

**Identification of PblB mediating galactose-specific adhesion in  
a successful *Streptococcus pneumoniae* clone**

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**Key Words:** *Streptococcus pneumoniae*; microarray; phage; adhesin;  
galactose

**Running Title:** *pblB* of *Streptococcus pneumoniae*

# CLUSTAL 2.1 multiple sequence alignment

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NTUH-P15      -----MAWFLAWYKTPKRALGDFSFNSDIQDRRTFNTTETETLYSVLLD 45
ST46-2        MMQRSITQMSVTSQSCGMALSRMVQNTKTALGDFSFNSDIQDRRTFNTTETETLYSVLLD 60
ST46-1        MMQRSITQMSVTSQSCGMALSRMVQNTKTALGDFSFNSDIQDRRTFNTTETETLYSVLLD 60
ST76-1        MMQRSITPVSVTSQSCGMALSRMVQNTKTALGDFSFNSDIQDRRTFNTTETETLYSILLD 60
ST76-2        MMQRSITPVSVTSQSCGMALSRMVQNTKTALGDFSFNSDIQDRRTFNTTETETLYSILLD 60
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NTUH-P15      GKHSIAGTWEGELVRDNFAMTVKKS RGENRGVVI TTHKNLKYQRTKNSQNVVTRIHARS 105
ST46-2        GKHSIAGTWEGELVRDNFAMTVKKS RGENRGVVI TTHKNLKYQRTKNSQNVVTRIHARS 120
ST46-1        GKHSIAGTWEGELVRDNFAMTVKKS RGENRGVVI TTHKNLKYQRTKNSQNVVTRIHARS 120
ST76-1        GKHSIVGTWEGELVRDNFAITVKKSRGENRGVVI TTHKNLKNYQRTKNSQNVVTRIHAKS 120
ST76-2        GKHSIVGTWEGELVRDNFAITVKKSRGENRGVVI TTHKNLKNYQRTKNSQNVVTRIHAKS 120
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NTUH-P15      TFKPEGAEKETTIRVTVDSP LINSYPYINEKEYENNAKTVEELQKWAQSKFSNEGIDKV 165
ST46-2        TFKPEGAEKETTIRVTVDSP LINSYPYINEKEYENNAKTVEELQKWAQSKFSNEGIDKV 180
ST46-1        TFKPEGAEKETTIRVTVDSP LINSYPYINEKEYENNAKTVEELQKWAQSKFSNEGIDKV 180
ST76-1        TFKPEGAEKETTIRVTVDSP LINSYPYINEKEYENNAKTVEELQKWAQSKFSNEGIDKV 180
ST76-2        TFKPEGAEKETTIRVTVDSP LINSYPYINEKEYENNAKTVEELQKWAQSKFSNEGIDKV 180
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NTUH-P15      SDAIKIEAYELDGQVVHMGDTANLKS WKHNVDVFKKAIAYEFDALKEEYISLTFNDKAGI 225
ST46-2        SDAIKIEAYELDGQVVHMGDTANLKS WKHNVDVFKKAIAYEFDALKEEYISLTFNDKAGI 240
ST46-1        SDAIKIEAYELDGQVVHMGDTANLKS WKHNVDVFKKAIAYEFDALKEEYISLTFNDKAGI 240
ST76-1        SDAIKIEAYELDGQVVHMGDTVNLKSWKHNVDAFKKAIAYEFDALKEEYISLTFDDKAGI 240
ST76-2        SDAIKIEAYELDGQVVHMGDTVNLKSWKHNVDAFKKAIAYEFDALKEEYISLTFDDKAGI 240
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NTUH-P15      GGSRASGGLSSAADAILGVTESAQEIALDKALQNADLDFDHKAGLLRQEISDGI ELAKAR 285
ST46-2        GGSRASGGLSSAADAILGVTESAQEIALDKALQNADLDFDHKAGLLRQEISDGI ELAKAR 300
ST46-1        GGSRASGGLSSAADAILGVTESAQEIALDKALQNADLDFDHKAGLLRQEISDGI ELAKAR 300
ST76-1        GGSRASGGLSSAADAILGVTESAQEIALEKALQNADLDFDHKAGLLRQEISDDI ELAKAK 300
ST76-2        GGSRASGGLSSAADAILGVTESAQEIALEKALQNADLDFDHKAGLLRQEISDDI ELAKAK 300
