

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

Genotyping Report

FMDV serotype: A
Country: Pakistan
Year: 2016, 2017
Batch: WRLFMD/2017/00021
No. of sequences: 9
Report date: 30th October 2017
Report generated by: Nick Knowles
Report checked by: Kasia Bankowska

Remarks:

The following samples contained both FMD type A and type Asia 1 viruses:

PAK/8/2016, PAK/13/2016, PAK/20/2016, PAK/22/2016, PAK/3/2017 & PAK/5/2017.

FMDV type A VP1 sequences were assembled in all cases, except for PAK/20/2016 & PAK/5/2017, where only poor quality data was obtained.



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www: <http://www.wrlfmd.org/>

email: reporting@pirbright.ac.uk

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Virus sample name:	PAK/3/2016
Sender reference:	PK18
Location of origin:	Islamabad Capital Territory
Country of origin:	Pakistan
Date of collection:	12/01/2016
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	03/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 35064, genome 35065, sequence viba_35066, sequencing info 35067	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35098	PAK/12/2017	cattle	100.0	0	A	ASIA	Iran-05	SIS-13
viba_33587	IRN/2/2017	cattle	98.9	0	A	ASIA	Iran-05	SIS-13
viba_33579	IRN/34/2016	cattle	98.9	0	A	ASIA	Iran-05	SIS-13
viba_33603	IRN/9/2017	cattle	98.7	0	A	ASIA	Iran-05	SIS-13
viba_33611	IRN/13/2017	sheep	98.4	0	A	ASIA	Iran-05	SIS-13
viba_25947	PAK/53/2015	cattle	98.4	0	A	ASIA	Iran-05	SIS-13
viba_33595	IRN/6/2017	sheep	98.4	0	A	ASIA	Iran-05	SIS-13
viba_33607	IRN/10/2017	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_35090	PAK/2/2017	cattle	97.3	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.0	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.0	0	A	ASIA	Iran-05	SIS-13
viba_10508	PAK/7/2008	water buffalo	93.5	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		93.4	0	A	ASIA	Iran-05	FAR-09
viba_414	AFG/6/2007	bovine	93.2	0	A	ASIA	Iran-05	AFG-07
viba_331	AFG/10/2010		93.0	0	A	ASIA	Iran-05	HER-10
viba_594	IRN/1/2011	bovine	92.7	0	A	ASIA	Iran-05	FAR-11
viba_34575	BAD/AFG/L2814/2009	cattle	92.4	0	A	ASIA	Iran-05	BAD-09
viba_34671	BAL/PAK/05/2011	cattle	92.4	0	A	ASIA	Iran-05	BAL-11
viba_319	BAR/6/2008	bovine	92.4	0	A	ASIA	Iran-05	BAR-08
viba_403	TUR/1/2008	cattle	91.9	0	A	ASIA	Iran-05	ARD-07

Virus sample name:	PAK/8/2016
Sender reference:	PK34
Location of origin:	Gharo, Thatta, Sindh
Country of origin:	Pakistan
Date of collection:	06/05/2016
Host species:	water buffalo
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1 04/10/2017 & BTy2
Harvest date of material:	05/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	24/10/2017
Last updated:	24/10/2017
VIBASys IDs: sample 35068, genome 35069, sequence viba_35070, sequencing info 35071	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35074	PAK/13/2016	water buffalo	99.7	0	A	ASIA	Iran-05	SIS-13
viba_35078	PAK/16/2016	cattle	99.5	0	A	ASIA	Iran-05	SIS-13
viba_22443	PAK/42/2014	water buffalo	98.4	0	A	ASIA	Iran-05	SIS-13
viba_22435	PAK/38/2014	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_25187	PAK/7/2015	cattle	98.1	0	A	ASIA	Iran-05	SIS-13
viba_22454	PAK/14/2014	cattle	97.8	0	A	ASIA	Iran-05	SIS-13
viba_25183	PAK/3/2015	cattle	97.8	0	A	ASIA	Iran-05	SIS-13
viba_22410	PAK/10/2014	cattle	97.8	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.5	0	A	ASIA	Iran-05	SIS-13
viba_20943	IRN/27/2013	cattle	97.5	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.5	0	A	ASIA	Iran-05	SIS-13
viba_414	AFG/6/2007	bovine	94.2	0	A	ASIA	Iran-05	AFG-07
viba_10508	PAK/7/2008	water buffalo	93.5	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		92.7	0	A	ASIA	Iran-05	FAR-09
viba_331	AFG/10/2010		92.4	0	A	ASIA	Iran-05	HER-10
viba_319	BAR/6/2008	bovine	92.3	0	A	ASIA	Iran-05	BAR-08
viba_594	IRN/1/2011	bovine	92.1	0	A	ASIA	Iran-05	FAR-11
viba_34671	BAL/PAK/05/2011	cattle	91.8	0	A	ASIA	Iran-05	BAL-11
viba_133	IRN/1/2005	cattle	91.6	0	A	ASIA	Iran-05	
viba_34575	BAD/AFG/L2814/2009	cattle	91.3	0	A	ASIA	Iran-05	BAD-09

