

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

Genotyping Report

FMDV serotype: O
Country: Pakistan
Year: 2016, 2017
Batch: WRLFMD/2017/00021
No. of sequences: 14
Report date: 29th October 2017
Report generated by: Nick Knowles
Report checked by: Kasia Bankowska



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

email: reporting@pirbright.ac.uk

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Virus sample name:	PAK/2/2016
Sender reference:	PK42
Location of origin:	Okara, Punjab
Country of origin:	Pakistan
Date of collection:	10/01/2016
Host species:	water buffalo
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	03/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34923, genome 34924, sequence viba_34925, sequencing info 34926	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_26195	PAK/44/2015	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34933	PAK/6/2016	water buffalo	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_26199	PAK/45/2015	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34953	PAK/21/2016	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	98.7	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		93.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.4	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.8	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	91.3	0	O	ME-SA	PanAsia-2	
viba_505	TUR/264/2009		91.2	0	O	ME-SA	PanAsia-2	SAN-09
viba_666	IRN/18/2010	cattle	91.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.0	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	90.8	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.6	0	O	ME-SA	PanAsia-2	QOM-15
viba_850	NEP/1/2015	cattle	89.1	1	O	ME-SA	PanAsia-2	KAT-15

Virus sample name:	PAK/4/2016
Sender reference:	PK35
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	03/02/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	03/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34927, genome 34928, sequence viba_34929, sequencing info 34930	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34933	PAK/6/2016	water buffalo	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.6	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.3	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.6	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	91.5	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.2	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.7	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.4	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/6/2016
Sender reference:	PK38
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	05/03/2016
Host species:	water buffalo
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	03/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34931, genome 34932, sequence viba_34933, sequencing info 34934	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34929	PAK/4/2016	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.6	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.3	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.6	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	91.5	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.2	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.7	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.4	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/7/2016
Sender reference:	PK43
Location of origin:	Multan, Punjab
Country of origin:	Pakistan
Date of collection:	09/03/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	04/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34935, genome 34936, sequence viba_34937, sequencing info 34938	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_33623	IRN/36/2016	sheep	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_33635	IRN/5/2017	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_33631	IRN/3/2017	sheep	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_33615	IRN/31/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_33639	IRN/8/2017	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_33627	IRN/37/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_33619	IRN/35/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34280	AFG/35/2017	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_33643	IRN/11/2017	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34268	AFG/16/2017	cattle	98.6	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.3	0	O	ME-SA	PanAsia-2	FAR-09
viba_354	PAK/16/2010	cattle	91.6	0	O	ME-SA	PanAsia-2	PUN-10
viba_491	TUR/257/2008		91.5	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	91.3	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_505	TUR/264/2009		90.8	0	O	ME-SA	PanAsia-2	SAN-09
viba_285	UKG/35/2001	porcine	90.5	0	O	ME-SA	PanAsia	
viba_860	IRN/6/2015	cattle	90.2	0	O	ME-SA	PanAsia-2	QOM-15
viba_850	NEP/1/2015	cattle	90.1	1	O	ME-SA	PanAsia-2	KAT-15

Virus sample name:	PAK/10/2016
Sender reference:	PK9
Location of origin:	Jhang, Punjab
Country of origin:	Pakistan
Date of collection:	12/05/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	03/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34939, genome 34940, sequence viba_34941, sequencing info 34942	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34965	PAK/4/2017	water buffalo	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_21539	AFG/27/2013	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_21536	AFG/23/2013	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_22729	AFG/9/2014	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_23077	PAK/23/2014	water buffalo	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_20089	PAK/58/2012	cattle	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_23030	PAK/5/2014	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23022	PAK/3/2014	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_21940	PAK/27/2013	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23018	PAK/2/2014	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	93.0	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.3	0	O	ME-SA	PanAsia-2	TER-08
viba_666	IRN/18/2010	cattle	91.9	0	O	ME-SA	PanAsia-2	BAL-09
viba_650	IRN/8/2005	ovine	91.8	0	O	ME-SA	PanAsia-2	
viba_285	UKG/35/2001	porcine	91.8	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		91.6	0	O	ME-SA	PanAsia-2	SAN-09
viba_354	PAK/16/2010	cattle	91.6	0	O	ME-SA	PanAsia-2	PUN-10
viba_705	KUW/3/97	bovine	90.2	0	O	ME-SA	Ind-2001	a
viba_860	IRN/6/2015	cattle	90.0	0	O	ME-SA	PanAsia-2	QOM-15

