

Supplementary Materials

Molecular serotype-specific identification of *Streptococcus pneumoniae* using loop-mediated isothermal amplification

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Fig. S1. Nucleotide sequence of the *S. pneumoniae* serotype-specific genes used to design the pneumococcal serotyping LAMP primers. The sequences used for the LAMP primers are indicated by arrows. (a) to (l) in the figure are the sequences for *S. pneumoniae* serotype-specific genes for serotypes 4, 6B, 9V, 14, 18C, 19F, 23F, 1, 3, 5, 7F, and 19A, respectively.

Fig. S1 (a) Target, serotype 4; GeneBank no. CR931635; Gene, *wzy*

No.	9677	9746
sequence	TTGCTTTCTA ATTATTTTTC AAATTACTGG TTTTATTTTA CAAAAGTTA GTATATATGA TTTTCTGTGA	
No.	9747	9816
sequence	TGGTATCTGA TTTTATCTTA TTTTTTATG TTTGGATTAA TTTTCAATGA GTATATGGGG TTTCAAACAA	
No.	9817	9886
sequence	CTCTGCTGTG GAGCCCTAGT AACTTCTATA ATAATGAAGA ATTATTTTCAT TCATATATTT TTATAATTTG	
No.	9887	9956
sequence pr imer	GATTTTGTTT TGTATTCTG TAGGCTATTT ATTTTTTTAT AGTGATGGAA AGGTACATTA TCATTCAGAA	-----
No.	9957	10026
sequence pr imer	GTACAAAATT ATCAGGAAAA TGAAGAGAAA ATTTTGTACA ATGCGGGTAG GATTTTAAACA GGAGTGGGCT	
	-----F3----->	-----F2-----> <-----
No.	10027	10096
sequence pr imer	TTATTTCTAG GGTAATAACT GATTCTAAAA CAGTACTAGC AGTTAGAGCG GCGAATAGCT ATTCAGCATA	
	-----LF-----	<-----F1----- -----
No.	10097	10166
sequence pr imer	TTCAGAGGCA GCTAGTTCAG GAATAATAGA TGATTTAGGA GTACTTATGC TTCCTGGTGT GTTCTCCTTG	
	-----B1-----> -----LB-----> <-----B2-----	
No.	10167	10236
sequence pr imer	TTTTATTCAG ATAAGCTGTC CCGAGTTATA AAGCGTACTA TTTTTGGGT AATGTTGTTT TACCTAATTT	
	<-----B3-----	
No.	10237	10306
sequence	TGATAATGAT CCTAACAGGA AGTCGTAAAA TCCAGGTGTT TTCAATCTTG GCGTTGGTTT TAGTATACAC	
No.	10307	10376
sequence	ACAATCTTTA GGGATTACTT TTTCGAAGAA AAGAGTACTT GTATTTTTAA TAGTAACTGT ATTTCTATTA	

Fig. S1 (b) Target, serotype 6A, 6B, 6C, 6D; GeneBank no. CR931639; Gene, *wciP*

No.	8410	8479
sequence	GGAGCTTATT ACAATTTTT TAATCTAATT GAATACGTTA AAAACAATTA TCAATTTGAT TATTACTTTT	
No.	8480	8479
sequence	TTTGTGATCA AGATGATATT TGGAAAGAGC ACAAGTTAGA AATACAGCTG TTAAGATTTT CTAAAGATGA	
No.	8550	8619
sequence	CATGCCAGAG ATGGTTTACT CTGATATGTC AACGATTGAT GCCAGTAATA ATTTGATAGA TATTAGTATA	
No.	8620	8689
sequence primer	AATAAAATAA TGGGGATTGA ATTACCGAAC ATAAATAATT TGTATTTTAT TCATGCCTAT ATCTGGGGGT -----F3-----> -----F2-----><---	
No.	8690	8759
sequence primer	GTACTGCAGG TTTTAATCAT GCATTGCTAG AGATGGTTCC TTCAGTTGAT ATTGATAAAG ATTATTTATA -----LF----- <-----F1-----	
No.	8760	8829
sequence primer	TATAGAAAAA CTGTCTCATG ATAATTATTT TGCAAAGTTT GCACTAGAGT ATGGGAAGGT GTTGTCTCTGC -----B1-----> -----LB-----> <-----	
No.	8830	8899
sequence primer	CCTGAGCAAC TGGTCTTGTA TCGAAGACAT GGACATAATG TAACAACCTAG TCATCATTTT AAATTATCTC ----B2---- <-----B3-----	
No.	8900	8969
sequence	CGCTAAATGT TTTCAGAAAG GCTATATTGG GTTTC AATGA ATTGGCACTT ACACATGCTG GGGTATATAA	
No.	8970	9039
sequence	TGAAACTCTT TATATGCTAA AAAAAGCTTC TGGAAAAAAT CCTTTAAGTG ATAGACTACT TGAAATTCAG	

