

FAO World Reference Laboratory for Foot-and-Mouth Disease

Genotyping Supplementary Report

Sample batch: WRLFMD/2016/00036

Received: 13/12/2016

Further Investigations

RNA extracted from all samples which were foot-and-mouth disease virus genome detected (FMDV-GD) by the real time RT-PCR were subsequently subjected to a conventional RT-PCR of the VP1-coding region using primer sets (two sets per serotype) designed to amplify O, A or Asia 1. Resultant amplicons were sequenced and in five samples only FMDV type O was detected in (plus BHU/9/2016 which was isolated on BTy cells (Table 1). The other six FMDV-GD samples were negative (Table 1).

Table 1. The results of real time RT-PCR and conventional RT-PCR/DNA sequencing.

WRLFMD Ref. No.	Sender Ref.	Date collected	Host	WRLFMD typing result	Sequencing result
BHU/1/2015	985	14/08/2015	Cattle	FMDV-GD	Negative
BHU/2/2015	697	15/08/2015	Cattle	FMDV-GD	O
BHU/3/2015	1042	22/11/2015	Cattle	FMDV-GD	Negative
BHU/4/2015	1105	26/12/2015	Cattle	FMDV-GD	Negative
BHU/1/2016	79(F)	15/02/2016	Cattle	FMDV-GD	Negative
BHU/2/2016	79(T)	15/02/2016	Cattle	FMDV-GD	O
BHU/3/2016	84	15/02/2016	Cattle	FMDV-GD	O
BHU/4/2016	97	17/02/2016	Cattle	FMDV-GD	Negative
BHU/5/2016	120	08/03/2016	Cattle	FMDV-GD	Negative
BHU/6/2016	158	24/03/2016	Cattle	FMDV-GD	Negative
BHU/7/2016	285(1)	04/06/2016	Cattle	NVD	Not done
BHU/8/2016	285(2)	04/06/2016	Cattle	FMDV-GD	O
BHU/9/2016	285(3)	04/06/2016	Cattle	O	O
BHU/10/2016	285(4)	04/06/2016	Cattle	FMDV-GD	O

Conclusions

No FMDV type A or Asia 1 sequences were detected in any of the samples. All FMDV type O sequences belonged to the ME-SA/Ind-2001d lineage (see accompanying genotyping report).

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

Genotyping Report

FMDV serotype: O
Country: Bhutan
Year: 2015, 2016
Batch: WRLFMD/2016/00036
No. of sequences: 6
Report date: 1st February 2017
Report generated by: Nick Knowles
Report checked by: Kasia Bankowska



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email: reporting@pirbright.ac.uk

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Virus sample name:	BHU/2/2015
Sender reference:	697
Location of origin:	Tari Thang, Umling, Sarpang, Rldc, Zhemgang
Country of origin:	Bhutan
Date of collection:	15/08/2015
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	OS
Harvest date of material:	13/12/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	01/02/2017
Last updated:	01/02/2017
VIBASys IDs: sample 31535, genome 31536, sequence viba_31537, sequencing info 31538	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31545	BHU/3/2016	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_25387	BAR/15/2015	cattle	98.6	0	O	ME-SA	Ind-2001	d
viba_25383	BAR/14/2015	cattle	98.6	0	O	ME-SA	Ind-2001	d
viba_25379	BAR/13/2015	cattle	98.6	0	O	ME-SA	Ind-2001	d
viba_21979	SRL/1/2013	bovine	98.3	0	O	ME-SA	Ind-2001	d
viba_21732	IND205/2013	cattle	98.3	0	O	ME-SA	Ind-2001	d
viba_21983	SRL/2/2013	bovine	98.1	0	O	ME-SA	Ind-2001	d
viba_31391	IND298(634)/2013	cattle	98.1	0	O	ME-SA	Ind-2001	d
viba_21728	IND189/2013	cattle	98.1	0	O	ME-SA	Ind-2001	d
viba_31050	BAN JA Ma-180 2013	cattle	98.1	0	O	ME-SA	Ind-2001	d

