

FAO World Reference Laboratory for Foot-and-Mouth Disease (WRLFMD)

Genotyping Report

Report Date for this Batch: 6 May 2015

FMDV type A

Country: Pakistan

Period: 2014-2015

No. of samples: 11

BATCH: WRLFMD/2015/00002



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FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A WRLFMD Ref No: PAK/28/2014 Batch No: WRLFMD/2015/00002 Sender Ref: PK26 Location: Muzafarabad, Azad Jammu and Kashmir, Pakistan Date collected: 30/01/2014 Date received by WRLFMD: 24/02/2015 Date received for sequencing: 19/03/2015 Species: Cattle Material used: BTy2 07/03/2015 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 06/05/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: ASIA Genotype/strain: Iran-05 ^{FAR-11} Sequence filename: PAK14-28.SEQ Date sequence last updated: 27/03/2015 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 2021 Min. no. of nt for comparison: 600 Total turn-around time: 71 days Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/33/2014	PAK14-33	639	636	0	99.53	0.47	ASIA	Iran-05 ^{FAR-11}
2	A/PAK/41/2014	PAK14-41	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-11}
3	A/PAK/43/2014	PAK14-43	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-11}
4	A/PAK/10/2015	PAK15-10	639	632	0	98.90	1.10	ASIA	Iran-05 ^{FAR-11}
5	A/IRN/1/2011	IRN11-01	639	614	0	96.09	3.91	ASIA	Iran-05 ^{FAR-11}
6	A/BAL/PAK/iso-2/2011 (JX435106)	PAK11-AB	639	612	0	95.77	4.23	ASIA	Iran-05 ^{FAR-11}
7	A/PAK/1/2013	PAK13-01	639	612	0	95.77	4.23	ASIA	Iran-05 ^{FAR-11}
8	A/PAK/48/2012	PAK12-48	639	612	0	95.77	4.23	ASIA	Iran-05 ^{FAR-11}
9	A/PAK/25/2013	PAK13-25	639	611	0	95.62	4.38	ASIA	Iran-05 ^{FAR-11}
10	A/PAK/8/2013	PAK13-08	639	611	0	95.62	4.38	ASIA	Iran-05 ^{FAR-11}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/IRN/1/2011	IRN11-01	639	614	0	96.09	3.91	ASIA	Iran-05 ^{FAR-11}
2	A/AFG/6/2007 (FJ755007)	AFG07-06	639	603	0	94.37	5.63	ASIA	Iran-05 ^{AFG-07}
3	A/BAR/6/2008 (FJ755010)	BAR08-06	639	599	0	93.74	6.26	ASIA	Iran-05 ^{BAR-08}
4	A/IRN/1/2005 (EF208769)	IRN05-01	639	597	0	93.43	6.57	ASIA	Iran-05
5	A/AFG/10/2010	AFG10-10	639	596	0	93.27	6.73	ASIA	Iran-05 ^{HER-10}
6	A/IRN/15/2012	IRN12-15	639	596	0	93.27	6.73	ASIA	Iran-05 ^{SIS-12}
7	A/IRN/78/2009	IRN09-78	639	595	0	93.11	6.89	ASIA	Iran-05 ^{FAR-09}
8	A/IRN/125/2010	IRN10125	639	594	0	92.96	7.04	ASIA	Iran-05 ^{SIS-10}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	592	0	92.64	7.36	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	588	0	92.02	7.98	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/32/2014	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK02	
Location: Gilgit, Gilgit-Baltistan, Pakistan	Topotype: ASIA
Date collected: 15/05/2014	Genotype/strain: Iran-05 ^{FAR-09}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK14-32.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 27/03/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy2 10/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/9/2015	PAK15-09	639	639	0	100.00	0.00	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/10/2014	PAK14-10	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/14/2014 (B)	PAK14B14	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/27/2013	IRN13-27	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
5	A/IRN/28/2013	IRN13-28	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
6	A/PAK/42/2014	PAK14-42	639	627	0	98.12	1.88	ASIA	Iran-05 ^{FAR-09}
7	A/PAK/38/2014	PAK14-38	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/7/2015	PAK15-07	639	625	0	97.81	2.19	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/3/2015	PAK15-03	639	623	0	97.50	2.50	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	596	0	93.27	6.73	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	595	0	93.11	6.89	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	595	0	93.11	6.89	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	588	0	92.02	7.98	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	587	0	91.86	8.14	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	583	0	91.24	8.76	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	583	0	91.24	8.76	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	580	0	90.77	9.23	ASIA	Iran-05 ^{SIS-12}
9	A/IRN/9/2011	IRN11-09	639	578	0	90.45	9.55	ASIA	Iran-05 ^{QAZ-11}
10	A/TUR/1/2008 (FJ755133)	TUR08-01	639	578	0	90.45	9.55	ASIA	Iran-05 ^{ARD-07}

