

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003						
Virus isolate: PAK/18/2002	Reported by: N.J. Knowles						
Material used: 10% epi. susp.	Signed (file copy only):						
Region sequenced: VP1	Seq. filename: PAK02-18						
RT-PCR primer set: O-1C272F/NK61							
Topotype: ME-SA	No. of ambiguities: 0						
Genotype/strain: not defined	Date seq. last updated: 15/07/2003						
No. of nt determined / no. in gene: 639 / 639	Total no. of comparisons made: 1291						
Comments:							
Ten Most Closely Related Viruses							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/19/2002	PAK02-19	635	630	4	99.21	0.79
2	O/PAK/16/2002	PAK02-16	639	631	0	98.75	1.25
3	O/PAK/15/2002	PAK02-15	639	631	0	98.75	1.25
4	O/IRN/18/2001	IRN01-18	431	422	11	97.91	2.09
5	O/IRN/8/2001	IRN01-08	183	177	14	96.72	3.28
6	O/IRN/6/2003	IRN03-06	638	617	1	96.71	3.29
7	O/IRN/4/2003	IRN03-04	637	616	2	96.70	3.30
8	O/IRN/55/2001	IRN01-55	597	577	0	96.65	3.35
9	O/IRN/8/2003	IRN03-08	639	617	0	96.56	3.44
10	O/PAK/1/2003	PAK03-01	639	617	0	96.56	3.44
Relationships to Reference Virus Strains							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/TAW/2/99	TAW99-02	639	579	0	90.61	9.39
2	O/IND/53/79	IND79A53	639	568	0	88.89	11.11
3	O1/Manisa/TUR/69	TUR69--E	639	565	0	88.42	11.58
4	O/ISR/1/88	ISR88-01	193	170	5	88.08	11.92
5	O/IND/R2/75*	IND75--A	639	562	0	87.95	12.05
6	O/MOR/1/91	MOR91-01	207	181	3	87.44	12.56
7	O/TAI/189/87*	TAI87--B	527	453	3	85.96	14.04
8	O/HKN/6/83	HKN83-06	637	517	2	81.16	18.84
9	O/PHI/5/95	PHI95-05	516	416	6	80.62	19.38
10	O1/BFS 1860/UK/67	UKG67--A	639	512	0	80.13	19.87
nt, nucleotides							
*, not a WRLFMD reference number							

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003						
Virus isolate: PAK/19/2002	Reported by: N.J. Knowles						
Material used: 10% epi. susp.	Signed (file copy only):						
Region sequenced: VP1	Seq. filename: PAK02-19						
RT-PCR primer set: O-1C272F/NK61							
Topotype: ME-SA	No. of ambiguities: 4						
Genotype/strain: not defined	Date seq. last updated: 15/07/2003						
No. of nt determined / no. in gene: 635 / 639	Total no. of comparisons made: 1291						
Comments:							
Ten Most Closely Related Viruses							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/18/2002	PAK02-18	635	630	4	99.21	0.79
2	O/PAK/16/2002	PAK02-16	635	626	4	98.58	1.42
3	O/PAK/15/2002	PAK02-15	635	626	4	98.58	1.42
4	O/IRN/18/2001	IRN01-18	427	417	15	97.66	2.34
5	O/IRN/6/2003	IRN03-06	634	612	5	96.53	3.47
6	O/IRN/4/2003	IRN03-04	634	612	5	96.53	3.47
7	O/IRN/8/2003	IRN03-08	635	612	4	96.38	3.62
8	O/IRN/61/2001	IRN01-61	634	611	5	96.37	3.63
9	O/IRN/55/2001	IRN01-55	597	575	0	96.31	3.69
10	O/PAK/1/2003	PAK03-01	635	611	4	96.22	3.78
Relationships to Reference Virus Strains							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/TAW/2/99	TAW99-02	635	575	4	90.55	9.45
2	O/IND/53/79	IND79A53	635	565	4	88.98	11.02
3	O1/Manisa/TUR/69	TUR69--E	635	562	4	88.50	11.50
4	O/ISR/1/88	ISR88-01	189	167	9	88.36	11.64
5	O/IND/R2/75*	IND75--A	635	561	4	88.35	11.65
6	O/MOR/1/91	MOR91-01	204	178	6	87.25	12.75
7	O/TAI/189/87*	TAI87--B	524	450	6	85.88	14.12
8	O/HKN/6/83	HKN83-06	633	513	6	81.04	18.96
9	O/PHI/5/95	PHI95-05	512	414	10	80.86	19.14
10	O1/BFS 1860/UK/67	UKG67--A	635	509	4	80.16	19.84
nt, nucleotides							
*, not a WRLFMD reference number							