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_293	BHU/3/2009	cattle	95.3	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	91.2	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	90.8	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.0	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	88.2	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	88.1	0	O	ME-SA	PanAsia-2	FAR-09
viba_860	IRN/6/2015	cattle	87.9	0	O	ME-SA	PanAsia-2	QOM-15
viba_666	IRN/18/2010	cattle	87.9	0	O	ME-SA	PanAsia-2	BAL-09
viba_650	IRN/8/2005	ovine	87.5	0	O	ME-SA	PanAsia-2	
viba_719	IRN/88/2009		87.1	0	O	ME-SA	PanAsia-2	ANT-10

Virus sample name:	BHU/2/2016
Sender reference:	79(T)
Location of origin:	Bukey, Samtse, Rldc, Tshimasham
Country of origin:	Bhutan
Date of collection:	15/02/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	OS
Harvest date of material:	13/12/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	01/02/2017
Last updated:	01/02/2017
VIBASys IDs: sample 31539, genome 31540, sequence viba_31541, sequencing info 31542	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31135	BAN/NL/Lo-245/2015	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_31082	BAN/GKa-236(pig)/2015	porcine	99.7	0	O	ME-SA	Ind-2001	d
viba_30855	Zabaikalskiy/1/RUS/2016	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_30859	Zabaikalskiy/2/RUS/2016	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_31492	VIT/20/2016	cattle	99.2	0	O	ME-SA	Ind-2001	d
viba_29927	NEP/6/2016	cattle	99.1	0	O	ME-SA	Ind-2001	d
viba_29907	NEP/28/2015	cattle	99.1	0	O	ME-SA	Ind-2001	d
viba_26117	NEP/17/2015	cattle	99.1	0	O	ME-SA	Ind-2001	d
viba_26125	NEP/19/2015	cattle	99.1	0	O	ME-SA	Ind-2001	d
viba_23820	SAU/7/2016	bovine	99.1	0	O	ME-SA	Ind-2001	d

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_293	BHU/3/2009	cattle	94.3	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	92.7	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	91.8	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.2	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	89.0	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	88.3	0	O	ME-SA	PanAsia-2	FAR-09
viba_359	Manisa/TUR/69		88.2	0	O	ME-SA		
viba_650	IRN/8/2005	ovine	88.2	0	O	ME-SA	PanAsia-2	
viba_666	IRN/18/2010	cattle	88.0	0	O	ME-SA	PanAsia-2	BAL-09
viba_719	IRN/88/2009		87.9	0	O	ME-SA	PanAsia-2	ANT-10

Virus sample name:	BHU/3/2016
Sender reference:	84
Location of origin:	Nashikha, Luni, Paro, Rldc, Tshimasham
Country of origin:	Bhutan
Date of collection:	15/02/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	OS
Harvest date of material:	13/12/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	26/01/2017
Last updated:	26/01/2017
VIBASys IDs: sample 31543, genome 31544, sequence viba_31545, sequencing info 31546	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31537	BHU/2/2015	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_25387	BAR/15/2015	cattle	98.9	0	O	ME-SA	Ind-2001	d
viba_25383	BAR/14/2015	cattle	98.9	0	O	ME-SA	Ind-2001	d
viba_25379	BAR/13/2015	cattle	98.9	0	O	ME-SA	Ind-2001	d
viba_21979	SRL/1/2013	bovine	98.6	0	O	ME-SA	Ind-2001	d
viba_21732	IND205/2013	cattle	98.6	0	O	ME-SA	Ind-2001	d
viba_21983	SRL/2/2013	bovine	98.4	0	O	ME-SA	Ind-2001	d
viba_31391	IND298(634)/2013	cattle	98.4	0	O	ME-SA	Ind-2001	d
viba_21728	IND189/2013	cattle	98.4	0	O	ME-SA	Ind-2001	d
viba_31050	BAN JA Ma-180 2013	cattle	98.4	0	O	ME-SA	Ind-2001	d

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_293	BHU/3/2009	cattle	95.6	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	91.5	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	91.2	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.2	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	88.5	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	88.3	0	O	ME-SA	PanAsia-2	FAR-09
viba_860	IRN/6/2015	cattle	88.2	0	O	ME-SA	PanAsia-2	QOM-15
viba_666	IRN/18/2010	cattle	88.2	0	O	ME-SA	PanAsia-2	BAL-09
viba_650	IRN/8/2005	ovine	87.6	0	O	ME-SA	PanAsia-2	
viba_719	IRN/88/2009		87.6	0	O	ME-SA	PanAsia-2	ANT-10