Virus sample name:	PAK/13/2016
Sender reference:	PK36
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	11/08/2016
Host species:	water buffalo
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	04/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	24/10/2017
Last updated:	24/10/2017
VIBASys IDs: sample 35072, genome 35073, sequence viba_35074, sequencing info 35075	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35078	PAK/16/2016	cattle	99.8	0	A	ASIA	Iran-05	SIS-13
viba_35070	PAK/8/2016	water buffalo	99.7	0	A	ASIA	Iran-05	SIS-13
viba_22443	PAK/42/2014	water buffalo	98.7	0	A	ASIA	Iran-05	SIS-13
viba_22435	PAK/38/2014	cattle	98.6	0	A	ASIA	Iran-05	SIS-13
viba_25187	PAK/7/2015	cattle	98.4	0	A	ASIA	Iran-05	SIS-13
viba_22454	PAK/14/2014	cattle	98.1	0	A	ASIA	Iran-05	SIS-13
viba_25183	PAK/3/2015	cattle	98.1	0	A	ASIA	Iran-05	SIS-13
viba_22410	PAK/10/2014	cattle	98.1	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.8	0	A	ASIA	Iran-05	SIS-13
viba_20943	IRN/27/2013	cattle	97.8	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.8	0	A	ASIA	Iran-05	SIS-13
viba_414	AFG/6/2007	bovine	94.2	0	A	ASIA	Iran-05	AFG-07
viba_10508	PAK/7/2008	water buffalo	93.5	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		92.7	0	A	ASIA	Iran-05	FAR-09
viba_331	AFG/10/2010		92.4	0	A	ASIA	Iran-05	HER-10
viba_319	BAR/6/2008	bovine	92.3	0	A	ASIA	Iran-05	BAR-08
viba_594	IRN/1/2011	bovine	92.1	0	A	ASIA	Iran-05	FAR-11
viba_34671	BAL/PAK/05/2011	cattle	91.8	0	A	ASIA	Iran-05	BAL-11
viba_133	IRN/1/2005	cattle	91.6	0	A	ASIA	Iran-05	
viba_34575	BAD/AFG/L2814/2009	cattle	91.3	0	A	ASIA	Iran-05	BAD-09

Virus sample name:	PAK/16/2016
Sender reference:	PK39
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	08/09/2016
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	05/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 35076, genome 35077, sequence viba_35078, sequencing info 35079	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35074	PAK/13/2016	water buffalo	99.8	0	A	ASIA	Iran-05	SIS-13
viba_35070	PAK/8/2016	water buffalo	99.5	0	A	ASIA	Iran-05	SIS-13
viba_22443	PAK/42/2014	water buffalo	98.6	0	A	ASIA	Iran-05	SIS-13
viba_22435	PAK/38/2014	cattle	98.4	0	A	ASIA	Iran-05	SIS-13
viba_25187	PAK/7/2015	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_22454	PAK/14/2014	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_25183	PAK/3/2015	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_22410	PAK/10/2014	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.6	0	A	ASIA	Iran-05	SIS-13
viba_20943	IRN/27/2013	cattle	97.6	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.6	0	A	ASIA	Iran-05	SIS-13
viba_414	AFG/6/2007	bovine	94.0	0	A	ASIA	Iran-05	AFG-07
viba_10508	PAK/7/2008	water buffalo	93.4	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		92.6	0	A	ASIA	Iran-05	FAR-09
viba_331	AFG/10/2010		92.3	0	A	ASIA	Iran-05	HER-10
viba_319	BAR/6/2008	bovine	92.1	0	A	ASIA	Iran-05	BAR-08
viba_594	IRN/1/2011	bovine	92.0	0	A	ASIA	Iran-05	FAR-11
viba_34671	BAL/PAK/05/2011	cattle	91.6	0	A	ASIA	Iran-05	BAL-11
viba_133	IRN/1/2005	cattle	91.5	0	A	ASIA	Iran-05	
viba_34575	BAD/AFG/L2814/2009	cattle	91.2	0	A	ASIA	Iran-05	BAD-09

