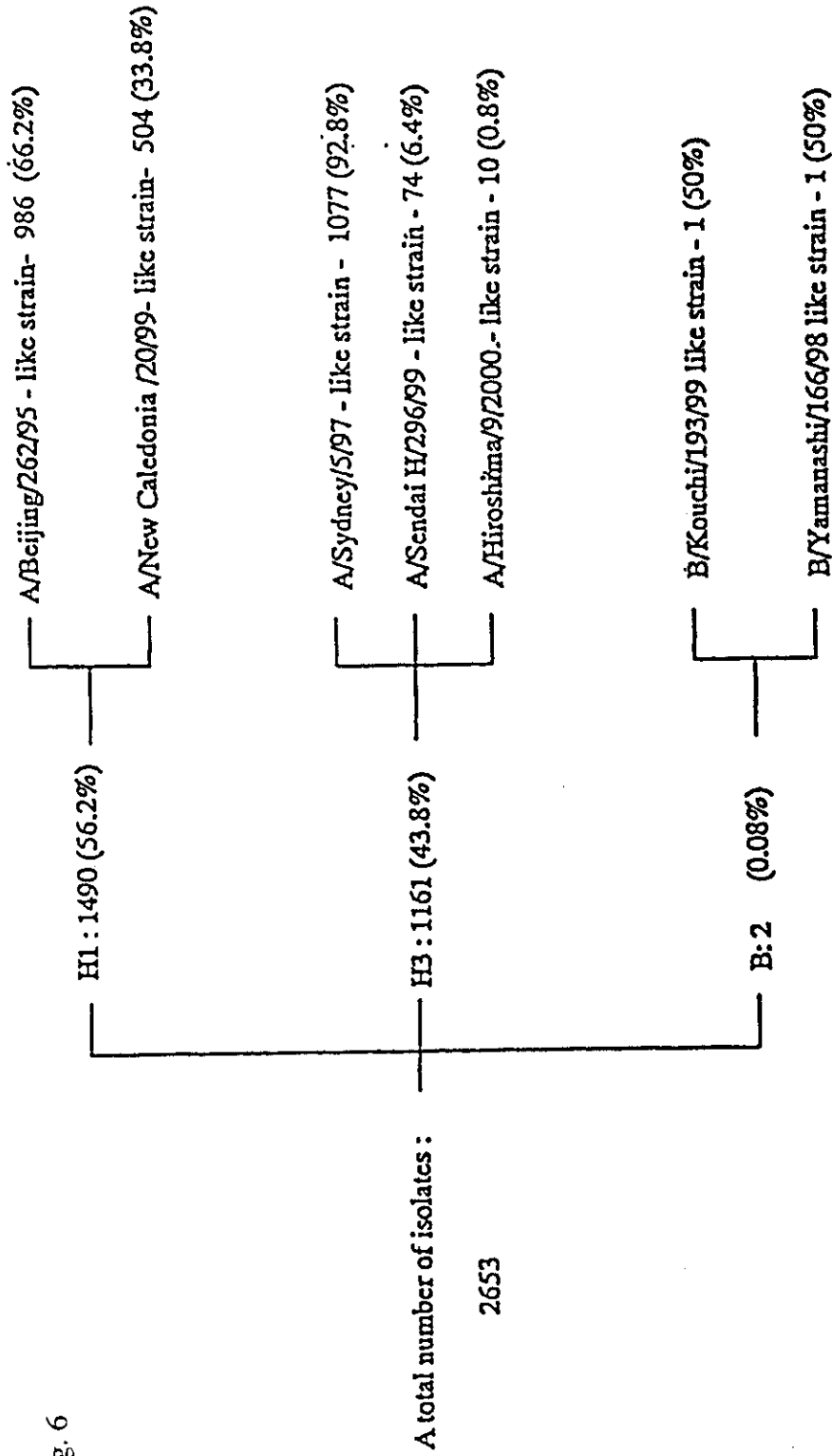


Fig. 6



Oct 1999 - January 2000 Months

NUMBER OF VIRUS ISOLATES AND ITS PROPORTION OF H1N1, H2N2 AND B VIRUS VARIANTS

Fig. 7-1

H1N1 Influenza HA protein (HA1 domain)

97/98 isolates  
98/99 isolates  
99/2000 isolates

Beijing/262/95	1:DTICIGYHANNSTDTVTVLEIQAVTTHSVNLLSDSHNGKLCULKGLAPLQLGKCSVAGVILGNPFCELSIKESHSYIVETPNPENGTCYFGYADYEE
Wuhan/371/95	1:.....N.....
HongKong/398/97	1:.....L.....
Karbin/04/97	1:.....L.....
Hubei/24/97	1:.....L.....
GuYwu/380/97	1:.....L.....
Hongol/742/97	1:.....L.....
Ibaraki/39/98	1:.....L.....
Ulan-Ude/207/98	1:.....L.....
Ulan-Ude/209/98	1:.....N.....
Jingjun/3/98	1:.....L.....
HongKong/503/98	1:.....L.....
Fukuoka/C-7/98	1:.....L.....
Gunma/1708/98	1:.....L.....
Kanagawa/92/98	1:.....Y.....
Hong Kong/831/98	1:.....L.....
Hogano/2020/98	1:.....N.....
Tokyo/65/99	1:.....L.....
Ishikawa/42/98	1:.....L.....
Ishikawa/43/98	1:.....L.....
Ibaraki/66/99	1:.....K.....
Peru/1798/99	1:.....L.....
New Caledonia/20/99	1:.....L.....D.....
Sendai/140/99	1:.....L.....
SendaiH/1544/99	1:.....L.....
Chiba/1042/99	1:.....L.....
Korea/292/99	1:.....L.....
Osaka/c-1/99	1:.....L.....K.....
Kobe/314/99	1:.....L.....
Bayern/07/95	1:.....R...T.....
Nagasaki/42/96	1:..M.....R...T.....P.....A...K.....
Johannesburg/82/96	1:.....N.....R...T.....P.....A.....
Hongol/756/97	1:.....R...T.....F.....A.....H.....
North Carolina/2/98	1:.....R...T.....F.....A.....
Ekaterinburg/848/98	1:.....R...T.....X.....F.....A.....
Montpellier/1025/98	1:.....R...T.....I.....F.....A.....H.....
Lyon/250/98	1:.....R...T.....I.....F.....A.....
Astrakhan/38/98	1:.....R...T.....I.....F.....A.....
Moscow/13/98	1:.....R...T.....I.....F.....A.....