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NTUH-P15      AEEVKRELSDTINQRFNSFDNGPLKETKRKAEEALRNAGASTLLAQEAKRIGLDSVARLE 345
ST46-2        AEEVKRELSDTINQRFNSFDNGPLKETKRKAEEALRNAGASTLLAQEAKRIGLDSVARLE 360
ST46-1        AEEVKRELSDTINQRFNSFDNGPLKETKRKAEEALRNAGASTLLAQEAKRIGLDSVARLE 360
ST76-1        AEEVKRELSDTINQRFNSFDNGPLKETKRKAEEALRNAGASSSLAQEAKRIGLDSVARLE 360
ST76-2        AEEVKRELSDTINQRFNSFDNGPLKETKRKAEEALRNAGASSSLAQEAKRIGLDSVARLE 360
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NTUH-P15           AFKSQTTSAQATALSGDLLALKRTIANDIRPKQAQAEAEIAKQVEALSRTKNELAGASSLL 405  
 ST46-2           AFKSQTTSAQATALSGDLLALKRTIANDIRPKQAQAEAEIAKQVEALSRTKNELAGASSLL 420  
 ST46-1           AFKSQTTSAQATALSGDLLALKRTIANDIRPKQAQAEAEIAKQVEALSRTKNELAGASSLL 420  
 ST76-1           AFKSQTTSAQATALSGDLLALKRTIVNDIRPKQAQVEAEIAKQAEALSRTKNELAG----- 415  
 ST76-2           AFKSQTTSAQATALSGDLLALKRTIVNDIRPKQAQVEAEIAKQAEALSRTKNELAG----- 415  
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 NTUH-P15           AQEAKRIELDSVARLEAFKSQTTSAQATALS----- 435  
 ST46-2           AQEAKRIELDSVARLEAFKSQTTSAQATALSGDLLVLRKRTIANDIRPKQAQAEAEIAKQVE 480  
 ST46-1           AQEAKRIELDSVARLEAFKSQTTSAQATALS----- 450  
 ST76-1           -----  
 ST76-2           -----  
 NTUH-P15           -----GDLVLRKRTIANDI 449  
 ST46-2           ALSRTKNELAGASTLLAQEAKRIELDSVARLEAFKSQTTSAQATALSGDLLVLRKRTIANDI 540  
 ST46-1           -----GDLVLRKRTIANDI 464  
 ST76-1           -----  
 ST76-2           -----  
 NTUH-P15           RPKQAQAEAEIAKQVEVLSRTKNELAGVKSAQATYEETTTTRRLSELTNLANGKASKSELT 509  
 ST46-2           RPKQAQAEAEIAKQVEVLSRTKNELAGVKSAQATYEETTTTRRLSELTNLANGKTSKSELT 600  
 ST46-1           PP----- 466  
 ST76-1           -----  
 ST76-2           -----  
 NTUH-P15           QTAEELASRIASVQAGSSRNYFRNSRSRTFTTGGQAVYDYRTFIVPDFWKNSDRFKRDYV 569  
 ST46-2           QTAEELASRIASVQAGSSRNYFRNSRSRTFTTGGQAVYDYRTFIVPDFWKNSDRFKRDYV 660  
 ST46-1           -----NYFTNSRSRTFTTGGQAVYDYRTFIVPDFWKNSDRFKRDYV 507  
 ST76-1           -----  
 ST76-2           -----  
 NTUH-P15           RISFDVTFPVALVNDMPAMVHFSAPWYAYRNLIKGGTVERQHFEFTIDLSSSEDYQT 629  
 ST46-2           RISFDVTFPVALVNDMPAMVHFSAPWYAYRNLIKGGTVERQHFEFTIDLSSSEDYQT 720  
 ST46-1           RISFDVTFPVALVNDMPAMVHFSAPWYAYRNLIKGGTVERQHFEFTIDLSSSEDYQT 567  
 ST76-1           -----  
 ST76-2           -----  
 NTUH-P15           NNVFIRFGTNYGFPAGLQVVIENAMLSVGNYPAYQPAYEDQEDRVSVVESNFKQRADSL 689  
 ST46-2           NNVFIRFGTNYGFPAGLQVVIENAMLSVGNYPAYQPAYEDQEDRVSVVESNFKQRADSL 780  
 ST46-1           NNVFIRFGTNYGFPAGLQVVIENAMLSVGNYPAYQPAYEDQEDRVSVVESNFKQRADSL 627  
 ST76-1           -----  
 ST76-2           -----