Virus sample name:	PAK/22/2016
Sender reference:	PK11
Location of origin:	Kasur, Punjab
Country of origin:	Pakistan
Date of collection:	11/11/2016
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	06/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	26/10/2017
Last updated:	26/10/2017
VIBASys IDs: sample 35080, genome 35081, sequence viba_35082, sequencing info 35083	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_25802	IRN/5/2015	cattle	98.4	0	A	ASIA	Iran-05	SIS-13
viba_22454	PAK/14/2014	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_25191	PAK/9/2015	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_22410	PAK/10/2014	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_22427	PAK/32/2014	cattle	98.3	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_20943	IRN/27/2013	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_22406	PAK/8/2014	water buffalo	97.6	0	A	ASIA	Iran-05	SIS-13
viba_22443	PAK/42/2014	water buffalo	97.6	0	A	ASIA	Iran-05	SIS-13
viba_22435	PAK/38/2014	cattle	97.5	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_414	AFG/6/2007	bovine	93.4	0	A	ASIA	Iran-05	AFG-07
viba_10508	PAK/7/2008	water buffalo	93.4	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		93.2	0	A	ASIA	Iran-05	FAR-09
viba_331	AFG/10/2010		92.9	0	A	ASIA	Iran-05	HER-10
viba_594	IRN/1/2011	bovine	92.6	0	A	ASIA	Iran-05	FAR-11
viba_34671	BAL/PAK/05/2011	cattle	91.9	0	A	ASIA	Iran-05	BAL-11
viba_319	BAR/6/2008	bovine	91.9	0	A	ASIA	Iran-05	BAR-08
viba_133	IRN/1/2005	cattle	91.8	0	A	ASIA	Iran-05	
viba_403	TUR/1/2008	cattle	91.3	0	A	ASIA	Iran-05	ARD-07

Virus sample name:	PAK/25/2016
Sender reference:	PK1
Location of origin:	Toba Tek Singh, Punjab
Country of origin:	Pakistan
Date of collection:	12/12/2016
Host species:	water buffalo
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	06/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 35084, genome 35085, sequence viba_35086, sequencing info 35087	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_25216	PAK/17/2015	water buffalo	99.4	0	A	ASIA	Iran-05	FAR-11
viba_25208	PAK/15/2015	water buffalo	99.2	0	A	ASIA	Iran-05	FAR-11
viba_25204	PAK/13/2015	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_25212	PAK/16/2015	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_25195	PAK/10/2015	cattle	99.2	0	A	ASIA	Iran-05	FAR-11
viba_25220	PAK/20/2015	cattle	99.1	0	A	ASIA	Iran-05	FAR-11
viba_25923	PAK/25/2015	cattle	99.1	0	A	ASIA	Iran-05	FAR-11
viba_22447	PAK/43/2014	cattle	98.9	0	A	ASIA	Iran-05	FAR-11
viba_22439	PAK/41/2014	cattle	98.9	0	A	ASIA	Iran-05	FAR-11
viba_22431	PAK/33/2014	cattle	98.6	0	A	ASIA	Iran-05	FAR-11