nt, nucleotides

*, not a WRLFMD reference number

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FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/33/2014	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK17	
Location: Karachi, Sindh, Pakistan	Topotype: ASIA
Date collected: 22/10/2014	Genotype/strain: Iran-05 ^{FAR-11}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK14-33.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 22/04/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 07/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/28/2014	PAK14-28	639	636	0	99.53	0.47	ASIA	Iran-05 ^{FAR-11}
2	A/PAK/41/2014	PAK14-41	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
3	A/PAK/43/2014	PAK14-43	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
4	A/PAK/10/2015	PAK15-10	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-11}
5	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
6	A/BAL/PAK/iso-2/2011 (JX435106)	PAK11-AB	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
7	A/PAK/1/2013	PAK13-01	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
8	A/PAK/48/2012	PAK12-48	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
9	A/AFG/4/2013	AFG13-04	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
10	A/PAK/11/2013	PAK13-11	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
2	A/AFG/6/2007 (FJ755007)	AFG07-06	639	604	0	94.52	5.48	ASIA	Iran-05 ^{AFG-07}
3	A/AFG/10/2010	AFG10-10	639	599	0	93.74	6.26	ASIA	Iran-05 ^{HER-10}
4	A/IRN/15/2012	IRN12-15	639	599	0	93.74	6.26	ASIA	Iran-05 ^{SIS-12}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	598	0	93.58	6.42	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	598	0	93.58	6.42	ASIA	Iran-05
7	A/IRN/78/2009	IRN09-78	639	596	0	93.27	6.73	ASIA	Iran-05 ^{FAR-09}
8	A/TUR/1/2008 (FJ755133)	TUR08-01	639	594	0	92.96	7.04	ASIA	Iran-05 ^{ARD-07}
9	A/IRN/125/2010	IRN10125	639	593	0	92.80	7.20	ASIA	Iran-05 ^{SIS-10}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	591	0	92.49	7.51	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/38/2014	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK04	
Location: Okara, Punjab, Pakistan	Topotype: ASIA
Date collected: 28/11/2014	Genotype/strain: Iran-05 ^{FAR-09}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK14-38.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 27/03/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 11/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/42/2014	PAK14-42	639	638	0	99.84	0.16	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/7/2015	PAK15-07	639	638	0	99.84	0.16	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/10/2014	PAK14-10	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-09}
4	A/PAK/14/2014 (B)	PAK14B14	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-09}
5	A/PAK/3/2015	PAK15-03	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-09}
6	A/IRN/27/2013	IRN13-27	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
7	A/IRN/28/2013	IRN13-28	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	629	0	98.44	1.56	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/32/2014	PAK14-32	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/9/2015	PAK15-09	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	603	0	94.37	5.63	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	596	0	93.27	6.73	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	596	0	93.27	6.73	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	591	0	92.49	7.51	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	589	0	92.18	7.82	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	589	0	92.18	7.82	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	587	0	91.86	8.14	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	583	0	91.24	8.76	ASIA	Iran-05 ^{SIS-12}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	583	0	91.24	8.76	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	580	0	90.77	9.23	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/41/2014	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK20	
Location: Karachi, Sindh, Pakistan	Topotype: ASIA