Fig. 7-2

Beijing/262/95	101:LRQLSSVSFERFEIPEPSSRNHTVT-CVTASCSHGKSSFYRLLMLTEKNGLYPNLSNSYVNNKEVILVLCGVHHPNIGVQRRAIYHTENAYVS
Wuhan/371/95	101:.....S.....K.....P..D.....
HongKong/398/97	101:.....S.....K.....D.....
Harbin/04/97	101:.....S.....K.....G.....D.....
Hubei/24/97	101:.....S.....K.....G.....N.....
Guivuu/380/97	101:.....S.....K.....D.....
Hongol/742/97	101:.....S.....K.....E.....
Ibaraki/39/98	101:.....S.....K.....D.....G.....
Ulan-Ude/207/98	101:.....S.....K.....G.....R.....
Ulan-Ude/209/98	101:.....S.....X.....K.....D.....H.....
Jingjun/3/98	101:.....S.....K.....P.....
HongKong/503/98	101:.....S.....X.....K.....D.....
Fukuoka/C-7/98	101:.....S.....G.....KP.....P..D.....
Gunma/1708/98	101:.....S.....G.....K.....P..D.....
Xangagawa/92/98	101:.....S.....G.....K.....P..N.....
Hong Kong/811/98	101:.....S.....X.....K.....D.....
Nagano/2020/98	101:.....S.....X.....K.....D.....
Tokyo/65/99	101:.....S.....R.....G.....T:D.....
Ishikawa/42/98	101:.....S.....R.....K.....P..D..L.....
Ishikawa/43/98	101:.....S.....G.....K.....P..D..L.....
Ibaraki/66/99	101:.....S.....I..G.....S..K.....P..D..L.....
Peru/1798/99	101:.....S.....K.....D.....
NewCaledonia/20/99	101:.....S.....G.....K.....P..D..L.....(aa125 N/T; aa187 D/N)
Sendai/140/99	101:.....S.....G.....K.....P..D..L.....
SendaiH/1544/99	101:.....S.....G.....K.....P..D..L.....
Chiba/1042/99	101:.....S.....G.....K..A.....P..D..L.....
Korea/292/99	101:.....S.....R.....K..A.....P..D..L.....
Osaka/C-1/99	101:.....S.....G.....K..A.....P..D..L.....
Kobe/314/99	101:.....S.....G.....K..A.....P..D..L.....
Bayern/07/95	101:.....X...A.....K.....D.....
Nagasaki/42/96	101:.....R.....K.....D.....
Johannesburg/82/96	101:.....K.....K.....D.....
Mongol/756/97	101:.....X...A.....K.....D.....
North Carolina/2/98	101:.....K.....K.....G.....M.D.....
Ekaterinburg/848/98	101:.....K.....G.....RD.....
Montpellier/1025/98	101:.....A..K.....K.....F..K.....D.....
Lyon/250/98	101:.....K.....K.....G.....H.D.....
Astrakhan/38/98	101:.....K.....K.....I..K.....RD.....
Moscow/11/98	101:.....K.....K.....D.....

Fig. 7-3

Beijing/262/95	201:VWSSHYSRPFTPEIAKRPKVRGQEGRNYYHTLLEFGDTIFEANGWLIAPWYAFALSRFGSGIITSNAPMNECDAMKCTPQCAINSLSLPFQWVHPVTI
Huhan/371/95	201:.....D.....
HongKong/398/97	201:.....D.....D.....T.....
Harbin/04/97	201:.....D.....D.....
Hubei/24/97	201:.....D.....D.....D.....
Guivm/380/97	201:.....D.....D.....D.....D.....
Hongol/742/97	201:.....D.K.....I.....G.....
Ibaraki/39/98	201:.....N.....D.....I.....
Ulan-Ude/207/98	201:.....A.....D.....
Ulan-Ude/209/98	201:.....V.....D.....D.....D.....
Jiangjun/3/98	201:.....T.....D.....D.....D.....
HongKong/503/98	201:.....T.....D.....D.....D.....
Fukuoka/C-7/98	201:.....D.....D.....G.....
Gunma/1708/98	201:.....D.....D.....G.....
Kanagawa/92/98	201:.....N.....D.....G.....
Hong Kong/831/98	201:.....D.....D.....D.....D.....
Nagano/2020/98	201:.....D.....D.....D.....I.....
Tokyo/65/99	201:.....D.....D.....G.....
Ishikawa/42/98	201:.....D.....D.....D.....
Ishikawa/43/98	201:.....D.....D.....D.....
Ibaraki/66/99	201:.....D.....D.....D.....
Peru/1798/99	201:.....T.....D.....D.....D.....
New Caledonia/20/99	201:.....D.....D.....D.....D.....
Sendai/140/99	201:.....D.....D.....D.....D.....
SendaiH/1544/99	201:.....D.....D.....D.....D.....
Chiba/1042/99	201:.....D.....D.....D.....D.....
Korea/292/99	201:.....D.....D.....D.....D.....
Osaka/C-1/99	201:.....D.....D.....D.....D.....
Kobe/314/99	201:.....D.....D.....D.....D.....
Bayern/07/95	201:.....S.G.....
Nagasaki/42/96	201:.....I.D.....S.G.....
Johannesburg/82/96	201:.....DR.....S.G.....
Mongol/756/97	201:.....S.G.....
North Carolina/2/98	201:L.....D.....S.G.....
Ekaterinburg/848/98	201:.....D.....L.....S.G.....
Montpellier/1025/98	201:.....N.....S.G.....
Lyon/250/98	201:L.....D.....S.G.....
Astrakhan/38/98	201:.....N.....S.G.....
Moscow/13/98	201:.....N.....E.....S.G.....