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_594	IRN/1/2011	bovine	96.7	0	A	ASIA	Iran-05	FAR-11
viba_414	AFG/6/2007	bovine	94.9	0	A	ASIA	Iran-05	AFG-07
viba_10508	PAK/7/2008	water buffalo	94.5	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		93.7	0	A	ASIA	Iran-05	FAR-09
viba_319	BAR/6/2008	bovine	93.7	0	A	ASIA	Iran-05	BAR-08
viba_331	AFG/10/2010		93.5	0	A	ASIA	Iran-05	HER-10
viba_557	IRN/15/2012	bovine	93.5	0	A	ASIA	Iran-05	SIS-12
viba_133	IRN/1/2005	cattle	93.4	0	A	ASIA	Iran-05	
viba_403	TUR/1/2008	cattle	93.2	0	A	ASIA	Iran-05	ARD-07
viba_791	IRN/125/2010	bovine	93.2	0	A	ASIA	Iran-05	SIS-10

Virus sample name:	PAK/2/2017
Sender reference:	PK44
Location of origin:	Faisalabad, Punjab
Country of origin:	Pakistan
Date of collection:	19/01/2017
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	04/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 35088, genome 35089, sequence viba_35090, sequencing info 35091	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_25947	PAK/53/2015	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_35098	PAK/12/2017	cattle	97.3	0	A	ASIA	Iran-05	SIS-13
viba_35066	PAK/3/2016	cattle	97.3	0	A	ASIA	Iran-05	SIS-13
viba_33587	IRN/2/2017	cattle	97.2	0	A	ASIA	Iran-05	SIS-13
viba_33595	IRN/6/2017	sheep	96.8	0	A	ASIA	Iran-05	SIS-13
viba_33579	IRN/34/2016	cattle	96.8	0	A	ASIA	Iran-05	SIS-13
viba_33611	IRN/13/2017	sheep	96.7	0	A	ASIA	Iran-05	SIS-13
viba_33603	IRN/9/2017	cattle	96.7	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	96.5	0	A	ASIA	Iran-05	SIS-13
viba_22454	PAK/14/2014	cattle	96.5	0	A	ASIA	Iran-05	SIS-13

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	96.5	0	A	ASIA	Iran-05	SIS-13
viba_10508	PAK/7/2008	water buffalo	93.0	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		92.9	0	A	ASIA	Iran-05	FAR-09
viba_331	AFG/10/2010		92.6	0	A	ASIA	Iran-05	HER-10
viba_414	AFG/6/2007	bovine	92.4	0	A	ASIA	Iran-05	AFG-07
viba_594	IRN/1/2011	bovine	92.0	0	A	ASIA	Iran-05	FAR-11
viba_34671	BAL/PAK/05/2011	cattle	91.9	0	A	ASIA	Iran-05	BAL-11
viba_319	BAR/6/2008	bovine	91.9	0	A	ASIA	Iran-05	BAR-08
viba_133	IRN/1/2005	cattle	91.3	0	A	ASIA	Iran-05	
viba_34575	BAD/AFG/L2814/2009	cattle	91.2	0	A	ASIA	Iran-05	BAD-09

Virus sample name:	PAK/3/2017
Sender reference:	PK32
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	01/02/2017
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	FAR-11
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	24/10/2017
Last updated:	24/10/2017
VIBASys IDs: sample 35092, genome 35093, sequence viba_35094, sequencing info 35095	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35086	PAK/25/2016	water buffalo	97.9	0	A	ASIA	Iran-05	FAR-11
viba_22431	PAK/33/2014	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_25208	PAK/15/2015	water buffalo	97.8	0	A	ASIA	Iran-05	FAR-11
viba_22447	PAK/43/2014	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_25204	PAK/13/2015	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_25212	PAK/16/2015	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_25195	PAK/10/2015	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_22439	PAK/41/2014	cattle	97.8	0	A	ASIA	Iran-05	FAR-11
viba_25220	PAK/20/2015	cattle	97.6	0	A	ASIA	Iran-05	FAR-11
viba_25200	PAK/12/2015	water buffalo	97.6	0	A	ASIA	Iran-05	FAR-11

Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_594	IRN/1/2011	bovine	95.3	0	A	ASIA	Iran-05	FAR-11
viba_414	AFG/6/2007	bovine	93.5	0	A	ASIA	Iran-05	AFG-07
viba_557	IRN/15/2012	bovine	93.0	0	A	ASIA	Iran-05	SIS-12
viba_10508	PAK/7/2008	water buffalo	93.0	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		92.6	0	A	ASIA	Iran-05	FAR-09
viba_133	IRN/1/2005	cattle	92.4	0	A	ASIA	Iran-05	
viba_331	AFG/10/2010		92.3	0	A	ASIA	Iran-05	HER-10
viba_319	BAR/6/2008	bovine	92.3	0	A	ASIA	Iran-05	BAR-08
viba_34487	SAR/AFG/L1435/2009	cattle	92.1	0	A	ASIA	Iran-05	SAR-09
viba_791	IRN/125/2010	bovine	92.1	0	A	ASIA	Iran-05	SIS-10

