

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

## Genotyping Report

FMDV serotype: O  
Country: Israel  
Year: 2022  
Batch: WRLMEG/2022/00039  
No. of sequences: 1  
Report date: 31st October 2022  
Report generated by: Nick Knowles  
Report checked by: Don King

This report is prepared on behalf of the Kimron Veterinary Institute (Beit Dagon, Hamerkaz, Israel) and covers a VP1 sequence submitted to the WRLFMD on 31 October 2022.



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email: [reporting@pirbright.ac.uk](mailto:reporting@pirbright.ac.uk)

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|                                    |                             |
|------------------------------------|-----------------------------|
| Virus sample name:                 | 465636/ISR/2022             |
| Sender reference:                  | 465636_Lehavot_HaBashan_VP1 |
| Location of origin:                | Lahavot HaBashan            |
| Country of origin:                 | Israel                      |
| Date of collection:                | 29/09/2022                  |
| Host species:                      | cattle                      |
| Serotype:                          | O                           |
| Topotype:                          | ME-SA                       |
| Lineage:                           | PanAsia-2                   |
| Sublineage:                        | ANT-10                      |
| Sequence length:                   | 633                         |
| Ambiguities:                       | 0                           |
| Material submitted for sequencing: | n/a                         |
| Harvest date of material:          | n/a                         |
| Primers:                           | n/a                         |
| Received for sequencing:           | n/a                         |
| Created:                           | 31/10/2022                  |
| Last updated:                      | 31/10/2022                  |

VIBASys IDs: sample 51825, genome 51826, sequence viba\_51827, sequencing info 51828

### Most Closely Related Sequences

| sequence   | virus name      | Host   | % Id. | # Ambig. | serotype | topotype | lineage   | sublineage |
|------------|-----------------|--------|-------|----------|----------|----------|-----------|------------|
| viba_50006 | JOR/1/2021      | cattle | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_49959 | JOR/609/2021    | cattle | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50707 | PAT/4/2021      | sheep  | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_49250 | 435458/PAT/2021 | sheep  | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50703 | PAT/3/2021      | sheep  | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50404 | 443555/ISR/2022 | sheep  | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50711 | PAT/5/2021      | goat   | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50682 | ISR/8/2022      | cattle | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50699 | PAT/2/2021      | cattle | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_50715 | PAT/6/2021      | goat   | 99.2  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |

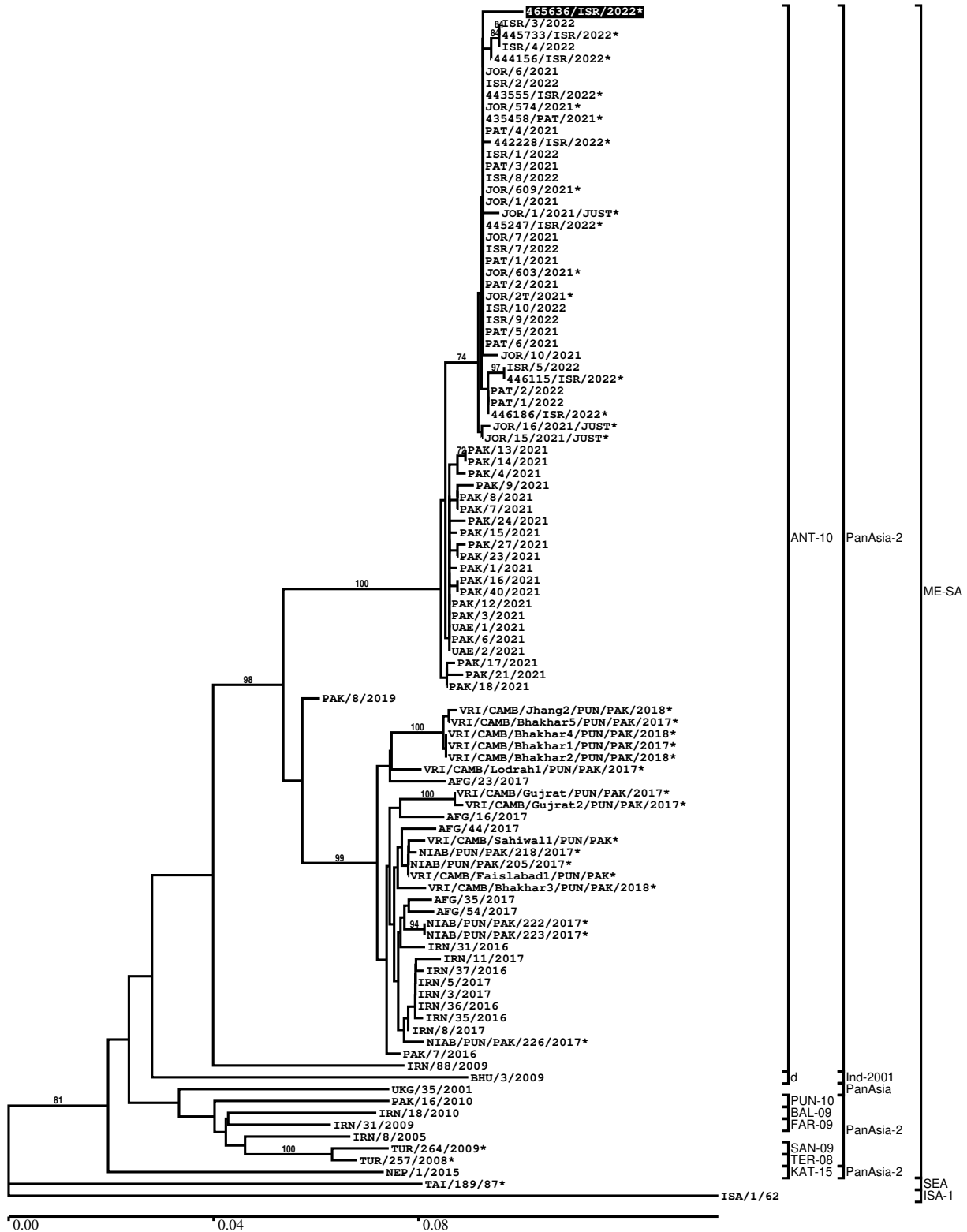
### Most Closely Related Prototype Sequences