Fig. 7-4

Beijing/262/95	301:GECFKYVRSFKLRHVVTGLRNIPSIQS
Wuhan/371/95	301:.....A.....
HongKong/398/97	301:.....A.....
Harbin/04/97	301:.....A.....
Hubei/24/97	301:.....A.....
Guiwu/380/97	301:.....A.....
Hongol/742/97	301:.....A.....
Ibaraki/39/98	301:.....A.....
Ulan-Ude/207/98	301:.....A.....
Ulan-Ude/209/98	301:.....A.....
Jingjun/3/98	301:.....A.....
HongKong/503/98	301:.....A.....
Fukuoka/C-7/98	301:.....A.....
Gunma/1708/98	301:.....A.....
Kanagawa/92/98	301:.....A.....
Hong Kong/831/98	301:.....A.....
Nagano/2020/98	301:.....A.....
Tokyo/65/99	301:.....A.....
Ishikawa/42/98	301:.....A.....
Ishikawa/43/98	301:.....A.....
Ibaraki/66/99	301:.....A.....
Peru/1798/99	301:.....A.....
New Caledonia/20/99	301:.....A.....
Sendai/140/99	301:.....A.....
SendaiH/1544/99	301:.....A.....
Chiba/1042/99	301:.....A.....
Korea/292/99	301:.....A.....
Osaka/C-1/99	301:.....A.....
Kobe/314/99	301:.....A.....
Bayern/07/95	301:.....A.....
Nagasaki/42/96	301:.....A.....
Johannesburg/82/96	301:.....A.....
Hongol/756/97	301:.....A.....
North Carolina/2/98	301:.....A.....
Ekaterinburg/848/98	301:.....A.....
Montpellier/1025/98	301:.....A.....
Lyon/250/98	301:.....A.....
Astrakhan/38/98	301:.....A.....
Moscow/13/98	301:.....A.....

Fig. 8

# Influenza A H1HA gene

1999/2000 isolates

1998/1999 isolates

1997/1998 isolates

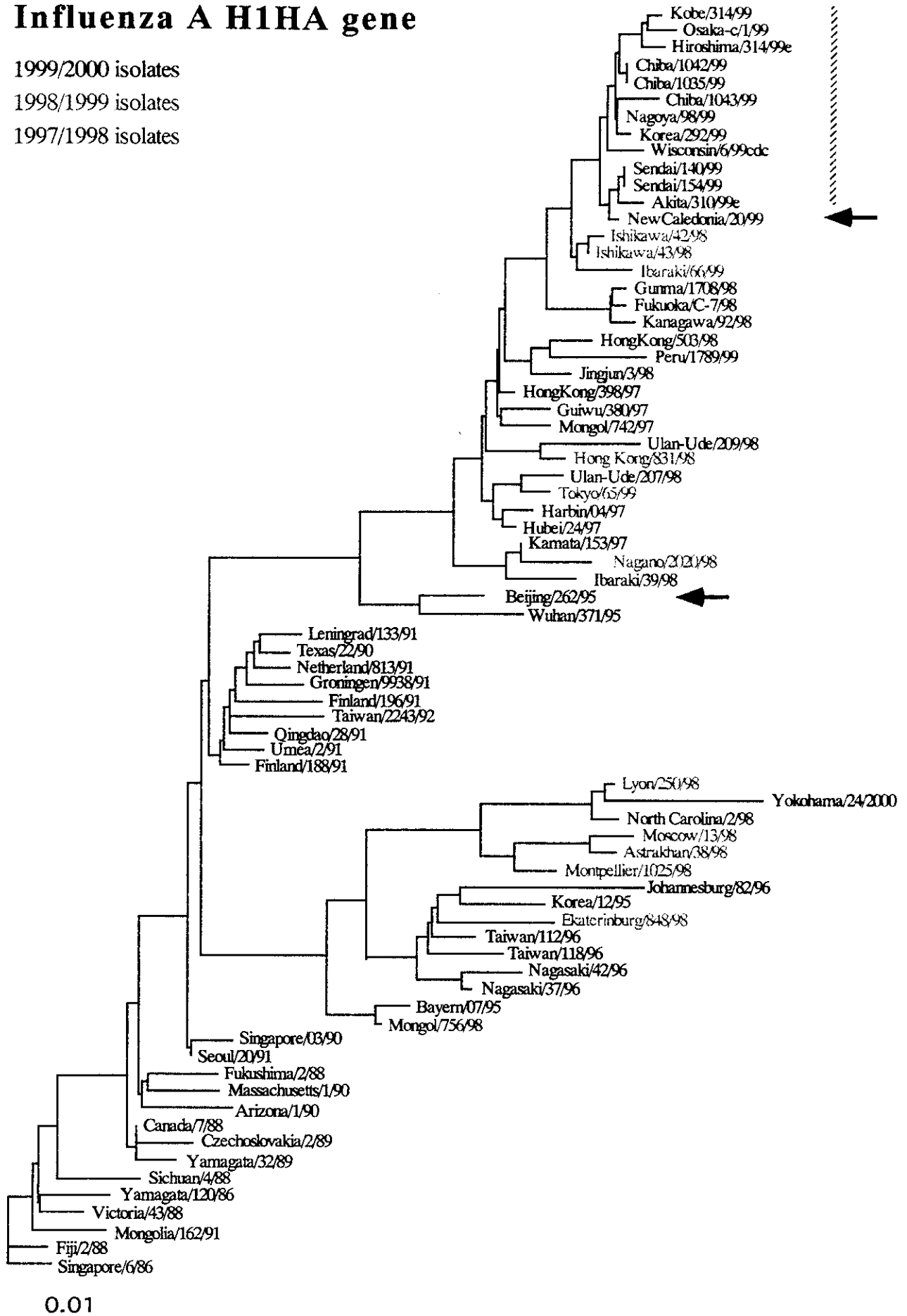


Fig. 9-1

Human H3N2 influenza HA protein (HA1 domain)