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003
Virus isolate: PAK/1/2003	Reported by: N.J. Knowles
Material used: 10% epi. susp.	Signed (file copy only):
Region sequenced: VP1	Seq. filename: PAK03-01
RT-PCR primer set: O-1C272F/NK61	
Topotype: ME-SA	No. of ambiguities: 0
Genotype/strain: not defined	Date seq. last updated: 15/07/2003
No. of nt determined / no. in gene: 639 / 639	Total no. of comparisons made: 1291

Comments:

Ten Most Closely Related Viruses

Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/IRN/18/2001	IRN01-18	431	422	11	97.91	2.09
2	O/PAK/16/2002	PAK02-16	639	623	0	97.50	2.50
3	O/PAK/15/2002	PAK02-15	639	623	0	97.50	2.50
4	O/IRN/6/2003	IRN03-06	638	620	1	97.18	2.82
5	O/IRN/4/2003	IRN03-04	637	619	2	97.17	2.83
6	O/IRN/55/2001	IRN01-55	597	580	0	97.15	2.85
7	O/IRN/52/2001	IRN01-52	551	535	15	97.10	2.90
8	O/IRN/8/2003	IRN03-08	639	620	0	97.03	2.97
9	O/IRN/61/2001	IRN01-61	638	618	1	96.87	3.13
10	O/PAK/18/2002	PAK02-18	639	617	0	96.56	3.44

Relationships to Reference Virus Strains

Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/TAW/2/99	TAW99-02	639	583	0	91.24	8.76
2	O/IND/53/79	IND79A53	639	573	0	89.67	10.33
3	O/IND/R2/75*	IND75--A	639	566	0	88.58	11.42
4	O1/Manisa/TUR/69	TUR69--E	639	566	0	88.58	11.42
5	O/ISR/1/88	ISR88-01	193	168	5	87.05	12.95
6	O/MOR/1/91	MOR91-01	207	179	3	86.47	13.53
7	O/TAI/189/87*	TAI87--B	527	451	3	85.58	14.42
8	O1/BFS 1860/UK/67	UKG67--A	639	523	0	81.85	18.15
9	O/HKN/6/83	HKN83-06	637	513	2	80.53	19.47
10	O/PHI/5/95	PHI95-05	516	413	6	80.04	19.96

nt, nucleotides

*, not a WRLFMD reference number

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O (+A)	Date: 15/07/2003						
Virus isolate: PAK/12/2003	Reported by: N.J. Knowles						
Material used: RS2	Signed (file copy only):						
Region sequenced: VP1	Seq. filename: PAK03-12						
RT-PCR primer set: O-1C272F/NK61 & A-1C562F/NK61							
Topotype: ME-SA	No. of ambiguities: 1						
Genotype/strain: not defined	Date seq. last updated: 15/07/2003						
No. of nt determined / no. in gene: 638 / 639	Total no. of comparisons made: 1291						
Comments: <i>Only the type O component could be amplified using either our standard O or A primer sets</i>							
Ten Most Closely Related Viruses							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/17/2003	PAK03-17	637	636	2	99.84	0.16
2	O/PAK/1/98	PAK98-01	503	501	8	99.60	0.40
3	O/PAK/16/2003	PAK03-16	638	634	1	99.37	0.63
4	O/PAK/14/2003	PAK03-14	637	633	2	99.37	0.63
5	O/IND/279/97*	IND97-AU	158	146	0	92.41	7.59
6	O/LEB/A/95	LEB95--A	197	182	1	92.39	7.61
7	O/IND/31/97 (1996)*	IND96-AA	162	149	3	91.98	8.02
8	O/NEP/90/96	NEP96-90	342	314	1	91.81	8.19
9	O/NEP/64/96	NEP96-64	301	276	2	91.69	8.31
10	O/IND/174/99*	IND99-AG	201	184	0	91.54	8.46
Relationships to Reference Virus Strains							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O1/Manisa/TUR/69	TUR69--E	638	577	1	90.44	9.56
2	O/TAW/2/99	TAW99-02	638	572	1	89.66	10.34
3	O/IND/R2/75*	IND75--A	638	570	1	89.34	10.66
4	O/IND/53/79	IND79A53	638	568	1	89.03	10.97
5	O/MOR/1/91	MOR91-01	207	177	3	85.51	14.49
6	O/ISR/1/88	ISR88-01	193	164	5	84.97	15.03
7	O/TAI/189/87*	TAI87--B	526	440	4	83.65	16.35
8	O1/BFS 1860/UK/67	UKG67--A	638	518	1	81.19	18.81
9	O/HKN/6/83	HKN83-06	636	511	3	80.35	19.65
10	O/PHI/5/95	PHI95-05	515	405	7	78.64	21.36
nt, nucleotides							
*, not a WRLFMD reference number							