Virus sample name:	PAK/11/2016
Sender reference:	PK40
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	06/06/2016
Host species:	water buffalo
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	04/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34943, genome 34944, sequence viba_34945, sequencing info 34946	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34933	PAK/6/2016	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		93.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_491	TUR/257/2008		92.1	0	O	ME-SA	PanAsia-2	TER-08
viba_766	IRN/31/2009	cattle	92.1	0	O	ME-SA	PanAsia-2	FAR-09
viba_650	IRN/8/2005	ovine	91.6	0	O	ME-SA	PanAsia-2	
viba_505	TUR/264/2009		91.5	0	O	ME-SA	PanAsia-2	SAN-09
viba_285	UKG/35/2001	porcine	91.3	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	91.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_666	IRN/18/2010	cattle	91.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_705	KUW/3/97	bovine	89.4	0	O	ME-SA	Ind-2001	a
viba_860	IRN/6/2015	cattle	89.3	0	O	ME-SA	PanAsia-2	QOM-15

Virus sample name:	PAK/15/2016
Sender reference:	PK30
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	08/09/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	05/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34947, genome 34948, sequence viba_34949, sequencing info 34950	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34957	PAK/24/2016	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_34933	PAK/6/2016	water buffalo	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.1	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.5	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	91.3	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.3	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	90.8	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.7	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.6	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/21/2016
Sender reference:	PK3
Location of origin:	Toba Tek Singh, Punjab
Country of origin:	Pakistan
Date of collection:	11/11/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	06/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34951, genome 34952, sequence viba_34953, sequencing info 34954	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_30296	AFG/11/2016	bovine	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34933	PAK/6/2016	water buffalo	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_26199	PAK/45/2015	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_26195	PAK/44/2015	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34925	PAK/2/2016	water buffalo	98.9	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.6	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.9	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	91.5	0	O	ME-SA	PanAsia-2	
viba_505	TUR/264/2009		91.3	0	O	ME-SA	PanAsia-2	SAN-09
viba_666	IRN/18/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.2	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.7	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.4	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/24/2016
Sender reference:	PK29
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	11/12/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	06/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34955, genome 34956, sequence viba_34957, sequencing info 34958	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34949	PAK/15/2016	cattle	100.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_34933	PAK/6/2016	water buffalo	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.7	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.1	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.5	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	91.3	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	91.3	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	90.8	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.7	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.6	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/26/2016
Sender reference:	PK25
Location of origin:	Swabi, Khyber Pakhtunkhwa
Country of origin:	Pakistan
Date of collection:	12/12/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy2
Harvest date of material:	10/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34959, genome 34960, sequence viba_34961, sequencing info 34962	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34933	PAK/6/2016	water buffalo	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_34969	PAK/8/2017	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_30328	AFG/25/2016	bovine	98.6	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		93.7	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	91.8	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.5	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		90.8	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	90.7	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	90.5	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	90.4	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	90.2	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	88.9	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	88.9	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/4/2017
Sender reference:	PK6
Location of origin:	Jhang, Punjab
Country of origin:	Pakistan
Date of collection:	02/02/2017
Host species:	water buffalo
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34963, genome 34964, sequence viba_34965, sequencing info 34966	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34941	PAK/10/2016	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_21539	AFG/27/2013	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_21536	AFG/23/2013	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_22729	AFG/9/2014	cattle	97.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_23077	PAK/23/2014	water buffalo	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_20089	PAK/58/2012	cattle	97.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_23030	PAK/5/2014	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23022	PAK/3/2014	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_21940	PAK/27/2013	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23018	PAK/2/2014	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		94.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	93.4	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		92.6	0	O	ME-SA	PanAsia-2	TER-08
viba_666	IRN/18/2010	cattle	92.3	0	O	ME-SA	PanAsia-2	BAL-09
viba_650	IRN/8/2005	ovine	92.1	0	O	ME-SA	PanAsia-2	
viba_285	UKG/35/2001	porcine	92.1	0	O	ME-SA	PanAsia	
viba_505	TUR/264/2009		91.9	0	O	ME-SA	PanAsia-2	SAN-09
viba_354	PAK/16/2010	cattle	91.9	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	90.4	0	O	ME-SA	PanAsia-2	QOM-15
viba_705	KUW/3/97	bovine	90.2	0	O	ME-SA	Ind-2001	a