NTUH-P15 DAGVSRLTEGLRTRKADISALNVTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQ 749  
ST46-2 DAGVSRLTEGLRTRKADISALNVTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQ 840  
ST46-1 DAGVSRLTEGLRTRKADISALNVTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQ 687  
ST76-1 -----VKSAQATYKETTTRRLS----- 432  
ST76-2 -----VKSAQATYKETTTRRLS----- 432

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NTUH-P15 EILNATKDKASKSELQTAEELASRIASVQASGRNLFNLSLFKQDIPKGTGIWTTSTYTAT 809  
ST46-2 EILNATKDKASKSELQTAEELASRIASVQASGRNLFNLSLFKQDIPKGTGIWTTSTYTAT 900  
ST46-1 EILNATKDKASKSELQTAEELASRIASVQASGRNLFNLSLFKQDIPKGTGIWTTSTYTAT 747  
ST76-1 ELTNLANGKASKSELQTAEELASRIASVQASGRNLFNLSLFKQDIPKGTGIWTTSTYTAT 492  
ST76-2 ELTNLANGKASKSELQTAEELASRIASVQASGRNLFNLSLFKQDIPKGTGIWTTSTYTAT 492

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NTUH-P15 IDSESKYLGHKALKI IGLNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKAN 869  
ST46-2 IDSESKYLGHKALKI IGLNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKAN 960  
ST46-1 IDSESKYLGHKALKI IGLNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKAN 807  
ST76-1 IDSESKYLGHKALKI IGLNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKAN 552  
ST76-2 IDSESKYLGHKALKI IGLNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKAN 552

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NTUH-P15 KNGIMLR SRLGNIGYKTGNVTLSTEIKRYVVH I PKGWTNESKQTTNEWLFNFNQEGTIWI 929  
ST46-2 KNGIMLR SRLGNIGYKTGNVTLSTEIKRYVVH I PKGWTNESKQTTNEWLFNFNFNQEGTIWI 1020  
ST46-1 KNGIMLR SRLGNIGYKTGNVTLSTEIKRYVVH I PKGWTNESKQTTNEWLFNFNFNQEGTIWI 867  
ST76-1 KNGIMLR SRLGNIGYKTGNVTLSTEIKRYVVH I PKGWTNESKQTTNEWLFNFNFNQEGTIWI 612  
ST76-2 KNGIMLR SRLGNIGYKTGNVTLSTEIKRYVVH I PKGWTNESKQTTNEWLFNFNFNQEGTIWI 612

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NTUH-P15 WMPKFEISDVDTSYSEAPEDIEGQISTVESNFKQRADSLEAGVSR LTEGLRTRKADISALN 989  
ST46-2 WMPKFEISDVDTSYSEAPEDIEGQISTVESNFKQRADSLEAGVSR LTEGLRTRKADISALN 1080  
ST46-1 WMPKFEISDVDTSYSEAPEDIEGQISTVESNFKQRADSLEAGVSR LTEGLRTRKADISALN 927  
ST76-1 WMPKFEISDVDTSYSEAPEDIEGQISTVESTFKQRADSLDAGVSR LTEGLRTRKADISSLN 672  
ST76-2 WMPKFEISDVDTSYSEAPEDIEGQISTVESTFKQRADSLDAGVSR LTEGLRTRKADISSLN 672

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NTUH-P15 VTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQEILNVT KDKASKSELQTAE 1049  
ST46-2 VTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQEILNVT KDKASKSELQTAE 1140  
ST46-1 VTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQEILNVT KDKASKSELQTAE 987  
ST76-1 VTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQEILNAT KDKASKTELQTAE 732  
ST76-2 VTAENIRQSVKSLETDTONKLNQKLSQAEFEVRAGSIRQEILNAT KDKASKSELQTAE 732

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NTUH-P15 LSSKIASVQVGGINLLRNTASLLIGDRSK-GCWMSASGGNGRAISVEVLDPKKMIKNMI 1108