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003						
Virus isolate: PAK/14/2003	Reported by: N.J. Knowles						
Material used: BTY1	Signed (file copy only):						
Region sequenced: VP1	Seq. filename: PAK03-14						
RT-PCR primer set: O-1C272F/NK61							
Topotype: ME-SA	No. of ambiguities: 1						
Genotype/strain: not defined	Date seq. last updated: 15/07/2003						
No. of nt determined / no. in gene: 638 / 639	Total no. of comparisons made: 1291						
Comments:							
Ten Most Closely Related Viruses							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/12/2003	PAK03-12	637	633	2	99.37	0.63
2	O/PAK/17/2003	PAK03-17	637	631	2	99.06	0.94
3	O/PAK/16/2003	PAK03-16	638	631	1	98.90	1.10
4	O/PAK/1/98	PAK98-01	503	497	8	98.81	1.19
5	O/LEB/A/95	LEB95--A	197	180	1	91.37	8.63
6	O/NEP/90/96	NEP96-90	343	313	0	91.25	8.75
7	O/IND/279/97*	IND97-AU	158	144	0	91.14	8.86
8	O/NEP/64/96	NEP96-64	302	275	1	91.06	8.94
9	O/IND/174/99*	IND99-AG	201	183	0	91.04	8.96
10	O/IND/31/97 (1996)*	IND96-AA	162	147	3	90.74	9.26
Relationships to Reference Virus Strains							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O1/Manisa/TUR/69	TUR69--E	638	573	1	89.81	10.19
2	O/TAW/2/99	TAW99-02	638	568	1	89.03	10.97
3	O/IND/R2/75*	IND75--A	638	567	1	88.87	11.13
4	O/IND/53/79	IND79A53	638	564	1	88.40	11.60
5	O/MOR/1/91	MOR91-01	207	175	3	84.54	15.46
6	O/ISR/1/88	ISR88-01	193	163	5	84.46	15.54
7	O/TAI/189/87*	TAI87--B	526	437	4	83.08	16.92
8	O1/BFS 1860/UK/67	UKG67--A	638	516	1	80.88	19.12
9	O/HKN/6/83	HKN83-06	636	508	3	79.87	20.13
10	O/PHI/5/95	PHI95-05	515	402	7	78.06	21.94
nt, nucleotides							
*, not a WRLFMD reference number							