1997/1998 isolates  
 1998/1999 isolates  
 1999/2000 isolates

Sydney/5/97	1:QKIPGNDNSTATLCLGHBVAVPNCGLVKTITNDQIEVTVNATELVQSSSTGRICDSPHRIIDGENCECTLIDALLGDPHCDCGFQNKENWDLFVRSKAYSNCYPY
Wakayama/1477/98	1:..L.....
Yokohama/8/98	1:..LS.....
Hiroshima/C1/98	1:..L.....
Tokyo/156/98	1:..L.....
Lyon/Chu/2228/98	1:..L.....
Johannesburg/3/98	1:..L.....
Canada/1/98	1:..L.....
Sichuan/346/98	1:..L.....
Okinawa/222/98	1:..L.....
Argentina/413/98	1:..L.....
Niigata/2685/98	1:..F.....
Kanagawa/99/98	1:..L.....N.....
Okinawa/289/98	1:..L.....N.....
Saga/156/99	1:..L.....S.....
Fukushima/67/99	1:..L.....K.....Q.....
Hiroshima/136/99	1:..L.....K.....Q.....
SendaiH/296/99	1:..L.....K.....Q.....
Wakayama/1818/99	1:..L.....K.....Q.....
Wakayama/1818/99(E)	1:..L.....K.....Q.....
Auckland/28/99(E)	1:..L.....K.....Q.....
Auckland/28/99(H)	1:..L.....K.....Q.....
Shanghai/42/99	1:..L.....K.....Q.....
Moscow/10/99	1:..L.....K.....Q.....
Panama/2007/99	1:..L.....S.....Q.....
Pusan/253/99	1:..L.....S.....Q.....
Hiroshima/C-174/99	1:..L.V.....H.....Q.....T.....
Osaka/2396/99	1:..ITV.....H.....Q.....T.....
Shiga/82/99	1:..L.....Q.....
Shizuoka/86/99	1:..L.....Q.....
Hokkaido/91/99	1:..L.....Q.....
Sapporo/303/99	1:..L.....Q.....
Sapporo/304/99	1:..L.....Q.....

Fig. 9-2

Sydney/5/97	101: DVPDYASLRSLSVASSGTLFEFNNESTNWTGVAQNGTSYACRBSIKSFFSRUNWHLQKXKYPALNVTHEPNDKFDKLYIWCVHBPSTDSQTSIYAQASG
Wakayama/1477/98	101: .....F...R.....L.....
Yokohama/8/98	101: .....F...R.....L.....
Hiroshima/C1/98	101: .....S...R.....L...F..
Tokyo/158/98	101: .....T.....R.....A.L.....
Lyon/Chu/2228/98	101: .....R.....L.....
ohannesburg/3/98	101: .....R.....L.....
Canada/1/98	101: .....S...R.....L.....
Sichuan/346/98	101: .....R.....N.....F.....L.....
Okinawa/222/98	101: .....F...R.....L.....
Argentina/413/98	101: .....S...R.....L.....
Niigata/2685/98	101: .....S...I.....L.....
Kanagawa/99/98	101: .....I.....S...R.....L.....
Okinawa/289/98	101: .....I.....S...R.....F.....L.....
Saga/156/99	101: .....F...R.V.....L.....
Fukushima/67/99	101: .....S...R.....R.....L.....
Hiroshima/136/99	101: .....S...R.....R.....L.....
SendaiH/296/99	101: .....S...R.....R.....L.....
Wakayama/1818/99	101: .....S...R.....R.....L.....
Wakayama/1818/99 (E)	101: .....S...R.....R.....L.....
Auckland/28/99 (E)	101: .....SS...R.....N.R.....A.L..P...
Auckland/28/99 (H)	101: .....S...R.....R.....L.....
Fukuoka/c-58/98	101: .....T.....R.....L.....
Shanghai/42/99	101: .....R.....NR.....V..L.V...
Moscow/10/99	101: .....S...R.....R.....L.T.....
Panama/2007/99	101: .....S...R.N.....E.....L.....
Pusan/253/99	101: .....P...R.....L.....
Hiroshima/c-174/99	101: .....S...R.....E.....I.L.....
Osaka/2396/99	101: .....S...R.....E.....I.L.....
Shiga/82/99	101: .....S...R.N.....E.....I.L.....
Shizuoka/86/99	101: .....D..S...R.N.....E.....I.L.....
Hokkaido/91/99	101: .....S...R.N.....E.....I.L.....
Sapporo/303/99	101: .....S...R.N.....E.....I.L.....
Sapporo/304/99	101: .....S...R.N.....E.....I.L.....



Fig. 9-3

Sydney/5/97	201:RVTVTKRSQQTVIPNIGSRPHYRGISSRISIHWTIVKPGDILLINSTGNLIAPRGYFKIRSGKSSIHRSDAPIGKCNSECITPNGSIPNDKPFQVNRRI
Wakayama/1477/98	201:.....DV.....Y.....
Yokohama/8/98	201:.....V.....Y.....
Hiroshima/C1/98	201:.....V.....Y.....
Tokyo/158/98	201:.....V.....Y.....S.....L.....
Lyon/Chu/2228/98	201:.....S.....V.....X.....
Johannesburg/3/98	201:.....V.....X.....
Canada/1/98	201:.....V.....X.....
Sichuan/346/98	201:.....G.....V.....Y.....
Okinawa/222/98	201:.....V.....G.....Y.....S.....
Argentina/413/98	201:.....V.....K.....Y.....
Nilgata/2685/98	201:.....V.....Y.....
Kanagawa/99/98	201:.....V.....Y.....
Okinawa/289/98	201:.....V.....Y.....L.....
Fukuoka/c-58/98	201:.....V.....Y.....K.....
Saga/156/99	201:.....V.....Y.....
Fukushima/67/99	201:.....V.....Y.....
Hiroshima/136/99	201:.....V.....Y.....
SendaiH/296/99	201:.....V.....X.....Y.....
Wakayama/1818/99	201:.....V.....X.....Y.....
Wakayama/1818/99(E)	201:.....V.....X.....Y.....
Auckland/28/99(E)	201:.....V.....Y.....
Auckland/28/99(H)	201:.....V.....Y.....L.....
Fukuoka/c-58/98	201:.....V.....Y.....
Shanghai/42/99	201:.....V.....Y.....
Moscow/10/99	201:.....V.....Y.....
Panama/2007/99	201:.....V.....Y.....K.....
Pusan/253/99	201:.....V.....Y.....N.....
Hiroshima/c-174/99	201:.....V.....Y.....N.....
Osaka/2396/99	201:.....V.....Y.....C.....S.....
Shiga/82/99	201:.....V.....Y.....R.....
Shizuoka/86/99	201:.....I.....V.....Y.....
Hokkaido/91/99	201:.....I.....V.....Y.....
Sapporo/303/99	201:.....I.....V.....Y.....
Sapporo/304/99	201:.....I.....V.....Y.....D.....