Fig. S1 (c) Target, serotype 9V, 9A; GeneBank no. CR931648; Gene, *wzy*

No.	10306	10375
sequence	GTTCGGAATT TTATCATTTT TAACACAATC CAGTACAGCG ATTATATGTT ATGTGCTTTT TATTTTATG	
No.	10376	10445
sequence	CGTATGTTAG GTTTAAAGGA AAATATAGGA AAACCATATT CTTTAGTCAG TATAACTGTG TATATTTGTT	
No.	10446	10515
sequence	TTAGTTTTTC TATAATTTTT TCACAAAGTA CAATTTTATC AACTTTTACA GCAATTTTTT CCAAAAATGC	
No.	10516	10585
sequence pr i mer	AACCTTTTCA GGACGTATCA ATATTTGGCA GTTAGCGATT CGTATTTTTG AAGAAAATTT TTGGTTTGGA -----F3-----> -----F2-----	
No.	10586	10655
sequence pr i mer	AAAGGACTTA ATATTGATTT CAATGCTTGG ACAAATGGGA TTATCGTTAA CTCGCACAC AATACCTTAC -----> <-----LF----- <-----F1----- -----	
No.	10656	10725
sequence pr i mer	TAGATATACT TGCTCGAACG GGTATATTTT CGGGTATTTT ATTTGTAGTG GTTCTTCTAA GTCTATTTCT -----B1-----> -----LB-----> <-----B2-----	
No.	10726	10795
sequence pr i mer	TGGAAAATAT AGAGTAAAAT CAAAACGCT ACTGACAATG TTGATTTTTCAT TCATGGTTTA TATTACGATG ---- <-----B3-----	
No.	10796	10865
sequence	GAGGCTACAT CTGTAAGTAT TCTTCTATTA ATAATTGCTA TTTGTGTGTA TTGGTCTTTT GGAGAGGAGA	
No.	10866	10888
sequence	AGTTATATGA GCAAGTTACT TAA	

Fig. S1 (d) Target, serotype 14; GeneBank no. CR931662; Gene, *wzy*

No.	7661	7730
sequence	ATTTAGATTT TTTACACAAA CTATCATTTT TGCTTTTCTT CTAGAGGTTT TGGTACTAAG CAAATCTAGA	
No.	7731	7800
sequence	ATAGCGATTG TTGCAATGCT TATATATATA GCATTTGCAG TAGTCAATGA GATTAATTCA AACAATAAAT	
No.	7801	7870
sequence	GGCTTATTGG AATTTTCTGT CCAATTATTC CTTTTATGTT ATTTTACAAT TTTGAAAAAA TTAACAGAT	
No.	7871	7940
sequence primer	TTTTTTTCAA ATGTTTAGTT CTAGATCGGG TAGCAATGCG ACACGCTTTA GAGTGTATGA GGAATCCCTA -----F3-----	
No.	7941	8010
sequence primer	AAAGCTATTA ATGGAATGGA AATGTTACTT GGCGCAGGTG TCAGAATTCC CTCTACAGTA GATATATTAT -----> -----F2-----><-----LF----- <-----F1-----	
No.	8011	8080
sequence primer	TGGGGTCACA TTCTATGTAT ATAAGTTTTA TTTATAGGAC AGGAGTTTTA GGAAGTATAA TAATAACAGT ----- -----B1-----> ---	
No.	8081	8150
sequence primer	AATGTTTTAT TATCTGTTTT CTAAATTTTT AAAATGTGAT TCATCTGAGA GACTAAGAAG TATTGGCTAT -----LB-----> <-----B2-----	
No.	8151	8220
sequence primer	ATTCTAGCTT TGTCAGTATT TTGGCTTTTT GAAGAGTTAG ATCCACATTA TTGGTGTTTA ATTTTATTTT <-----B3-----	
No.	8221	8273
sequence	TTTCAACAAT AAGTATTTTC ATAAACAATA GAAAAGAGGA AATAGTTGGA TGA	