Date collected: 05/12/2014	Genotype/strain: Iran-05 ^{FAR-11}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK14-41.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 06/05/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 12/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/43/2014	PAK14-43	639	639	0	100.00	0.00	ASIA	Iran-05 ^{FAR-11}
2	A/PAK/10/2015	PAK15-10	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
3	A/PAK/33/2014	PAK14-33	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
4	A/PAK/28/2014	PAK14-28	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-11}
5	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
6	A/PAK/1/2013	PAK13-01	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
7	A/PAK/48/2012	PAK12-48	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
8	A/AFG/4/2013	AFG13-04	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
9	A/BAL/PAK/iso-2/2011 (JX435106)	PAK11-AB	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
10	A/PAK/11/2013	PAK13-11	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
2	A/AFG/6/2007 (FJ755007)	AFG07-06	639	606	0	94.84	5.16	ASIA	Iran-05 ^{AFG-07}
3	A/BAR/6/2008 (FJ755010)	BAR08-06	639	600	0	93.90	6.10	ASIA	Iran-05 ^{BAR-08}
4	A/AFG/10/2010	AFG10-10	639	599	0	93.74	6.26	ASIA	Iran-05 ^{HER-10}
5	A/IRN/15/2012	IRN12-15	639	599	0	93.74	6.26	ASIA	Iran-05 ^{SIS-12}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	598	0	93.58	6.42	ASIA	Iran-05
7	A/IRN/78/2009	IRN09-78	639	598	0	93.58	6.42	ASIA	Iran-05 ^{FAR-09}
8	A/IRN/125/2010	IRN10125	639	595	0	93.11	6.89	ASIA	Iran-05 ^{SIS-10}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	594	0	92.96	7.04	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	591	0	92.49	7.51	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A WRLFMD Ref No: PAK/42/2014 Batch No: WRLFMD/2015/00002 Sender Ref: PK24 Location: Abbottabad, Khyber Pakhtunkhwa, Pakistan Date collected: 15/12/2014 Date received by WRLFMD: 24/02/2015 Date received for sequencing: 19/03/2015 Species: Water Buffalo Material used: BTy1 12/03/2015 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 06/05/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: ASIA Genotype/strain: Iran-05 ^{FAR-09} Sequence filename: PAK14-42.SEQ Date sequence last updated: 27/03/2015 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 2021 Min. no. of nt for comparison: 600 Total turn-around time: 71 days Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/38/2014	PAK14-38	639	638	0	99.84	0.16	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/7/2015	PAK15-07	639	637	0	99.69	0.31	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/10/2014	PAK14-10	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-09}
4	A/PAK/14/2014 (B)	PAK14B14	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-09}
5	A/PAK/3/2015	PAK15-03	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-09}
6	A/IRN/27/2013	IRN13-27	639	632	0	98.90	1.10	ASIA	Iran-05 ^{FAR-09}
7	A/IRN/28/2013	IRN13-28	639	632	0	98.90	1.10	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	630	0	98.59	1.41	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/32/2014	PAK14-32	639	627	0	98.12	1.88	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/9/2015	PAK15-09	639	627	0	98.12	1.88	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	604	0	94.52	5.48	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	597	0	93.43	6.57	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	597	0	93.43	6.57	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	592	0	92.64	7.36	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	590	0	92.33	7.67	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	590	0	92.33	7.67	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	586	0	91.71	8.29	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	584	0	91.39	8.61	ASIA	Iran-05 ^{SIS-12}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	584	0	91.39	8.61	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	581	0	90.92	9.08	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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FAO World Reference Laboratory for FMD Genotyping Report

IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/43/2014	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK30	
Location: Karachi, Sindh, Pakistan	Topotype: ASIA
Date collected: 20/12/2014	Genotype/strain: Iran-05 ^{FAR-11}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK14-43.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 27/03/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy2 07/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/41/2014	PAK14-41	639	639	0	100.00	0.00	ASIA	Iran-05 ^{FAR-11}
2	A/PAK/10/2015	PAK15-10	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
3	A/PAK/33/2014	PAK14-33	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
4	A/PAK/28/2014	PAK14-28	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-11}
5	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
6	A/PAK/1/2013	PAK13-01	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
7	A/PAK/48/2012	PAK12-48	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
8	A/AFG/4/2013	AFG13-04	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
9	A/BAL/PAK/iso-2/2011 (JX435106)	PAK11-AB	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
10	A/PAK/11/2013	PAK13-11	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/IRN/1/2011	IRN11-01	639	617	0	96.56	3.44	ASIA	Iran-05 ^{FAR-11}
2	A/AFG/6/2007 (FJ755007)	AFG07-06	639	606	0	94.84	5.16	ASIA	Iran-05 ^{AFG-07}
3	A/BAR/6/2008 (FJ755010)	BAR08-06	639	600	0	93.90	6.10	ASIA	Iran-05 ^{BAR-08}
4	A/AFG/10/2010	AFG10-10	639	599	0	93.74	6.26	ASIA	Iran-05 ^{HER-10}
5	A/IRN/15/2012	IRN12-15	639	599	0	93.74	6.26	ASIA	Iran-05 ^{SIS-12}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	598	0	93.58	6.42	ASIA	Iran-05
7	A/IRN/78/2009	IRN09-78	639	598	0	93.58	6.42	ASIA	Iran-05 ^{FAR-09}
8	A/IRN/125/2010	IRN10125	639	595	0	93.11	6.89	ASIA	Iran-05 ^{SIS-10}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	594	0	92.96	7.04	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	591	0	92.49	7.51	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A WRLFMD Ref No: PAK/3/2015 Batch No: WRLFMD/2015/00002 Sender Ref: PK16 Location: Islamabad, Islamabad Capital Territory, Pakistan Date collected: 15/01/2015 Date received by WRLFMD: 24/02/2015 Date received for sequencing: 13/04/2015 Species: Cattle Material used: BTy1 14/03/2015 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 06/05/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: ASIA Genotype/strain: Iran-05 ^{FAR-09} Sequence filename: PAK15-03.SEQ Date sequence last updated: 15/04/2015 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 2021 Min. no. of nt for comparison: 600 Total turn-around time: 71 days Sequencing time: 23 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/42/2014	PAK14-42	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/38/2014	PAK14-38	639	634	0	99.22	0.78	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/7/2015	PAK15-07	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-09}
4	A/PAK/10/2014	PAK14-10	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
5	A/PAK/14/2014 (B)	PAK14B14	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
6	A/IRN/27/2013	IRN13-27	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
7	A/IRN/28/2013	IRN13-28	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/32/2014	PAK14-32	639	623	0	97.50	2.50	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/9/2015	PAK15-09	639	623	0	97.50	2.50	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	600	0	93.90	6.10	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	593	0	92.80	7.20	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	593	0	92.80	7.20	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	588	0	92.02	7.98	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	586	0	91.71	8.29	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	586	0	91.71	8.29	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	584	0	91.39	8.61	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	582	0	91.08	8.92	ASIA	Iran-05 ^{SIS-12}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	580	0	90.77	9.23	ASIA	Iran-05 ^{ARD-07}
10	A/IRN/9/2011	IRN11-09	639	577	0	90.30	9.70	ASIA	Iran-05 ^{QAZ-11}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/7/2015	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK09	