Fig. 9-4

Sydney/5/97	301:TYGACPRVVKQNTLKLATGCHRVPEKQT
Wakayama/1477/98	301:.....
Yokohama/8/98	301:.....
Hiroshima/C1/98	301:.....
Tokyo/158/98	301:.....
Lyon/Chu/2228/98	301:.....
Johannesburg/3/98	301:.....
Canada/1/98	301:.....
Sichuan/346/98	301:.....
Okinawa/227/98	301:.....
Argentina/413/98	301:.....
Niigata/2685/98	301:.....
Kanagawa/99/98	301:.....
Okinawa/289/98	301:.....
Saga/156/99	301:.....
Fukushima/67/99	301:.....
Hiroshima/136/99	301:.....
SendaiH/457/99	301:.....
Wakayama/1818/99	301:.....
Wakayama/1818/99(E)	301:.....
Auckland/28/99(E)	301:.....
Auckland/28/99(H)	301:.....
Fukuoka/c-58/98	301:.....
Shanghai/42/99	301:.....
Moscow/10/99	301:.....
Panama/2007/99	301:.....
Pusan/253/99	301:.....
Hiroshima/c-174/99	301:.....
Osaka/2396/99	301:.....
Shiga/82/99	301:.....
Shizuoka/86/99	301:.....
Hokkaido/91/99	301:.....
Sapporo/303/99	301:.....
Sapporo/304/99	301:.....

Fig. 10

# Influenza A H3N2 HA gene

1999/2000 isolates

1998/1999 isolates

1997/1998 isolates

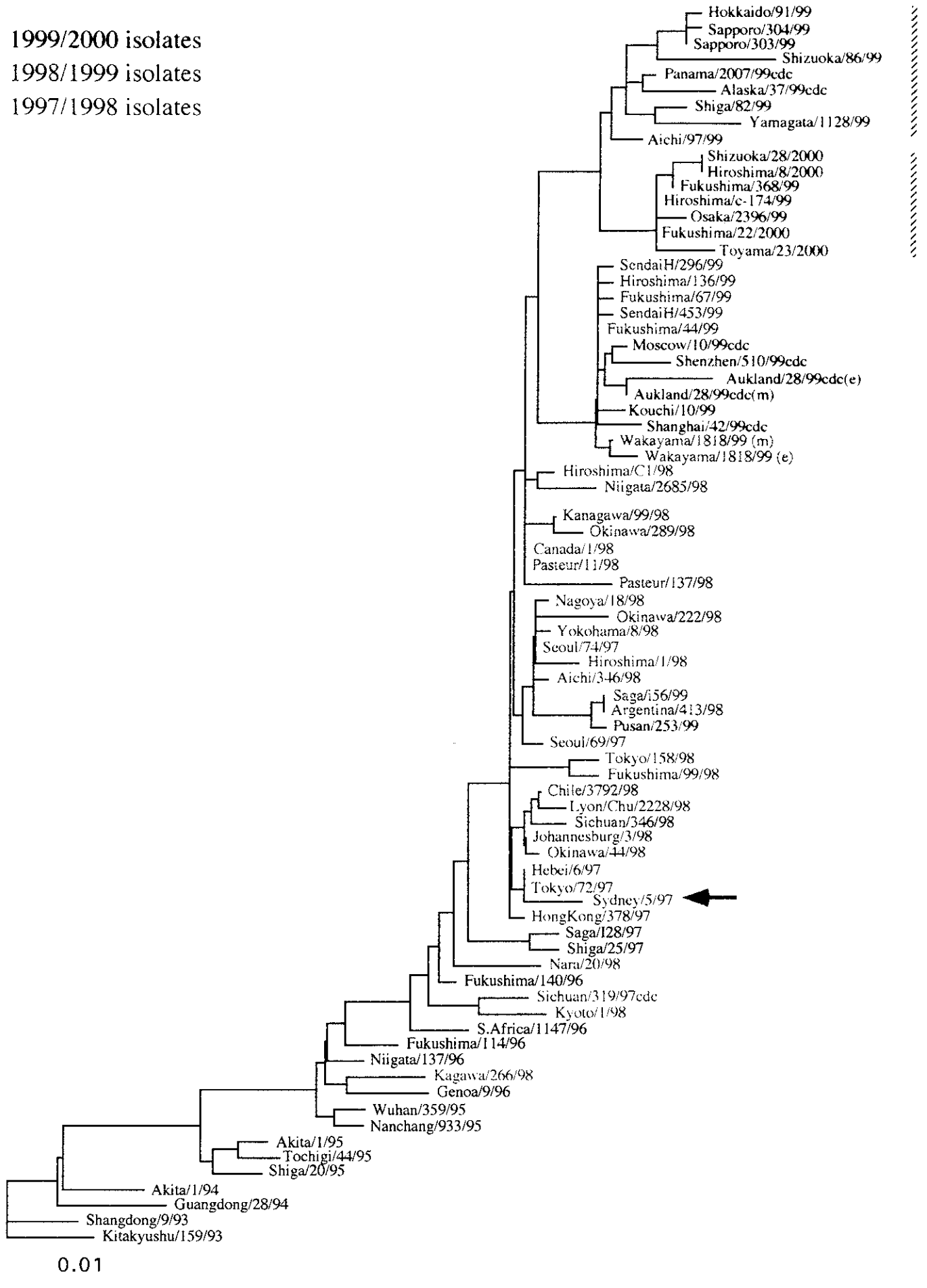




Fig. 11-2

Yamagata/16/88-like

Beijing/184/93  
 Sapporo/1/96  
 Tokyo/942/96  
 Nagasaki/1/96  
 Alaska/12/96  
 Argentina/218/97  
 Shiga/TJ30/98  
 Nagano/2038/98  
 Yamagata/166/98  
 Kouchi/193/98  
 Tokyo/6/98  
 Yokohama/17/98  
 Hong Kong/885/98  
 Lyon/CHU/11024/98  
 Poitiers/1510/98  
 Hiroshima/246/99  
 Hiroshima/252/99  
 Kouchi/193/99  
 St Petersburg/65/99  
 Kouchi/378/99  
 Kouchi/361/99  
 Fukushima/220/99  
 Pasteur/266/99  
 Shizane/241/99  
 JingJun/64/99(E)  
 Johannesburg/45/99(E)  
 S.Australia/5/99(E)  
 Victoria/50/99(E)

