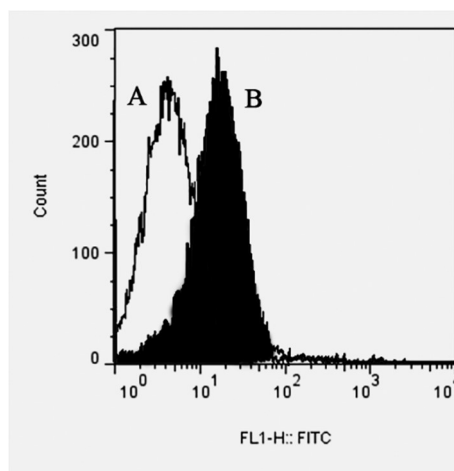


Figure S2. Cell surface localization confirmed by flow cytometry. Briefly, overnight cultures were pelleted, washed with PBS, and adjusted to 10^8 CFU/mL. The bacteria were then incubated with mouse anti-rHP177(B) or preimmune serum (A) as a control for 1 h. Following three washes, the cells were incubated with goat anti-

mouse IgG–fluorescein isothiocyanate (FITC) (KPL) for 1 h and then fixed with 4% paraformaldehyde for 30 min. After washing with PBS, the cells were analyzed by flow cytometry.

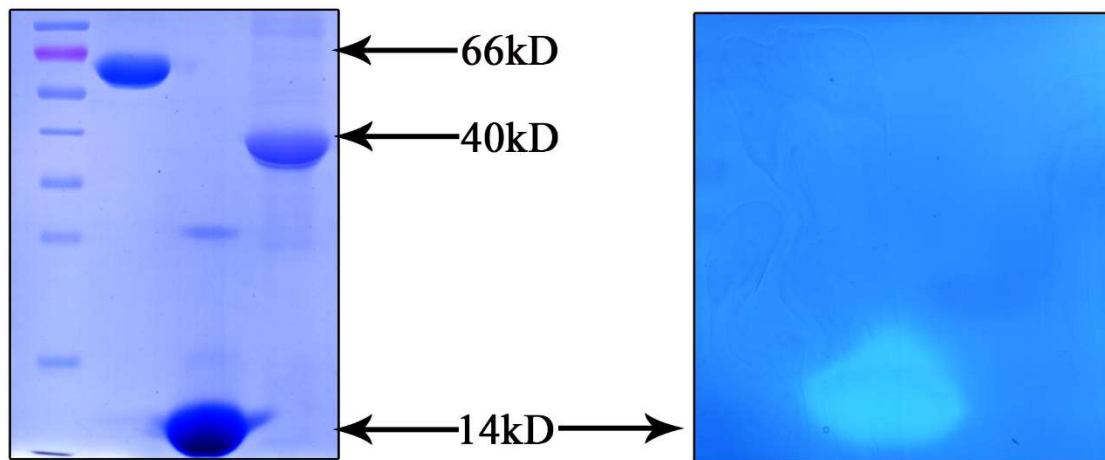


Figure S3. Zymogram analysis. SDS-PAGE were stained by Coomassie Brilliant Blue (left) and Methylene Blue (right) separately. Methylene blue can dye peptidoglycan and the light bands is clearing zones showing degradation of the PG of *S. suis* incorporated in the SDS-PAGE gel. M: Mark; L1: BSA; L2 Lysozyme; L3: HP1717.