Virus sample name:	PAK/8/2017
Sender reference:	PK41
Location of origin:	Peshawar, Khyber Pakhtunkhwa
Country of origin:	Pakistan
Date of collection:	03/02/2017
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy2
Harvest date of material:	12/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34967, genome 34968, sequence viba_34969, sequencing info 34970	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_34933	PAK/6/2016	water buffalo	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34929	PAK/4/2016	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_26191	PAK/42/2015	cattle	99.5	0	O	ME-SA	PanAsia-2	ANT-10
viba_34957	PAK/24/2016	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_34949	PAK/15/2016	cattle	99.4	0	O	ME-SA	PanAsia-2	ANT-10
viba_30320	AFG/19/2016	bovine	99.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_34945	PAK/11/2016	water buffalo	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_30296	AFG/11/2016	bovine	99.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_30304	AFG/15/2016	bovine	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_34961	PAK/26/2016	cattle	98.7	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		93.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.3	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.9	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.3	0	O	ME-SA	PanAsia-2	SAN-09
viba_650	IRN/8/2005	ovine	91.2	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	90.8	0	O	ME-SA	PanAsia	
viba_354	PAK/16/2010	cattle	90.7	0	O	ME-SA	PanAsia-2	PUN-10
viba_860	IRN/6/2015	cattle	89.4	0	O	ME-SA	PanAsia-2	QOM-15
viba_541	OMN/7/2001	bovine	89.1	0	O	ME-SA	Ind-2001	b

Virus sample name:	PAK/13/2017
Sender reference:	PK10
Location of origin:	Attock, Punjab
Country of origin:	Pakistan
Date of collection:	04/03/2017
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34971, genome 34972, sequence viba_34973, sequencing info 34974	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_23077	PAK/23/2014	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23030	PAK/5/2014	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_23062	PAK/16/2014	water buffalo	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_20089	PAK/58/2012	cattle	97.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_21539	AFG/27/2013	cattle	97.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_23054	PAK/13/2014	cattle	97.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_23022	PAK/3/2014	cattle	97.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_21940	PAK/27/2013	water buffalo	97.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_22701	AFG/1/2014	cattle	97.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_21536	AFG/23/2013	cattle	97.0	0	O	ME-SA	PanAsia-2	ANT-10

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_719	IRN/88/2009		93.8	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.3	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.5	0	O	ME-SA	PanAsia-2	TER-08
viba_650	IRN/8/2005	ovine	91.3	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	BAL-09
viba_505	TUR/264/2009		90.8	0	O	ME-SA	PanAsia-2	SAN-09
viba_354	PAK/16/2010	cattle	90.5	0	O	ME-SA	PanAsia-2	PUN-10
viba_285	UKG/35/2001	porcine	90.1	0	O	ME-SA	PanAsia	
viba_860	IRN/6/2015	cattle	89.6	0	O	ME-SA	PanAsia-2	QOM-15
viba_850	NEP/1/2015	cattle	89.0	1	O	ME-SA	PanAsia-2	KAT-15

Virus sample name:	PAK/14/2017
Sender reference:	PK5
Location of origin:	Sahiwal, Punjab
Country of origin:	Pakistan
Date of collection:	11/03/2017
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	PanAsia-2
Sublineage:	ANT-10
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/10/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	18/10/2017
Created:	25/10/2017
Last updated:	25/10/2017
VIBASys IDs: sample 34975, genome 34976, sequence viba_34977, sequencing info 34978	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_30292	AFG/4/2016	bovine	98.9	0	O	ME-SA	PanAsia-2	ANT-10
viba_23077	PAK/23/2014	water buffalo	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_23070	PAK/18/2014	water buffalo	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_22721	AFG/7/2014	cattle	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_23030	PAK/5/2014	cattle	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_22701	AFG/1/2014	cattle	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_22705	AFG/2/2014	cattle	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_20089	PAK/58/2012	cattle	98.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_21539	AFG/27/2013	cattle	98.1	0	O	ME-SA	PanAsia-2	ANT-10
viba_23022	PAK/3/2014	cattle	98.1	0	O	ME-SA	PanAsia-2	ANT-10