Victoria/2/87-like

Guangdong/08/93  
 Osaka/491/97  
 Nara/4/97  
 Shiga/56/97  
 Beijing/243/97  
 Henan/22/97  
 Shangdong/07/97  
 Chiba/447/98  
 Shiga/44/98  
 Shiga/51/98  
 Shizuoka/1/98  
 Shizuoka/20/98  
 Nagoya/20/99

Fig. 11-3

Yamagata/16/88-like

Beijing/184/93  
 Sapporo/1/96  
 Tokyo/942/96  
 Nagasaki/1/96  
 Aizawa/12/96  
 Argentina/218/97  
 Shiga/T30/98  
 Nagano/2038/98  
 Yamanashi/166/98  
 Kouchi/193/98  
 Tokyo/6/98  
 Yokohama/1/98  
 Hong Kong/885/98  
 Lyon/CHU/11024/98  
 Poitiers/1510/98  
 Hiroshima/246/99  
 Hiroshima/252/99  
 Kouchi/193/99  
 St Petersburg/65/99  
 Kouchi/378/99  
 Kouchi/361/99  
 Fukushima/220/99  
 Pasteur/266/99  
 Shimane/241/99  
 JingJun/64/99(E)  
 Johannesburg/45/99(E)  
 S.Australia/5/99(E)  
 Victoria/50/99(E)

Victoria/2/87-like

Guangdong/08/93  
 Osaka/491/97  
 Nara/4/97  
 Shiga/56/97  
 Beijing/243/97  
 Benan/22/97  
 Shangdong/07/97  
 Chiba/447/98  
 Shiga/44/98  
 Shiga/51/98  
 Shizuoka/1/98  
 Shizuoka/20/98  
 Nagoya/20/99

Fig. 11-4

Yamagata/16/88-like

Beijing/184/93	300:CGLNKSPYTTGEBAKAIGNCFYVWXTPLKLANCTYRPPAKLKER
Sapporo/1/96	300:.....
Tokyo/942/96	300:.....
Nagasaki/1/96	300:.....
Alaska/12/96	300:.....
Argentina/218/97	299:.....
Shiga/T30/98	299:.....
Nagano/2038/98	300:.....
Yamanashi/166/98	299:.....
Kouchi/193/98	300:.....
Tokyo/6/98	300:.....
Yokohama/17/98	300:.....
Hong Kong/885/98	300:.....
Lyon/CHU/11024/98	300:.....
Poitiers/1510/98	300:.....
Hiroshima/246/99	300:.....
Hiroshima/252/99	300:.....
Kowchi/193/99	300:.....
St Petersburg/65/99	300:.....
Kouchi/378/99	300:.....
Kouchi/361/99	300:.....
Fukushima/220/99	300:.....
Pasteur/266/99	300:.....
Shimane/241/99	300:.....
JingJun/64/99(E)	300:.....
Johannesburg/45/99(E)	300:.....
S.Australia/5/99(E)	300:.....
Victoria/50/99(E)	300:.....
Victoria/2/87-like	
Guandong/08/93	301:.....N.....
Osaka/491/97	301:.....
Nara/4/97	301:.....
Shiga/56/97	301:.....
Beijing/243/97	301:.....
Henan/22/97	301:.....
Shangdong/07/97	301:.....
Chiba/447/98	301:.....
Shiga/44/98	301:.....
Shiga/51/98	301:.....
Shizuoka/1/98	301:.....
Shizuoka/20/98	301:.....
Nagoya/20/99	301:.....