Virus sample name:	BHU/8/2016
Sender reference:	285(2)
Location of origin:	Gomu, Naja, Paro, Rldc, Tshimasham
Country of origin:	Bhutan
Date of collection:	04/06/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	OS
Harvest date of material:	13/12/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	26/01/2017
Last updated:	26/01/2017
VIBASys IDs: sample 31547, genome 31548, sequence viba_31549, sequencing info 31550	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31553	BHU/9/2016	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_31557	BHU/10/2016	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_29927	NEP/6/2016	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_29907	NEP/28/2015	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_26117	NEP/17/2015	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_26125	NEP/19/2015	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_29923	NEP/5/2016	cattle	99.2	0	O	ME-SA	Ind-2001	d
viba_29959	NEP/14/2016	water buffalo	99.1	0	O	ME-SA	Ind-2001	d
viba_29951	NEP/12/2016	cattle	99.1	0	O	ME-SA	Ind-2001	d
viba_29943	NEP/10/2016	goats	99.1	0	O	ME-SA	Ind-2001	d

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_293	BHU/3/2009	cattle	94.0	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	92.7	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	91.5	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.5	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	89.0	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	88.9	0	O	ME-SA	PanAsia-2	FAR-09
viba_359	Manisa/TUR/69		88.3	0	O	ME-SA		
viba_650	IRN/8/2005	ovine	88.2	0	O	ME-SA	PanAsia-2	
viba_719	IRN/88/2009		88.2	0	O	ME-SA	PanAsia-2	ANT-10
viba_666	IRN/18/2010	cattle	87.5	0	O	ME-SA	PanAsia-2	BAL-09

Virus sample name:	BHU/9/2016
Sender reference:	285(3)
Location of origin:	Tshibji, Naja, Paro, Rldc, Tshimasham
Country of origin:	Bhutan
Date of collection:	04/06/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	BTy1
Harvest date of material:	19/01/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	26/01/2017
Last updated:	26/01/2017
VIBASys IDs: sample 31551, genome 31552, sequence viba_31553, sequencing info 31554	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_31549	BHU/8/2016	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_31557	BHU/10/2016	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_29927	NEP/6/2016	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_29907	NEP/28/2015	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_26117	NEP/17/2015	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_26125	NEP/19/2015	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_29923	NEP/5/2016	cattle	99.4	0	O	ME-SA	Ind-2001	d
viba_29959	NEP/14/2016	water buffalo	99.2	0	O	ME-SA	Ind-2001	d
viba_29951	NEP/12/2016	cattle	99.2	0	O	ME-SA	Ind-2001	d
viba_29943	NEP/10/2016	goats	99.2	0	O	ME-SA	Ind-2001	d

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_293	BHU/3/2009	cattle	94.2	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	92.9	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	91.6	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.4	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	89.1	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	88.8	0	O	ME-SA	PanAsia-2	FAR-09
viba_359	Manisa/TUR/69		88.5	0	O	ME-SA		
viba_650	IRN/8/2005	ovine	88.3	0	O	ME-SA	PanAsia-2	
viba_719	IRN/88/2009		88.3	0	O	ME-SA	PanAsia-2	ANT-10
viba_666	IRN/18/2010	cattle	87.7	0	O	ME-SA	PanAsia-2	BAL-09

Virus sample name:	BHU/10/2016
Sender reference:	285(4)
Location of origin:	Tshibji, Naja, Paro, Rldc, Tshimasham
Country of origin:	Bhutan
Date of collection:	04/06/2016
Host species:	cattle
Serotype:	O
Topotype:	ME-SA
Lineage:	Ind-2001
Sublineage:	d
Sequence length:	633
Ambiguities:	0
Material submitted for sequencing:	OS
Harvest date of material:	13/12/2017
Primers:	O-1C244F/EUR-2B52R; O-1C272F/EUR-2B52R
Received for sequencing:	23/01/2017
Created:	26/01/2017
Last updated:	26/01/2017
VIBASys IDs: sample 31555, genome 31556, sequence viba_31557, sequencing info 31558	

