

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

## Genotyping Report

FMDV serotype: Asia1  
Country: Pakistan  
Year: 2016, 2019  
Batch: WRLFMD/2020/00002  
No. of sequences: 9  
Report date: 29th June 2020  
Report generated by: Nick Knowles  
Report checked by: Jemma Wadsworth



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Virus sample name:	PAK/29/2016
Sender reference:	PK/20/49 (3632)
Location of origin:	Rawalpindi, Punjab
Country of origin:	Pakistan
Date of collection:	24/03/2016
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	17/03/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44792, genome 44793, sequence viba_44794, sequencing info 44795	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_35178	PAK/16/2017	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_35158	PAK/6/2017	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_35124	PAK/17/2016	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_35102	PAK/1/2016	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_38816	NIAB/PUN/PAK/160/2016	water buffalo	99.7	0	Asia1	ASIA	Sindh-08	
viba_38860	NIAB/PUN/PAK/156/2016	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_38840	NIAB/PUN/PAK/195/2016	dromedary	99.5	0	Asia1	ASIA	Sindh-08	
viba_38852	NIAB/PUN/PAK/144/2016	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_38868	NIAB/PUN/PAK/152/2016	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_38824	NIAB/PUN/PAK/145/2016	cattle	99.5	0	Asia1	ASIA	Sindh-08	

### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	95.2	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.9	0	Asia1	ASIA	G- I	
viba_737	IND/18/80	bovine	85.7	0	Asia1	ASIA	G-V	
viba_385	IND/762/2003	bovine	85.7	0	Asia1	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	85.4	0	Asia1	ASIA	G-VIII	
viba_551	YNBS/CHA/58	bovine	85.0	0	Asia1	ASIA		
viba_297	IND/63/72		84.8	0	Asia1	ASIA		
viba_146	Shamir/ISR/89	bovine	84.6	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	84.4	0	Asia1	ASIA	G-VIb	
viba_646	HKN/19/74	bovine	84.2	0	Asia1	ASIA		

Virus sample name:	PAK/32/2016
Sender reference:	PK/20/43 (5)
Location of origin:	Faisalabad, Punjab
Country of origin:	Pakistan
Date of collection:	09/12/2016
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	17/03/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44796, genome 44797, sequence viba_44798, sequencing info 44799	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_25334	TUR/2/2015	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_25338	TUR/7/2015	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_25346	TUR/12/2015	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_25342	TUR/9/2015	cattle	99.4	0	Asia1	ASIA	Sindh-08	
viba_27657	IRN/26/2016	cattle	99.2	0	Asia1	ASIA	Sindh-08	
viba_25330	PAK/1/2015	water buffalo	99.2	0	Asia1	ASIA	Sindh-08	
viba_26032	PAK/43/2015	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_25350	TUR/18/2015	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_25875	IRN/2/2015	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_25871	IRN/1/2015	cattle	98.9	2	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.6	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	89.8	0	Asia1	ASIA	G- I	
viba_385	IND/762/2003	bovine	84.4	0	Asia1	ASIA	G-III	
viba_12154	BAR/8/2009	cattle	84.2	0	Asia1	ASIA	G-VIII	
viba_646	HKN/19/74	bovine	83.7	0	Asia1	ASIA		
viba_737	IND/18/80	bovine	83.6	0	Asia1	ASIA	G-V	
viba_297	IND/63/72		83.4	0	Asia1	ASIA		
viba_161	IND/14/95	bovine	83.1	0	Asia1	ASIA		
viba_551	YNBS/CHA/58	bovine	82.9	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	82.6	0	Asia1	ASIA	G-VIb	

Virus sample name:	PAK/48/2019
Sender reference:	PK/20/13 (4651)
Location of origin:	Swat, Khyber Pakhtunkhwa
Country of origin:	Pakistan
Date of collection:	24/01/2019
Host species:	water buffalo
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44800, genome 44801, sequence viba_44802, sequencing info 44803	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42535	PAK/4/2019	cattle	100.0	0	Asia1	ASIA	Sindh-08	
viba_44806	PAK/49/2019	cattle	100.0	0	Asia1	ASIA	Sindh-08	
viba_42571	PAK/21/2019	water buffalo	99.4	0	Asia1	ASIA	Sindh-08	
viba_42559	PAK/18/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_42531	PAK/3/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_42539	PAK/7/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42551	PAK/13/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42575	PAK/22/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.0	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.9	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.4	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	85.2	0	Asia1	ASIA	G-V	
viba_551	YNBS/CHA/58	bovine	84.3	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	84.3	0	Asia1	ASIA	G-VIb	
viba_161	IND/14/95	bovine	84.0	0	Asia1	ASIA		
viba_297	IND/63/72		83.9	0	Asia1	ASIA		
viba_385	IND/762/2003	bovine	83.6	0	Asia1	ASIA	G-III	
viba_146	Shamir/ISR/89	bovine	83.5	0	Asia1	ASIA		