Fig. 12

# Influenza B HA gene

1999/2000 isolates

1998/1999 isolates

1997/1998 isolates

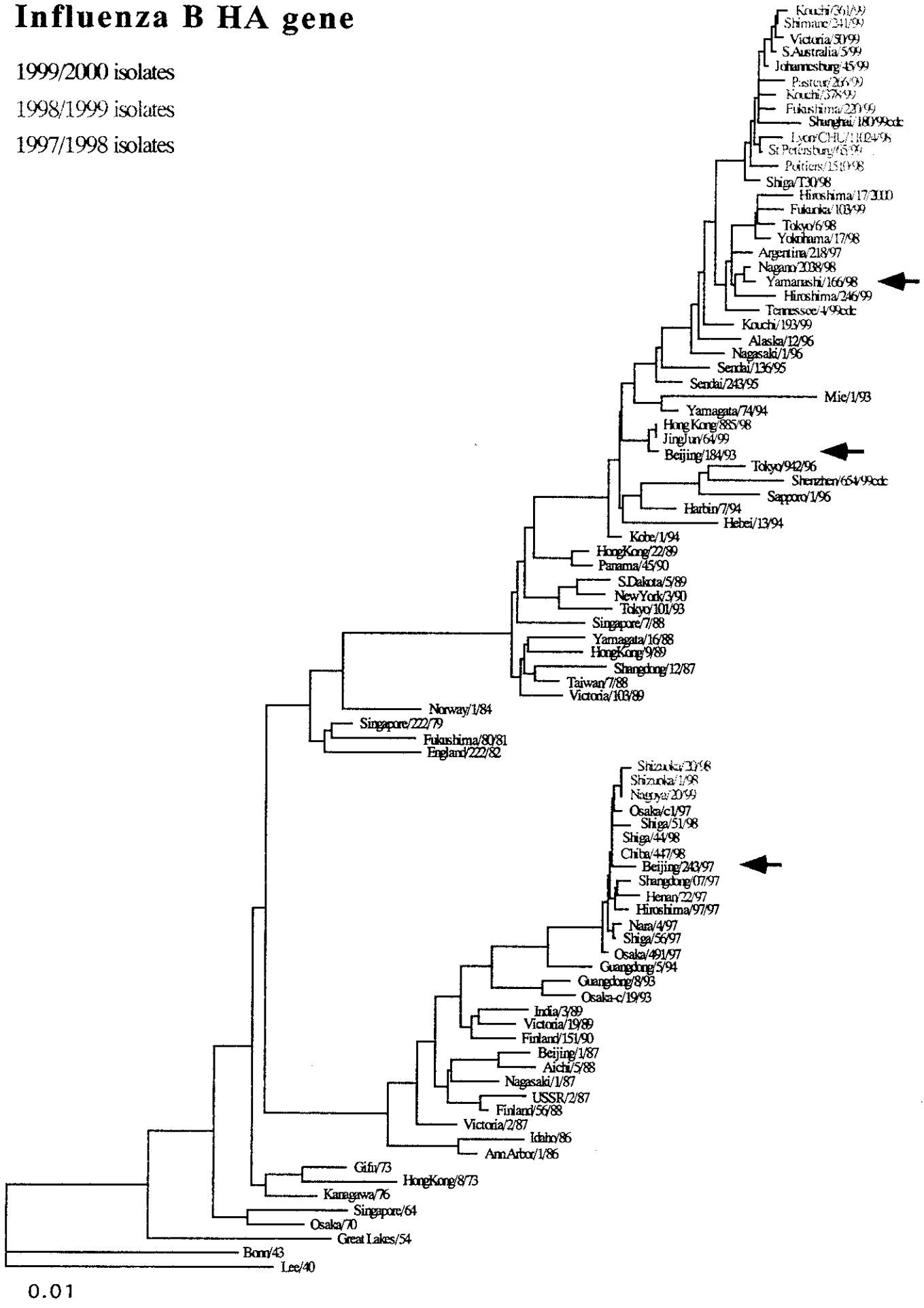




Fig. 13

R. Nerome et al.

LEE40	501:CTTCAACACAAATGGCTGGGT	ATCCCAAAA--GACAACAACAGACAGCAATAATCCAGTAAC	GTAGAGTACCATACATTTGTTTCAGAGGGAA	597
GL54	501:....G.A.....C	.....A.....G.....T.....G.....	.....A.A...A...A...	591
ENG22282	501:....GCA.....C	G.....A.....CG.....T.....	.....A.A...A...A...	594
VIC287	501:....GCA.....C	G.....AAC.....C.....T.....	.....A.A...A...A...	600
YAM1688	501:....GCA.....C	G.....GG.....A.....CG.....C.....	.....CA.A...A...A...	594
BK16390	501:....GCA.....C	G.....GG.....A.....CG.C.C.C.....	.....A.A...A...A...	594
MIE193	501:T...GCA.....C	G.....GG.....A.....CG.T.C.C.....	.....A.A...A...A.G.	597
TOK10193	501:....GCA.....C	G.....GG.....A.....CG.C.C.C.....	.....A.A...A...A...	597
OSA1993	501:....GCA.....C	G.....AAC.....A.....C...T.T.....	.....A.A...A...A...	600
KOB194	501:T...GCA.....C	G.....GG.....A.....CG.....C.....	.....A.A...A...A...	597
YAM7494	501:T...GCA.....C	G.....GG.....G.....A.....CG.....C.....	.....A.A...A...A.G.	597
HEB1394	501:T...GCA.....C	G.T...GG.....C.A.....CG.....C.....	.....A.CA...A...A...	597
HEB1994	501:T...GCA.....C	G.....GG.....A.....CG.....C.....	.....G.A...A...A...	597
HAR794	501:T...TGCA.....C	G.....GG.....G.....A.....CG.....C.....	.....G...A...A...A...	597
KAG1594	501:....GCA.....C	G.....AAC...G.....A.....C...T.T.....	.....A...G...A...A...	600
SEN13695	501:T...GCA.....C	G.....GG.....G.....A.....CG.....C.....	.....A.A...A...A...	597
SEN24095	501:T...GCA.....C	G.....GG.....G.....A.....CG.....C.....	.....A.A...A...A...	597
SEN24395	501:T...GCA.....C	G.....GG.....G.....A.....CG.....C.....	.....A.A...A...A...	597
ALA1296	501:T...GCA.....C	G.....GG.....A.....CG.C.C.C.....	.....C...A.A...AA...	597
NAG196	501:T...GCA.....C	G.....GG.....A.....CG.....C.....	.....C...A.A...AA...	597
TOK94296	501:T...GCA.....C	G.....G.....A.AT...CG.....C.....	.....G...A...A...A...	597
SAP196	501:T...GCA.....C	G.....G.....A.AT...CG.....C.....	.....G...A...A...A...	597
OSA49197	501:....GCA.....C	CG.....AAC.....A.....C...T.T.....	.....A...A...A...A...	600
BEI24397	501:....GTA.....CCG	.....AAC.....T.....C...T.T.....	.....A...A...A...A...	600

Lineages		160	174
I	LEE40	IPK-DNNKTAINPVT	
I	GL54	...---...M..L.	
II (I)	ENG22282	V...-...T..L.	
III	VIC287	V..N.....T..L.	
II (II)	YAM1688	V.R-...-...T..L.	
II (II)	BK16390	V.R-...-...T..L.	
II (III)	MIE193	V.R-...-...TI.L.	
II (II)	TOK10193	V.R-...-...T..L.	
III	OSA1993	V..N.....T.SL.	
II (III)	KOB194	V.R-...-...T..L.	
II (III)	YAM7494	V.R-.D...T..L.	
II (III)	HEB1394	V.R-...Q...T..L.	
II (III)	HEB1994	V.R-...-...T..L.	
II (III)	HAR794	V.R-.D...T..L.	
III	KAG1594	V..N.S...T.SL.	
II (III)	SEN13695	V.R-.D...T..L.	
II (III)	SEN24095	V.R-.D...T..L.	
II (III)	SEN24395	V.R-.D...T..L.	
II (III)	ALA1296	V.R-...-...T..L.	
II (III)	NAG196	V.R-...-...T..L.	
II (III)	TOK94296	V...-...N.T..L.	
II (III)	SAP196	V...-...N.T..L.	
III	OSA49197	V..N.....T.SL.	
III	BEI24397	V..N.....T.SL.	