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003						
Virus isolate: PAK/16/2003	Reported by: N.J. Knowles						
Material used: BTY1	Signed (file copy only):						
Region sequenced: VP1	Seq. filename: PAK03-16						
RT-PCR primer set: O-1C272F/NK61							
Topotype: ME-SA	No. of ambiguities: 0						
Genotype/strain: not defined	Date seq. last updated: 15/07/2003						
No. of nt determined / no. in gene: 639 / 639	Total no. of comparisons made: 1291						
Comments:							
Ten Most Closely Related Viruses							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/12/2003	PAK03-12	638	634	1	99.37	0.63
2	O/PAK/17/2003	PAK03-17	638	633	1	99.22	0.78
3	O/PAK/1/98	PAK98-01	504	499	7	99.01	0.99
4	O/PAK/14/2003	PAK03-14	638	631	1	98.90	1.10
5	O/IND/279/97*	IND97-AU	158	147	0	93.04	6.96
6	O/IND/31/97 (1996)*	IND96-AA	162	150	3	92.59	7.41
7	O/LEB/A/95	LEB95--A	197	182	1	92.39	7.61
8	O/IND/424/97 (1996)*	IND96-AJ	165	152	0	92.12	7.88
9	O/IND/414/97 (1996)*	IND96-AF	165	152	0	92.12	7.88
10	O/IND/205/99*	IND99-AI	165	152	0	92.12	7.88
Relationships to Reference Virus Strains							
Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O1/Manisa/TUR/69	TUR69--E	639	578	0	90.45	9.55
2	O/TAW/2/99	TAW99-02	639	574	0	89.83	10.17
3	O/IND/R2/75*	IND75--A	639	572	0	89.51	10.49
4	O/IND/53/79	IND79A53	639	570	0	89.20	10.80
5	O/MOR/1/91	MOR91-01	207	176	3	85.02	14.98
6	O/ISR/1/88	ISR88-01	193	164	5	84.97	15.03
7	O/TAI/189/87*	TAI87--B	527	442	3	83.87	16.13
8	O1/BFS 1860/UK/67	UKG67--A	639	520	0	81.38	18.62
9	O/HKN/6/83	HKN83-06	637	513	2	80.53	19.47
10	O/PHI/5/95	PHI95-05	516	405	6	78.49	21.51
nt, nucleotides							
*, not a WRLFMD reference number							

Report from the Molecular Epidemiology Section of the Experimental Epidemiology Group to the Head of the World Reference Laboratory for FMD (Non-QAU Form)

Serotype: O	Date: 15/07/2003
Virus isolate: PAK/17/2003	Reported by: N.J. Knowles
Material used: BTY1	Signed (file copy only):
Region sequenced: VP1	Seq. filename: PAK03-17
RT-PCR primer set: O-1C272F/NK61	
Topotype: ME-SA	No. of ambiguities: 1
Genotype/strain: not defined	Date seq. last updated: 15/07/2003
No. of nt determined / no. in gene: 638 / 639	Total no. of comparisons made: 1291

Comments:

Ten Most Closely Related Viruses

Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O/PAK/12/2003	PAK03-12	637	636	2	99.84	0.16
2	O/PAK/1/98	PAK98-01	503	500	8	99.40	0.60
3	O/PAK/16/2003	PAK03-16	638	633	1	99.22	0.78
4	O/PAK/14/2003	PAK03-14	637	631	2	99.06	0.94
5	O/IND/279/97*	IND97-AU	158	146	0	92.41	7.59
6	O/LEB/A/95	LEB95--A	197	182	1	92.39	7.61
7	O/NEP/90/96	NEP96-90	342	315	1	92.11	7.89
8	O/NEP/64/96	NEP96-64	302	278	1	92.05	7.95
9	O/IND/31/97 (1996)*	IND96-AA	162	149	3	91.98	8.02
10	O/IND/174/99*	IND99-AG	201	184	0	91.54	8.46