Fig. S1 (e) Target, serotype 18 (18A, 18B, 18C, 18F); GeneBank no. CR931673; Gene, *wzy*

No.	12718	12787
sequence	CTTAAACGAA TCGTTCTTTT GAGTGTATTA ATTATCATAC CAGTATTTTT GGTAATTTAT TGGTATGATA	
No.	12788	12857
sequence	AAAAAGTAAG TAAACTAGGG AAAGAACGAA AAATTTAAG TTTATTAAT ATCTTTTCTT TAATATTTAT	
No.	12858	12927
sequence	AACAGGAATA TTCCTTTATG TTTATAGTGT AAAATCTGAT TTTATATATA CATTATTCA AGAACATAAT	
No.	12928	12997
sequence primer	ATTAATTCGA TGGCTAGAAC AGATTTATGG AAGGGAGTTG AATCAACCTA TAATTTCGCC CCTATATTTA -----F3-----> -----F2-----> <-----LF-----	
No.	12998	13067
sequence primer	TGGGGAGAGG GATAGGGTTT GTAACAAAAT GGATGGATAA TAATTGGATG ACTTTGAATA TCAATGGTCT -- <-----F1----- -----	
No.	13068	13137
sequence primer	TACAGGGACA ATGGGGATCC ATAATGATAT TTTGAAGTAC TACATTGAGA TAGGATTTGT AGGATTATTT -----B1-----> -----LB-----> <-----B2-----	
No.	13138	13207
sequence primer	ATTTATTTTT ACACTCTTCT TTATAGAAAT GCTAAACGTA TATTTGTAAA AATTGGTCAT AAAGAATCAT <-----B3-----	
No.	13208	13277
sequence	TCATATATTT TGTATTGATA ATGTTTCAGA TGCTGATATG GTTTACAGAT AATATTTCAA TTTACCATAA	
No.	13278	13347
sequence	TTTTTTATGG ATCCTAAATC TACTACTCTT TTCTTTAACT AATTCGGATA CAGAATTGGA AAATTTAGAT	

Fig. S1 (f) Target, serotype 19F; GeneBank no. CR931678; Gene, *wzy*

No.	11370	11439
sequence	ATATTTTGG ATATACTTTT ATTAATAATT TTCTTATCTA TCGCCATAAA CGCCCTAAAG ACATATTACT	
No.	11440	11509
sequence	TTTAGTACCT TTATTAATAT TTATTTCAAA AACTTTAATA TCAGGAGGCC GGCAAGATAT TATTAATAATT	
No.	11510	11579
sequence	CTGATTGCCT ATGTAATCAT GATGTATATC CAACAAAAAC GGAAAGTTGG ATGGAATAGA GTCATATCTC	
No.	11580	11649
sequence	ATAAATATAT TCACCTTGGG TTTGTTGGTT TAATAGCAGG TATTCCAGCA TTTTACTACT CTTTGTITTTT	
primer	-----F3-----> -----F2-----<-----	
No.	11650	11719
sequence	AGCCGGTCGT TCAACGACTA GGACGCTATT TGAGAGTGTT TCGACCTATC TAGGAGGCTC AATTCAGCAT	
primer	-----LF----- <-----F1----- -----B1-----	
No.	11720	11789
sequence	TTAATCAGT ATATTGAAAA TCCATTAGAT CCTGGTGAAG TTTTGGCAG TGAAACATTG GTGCCTATAT	
primer	-----> -----LB-----<-----B2-----	
No.	11790	11859
sequence	TAAATATATT AGGGGAAATG GGCCTAGTTA ATTATCGTAG TACAATTCAT TTAGAATTTT GGACACTAGG	
primer	<-----B3-----	
No.	11860	11929
sequence	AGTACTGTA GGAAATGTTT AACTTTTTT TAGAAGACCC TTGCATGATT TTGGTCTAGT TGGTATGTAT	
No.	11930	11999
sequence	GTATTTGTCT TTGCTGTAGG TGCTTTTTT GCTATTTATT ATTTAGTTCT GAGAAAGAAA CAGGTTGGTT	