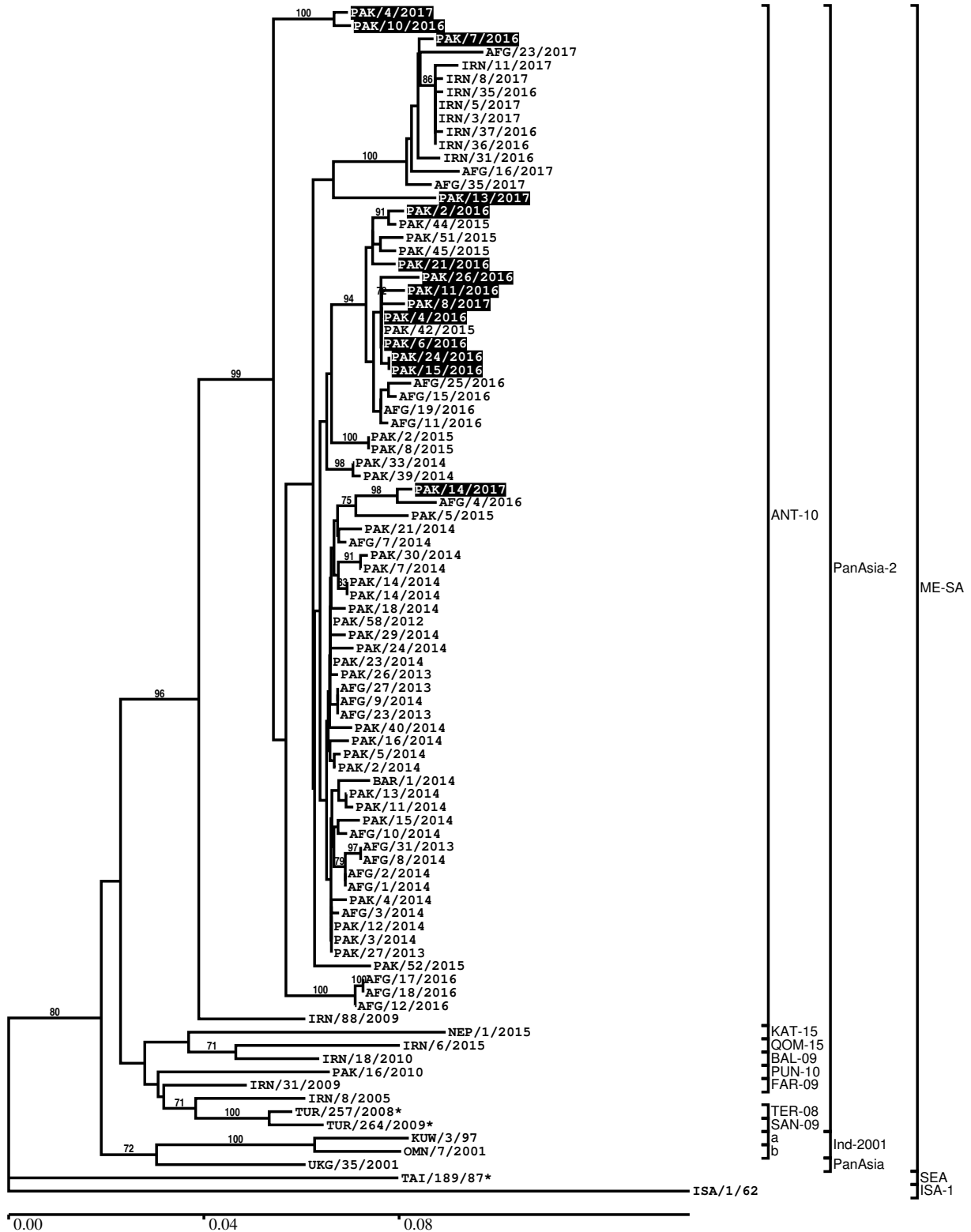
Most Closely Related Prototype Sequences