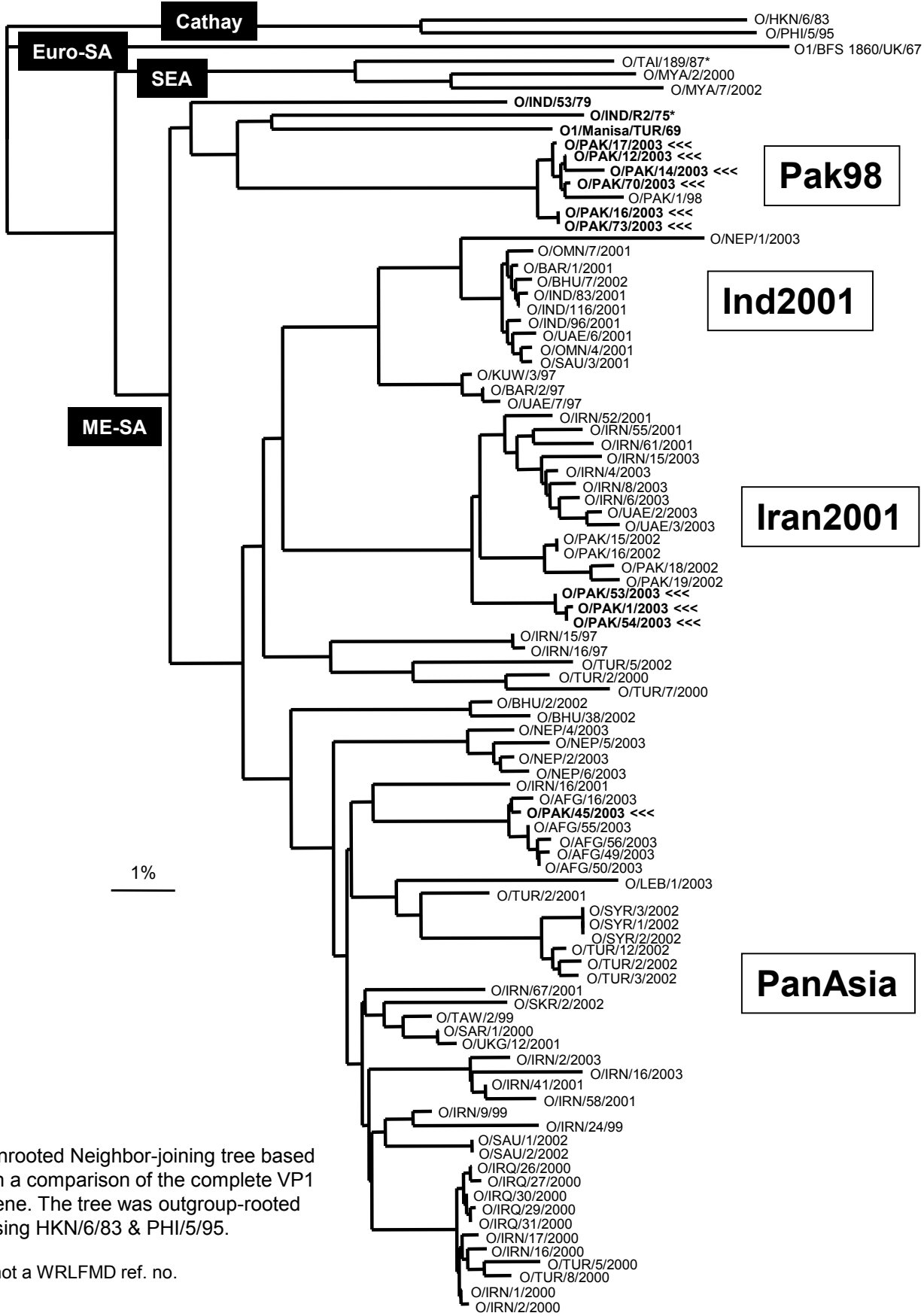
Relationships to Reference Virus Strains

Pos.	Virus name	Filename	No. nt compared	No. nt matched	No. of ambiguities	% Identity	% Difference
1	O1/Manisa/TUR/69	TUR69--E	638	579	1	90.75	9.25
2	O/TAW/2/99	TAW99-02	638	573	1	89.81	10.19
3	O/IND/R2/75*	IND75--A	638	572	1	89.66	10.34
4	O/IND/53/79	IND79A53	638	569	1	89.18	10.82
5	O/MOR/1/91	MOR91-01	207	177	3	85.51	14.49
6	O/ISR/1/88	ISR88-01	193	164	5	84.97	15.03
7	O/TAI/189/87*	TAI87--B	526	441	4	83.84	16.16
8	O1/BFS 1860/UK/67	UKG67--A	638	518	1	81.19	18.81
9	O/HKN/6/83	HKN83-06	636	512	3	80.50	19.50
10	O/PHI/5/95	PHI95-05	515	406	7	78.83	21.17