Fig. S1 (g) Target, serotype 23F; GeneBank no. CR931685; Gene, *wzy*

No.	8841							8910
sequence	CAATTACAAT	TTAGTTTCC	TATATTCTAC	TATATGTCAG	CAGAAAATAT	GACGCTAAAC	ATCAGATTGA	
No.	8911							8980
sequence	TAGTTTTGTA	TTATGGTTAG	ATCTTTTTTT	ACTTTTAATA	TCTAATACGC	GAACAGTTTA	TATAATACTA	
No.	8981							9050
sequence	GTTGTTTTTT	GGATTATTAT	TAATAGAAAT	TTTATAAATA	ATATTAATAA	AGAGCATAGA	CTGGTAGTGA	
No.	9051							9120
sequence	CAGCAACGAC	AATAGTCATC	TCTTTACTGG	CGTTAACATT	TTTTTTCAAA	CATATAATTA	ATAATAGTGA	
primer				-----F3----->				
No.	9121							9190
sequence	ATCATATAGC	CATCGAGTGT	TAGGTGTTGT	GAATTTTTTT	AAATATTATG	AATCAGATAG	GTTTCATTG	
primer	-----F2----->		<-----LF-----				<-----	
No.	9191							9260
sequence	TTTTTTGGGG	ATGCTGAATT	AGCCTTTGGA	AATACGACGA	AGGGTTATGG	ACACAATATT	AGAAGTGTGT	
primer	--F1-----		-----B1----->		-----LB----->			
No.	9261							9330
sequence	TAGGTTGGGA	TGGAACGGTA	GAGATGCCTT	TACTCAGTGT	AATGATTAAT	AATGGTTATG	TTGGGTTAGT	
primer		<-----B2-----				<-----B3-----		
No.	9331							9400
sequence	TGGTTACATT	ATAGTGCTGT	TTAAGTTTAT	ATCTTCAATA	ATCTCAGTTA	AAAATAGCAC	AAAAAAAAAT	
primer	-							
No.	9401							9470
Sequence	ATTGGATTAT	CAATCTTTAT	TCCGTTACTT	CTATCTGCAA	CAGTTGAAAA	TTATATCGTC	AACATTAGCT	
No.	9471							9540
sequence	TTGTATTCAT	GCCTGTCTGC	TTTTGTATTT	TATGTTCAAT	TAAAAATATA	AAATTAGTAA	ATAACAGAAA	