Most Closely Related Sequences

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_29927	NEP/6/2016	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_29907	NEP/28/2015	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_26117	NEP/17/2015	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_26125	NEP/19/2015	cattle	99.8	0	O	ME-SA	Ind-2001	d
viba_31553	BHU/9/2016	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_29923	NEP/5/2016	cattle	99.7	0	O	ME-SA	Ind-2001	d
viba_29959	NEP/14/2016	water buffalo	99.5	0	O	ME-SA	Ind-2001	d
viba_31549	BHU/8/2016	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_29951	NEP/12/2016	cattle	99.5	0	O	ME-SA	Ind-2001	d
viba_29943	NEP/10/2016	goats	99.5	0	O	ME-SA	Ind-2001	d

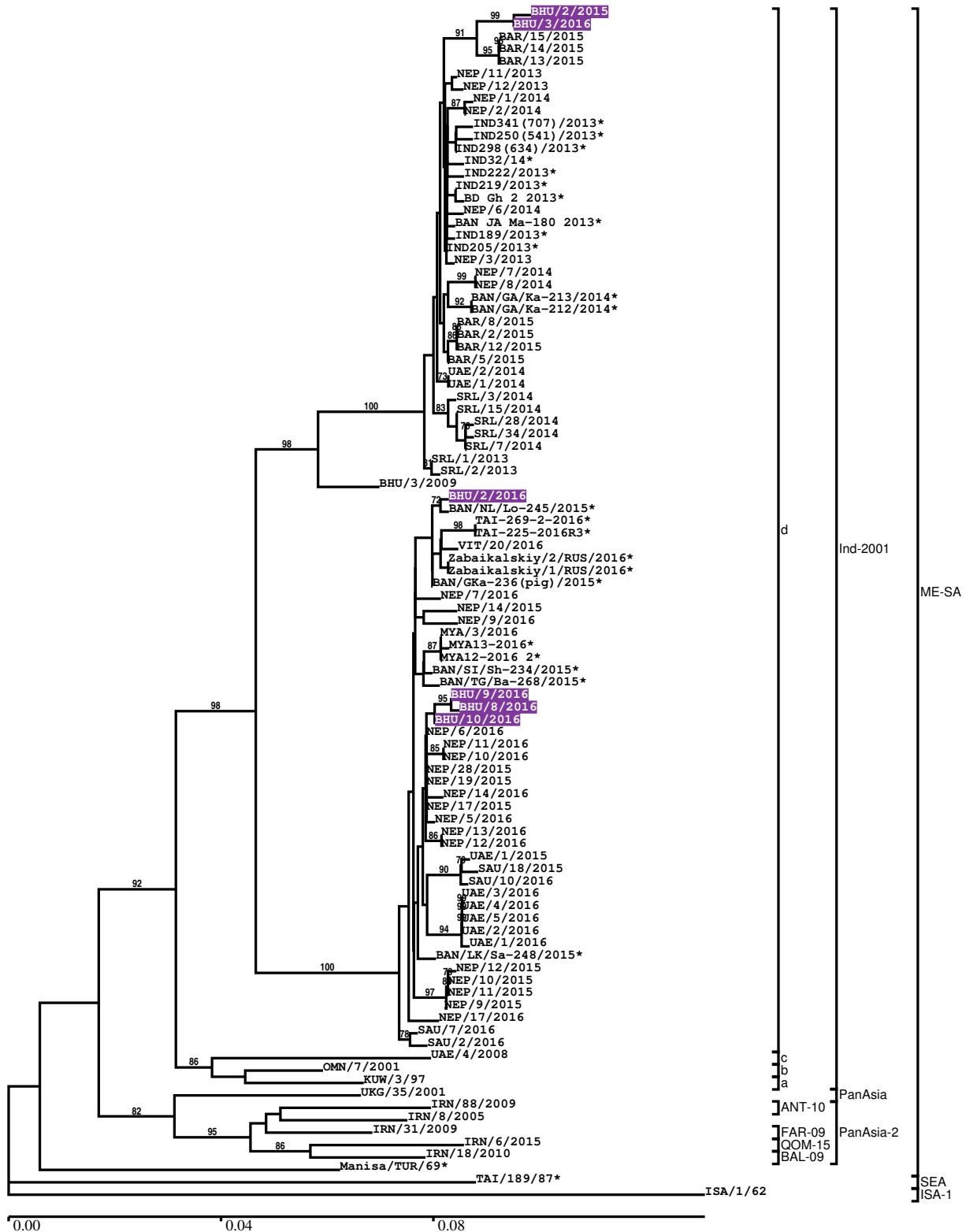
Most Closely Related Prototype Sequences