Virus sample name:	PAK/12/2017
Sender reference:	PK17
Location of origin:	Islamabad Capital Territory
Country of origin:	Pakistan
Date of collection:	03/03/2017
Host species:	cattle
Serotype:	A
Topotype:	ASIA
Lineage:	Iran-05
Sublineage:	SIS-13
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/10/2017
Primers:	A-1C562F/EUR-2B52R; A-1C612F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 35096, genome 35097, sequence viba_35098, sequencing info 35099	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35066	PAK/3/2016	cattle	100.0	0	A	ASIA	Iran-05	SIS-13
viba_33587	IRN/2/2017	cattle	98.9	0	A	ASIA	Iran-05	SIS-13
viba_33579	IRN/34/2016	cattle	98.9	0	A	ASIA	Iran-05	SIS-13
viba_33603	IRN/9/2017	cattle	98.7	0	A	ASIA	Iran-05	SIS-13
viba_33611	IRN/13/2017	sheep	98.4	0	A	ASIA	Iran-05	SIS-13
viba_25947	PAK/53/2015	cattle	98.4	0	A	ASIA	Iran-05	SIS-13
viba_33595	IRN/6/2017	sheep	98.4	0	A	ASIA	Iran-05	SIS-13
viba_33607	IRN/10/2017	cattle	97.9	0	A	ASIA	Iran-05	SIS-13
viba_35090	PAK/2/2017	cattle	97.3	0	A	ASIA	Iran-05	SIS-13
viba_20947	IRN/28/2013	cattle	97.0	0	A	ASIA	Iran-05	SIS-13

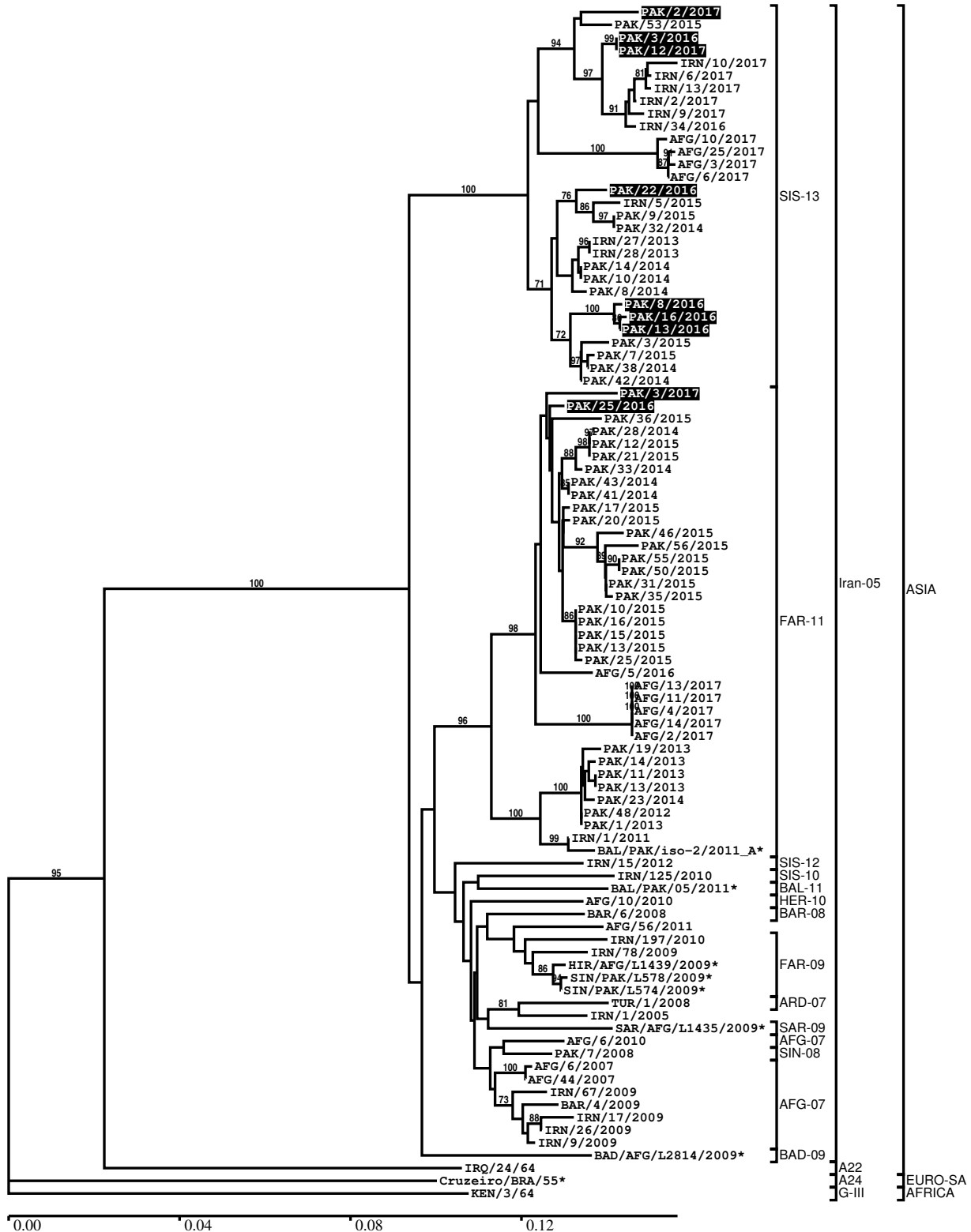
Most Closely Related Prototype Sequences