Fig. S1 (h) Target, serotype 1; GeneBank no. CR931632; Gene, *wzy*

No.	10334	10403
sequence	ACAGGGGAAA GAGATTATAT GTTTACTTTA TTCATCCTTG ATGTGATTAT ATTATTTTAC TTTCACAAAA	
No.	10404	10473
sequence	TAAAACGTTT TTATCTTGTA ATGTTAGTTC CGCTTGCGGC ACTACTGATT CCGTTATCTG CAGTTTTTAA	
No.	10474	10543
sequence	ATATACTTTA TTAAGTGCGC AAGTTTCATC TATAAATACA AATAATATTT GGTTCGATTT GCTAGATGGT	
No.	10544	10613
sequence pr imer	GAGTTTGTAT CAGCTAGTCG TAATTTACAG ATTCTGATAT TACATAATAT GGGCAATTAT TTCGAAGGTC -----F3-----> -----F2-----	
No.	10614	10683
sequence pr imer	GTTCTTTTTT TAATGACATA GTAAGAATTT TTTATAATAC GGGGTATTCT AATCAAACCTT GGTTCATGGA -> <-----LF----- <-----F1----- ---	
No.	10684	10753
sequence pr imer	CACCTTTTTT CCAAACGTAC ATTCAACCAA ATATGGTTTT ACTCTTGTGG GAGAGGGATA TGTGAATGGA -----B1-----> -----LB-----> <-----B2----- <---	
No.	10754	10823
sequence pr imer	GGATACTTTG GAATTGTAAT GATTTTTATG CTAACAGGCT TTTTGATGAG ATTTCTTTA TATAACGCTC -----B3-----	
No.	10824	10893
sequence	AAAGAAATAT ATACGGGATG CTGATATATC TGTATATGAT ACCTATTTTT ATTTATTCTA CTCGTGCTGA	
No.	10894	10963
sequence	TTTTGCTAAC ATATTATCTC CATTACTTAA ATATGCTATA TTGGGAACAT TGGTTATTGT TTTTATCAAT	

Fig. S1 (i) Target, serotype 3; GeneBank no. CR931634; Gene, *galU*

No.	8783						8852
sequence	CTGATATTAA	AGTACATTTG	GTTGGTCAAA	GTTACCACAG	TGGTCTTGGT	GACGCTGTTG	TCCAAGCGAA
No.	8853						8922
sequence	GTCTTTTGTT	GGTGACGATC	CCTTTGTTGT	AATGCTTGGT	GATGACCTTA	TGGATATCAC	CGACTCAACT
No.	8923						8992
Sequence primer	GCTGTACCTT	TAACAAGACA	ATTGATGGAT	GATTACAAGG	CAACACAGGC	TTCAACTATC	GCAGTAATGC
							-
No.	8993						9062
sequence primer	CTGTTAGATA	TGAAGATGTT	TCTTCTTATG	GTGTGATTC	TCCTAGATTG	GAAAGTAGTA	ATGGCCTCTA
	-----F3----->	-----F2----->	<-----LF-----				
No.	9063						9132
sequence primer	TAGTGTGGAT	GCTTTTGTAG	AGAAACCAAA	ACCAGAAGAA	GCGCCTAGCA	ATTTAGCTAT	TATTGGACGT
	<-----F1-----					-----	
No.	9133						9202
sequence primer	TATCTACTTA	CTCCTGAGAT	TTTTTCTATA	TTAGAAACCC	AAAAGCCAGG	AGCAGGTAAT	GAAATTCAAT
	-----B1----->	-----LB----->	<-----B2-----	<			
No.	9203						9272
sequence primer	TGACAGATGC	TATTGATACA	TTGAATAAGA	CACAGAGTGT	TTTTGCGCGT	GAATTTGTGG	GCAAACGTTA
	-----B3-----						
No.	9273						9342
sequence	TGATGTTGGT	GATAAGTTTA	ATTTTATGAA	AACATCAATT	GATTATGCTC	TTCAACATCC	TCAGATTA
No.	9343						9412
sequence	GAGAGTTTAA	AAAATTACGT	TATTGCACTT	GGTAAGCAAT	TGGAGAAGCT	AGATGACTGT	TCGTCAAGTG