nt, nucleotides

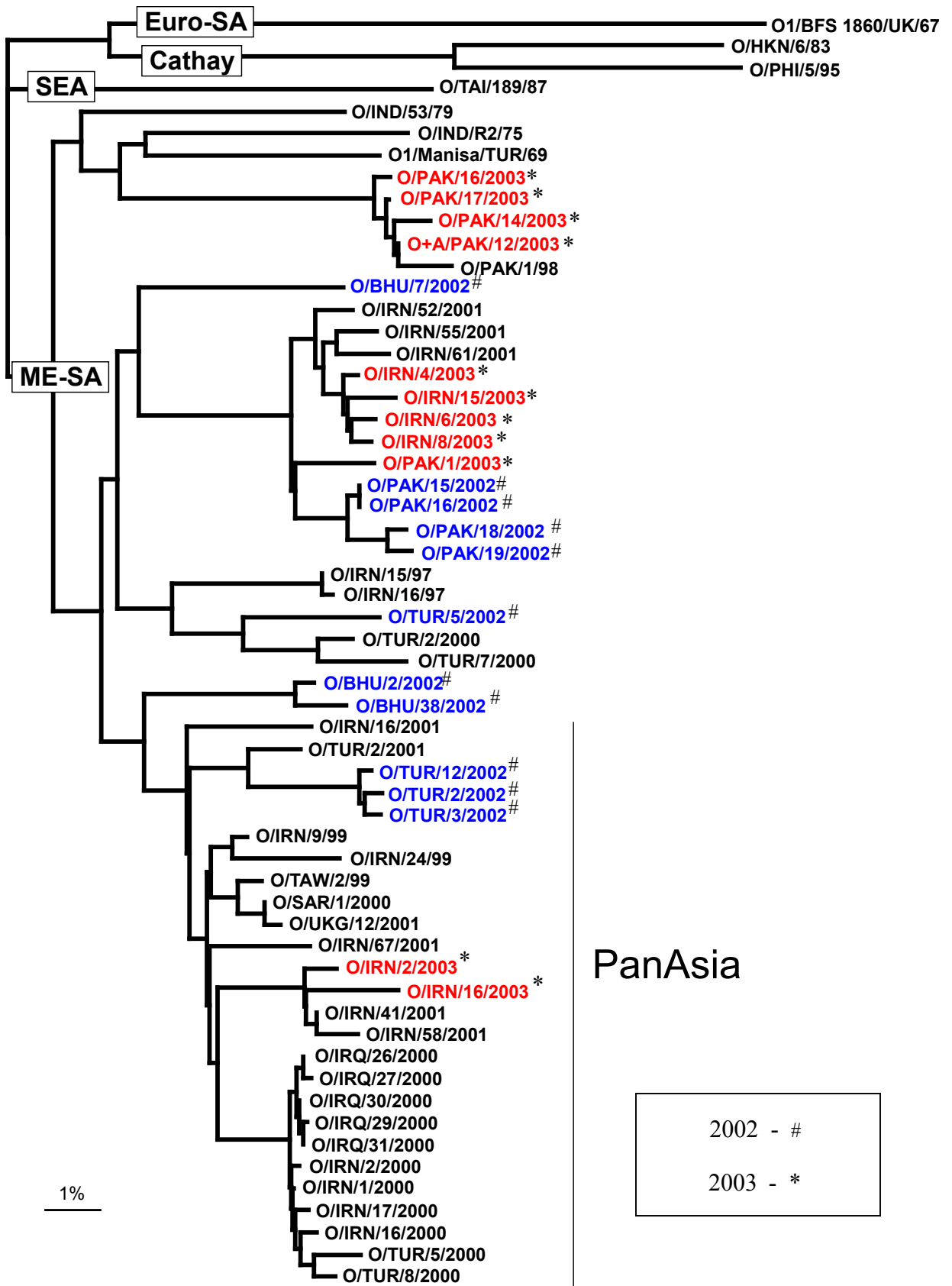
*, not a WRLFMD reference number

Report on: FMDV O Pakistan 2003



Unrooted Neighbor-joining tree based on a comparison of the complete VP1 gene. The tree was outgroup-rooted using HKN/6/83 & PHI/5/95.

* not a WRLFMD ref. no.



Neighbor-joining tree showing the relationships between recent FMD O viruses from Iran, Turkey, Pakistan and Bhutan. Isolates from 2002 are highlighted in blue and those from 2003 are in red.