Virus sample name:	PAK/49/2019
Sender reference:	PK/20/14 (4652)
Location of origin:	Swat, Khyber Pakhtunkhwa
Country of origin:	Pakistan
Date of collection:	24/01/2019
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	10/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44804, genome 44805, sequence viba_44806, sequencing info 44807	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42535	PAK/4/2019	cattle	100.0	0	Asia1	ASIA	Sindh-08	
viba_44802	PAK/48/2019	water buffalo	100.0	0	Asia1	ASIA	Sindh-08	
viba_42571	PAK/21/2019	water buffalo	99.4	0	Asia1	ASIA	Sindh-08	
viba_42559	PAK/18/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_42531	PAK/3/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_42539	PAK/7/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42551	PAK/13/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42575	PAK/22/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.0	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.9	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.4	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	85.2	0	Asia1	ASIA	G-V	
viba_551	YNBS/CHA/58	bovine	84.3	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	84.3	0	Asia1	ASIA	G-VIb	
viba_161	IND/14/95	bovine	84.0	0	Asia1	ASIA		
viba_297	IND/63/72		83.9	0	Asia1	ASIA		
viba_385	IND/762/2003	bovine	83.6	0	Asia1	ASIA	G-III	
viba_146	Shamir/ISR/89	bovine	83.5	0	Asia1	ASIA		

Virus sample name:	PAK/59/2019
Sender reference:	PK/20/42 (1)
Location of origin:	Nankana Sahib, Punjab
Country of origin:	Pakistan
Date of collection:	26/02/2019
Host species:	water buffalo
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	17/03/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44808, genome 44809, sequence viba_44810, sequencing info 44811	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42539	PAK/7/2019	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	99.8	0	Asia1	ASIA	Sindh-08	
viba_42599	PAK/33/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42587	PAK/27/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42567	PAK/20/2019	water buffalo	99.7	0	Asia1	ASIA	Sindh-08	
viba_42563	PAK/19/2019	water buffalo	99.7	0	Asia1	ASIA	Sindh-08	
viba_42595	PAK/31/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42551	PAK/13/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42591	PAK/30/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.0	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.9	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.4	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	85.2	0	Asia1	ASIA	G-V	
viba_551	YNBS/CHA/58	bovine	84.6	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	84.3	0	Asia1	ASIA	G-VIb	
viba_297	IND/63/72		84.2	0	Asia1	ASIA		
viba_161	IND/14/95	bovine	84.1	0	Asia1	ASIA		
viba_35781	NEP/42/2017	cattle	83.6	0	Asia1	ASIA	G-IX	
viba_385	IND/762/2003	bovine	83.6	0	Asia1	ASIA	G-III	

Virus sample name:	PAK/69/2019
Sender reference:	PK/20/39 (5087)
Location of origin:	Attock, Punjab
Country of origin:	Pakistan
Date of collection:	17/04/2019
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	11/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44812, genome 44813, sequence viba_44814, sequencing info 44815	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42595	PAK/31/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42591	PAK/30/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42539	PAK/7/2019	cattle	99.4	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	99.4	0	Asia1	ASIA	Sindh-08	
viba_42599	PAK/33/2019	cattle	99.2	0	Asia1	ASIA	Sindh-08	
viba_44810	PAK/59/2019	water buffalo	99.2	0	Asia1	ASIA	Sindh-08	
viba_42587	PAK/27/2019	cattle	99.2	0	Asia1	ASIA	Sindh-08	
viba_42567	PAK/20/2019	water buffalo	99.2	0	Asia1	ASIA	Sindh-08	
viba_42563	PAK/19/2019	water buffalo	99.2	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	92.5	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.4	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.6	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	84.8	0	Asia1	ASIA	G-V	
viba_775	IRN/10/2004	cattle	84.4	0	Asia1	ASIA	G-VIb	
viba_551	YNBS/CHA/58	bovine	84.3	0	Asia1	ASIA		
viba_161	IND/14/95	bovine	84.1	0	Asia1	ASIA		
viba_35781	NEP/42/2017	cattle	84.0	0	Asia1	ASIA	G-IX	
viba_385	IND/762/2003	bovine	84.0	0	Asia1	ASIA	G-III	
viba_297	IND/63/72		83.9	0	Asia1	ASIA		