Fig. S1 (j) Target, serotype 5; GeneBank no. CR931637; Gene, *wzy*

No.	6773								6842
sequence	TATCAATAAT	CTATTTTTAA	GGGTCACATC	TGAATATCGA	CCATCTAGTC	TGACTTTGGA	CTACGTTTCC		
No.	6843								6912
sequence	TCCAACCGTT	TTGTGTATTT	TGAGATCTTT	GCTAAAGAAA	TTTCAGGACA	TGAATTAACA	GGGATTGGTT		
No.	6913								6982
Sequence	ATTATTATAT	GGATAATTTT	TTTCTAGAGA	GTTTTCTCAA	TTATGGTTAT	ATAGTAGGGA	CTGCTTTTGT		
No.	6983								7052
sequence primer	TTTAATAGCC	TTGTCTCCCA	TGATTTATGC	CCTCTTGCAA	CGTTCTTCTT	CTCATCGTTT	CCGCATGCTT		
			-----F3----->	-----F2----->	<-----LF----				
No.	7053								7122
sequence primer	TTTTTAGCCC	TTGCTTTTTC	TTATACTGTC	AATGCCTTAT	TTGAAGGTTA	CGCGCCATTT	GGTCCTGGTG		
	-----	<-----F1-----	-----B1----->	-----					
No.	7123								7192
sequence primer	CCAAGAGTTT	TATTCTTTGG	TTAGTTTTTG	GTTGCCTTCT	GAATACACGA	ATTGGAAAGG	TTGGTGAACA		
	-----LB----->		<-----B2-----			<-----			
No.	7193	7208							
sequence primer	TTCTGAAACA	AGTTAG							
	---B3---								

Fig. S1 (k) Target, serotype 7F, 7A; GeneBank no. CR931643; Gene, *wzy*

No.	15065	15134
sequence	ATTATGTATC AGATAATTCG AGTTTAGTTA TTTAACAAG TTATATCGTT TCAACTCTAT ACGTAGCTGC	
No.	15135	15204
sequence	TTTGT CAGAG TAAAGATTA TTTTGTGGA ATTACCTATT ATTATTATT TGACTTTACT ATTTAAAGA	
No.	15205	15274
Sequence	TTAGGAATAA AAATACTGCT TAAAATAATA TCTATCACTT GCATAGTGGT GGTCGCTTTG GCAATCTCAA	
No.	15275	15344
sequence primer	TTCCTATTTT ATATGAATTA TTCCTATAT TTGACAATTT TTTTAAATTA GAAAATTAT TTGGCTATTC -----F3-----	
No.	15345	15414
sequence primer	AACAGGAAAC TATTCAACTA GTTCTGATTT TGGTCGGTTA AGTTCAATTG TTCAAATAAT CTCAACTATT -----> -----F2-----> <-----LF-----	
No.	15415	15484
sequence primer	TTTTATGGAG ATGTTTGGCA GACTTTATTT GGTATTGGTT TAGGAGAGGC GGAAATTTC A AAATTCCGA <-----F1----- -----B1-----> -	
No.	15485	15554
sequence Primer	TATTTAGTGG TTCCTTTTAT TATAATTACG AATACACCCA TTA CTATCTG TTCAC TTTAT CATATGTTTT -----LB-----> <-----B2-----	
No.	15555	15624
sequence primer	TATTGAGAAT GGATTTATAG GATTGTTCTT ATTCATGTTT ATGCCAATTT ACCTTGCTTT AAAGATGATT <-----B3-----	
No.	15625	15694
sequence	TTTGAGCGAG GGACATCTAA ATATGATCTT CTTCTGATAG TATTATCTAT TTCTTTATTT ATGCTCTTGT	
No.	15695	15764
sequence	TGTATAATAA TACAATGAGG TCAGAGATAT ATTATCTTTA TTTATTTGTT CTTTCATGGG GAGTTGCAAT	