ST46-2 LSSKIASVQVGGINLLRNTASLLIGDRSK-GCWMSASGGNGRAISVEVLDPKKMIKNMI 1199

ST46-1 LSSKIASVQVGGINLLRNTASLLIGDRSK-GCWMSASGGNGRAISVEVLDPKKMIKNMI 1046

ST76-1 LSSKIASVQASGRNLFLN--SLFKQDISKTGIWTTST--YTAADSESKYLGHKALKIIG 788

ST76-2 LSSKIASVQASGRNLFLN--SLFKQDISKTGIWTTST--YTAADSESKYLGHKALKIIG 788

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NTUH-P15 RVIENTNGGNKDLTQLVRLRIGEKYTISCYARIASDSPNANVN---LLFRSWANNTDLNR 1165

ST46-2 RVIENTNGGNKDLTQLVRLRIGEKYTISCYARIASDSPNANVN---LLFRSWANNTDLNR 1256

ST46-1 RVIENTNGGNKDLTQLVRLRIGEKYTISCYARIASDSPNANVN---LLFRSWANNTDLNR 1103

ST76-1 LNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKANKNGIMLRSRLGNIGYKT 848

ST76-2 LNPSGRDGGNPKVTPALGQFGKVI PGSTTNQDVTISFYAKANKNGIMLRSRLGNIGYKT 848

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NTUH-P15 -KFQKSISHKNWQKYS---FTFTADAIENSIQFGQSGAGIIEICAPKIESGLTLDYSEA 1221

ST46-2 -KFQKSISHKNWQKYS---FTFTADAIENSIQFGQSGAGIIEICAPKIESGLTLDYSEA 1312

ST46-1 -KFQKSISHKNWQKYS---FTFTADAIENSIQFGQSGAGIIEICAPKIESGLTLDYSEA 1159

ST76-1 GNVTLSTEIKRYVVHIPKGWTNESKQTTNEWLFNFNQEGTIWIWMPKFEISDVTDSYSEA 908

ST76-2 GNVTLSTEIKRYVVHIPKGWTNESKQTTNEWLFNFNQEGTIWIWMPKFEISDVTDSYSEA 908

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NTUH-P15 PEDIEGQISTVESTFKQRANSLDAGVSRLEGLRTRKVDISALNVAENIRQSVKSLETDT 1281

ST46-2 PEDIEGQISTVESTFKQRANSLDAGVSRLEGLRTRKVDISALNVAENIRQSVKSLETDT 1372

ST46-1 PEDIEGQISTVESTFKQRANSLDAGVSRLEGLRTRKVDISALNVAENIRQSVKSLETDT 1219

ST76-1 PEDIEGQISTVESTFKQRANSLDAGVSRLEGLRTRKADISSLNVAENIRQSVKSLETDT 968

ST76-2 PEDIEGQISTVESTFKQRANSLDAGVSRLEGLRTRKADISSLNVAENIRQSVKSLETDT 968

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NTUH-P15 QNKLNQKLSQAEFEVRAGSIRQEILNATKDKADKTLVVSEAGKLRREEFSKMKVGGRNLIWI 1341

ST46-2 QNKLNQKLSQAEFEVRAGSIRQEILNATKDKADKTLVVSEAGKLRREEFSKMKVGGRNLIWI 1432

ST46-1 QNKLNQKLSQAEFEVRAGSIRQEILNATKDKADKTLVVSEAGKLRREEFSKMKVGGRNLIWI 1279

ST76-1 QNKLNQKLSQAEFEVRAGSIRQEILNATKDKADKTLVVAEAGKLRREEFSKMKVGGRNLIWI 1028

ST76-2 QNKLNQKLSQAEFEVRAGSIRQEILNATKDKADKTLVVAEAGKLRREEFSKMKVGGRNLIWI 1028

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NTUH-P15 KSKTVGAVIEKLPENHVTGQKECYRLENNSTLTFNLEPDFSSRLYQKVTFSAWIKYENVV 1401