Virus sample name:	PAK/70/2019
Sender reference:	PK/20/38 (5187)
Location of origin:	Rawalpindi, Punjab
Country of origin:	Pakistan
Date of collection:	29/04/2019
Host species:	water buffalo
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	12/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44816, genome 44817, sequence viba_44818, sequencing info 44819	

### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42539	PAK/7/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42551	PAK/13/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42575	PAK/22/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_42599	PAK/33/2019	cattle	99.4	0	Asia1	ASIA	Sindh-08	
viba_44810	PAK/59/2019	water buffalo	99.4	0	Asia1	ASIA	Sindh-08	
viba_42587	PAK/27/2019	cattle	99.4	0	Asia1	ASIA	Sindh-08	
viba_42567	PAK/20/2019	water buffalo	99.4	0	Asia1	ASIA	Sindh-08	
viba_42579	PAK/25/2019	cattle	99.4	0	Asia1	ASIA	Sindh-08	

### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.6	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.9	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.4	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	85.2	0	Asia1	ASIA	G-V	
viba_775	IRN/10/2004	cattle	84.7	0	Asia1	ASIA	G-VIb	
viba_161	IND/14/95	bovine	84.5	0	Asia1	ASIA		
viba_551	YNBS/CHA/58	bovine	84.3	0	Asia1	ASIA		
viba_385	IND/762/2003	bovine	84.0	0	Asia1	ASIA	G-III	
viba_297	IND/63/72		83.9	0	Asia1	ASIA		
viba_146	Shamir/ISR/89	bovine	83.5	0	Asia1	ASIA		



Virus sample name:	PAK/71/2019
Sender reference:	PK/20/33 (5192)
Location of origin:	Jhelum, Punjab
Country of origin:	Pakistan
Date of collection:	16/05/2019
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	12/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44820, genome 44821, sequence viba_44822, sequencing info 44823	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42539	PAK/7/2019	cattle	99.2	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	99.2	0	Asia1	ASIA	Sindh-08	
viba_42599	PAK/33/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_44810	PAK/59/2019	water buffalo	99.0	0	Asia1	ASIA	Sindh-08	
viba_42587	PAK/27/2019	cattle	99.0	0	Asia1	ASIA	Sindh-08	
viba_42567	PAK/20/2019	water buffalo	99.0	0	Asia1	ASIA	Sindh-08	
viba_42563	PAK/19/2019	water buffalo	99.0	0	Asia1	ASIA	Sindh-08	
viba_44814	PAK/69/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_42595	PAK/31/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	
viba_44826	PAK/75/2019	cattle	98.9	0	Asia1	ASIA	Sindh-08	

#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	92.7	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.3	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	85.7	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	84.7	0	Asia1	ASIA	G-V	
viba_385	IND/762/2003	bovine	84.2	0	Asia1	ASIA	G-III	
viba_551	YNBS/CHA/58	bovine	84.1	0	Asia1	ASIA		
viba_161	IND/14/95	bovine	84.1	0	Asia1	ASIA		
viba_297	IND/63/72		83.7	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	83.5	0	Asia1	ASIA	G-VIb	
viba_146	Shamir/ISR/89	bovine	83.2	0	Asia1	ASIA		

Virus sample name:	PAK/75/2019
Sender reference:	PK/20/36 (705)
Location of origin:	Karachi, Sindh
Country of origin:	Pakistan
Date of collection:	18/12/2019
Host species:	cattle
Serotype:	Asia1
Topotype:	ASIA
Lineage:	Sindh-08
Sublineage:	
Sequence length:	627
Ambiguities:	0
Material submitted for sequencing:	BTy2
Harvest date of material:	16/06/2020
Primers:	As1-1C530F/EUR-2B52R; FMD-3161F/FMD-4303R
Received for sequencing:	22/06/2020
Created:	29/06/2020
Last updated:	29/06/2020
VIBASys IDs: sample 44824, genome 44825, sequence viba_44826, sequencing info 44827	

#### Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_42539	PAK/7/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42551	PAK/13/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42583	PAK/26/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42575	PAK/22/2019	cattle	99.7	0	Asia1	ASIA	Sindh-08	
viba_42599	PAK/33/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_44810	PAK/59/2019	water buffalo	99.5	0	Asia1	ASIA	Sindh-08	
viba_42587	PAK/27/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	
viba_44818	PAK/70/2019	water buffalo	99.5	0	Asia1	ASIA	Sindh-08	
viba_42567	PAK/20/2019	water buffalo	99.5	0	Asia1	ASIA	Sindh-08	
viba_42579	PAK/25/2019	cattle	99.5	0	Asia1	ASIA	Sindh-08	