Location: Khanewal, Punjab, Pakistan	Topotype: ASIA
Date collected: 28/01/2015	Genotype/strain: Iran-05 ^{FAR-09}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK15-07.SEQ
Date received for sequencing: 13/04/2015	Date sequence last updated: 22/04/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 17/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 23 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/38/2014	PAK14-38	639	638	0	99.84	0.16	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/42/2014	PAK14-42	639	637	0	99.69	0.31	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/10/2014	PAK14-10	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-09}
4	A/PAK/14/2014 (B)	PAK14B14	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-09}
5	A/PAK/3/2015	PAK15-03	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-09}
6	A/IRN/27/2013	IRN13-27	639	630	0	98.59	1.41	ASIA	Iran-05 ^{FAR-09}
7	A/IRN/28/2013	IRN13-28	639	630	0	98.59	1.41	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/32/2014	PAK14-32	639	625	0	97.81	2.19	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/9/2015	PAK15-09	639	625	0	97.81	2.19	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	602	0	94.21	5.79	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	595	0	93.11	6.89	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	595	0	93.11	6.89	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	590	0	92.33	7.67	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	588	0	92.02	7.98	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	588	0	92.02	7.98	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	586	0	91.71	8.29	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	582	0	91.08	8.92	ASIA	Iran-05 ^{SIS-12}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	582	0	91.08	8.92	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	579	0	90.61	9.39	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A WRLFMD Ref No: PAK/9/2015 Batch No: WRLFMD/2015/00002 Sender Ref: PK13 Location: Muzafarabad, Azad Jammu and Kashmir, Pakistan Date collected: 30/01/2015 Date received by WRLFMD: 24/02/2015 Date received for sequencing: 13/04/2015 Species: Cattle Material used: BTy1 17/03/2015 Region sequenced: VP1 RT-PCR primers: A-1C562F/EUR-2B52R A-1C612F/EUR-2B52R	Report date: 06/05/2015 Reported by: N.J. Knowles Checked by: K. Bachanek-Bankowska Topotype: ASIA Genotype/strain: Iran-05 ^{FAR-09} Sequence filename: PAK15-09.SEQ Date sequence last updated: 16/04/2015 No. of Nt determined: 639 No. of ambiguities: 0 Gene length: 639 Total no. of comparisons: 2021 Min. no. of nt for comparison: 600 Total turn-around time: 71 days Sequencing time: 23 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/32/2014	PAK14-32	639	639	0	100.00	0.00	ASIA	Iran-05 ^{FAR-09}
2	A/PAK/10/2014	PAK14-10	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
3	A/PAK/14/2014 (B)	PAK14B14	639	631	0	98.75	1.25	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/27/2013	IRN13-27	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
5	A/IRN/28/2013	IRN13-28	639	628	0	98.28	1.72	ASIA	Iran-05 ^{FAR-09}
6	A/PAK/42/2014	PAK14-42	639	627	0	98.12	1.88	ASIA	Iran-05 ^{FAR-09}
7	A/PAK/38/2014	PAK14-38	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
8	A/PAK/8/2014	PAK14-08	639	626	0	97.97	2.03	ASIA	Iran-05 ^{FAR-09}
9	A/PAK/7/2015	PAK15-07	639	625	0	97.81	2.19	ASIA	Iran-05 ^{FAR-09}
10	A/PAK/3/2015	PAK15-03	639	623	0	97.50	2.50	ASIA	Iran-05 ^{FAR-09}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/AFG/6/2007 (FJ755007)	AFG07-06	639	596	0	93.27	6.73	ASIA	Iran-05 ^{AFG-07}
2	A/AFG/10/2010	AFG10-10	639	595	0	93.11	6.89	ASIA	Iran-05 ^{HER-10}
3	A/IRN/78/2009	IRN09-78	639	595	0	93.11	6.89	ASIA	Iran-05 ^{FAR-09}
4	A/IRN/1/2011	IRN11-01	639	588	0	92.02	7.98	ASIA	Iran-05 ^{FAR-11}
5	A/BAR/6/2008 (FJ755010)	BAR08-06	639	587	0	91.86	8.14	ASIA	Iran-05 ^{BAR-08}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	583	0	91.24	8.76	ASIA	Iran-05
7	A/IRN/125/2010	IRN10125	639	583	0	91.24	8.76	ASIA	Iran-05 ^{SIS-10}
8	A/IRN/15/2012	IRN12-15	639	580	0	90.77	9.23	ASIA	Iran-05 ^{SIS-12}
9	A/IRN/9/2011	IRN11-09	639	578	0	90.45	9.55	ASIA	Iran-05 ^{QAZ-11}
10	A/TUR/1/2008 (FJ755133)	TUR08-01	639	578	0	90.45	9.55	ASIA	Iran-05 ^{ARD-07}