ST46-2 KSKTVGAVIEKLPENHVTGQKECYRLENNSTLTFNLEPDFSSRLYQKVTFSAWIKYENVV 1492

ST46-1 KSKTVGAVIEKLPENHVTGQKECYRLENNSTLTFNLEPDFSSRLYQKVTFSAWIKYENVV 1339

ST76-1 KSKTVGAVIEKLPENHVTGQKECYRLENNSTLTFNLEPDFSSRLYQKVTFSAWIKYENVV 1088

ST76-2 KSKTVGAVIEKLPENHVTGQKECYRLENNSTLTFNLEPDFSSRLYQKVTFSAWIKYENVV 1088

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NTUH-P15 QGRNFWNVFNCFKHYLFRKNSETGVQSGPDYATLGMKGSADWKYITFTYDYSEKTNFDQ 1461  
ST46-2 QGRNFWNVFNCFKHYLFRKNSETGVQSGPDYATLGMKGSADWKYITFTYDYSEKTNFDQ 1552  
ST46-1 QGRNFWNVFNCFKHYLFRKNSETGVQSGPDYATLGMKGSADWKYITFTYDYSEKTNFDQ 1399  
ST76-1 QGRNFWNVFNCFKHYLFRKNSETGVQSGPDYATLGMKGSADWKYITFTYDYSEKTNFDQ 1148  
ST76-2 QGRNFWNVFNCFKHYLFRKNSETGVQSGPDYATLGMKGSADWKYITFTYDYSEKTNFDQ 1148

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NTUH-P15 LKTSLRFNLEGATSGTAWVTGIKVEIGSVATDWSAPEDADGLITEAKATFERTAQGLRT 1521  
ST46-2 LKTSLRFNLEGATSGTAWVTGIKVEIGSVATDWSAPEDADGLITEAKATFERTAQGLRT 1612  
ST46-1 LKTSLRFNLEGATSGTAWVTGIKVEIGSVATDWSAPEDADGLITEAKATFERTAQGLRT 1459  
ST76-1 LKTSLRFNLEGATSGTAWVTGIKVEIGSVATDWSAPEDADGLITEAKATFERTAQGLRT 1208  
ST76-2 LKTSLRFNLEGATSGTAWVTGIKVEIGSVATDWSAPEDADGLITEAKATFERTAQGLRT 1208

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NTUH-P15 DLSAIQEYVNKNGQRQEALQRYTREESARQATAVRELVNRDFVGKATYQEDVKGINQRIE 1581  
ST46-2 DLSAIQEYVNKNGQRQEALQRYTREESARQATAVRELVNRDFVGKATYQEDVKGINQRIE 1672  
ST46-1 DLSAIQEYVNKNGQRQEALQRYTREESARQATAVRELVNRDFVGKATYQEDVKGINQRIE 1519  
ST76-1 DLSAIQEYVNKNGQRQEALQRYTREESTRQATAVRELVNRDFVGKATYQEDVKGINQRIE 1268  
ST76-2 DLSAIQEYVNKNGQRQEALQRYTREESTRQATAVRELVNRDFVGKATYQEDVKGINQRIE 1268

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NTUH-P15 AVKTSANKDIASQIASYRQSVDGKFTDISSQITTYKQDVGGQISGLSNRLTSSEQGTQQ 1641  
ST46-2 AVKTSANKDIASQIASYRQSVDGKFTDISSQITTYKQDVGGQISGLSNRLTSSEQGTQQ 1732  
ST46-1 AVKTSANKDIASQIASYRQSVDGKFTDISSQITTYKQDVGGQISGLSNRLTSSEQGTQQ 1579  
ST76-1 AVKTSANKDIASQIASYRQSVDGKFTDISSQITTYKQDVGGQISGLSNRLTSSEQGTQQ 1328  
ST76-2 AVKTSANKDIASQIASYRQSVDGKFTDISSQITTYKQDVGGQISGLSNRLTSSEQGTQQ 1328

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NTUH-P15 ISNISNRINSNKQGTNDQISNLKTQVATNKDNAERQMGRISDQVSANKANADSQFANVTN 1701  
ST46-2 ISNISNRINSNKQGTNDQISNLKTQVATNKDNAERQMGRISDQVSANKANADSQFANVTN 1792  
ST46-1 ISNISNRINSNKQGTNDQISNLKTQVATNKDNAERQMGRISDQVSANKANADSQFANVTN 1639  
ST76-1 ISNLSNRINSNKQGTNDQISNLKTQVATNKDNAERQMGRISDQVSANKANADSQFVNVN 1388  
ST76-2 ISNLSNRINSNKQGTNDQISNLKTQVATNKDNAERQMGRISDQVSANKANADSQFVNVN 1388

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NTUH-P15 QLARKVETTEFQRVKETSCLYERILGNTENGIADKQVARMALTNQLFQVEVAKNASNGQNL 1761  
ST46-2 QLARKVETTEFQRVKETSCLYERILGNTENGIADKQVARMALTNQLFQVEVAKNASNGQNL 1852  
ST46-1 QLARKVETTEFQRVKETSCLYERILGNTENGIADKQVARMALTNQLFQVEVAKNASNGQNL 1699  
ST76-1 QLARKVETTEFQRVKETSCLYERILGNTENGIADKQVARMALTNQLFQVEVKGYSVSGPNL 1448  
ST76-2 QLARKVETTEFQRVKETSCLYERILGNTENGIADKQVARMALTNQLFQVEVKGYSVSGPNL 1448