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

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_719	IRN/88/2009		94.0	0	O	ME-SA	PanAsia-2	ANT-10
viba_766	IRN/31/2009	cattle	92.4	0	O	ME-SA	PanAsia-2	FAR-09
viba_491	TUR/257/2008		91.6	0	O	ME-SA	PanAsia-2	TER-08
viba_505	TUR/264/2009		91.6	0	O	ME-SA	PanAsia-2	SAN-09
viba_354	PAK/16/2010	cattle	91.3	0	O	ME-SA	PanAsia-2	PUN-10
viba_650	IRN/8/2005	ovine	91.0	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	91.0	0	O	ME-SA	PanAsia-2	BAL-09
viba_285	UKG/35/2001	porcine	90.4	0	O	ME-SA	PanAsia	
viba_705	KUW/3/97	bovine	89.9	0	O	ME-SA	Ind-2001	a
viba_860	IRN/6/2015	cattle	89.6	0	O	ME-SA	PanAsia-2	QOM-15

Report on FMDV O in Pakistan in 2016, 2017

Batch: WRLFMD/2017/00021



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLFMD/2017/00021-Pakistan-O (14 sequences)
Sequence database set:	allseqs_O (3635 sequences)
Prototype sequence set:	!prototypes_O (47 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	636
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:	12
VIBASys version:	reflabs-1.1.2

Sequences in the Phylogenetic Tree

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

label	accession	host(s)	lab	country	taxonomic information
PAK/4/2017	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/10/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/7/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/23/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
IRN/11/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/8/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/35/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/5/2017	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/3/2017	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/37/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/36/2016	n/a	sheep	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/31/2016	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
AFG/16/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/35/2017	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/13/2017	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/2/2016	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/44/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/51/2015	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/45/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/21/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/26/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/11/2016	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/8/2017	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/4/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/42/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/6/2016	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/24/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/15/2016	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/25/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/15/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/19/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/11/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/2/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/8/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/33/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/39/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10

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label	accession	host(s)	lab	country	taxonomic information
PAK/14/2017	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/4/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/5/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/21/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/7/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/30/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/7/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/14/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/14/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/18/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/58/2012	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/29/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/24/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/23/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/26/2013	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/27/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/9/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/23/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/40/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/16/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/5/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/2/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
BAR/1/2014	n/a	cattle	WRLFMD	Bahrain	ME-SA/PanAsia-2/ANT-10
PAK/13/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/11/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/15/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/10/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/31/2013	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/8/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/2/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/1/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/4/2014	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/3/2014	n/a	cattle	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
PAK/12/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/3/2014	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/27/2013	n/a	water buffalo	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
PAK/52/2015	n/a	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/ANT-10
AFG/17/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/18/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
AFG/12/2016	n/a	bovine	WRLFMD	Afghanistan	ME-SA/PanAsia-2/ANT-10
IRN/88/2009	KY091282	n/a	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
NEP/1/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/PanAsia-2/KAT-15
IRN/6/2015	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/QOM-15
IRN/18/2010	KY091283	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/BAL-09
PAK/16/2010	KY091285	cattle	WRLFMD	Pakistan	ME-SA/PanAsia-2/PUN-10
IRN/31/2009	KY091284	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/FAR-09
IRN/8/2005	KY091281	ovine	WRLFMD	Iran	ME-SA/PanAsia-2
TUR/257/2008*	n/a	n/a	FMDI-Ankara	Turkey	ME-SA/PanAsia-2/TER-08
TUR/264/2009*	n/a	n/a	FMDI-Ankara	Turkey	ME-SA/PanAsia-2/SAN-09
KUW/3/97	DQ164904	bovine	WRLFMD	Kuwait	ME-SA/Ind-2001/a
OMN/7/2001	DQ164941	bovine	WRLFMD	Oman	ME-SA/Ind-2001/b
UKG/35/2001	AJ539141	porcine	PIADC	United Kingdom	ME-SA/PanAsia
TAI/189/87*	KY091288	bovine	TRRL	Thailand	SEA
ISA/1/62	AJ303500	n/a	WRLFMD	Indonesia	ISA-1

*, not a WRLFMD Reference Number
n/a, not available