see http://www.wrlfmd.org/fmd_genotyping/prototypes.htm

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_20943	IRN/27/2013	cattle	97.0	0	A	ASIA	Iran-05	SIS-13
viba_10508	PAK/7/2008	water buffalo	93.5	0	A	ASIA	Iran-05	SIN-08
viba_636	IRN/78/2009		93.4	0	A	ASIA	Iran-05	FAR-09
viba_414	AFG/6/2007	bovine	93.2	0	A	ASIA	Iran-05	AFG-07
viba_331	AFG/10/2010		93.0	0	A	ASIA	Iran-05	HER-10
viba_594	IRN/1/2011	bovine	92.7	0	A	ASIA	Iran-05	FAR-11
viba_34575	BAD/AFG/L2814/2009	cattle	92.4	0	A	ASIA	Iran-05	BAD-09
viba_34671	BAL/PAK/05/2011	cattle	92.4	0	A	ASIA	Iran-05	BAL-11
viba_319	BAR/6/2008	bovine	92.4	0	A	ASIA	Iran-05	BAR-08
viba_403	TUR/1/2008	cattle	91.9	0	A	ASIA	Iran-05	ARD-07

Report on FMDV A in Pakistan in 2016, 2017

Batch: WRLFMD/2017/00021



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_A
Query sequence set:	WRLFMD/2017/00021-Pakistan-A (9 sequences)
Sequence database set:	allseqs_A (1773 sequences)
Prototype sequence set:	!prototypes_A (40 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	633
Phylogeny reconstruction method:	fdnadist, fneighbor
Number of bootstrap samples:	1000
Random seed for bootstrapping:	1
Displaying bootstrap values above:	70.0%
Number of sequences in tree capped at:	100
Number of prototype sequences in tree:	14
VIBASys version:	reflabs-1.1.2

Sequences in the Phylogenetic Tree

All sequences in the tree are in taxonomic group FMDV/A

label	accession	host(s)	lab	country	taxonomic information
PAK/2/2017	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/53/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/3/2016	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/12/2017	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
IRN/10/2017	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/6/2017	n/a	sheep	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/13/2017	n/a	sheep	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/2/2017	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/9/2017	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/34/2016	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
AFG/10/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/SIS-13
AFG/25/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/SIS-13
AFG/3/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/SIS-13
AFG/6/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/SIS-13
PAK/22/2016	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
IRN/5/2015	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
PAK/9/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/32/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
IRN/27/2013	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
IRN/28/2013	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/SIS-13
PAK/14/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/10/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/8/2014	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/8/2016	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/16/2016	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/13/2016	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/3/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/7/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/38/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/42/2014	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIS-13
PAK/3/2017	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/25/2016	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/36/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/28/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/12/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/21/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11