Fig. 4. Partial nucleotide and deduced amino acid sequences of the deletion and insertion region of the HA1 domain of the hemagglutinin genes of influenza B viruses and their relation to determined evolutionary pathways. Broken lines in the sequences indicate deletion positions

Fig. 14

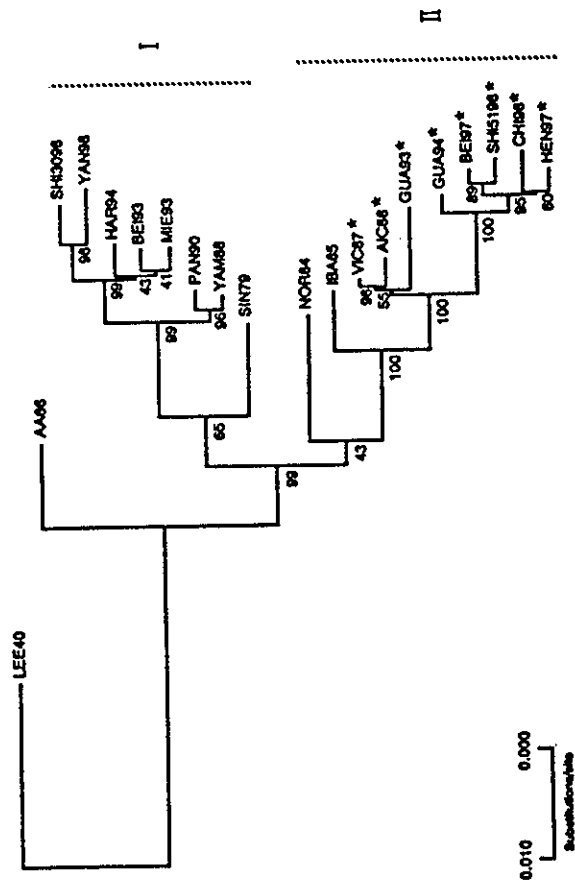


Fig. 1. Phylogenetic tree of the PB2 gene of influenza B viruses isolated from 1940 to 1998. This tree was constructed by the neighbour-joining method. Internal branching probabilities were determined by bootstrap analysis using 500 replications and are indicated by a percentage value on each branch. Viruses belonging to the Victoria-like HA lineage are indicated with an asterisk (\*). Dendrograms of the PB2 gene were also constructed by maximum-parsimony and maximum-likelihood methods using PHYLIP software version 3.57c (Felsenstein, 1995) (not shown) and were identical to that shown.

Fig. 15

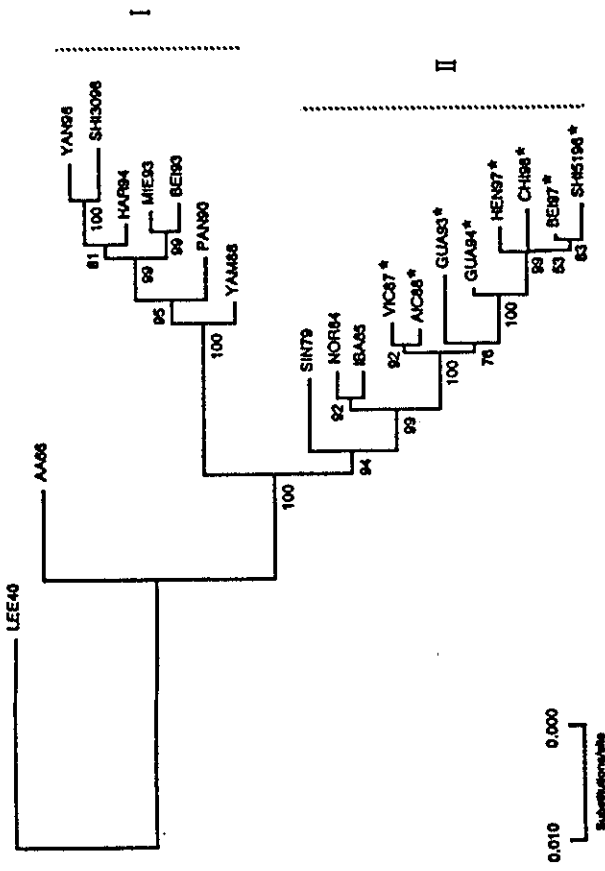


Fig. 2. Phylogenetic tree of the PB1 gene of influenza B viruses isolated from 1940 to 1998. This tree was constructed by the neighbour-joining method. Internal branching probabilities were determined by bootstrap analysis using 500 replications and are indicated by a percentage value on each branch. Viruses belonging to the Victoria-like HA lineage are indicated with an asterisk (\*). Dendrograms of the PB1 gene were also constructed by maximum-parsimony and maximum-likelihood methods using PHYLIP software version 3.57c (Felsenstein, 1995) (not shown) and were identical to that shown.

Fig. 16

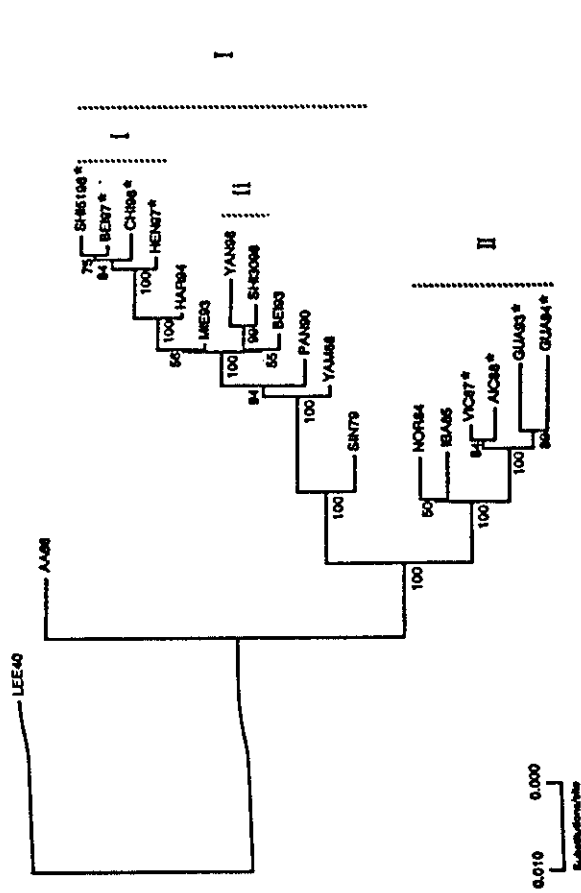


Fig. 3. Phylogenetic tree of the PA gene of influenza B viruses isolated from 1940 to 1998. This tree was constructed by the neighbour-joining method. Internal branching probabilities were determined by bootstrap analysis using 500 replications and are indicated by a percentage value on each branch. Viruses belonging to the Victoria-like HA lineage are indicated with an asterisk (\*). Dendrograms of the PA gene were also constructed by maximum-parsimony and maximum-likelihood methods using PHYLIP software version 3.57c (Felsenstein, 1995) (not shown) and were identical to that shown.