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NTUH-P15	LKGTKDFSGGWKNKGANWKKHAEKYKGVDFLTKNNSWNGVGQEIDAKIGEYVTFSLWMKS	1821
ST46-2	LKGTKDFSGGWKNKGANWKKHAEKYKGVDFLTKNNSWNGVGQEIDAKIGEYVTFSLWMKS	1912
ST46-1	LKGTKDFSGGWKNKGANWKKHAEKYKGVDFLTKNNSWNGVGQEIDAKIGEYVTFSLWMKS	1759
ST76-1	IK-----NSDFKNATNEWGSTQNLGRLVKHSFYHNGQKDLMRLSNATKKNENFLYSHRFNL	1503
ST76-2	IK-----NSDFKNATNEWGSTQNLGRLVKHSFYHNGQKDLMRLSNATKKNENFLYSHRFNL	1503
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NTUH-P15	DWKNDTAN-----FYVNRNGSVEKGGWVPSETS---VAITSEWKRYSTFTF	1863
ST46-2	DWKNDTVN-----FYVNRNGSVEKGGWVPSETS---VAITSEWKRYSTFTF	1954
ST46-1	DWKNDTVN-----FYVNRNGSVEKGGWVPSETS---VAITSEWKRYSTFTF	1801
ST76-1	ERNTDYVLNFRGFNNSALASYDVYILGRRAGESDGFTIVKKVVS SKKLLTSRCEDEVSVTF	1563
ST76-2	ERNTDYVLNFRGFNNSALASYDVYILGRRAGESDGFTIVKKVVS SKKLLTSRCEDEVSVTF	1563
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NTUH-P15	KITVDGFIFPRVERLNQN---TNLYIAGLKLEKGSYATPYTEAPEDTD-----EAIRS	1913
ST46-2	KITVDGFIFPRVERLNQN---TNLYIAGLKLEKGSYATPYTEAPEDTD-----EAIRS	2004
ST46-1	KITVDGFIFPRVERLNQN---TNLYIAGLKLEKGSYATPYTEAPEDTD-----EAIRS	1851
ST76-1	NSGEMDNAYIRFDNNGSSSGTADLYITEVDLYKGYKPRTWQPHPEDVVADANKKLEATQT	1623
ST76-2	NSGEMDNAYIRFDNNGSSSGTADLYITEVDLYKGYKPRTWQPHPEDVVADANKKLEATQT	1623
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NTUH-P15	VQSQLTGSWAVQNINSAGDIISGINLGANGHNRFVGLKTHITGETLIDRAVIKSAMVDKL	1973
ST46-2	VQSQLTGSWAVQNINSAGDIISGINLGANGHNRFVGLKTHITGETLIDRAVIKSAMVDKL	2064
ST46-1	VQSQLTGSWAVQNINSAGDIISGINLGANGHNRFVGLKTHITGETLIDRAVIKSAMVDKL	1911
ST76-1	KMTLLTGSWAVQNINSAGDIISGINLGANGHNRFVGLKTHITGETLIDRAVIKSAMVDKL	1683
ST76-2	KMTLLTGSWAVQNINSAGDIISGINLGANGHNRFVGLKTHITGETLIDRAVIKSAMVDKL	1683
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NTUH-P15	KTA-----ILKLVRSRLRY-----	1987
ST46-2	KTANFEAGSVTTTILDAEAVTAEKLVKNALIRKLTATDAF-----	2105
ST46-1	KTANFEAGSVTTTILDAEAVTAEKLVKNALIRKLTATDAFIDQLISKT	1960
ST76-1	KTGNFEAGSVTTTILDAEAVTAEKLVKNALIRKLTANDAFI-----	1725
ST76-2	KTGNFEAGSVTTTILDAEAVTAEKLVKNALIRKLTANDAFI-----	1725
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**Supplementary Figure S1.** Comparison of amino acid sequences of PblB in NTUH-P15, serotype 14 ST46-1, serotype 14 ST46-2, serotype 6B ST76-1 and serotype 6B ST76-2. Gray shaded area indicted predicted galactose-binding domain-like region.