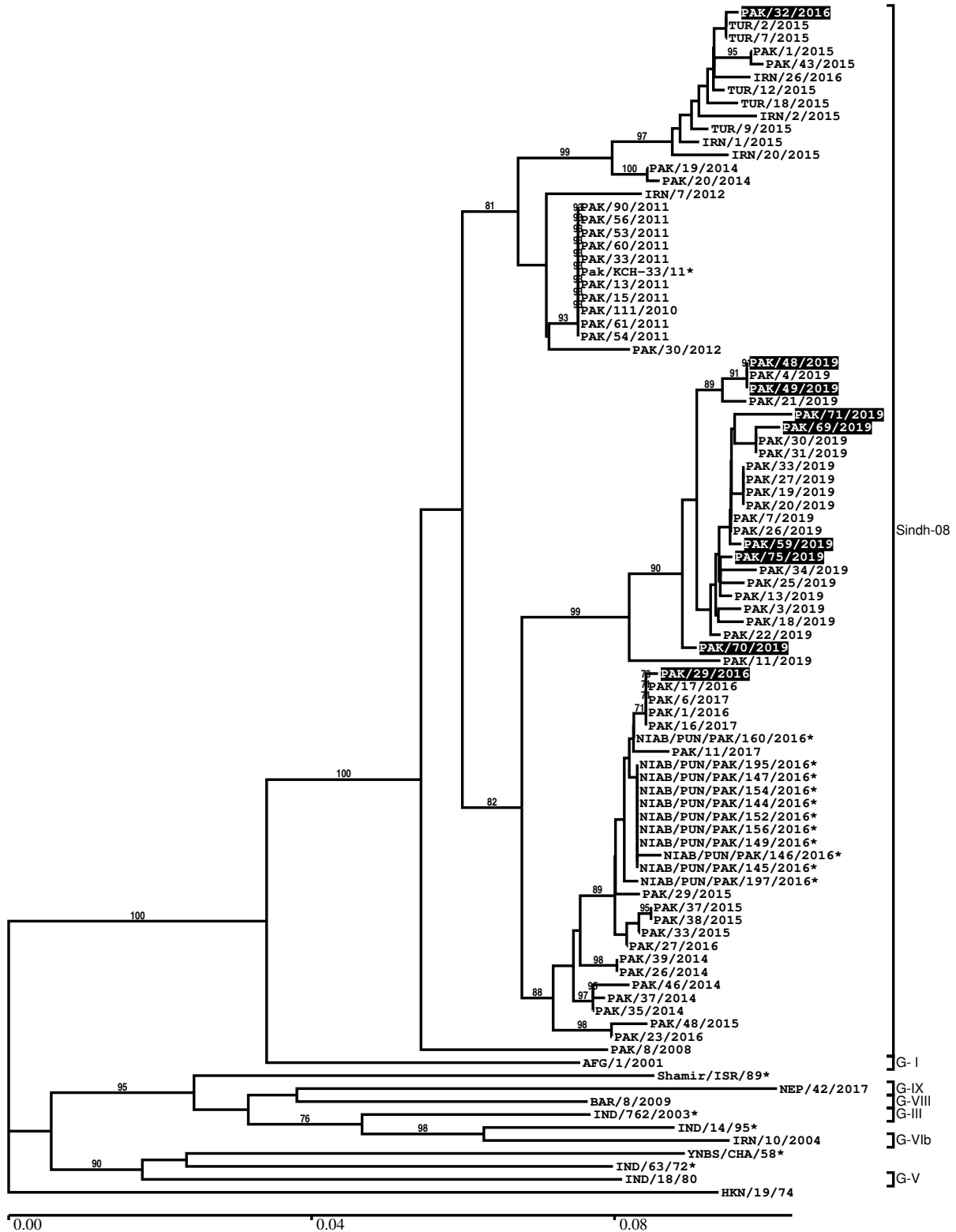
#### Most Closely Related Prototype Sequences

see <http://www.wrlfmd.org/fmdv-genome/fmd-prototype-strains>

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_206	PAK/8/2008	water buffalo	93.1	0	Asia1	ASIA	Sindh-08	
viba_167	AFG/1/2001	bovine	90.7	0	Asia1	ASIA	G- I	
viba_12154	BAR/8/2009	cattle	86.2	0	Asia1	ASIA	G-VIII	
viba_737	IND/18/80	bovine	85.1	0	Asia1	ASIA	G-V	
viba_551	YNBS/CHA/58	bovine	84.4	0	Asia1	ASIA		
viba_775	IRN/10/2004	cattle	84.2	0	Asia1	ASIA	G-VIb	
viba_297	IND/63/72		84.0	0	Asia1	ASIA		
viba_161	IND/14/95	bovine	84.0	0	Asia1	ASIA		
viba_385	IND/762/2003	bovine	83.5	0	Asia1	ASIA	G-III	
viba_146	Shamir/ISR/89	bovine	83.3	0	Asia1	ASIA		