Fig. S1 (l) Target, serotype 19A; GeneBank no. CR931675; Gene, *wzy*

No.	9327								9396
sequence	AAGATTTGAT	AGCTCCGCCA	GTTGTCATGT	CTGTTATGTT	TCTCATTAGT	TCTGTATTTG	CCCTTATTAA		
No.	9397								9466
sequence	TGTGCAAAAC	TGGAATATTG	AGTATAGTGG	TTAGCTTAT	CTTTTGATTA	TTAGTGGCAT	TATTGTTTTT		
No.	9467								9536
Sequence	TCAATGCCTC	TCTTGGCTCT	TAATTCGCCT	AGTCTAAATA	CCAAGATTAA	AGTGACGGAT	CGGCTCATTG		
No.	9537								9606
sequence primer	ATATCCAATT	CTGGAAAATA	GCTCTTACTA	TTATAGTTGA	CCTCATTATT	CTATATCTTT	ATAGGAGAGA		
			-----F3----->				-----		
No.	9607								9676
sequence primer	GATTCATAAT	CTTGCACTTA	GCCATGGTTA	TACGGGTTCA	AATTTTCAGT	GGTTCCTTAG	AAATGCTACC		
	----F2----->			<-----F1-----			---		
No.	9677								9746
sequence primer	AGTTATGAAG	GTGAGCTAAC	AGTGCGAACT	TCGATTCGGG	TCCTCATTGG	TATCATTGAC	GTATCTGCTT		
	-----B1----->	-----LB----->				<-----B2-----			
No.	9747								9816
sequence Primer	ATATTTTTGG	ATATACTTTT	ATTAATAATT	TCTTCATTTA	TAGTCATAAA	CGCTCTAAAG	ATTTACTGCT		
	-----			<-----B3-----					
No.	9817								9886
sequence	CTTAGTTCCA	TTCTTGATTT	TTATTTCTAA	AACCTTATTA	TCTGGGGGTA	GATTGGATAT	TATAAAAATT		
No.	9887								9956
sequence	TTAATTGCGT	ATGTTGTAAT	GGCCTATATT	CAGCAAAAAC	GAAAAGTTGG	CTGGGATAAG	GTCATCTCCC		

Fig. S2. Sequence data of amplified products of the pneumococcal-serotype-specific LAMP. (a) to (l) in the figure are the sequences for the amplified products of *S. pneumoniae* serotype-specific genes for serotypes 4, 6B, 9V, 14, 18C, 19F, 23F, 1, 3, 5, 7F, and 19A, respectively.

(a)

TCTAAACAG TACTAGCAGT TAGAGCGGCG AATAGCTATT
CAGCATATTC AGAGGCAGC

(b)

TAATCATGCA TTGCTAGAGA TGGTTCCTTC AGTTGATATT
GATAAAGATT ATTTATATAT AGAAAACTG TCTCATGATA
ATTATTTTGC AAAG

(c)

CCCGTTCGAG CAAGTATATC TAGTACACAC AATACCTTAC
TAGATATACT TGCTCGAACG GG

(d)

CTACAGTAGA TATTTTATTG GGGTCACATT CTATGTATAT
AAGTTTTATT TATAGGACAG GAGTTTTAGG AAGTATAATA A

(e)

GGAGAGGGAT AGGGTTTGTA ACAAATGGA TGGATAATAA
TTGGATGACT TTGAATATCA ATGGTCTTAC AGGGACAATG GG

(f)

CGACTAGGAC GCTATTTGAG AGTGTTTCGA CCTATCTAGG
AGGCTCAATT CAGCATTTTA ATCA

(g)

GGTTTCATTT GTTTTTTGGG GATGCTGAAT TAGCCTTTGG
AAATACGACG AAGGG

(h)

ACGGGGTATT CTAATCAAAC TTGGTTTATG GACACCTTTT
TTCCAAACGT

(i)

GTTGATGCTT TTGTAGAGAA ACCAAAACCA GAAGAAGCGC
CTAGCAATTT AGCTATTATT GGACGTTATC TACTTACTCC TGA

(j)

TGCTTTTTCT TATACTGTCA ATGCCTTATT TGAAGGTTAC
GCGCCATTT

(k)

TTTTATGGAG ATGTTTGGCA GACTTTATTT GGTATTGGTT
TAGGAGAGGC GGAAATTTCA AAAATTCC

(l)

ACGGGTTCAA ATTTTCAGTG GTTCTTTAGA AATGCTACCA
GTTATGAAGG TGAGCTAACA