nt, nucleotides

*, not a WRLFMD reference number

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IAH-P-EP-MEG-FOR-005-3

Page 1 of 1

Serotype: A	Report date: 06/05/2015
WRLFMD Ref No: PAK/10/2015	Reported by: N.J. Knowles
Batch No: WRLFMD/2015/00002	Checked by: K. Bachanek-Bankowska
Sender Ref: PK25	
Location: Faisalabad, Punjab, Pakistan	Topotype: ASIA
Date collected: 02/02/2015	Genotype/strain: Iran-05 ^{FAR-11}
Date received by WRLFMD: 24/02/2015	Sequence filename: PAK15-10.SEQ
Date received for sequencing: 19/03/2015	Date sequence last updated: 27/03/2015
Species: Cattle	No. of Nt determined: 639
Material used: BTy1 05/03/2015	No. of ambiguities: 0
Region sequenced: VP1	Gene length: 639
RT-PCR primers: A-1C562F/EUR-2B52R	Total no. of comparisons: 2021
A-1C612F/EUR-2B52R	Min. no. of nt for comparison: 600
	Total turn-around time: 71 days
	Sequencing time: 48 days
Comments:	

Most Closely Related Viruses									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/PAK/41/2014	PAK14-41	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
2	A/PAK/43/2014	PAK14-43	639	635	0	99.37	0.63	ASIA	Iran-05 ^{FAR-11}
3	A/PAK/33/2014	PAK14-33	639	633	0	99.06	0.94	ASIA	Iran-05 ^{FAR-11}
4	A/PAK/28/2014	PAK14-28	639	632	0	98.90	1.10	ASIA	Iran-05 ^{FAR-11}
5	A/IRN/1/2011	IRN11-01	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
6	A/AFG/4/2013	AFG13-04	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
7	A/PAK/1/2013	PAK13-01	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
8	A/PAK/48/2012	PAK12-48	639	613	0	95.93	4.07	ASIA	Iran-05 ^{FAR-11}
9	A/PAK/19/2013	PAK13-19	639	612	0	95.77	4.23	ASIA	Iran-05 ^{FAR-11}
10	A/BAL/PAK/iso-2/2011 (JX435106)	PAK11-AB	639	611	0	95.62	4.38	ASIA	Iran-05 ^{FAR-11}
Most Closely Related Reference Viruses									
(see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm)									
Pos.	Virus name	Filename	No. nt comp.	No. nt match.	No. of ambig.	% Id.	% Diff.	Topotype	Strain
1	A/IRN/1/2011	IRN11-01	639	615	0	96.24	3.76	ASIA	Iran-05 ^{FAR-11}
2	A/AFG/6/2007 (FJ755007)	AFG07-06	639	604	0	94.52	5.48	ASIA	Iran-05 ^{AFG-07}
3	A/BAR/6/2008 (FJ755010)	BAR08-06	639	598	0	93.58	6.42	ASIA	Iran-05 ^{BAR-08}
4	A/AFG/10/2010	AFG10-10	639	597	0	93.43	6.57	ASIA	Iran-05 ^{HER-10}
5	A/IRN/15/2012	IRN12-15	639	597	0	93.43	6.57	ASIA	Iran-05 ^{SIS-12}
6	A/IRN/1/2005 (EF208769)	IRN05-01	639	596	0	93.27	6.73	ASIA	Iran-05
7	A/IRN/78/2009	IRN09-78	639	596	0	93.27	6.73	ASIA	Iran-05 ^{FAR-09}
8	A/IRN/125/2010	IRN10125	639	593	0	92.80	7.20	ASIA	Iran-05 ^{SIS-10}
9	A/TUR/1/2008 (FJ755133)	TUR08-01	639	592	0	92.64	7.36	ASIA	Iran-05 ^{ARD-07}
10	A/TUR/33/2008 (FJ755155)	TUR08-33	639	589	0	92.18	7.82	ASIA	Iran-05 ^{EZM-07}

nt, nucleotides

*, not a WRLFMD reference number

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Report on FMDV A in Pakistan in 2014-2015

Batch: WRLFMD/2015/00002

◆ indicates viruses in this batch

Software: MEGA 6.06

Analysis

Analysis ----- Phylogeny Reconstruction

Scope ----- All Selected Taxa

Statistical Method ----- Neighbor-joining

Phylogeny Test

Test of Phylogeny ----- Bootstrap method

No. of Bootstrap Replications ----- 1000

Substitution Model

Substitutions Type ----- Nucleotide

Model/Method ----- Kimura 2-parameter model

Substitutions to Include ----- d: Transitions + Transversions

Rates and Patterns

Rates among Sites ----- Uniform rates

Pattern among Lineages ----- Same (Homogeneous)

Data Subset to Use

Gaps/Missing Data Treatment ----- Pairwise deletion

Codons Included ----- 1st+2nd+3rd+Non-Coding

No. of Sites : 639

No Of Bootstrap Reps = 1000

Only bootstrap values of 70% and above are shown

*, not a WRLFMD Ref. No.

N.J. Knowles, J. Wadsworth & K. Bachanek-Bankowska,
06 May 2015

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