continued on next page

label	accession	host(s)	lab	country	taxonomic information
PAK/33/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/43/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/41/2014	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/17/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/20/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/46/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/56/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/55/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/50/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/31/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/35/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/10/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/16/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/15/2015	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/13/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/25/2015	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
AFG/5/2016	n/a	bovine	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/13/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/11/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/4/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/14/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
AFG/2/2017	n/a	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/FAR-11
PAK/19/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/14/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/11/2013	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/13/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/23/2014	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/48/2012	n/a	cattle	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
PAK/1/2013	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/FAR-11
IRN/1/2011	KY091292	bovine	WRLFMD	Iran	ASIA/Iran-05/FAR-11
BAL/PAK/iso-2/2011_A*	JX435106	cattle	ANSES	Pakistan	ASIA/Iran-05/FAR-11
IRN/15/2012	KY091297	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-12
IRN/125/2010	KY091296	bovine	WRLFMD	Iran	ASIA/Iran-05/SIS-10
BAL/PAK/05/2011*	KT832824	cattle	Univ Malakand	Pakistan	ASIA/Iran-05/BAL-11
AFG/10/2010	KY091293	n/a	WRLFMD	Afghanistan	ASIA/Iran-05/HER-10
BAR/6/2008	FJ755010	bovine	WRLFMD	Bahrain	ASIA/Iran-05/BAR-08
AFG/56/2011	n/a	n/a	WRLFMD	Afghanistan	ASIA/Iran-05
IRN/197/2010	n/a	cattle	WRLFMD	Iran	ASIA/Iran-05/FAR-09
IRN/78/2009	KY091291	n/a	WRLFMD	Iran	ASIA/Iran-05/FAR-09
HIR/AFG/L1439/2009*	HQ439278	cattle	LINDHOLM	Afghanistan	ASIA/Iran-05/FAR-09
SIN/PAK/L578/2009*	HQ439245	cattle	LINDHOLM	Pakistan	ASIA/Iran-05/FAR-09
SIN/PAK/L574/2009*	HQ439244	cattle	LINDHOLM	Pakistan	ASIA/Iran-05/FAR-09
TUR/1/2008	FJ755133	cattle	WRLFMD	Turkey	ASIA/Iran-05/ARD-07
IRN/1/2005	EF208769	cattle	WRLFMD	Iran	ASIA/Iran-05
SAR/AFG/L1435/2009*	HQ439274	cattle	LINDHOLM	Afghanistan	ASIA/Iran-05/SAR-09
AFG/6/2010	n/a	n/a	WRLFMD	Afghanistan	ASIA/Iran-05/AFG-07
PAK/7/2008	n/a	water buffalo	WRLFMD	Pakistan	ASIA/Iran-05/SIN-08
AFG/6/2007	FJ755007	bovine	WRLFMD	Afghanistan	ASIA/Iran-05/AFG-07
AFG/44/2007	FJ755009	cattle	WRLFMD	Afghanistan	ASIA/Iran-05/AFG-07
IRN/67/2009	n/a	sheep	WRLFMD	Iran	ASIA/Iran-05/AFG-07
BAR/4/2009	n/a	cattle	WRLFMD	Bahrain	ASIA/Iran-05/AFG-07
IRN/17/2009	n/a	n/a	WRLFMD	Iran	ASIA/Iran-05/AFG-07
IRN/26/2009	n/a	n/a	WRLFMD	Iran	ASIA/Iran-05/AFG-07
IRN/9/2009	n/a	n/a	WRLFMD	Iran	ASIA/Iran-05/AFG-07
BAD/AFG/L2814/2009*	HQ439296	cattle	LINDHOLM	Afghanistan	ASIA/Iran-05/BAD-09
IRQ/24/64	AY593763	bovine	PIADC	Iraq	ASIA/A22
Cruzeiro/BRA/55*	AY593768	bovine	PIADC	Brazil	EURO-SA/A24
KEN/3/64	AY593761	n/a	PIADC	Kenya	AFRICA/G-III

*, not a WRLFMD Reference Number

n/a, not available