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

sequence	virus name	Host	% Id.	# Ambig.	serotype	topotype	lineage	sublineage
viba_293	BHU/3/2009	cattle	94.5	0	O	ME-SA	Ind-2001	d
viba_541	OMN/7/2001	bovine	93.2	0	O	ME-SA	Ind-2001	b
viba_705	KUW/3/97	bovine	92.0	0	O	ME-SA	Ind-2001	a
viba_397	UAE/4/2008	gazelle	90.7	0	O	ME-SA	Ind-2001	c
viba_285	UKG/35/2001	porcine	89.4	0	O	ME-SA	PanAsia	
viba_766	IRN/31/2009	cattle	89.1	0	O	ME-SA	PanAsia-2	FAR-09
viba_359	Manisa/TUR/69		88.8	0	O	ME-SA		
viba_650	IRN/8/2005	ovine	88.6	0	O	ME-SA	PanAsia-2	
viba_719	IRN/88/2009		88.6	0	O	ME-SA	PanAsia-2	ANT-10
viba_666	IRN/18/2010	cattle	88.0	0	O	ME-SA	PanAsia-2	BAL-09

Report on FMDV O in Bhutan in 2015, 2016

Batch: WRLFMD/2016/00036



*, not a WRLFMD Reference Number

Analysis Parameters

VP1 subsequence extractor:	vp1_O
Query sequence set:	WRLFMD/2016/00036-Bhutan-O (6 sequences)
Sequence database set:	allseqs_O (3287 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:	11
VIBASys version:	master-1.1.0-17-gf69a4d1

Sequences in the Phylogenetic Tree

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

label	accession	host(s)	lab	country	taxonomic information
BHU/2/2015	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BHU/3/2016	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BAR/15/2015	n/a	cattle	WRLFMD	Bahrain	ME-SA/Ind-2001/d
BAR/14/2015	n/a	cattle	WRLFMD	Bahrain	ME-SA/Ind-2001/d
BAR/13/2015	n/a	cattle	WRLFMD	Bahrain	ME-SA/Ind-2001/d
NEP/11/2013	KM921855	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/12/2013	KM921856	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/1/2014	KM921861	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/2/2014	KM921862	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
IND341(707)/2013*	KJ825805	cattle	PD-FMD	India	ME-SA/Ind-2001/d
IND250(541)/2013*	KJ825809	water buffalo	PD-FMD	India	ME-SA/Ind-2001/d
IND298(634)/2013*	KJ825804	cattle	PD-FMD	India	ME-SA/Ind-2001/d
IND32/14*	KP822942	cattle	PD-FMD	India	ME-SA/Ind-2001/d
IND222/2013*	KM264364	cattle	PD-FMD	India	ME-SA/Ind-2001/d
IND219/2013*	KM264363	cattle	PD-FMD	India	ME-SA/Ind-2001/d
BD Gh 2 2013*	KT037119	cattle	Bangladesh Agri Univ	Bangladesh	ME-SA/Ind-2001/d
NEP/6/2014	KM921865	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
BAN JA Ma-180 2013*	KJ175183	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
IND189/2013*	KM264361	cattle	PD-FMD	India	ME-SA/Ind-2001/d
IND205/2013*	KM264362	cattle	PD-FMD	India	ME-SA/Ind-2001/d
NEP/3/2013	KM921853	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/7/2014	KM921866	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/8/2014	KM921867	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
BAN/GA/Ka-213/2014*	KY077606	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
BAN/GA/Ka-212/2014*	KY077605	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
BAR/8/2015	n/a	sheep	WRLFMD	Bahrain	ME-SA/Ind-2001/d
BAR/2/2015	n/a	cattle	WRLFMD	Bahrain	ME-SA/Ind-2001/d
BAR/12/2015	n/a	sheep	WRLFMD	Bahrain	ME-SA/Ind-2001/d
BAR/5/2015	n/a	cattle	WRLFMD	Bahrain	ME-SA/Ind-2001/d
UAE/2/2014	KM921878	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
UAE/1/2014	KM921877	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
SRL/3/2014	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
SRL/15/2014	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d