Report on FMDV Asia1 in Pakistan in 2016, 2019

Batch: WRLFMD/2020/00002



\*, not a WRLFMD Reference Number

## Analysis Parameters

VP1 subsequence extractor:	vp1_Asia1
Query sequence set:	WRLFMD/2020/00002-Pakistan-Asia1 (9 sequences)
Sequence database set:	allseqs_Asia1 (700 sequences)
Prototype sequence set:	!prototypes_Asia1 (13 sequences)
Number of related sequences reported:	10
Minimal VP1 subsequence match length	600
Sequence alignment method:	muscle (default parameters)
Sequence alignment length:	627
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/Asia1/ASIA

label	accession	host(s)	lab	country	taxonomic information
PAK/32/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
TUR/2/2015	n/a	cattle	WRLFMD	Turkey	Sindh-08
TUR/7/2015	n/a	cattle	WRLFMD	Turkey	Sindh-08
PAK/1/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/43/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
IRN/26/2016	n/a	cattle	WRLFMD	Iran	Sindh-08
TUR/12/2015	n/a	cattle	WRLFMD	Turkey	Sindh-08
TUR/18/2015	n/a	cattle	WRLFMD	Turkey	Sindh-08
IRN/2/2015	n/a	cattle	WRLFMD	Iran	Sindh-08
TUR/9/2015	n/a	cattle	WRLFMD	Turkey	Sindh-08
IRN/1/2015	n/a	cattle	WRLFMD	Iran	Sindh-08
IRN/20/2015	n/a	cattle	WRLFMD	Iran	Sindh-08
PAK/19/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/20/2014	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
IRN/7/2012	n/a	cattle	WRLFMD	Iran	Sindh-08
PAK/90/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/56/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/53/2011	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/60/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2011	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
Pak/KCH-33/11*	KU365793	water buffalo	PIADC	Pakistan	Sindh-08
PAK/13/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/15/2011	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/111/2010	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/61/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/54/2011	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/30/2012	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/48/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/4/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/49/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/21/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/71/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/69/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/30/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/31/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08

*continued on next page*

label	accession	host(s)	lab	country	taxonomic information
PAK/27/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/19/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/20/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/7/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/26/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/59/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/75/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/34/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/25/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/13/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/3/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/18/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/22/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/70/2019	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/11/2019	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/29/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/17/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/6/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/1/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/16/2017	n/a	cattle	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/160/2016*	MF140439	water buffalo	NIAB	Pakistan	Sindh-08
PAK/11/2017	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
NIAB/PUN/PAK/195/2016*	MF140443	dromedary	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/147/2016*	KY659573	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/154/2016*	KY659575	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/144/2016*	KY659570	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/152/2016*	MF115989	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/156/2016*	MF115991	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/149/2016*	KY659574	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/146/2016*	KY659572	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/145/2016*	KY659571	cattle	NIAB	Pakistan	Sindh-08
NIAB/PUN/PAK/197/2016*	MF167435	dromedary	NIAB	Pakistan	Sindh-08
PAK/29/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/37/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/38/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/33/2015	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/27/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/39/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/26/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/46/2014	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/37/2014	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/35/2014	n/a	water buffalo	WRLFMD	Pakistan	Sindh-08
PAK/48/2015	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/23/2016	n/a	cattle	WRLFMD	Pakistan	Sindh-08
PAK/8/2008	KY091304	water buffalo	WRLFMD	Pakistan	Sindh-08
AFG/1/2001	DQ121109	bovine	WRLFMD	Afghanistan	G- I
Shamir/ISR/89*	n/a	bovine	BFAV	Israel	
NEP/42/2017	n/a	cattle	WRLFMD	Nepal	G-IX
BAR/8/2009	MG603264	cattle	WRLFMD	Bahrain	G-VIII
IND/762/2003*	DQ101240	bovine	PD-FMD	India	G-III
IND/14/95*	AF390678	bovine	PD-FMD	India	
IRN/10/2004	DQ121119	cattle	WRLFMD	Iran	G-VIb
YNBS/CHA/58*	AY390432	bovine	LVRI	China	
IND/63/72*	AY304994	n/a	IVRI- Bangalore	India	
IND/18/80	DQ121116	bovine	WRLFMD	India	G-V
HKN/19/74	n/a	bovine	WRLFMD	Hong Kong SAR	

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n/a, not available