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label	accession	host(s)	lab	country	taxonomic information
SRL/28/2014	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
SRL/34/2014	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
SRL/7/2014	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
SRL/1/2013	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
SRL/2/2013	n/a	bovine	WRLFMD	Sri Lanka	ME-SA/Ind-2001/d
BHU/3/2009	KM921814	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BHU/2/2016	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BAN/NL/Lo-245/2015*	KY077611	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
TAI-269-2-2016*	n/a	cattle	TRRL	Thailand	ME-SA/Ind-2001/d
TAI-225-2016R3*	n/a	cattle	TRRL	Thailand	ME-SA/Ind-2001/d
VIT/20/2016	n/a	cattle	WRLFMD	Vietnam	ME-SA/Ind-2001/d
Zabaikalskiy/2/RUS/2016*	n/a	cattle	ARRIAH	Russia	ME-SA/Ind-2001/d
Zabaikalskiy/1/RUS/2016*	n/a	cattle	ARRIAH	Russia	ME-SA/Ind-2001/d
BAN/GKa-236(pig)/2015*	KX712091	porcine	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
NEP/7/2016	KY449055	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/14/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/9/2016	n/a	porcine	WRLFMD	Nepal	ME-SA/Ind-2001/d
MYA/3/2016	n/a	cattle	WRLFMD	Myanmar	ME-SA/Ind-2001/d
MYA13-2016*	n/a	n/a	TRRL	Myanmar	ME-SA/Ind-2001/d
MYA12-2016 2*	n/a	n/a	TRRL	Myanmar	ME-SA/Ind-2001/d
BAN/SI/Sh-234/2015*	KY077610	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
BAN/TG/Ba-268/2015*	KY077621	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
BHU/9/2016	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BHU/8/2016	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
BHU/10/2016	n/a	cattle	WRLFMD	Bhutan	ME-SA/Ind-2001/d
NEP/6/2016	KY449054	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/11/2016	n/a	goats	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/10/2016	n/a	goats	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/28/2015	KY449052	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/19/2015	KY449051	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/14/2016	n/a	water buffalo	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/17/2015	KY449050	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/5/2016	KY449053	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/13/2016	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/12/2016	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
UAE/1/2015	n/a	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
SAU/18/2015	n/a	bovine	WRLFMD	Saudi Arabia	ME-SA/Ind-2001/d
SAU/10/2016	n/a	bovine	WRLFMD	Saudi Arabia	ME-SA/Ind-2001/d
UAE/3/2016	n/a	cattle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
UAE/4/2016	n/a	cattle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
UAE/5/2016	n/a	cattle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
UAE/2/2016	n/a	cattle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
UAE/1/2016	n/a	cattle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/d
BAN/LK/Sa-248/2015*	KY077612	cattle	Univ Dhaka	Bangladesh	ME-SA/Ind-2001/d
NEP/12/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/10/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/11/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/9/2015	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
NEP/17/2016	n/a	cattle	WRLFMD	Nepal	ME-SA/Ind-2001/d
SAU/7/2016	n/a	bovine	WRLFMD	Saudi Arabia	ME-SA/Ind-2001/d
SAU/2/2016	n/a	bovine	WRLFMD	Saudi Arabia	ME-SA/Ind-2001/d
UAE/4/2008	KM921876	gazelle	WRLFMD	United Arab Emirates	ME-SA/Ind-2001/c
OMN/7/2001	DQ164941	bovine	WRLFMD	Oman	ME-SA/Ind-2001/b
KUW/3/97	DQ164904	bovine	WRLFMD	Kuwait	ME-SA/Ind-2001/a
UKG/35/2001	AJ539141	porcine	PIADC	United Kingdom	ME-SA/PanAsia
IRN/88/2009	KY091282	n/a	WRLFMD	Iran	ME-SA/PanAsia-2/ANT-10
IRN/8/2005	KY091281	ovine	WRLFMD	Iran	ME-SA/PanAsia-2
IRN/31/2009	KY091284	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/FAR-09
IRN/6/2015	n/a	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/QOM-15

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label	accession	host(s)	lab	country	taxonomic information
IRN/18/2010	KY091283	cattle	WRLFMD	Iran	ME-SA/PanAsia-2/BAL-09
Manisa/TUR/69*	AY593823	n/a	PIADC	Turkey	ME-SA
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