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

| sequence | virus name   | Host    | % Id. | # Ambig. | serotype | topotype | lineage   | sublineage |
|----------|--------------|---------|-------|----------|----------|----------|-----------|------------|
| viba_719 | IRN/88/2009  |         | 91.5  | 0        | O        | ME-SA    | PanAsia-2 | ANT-10     |
| viba_766 | IRN/31/2009  | cattle  | 89.6  | 0        | O        | ME-SA    | PanAsia-2 | FAR-09     |
| viba_491 | TUR/257/2008 |         | 89.1  | 0        | O        | ME-SA    | PanAsia-2 | TER-08     |
| viba_650 | IRN/8/2005   | ovine   | 89.1  | 0        | O        | ME-SA    | PanAsia-2 |            |
| viba_505 | TUR/264/2009 |         | 88.8  | 0        | O        | ME-SA    | PanAsia-2 | SAN-09     |
| viba_666 | IRN/18/2010  | cattle  | 88.6  | 0        | O        | ME-SA    | PanAsia-2 | BAL-09     |
| viba_293 | BHU/3/2009   | cattle  | 88.5  | 0        | O        | ME-SA    | Ind-2001  | d          |
| viba_285 | UKG/35/2001  | porcine | 88.3  | 0        | O        | ME-SA    | PanAsia   |            |
| viba_354 | PAK/16/2010  | cattle  | 88.3  | 0        | O        | ME-SA    | PanAsia-2 | PUN-10     |
| viba_850 | NEP/1/2015   | cattle  | 87.9  | 1        | O        | ME-SA    | PanAsia-2 | KAT-15     |

Report on FMDV O in Israel in 2022

Batch: WRLMEG/2022/00039



\*, not a WRLFMD Reference Number

## Analysis Parameters

|  |  |
|--|--|
| VP1 subsequence extractor:             | vp1_O                                    |
| Query sequence set:                    | WRLMEG/2022/00039-Israel-O (1 sequences) |
| Sequence database set:                 | allseqs_O (5754 sequences)               |
| Prototype sequence set:                | !prototypes_O (49 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: | 10                                       |
| 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  |
|------------------|-----------|---------|--------|----------------|------------------------|
| 465636/ISR/2022* | n/a       | cattle  | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |
| ISR/3/2022       | n/a       | cattle  | WRLFMD | Israel         | ME-SA/PanAsia-2/ANT-10 |
| 445733/ISR/2022* | n/a       | cattle  | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |
| ISR/4/2022       | n/a       | cattle  | WRLFMD | Israel         | ME-SA/PanAsia-2/ANT-10 |
| 444156/ISR/2022* | n/a       | cattle  | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |
| JOR/6/2021       | n/a       | cattle  | WRLFMD | Jordan         | ME-SA/PanAsia-2/ANT-10 |
| ISR/2/2022       | n/a       | cattle  | WRLFMD | Israel         | ME-SA/PanAsia-2/ANT-10 |
| 443555/ISR/2022* | n/a       | sheep   | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |
| JOR/574/2021*    | n/a       | cattle  | JUST   | Jordan         | ME-SA/PanAsia-2/ANT-10 |
| 435458/PAT/2021* | n/a       | sheep   | KVI    | Palestinian AT | ME-SA/PanAsia-2/ANT-10 |
| PAT/4/2021       | n/a       | sheep   | WRLFMD | Palestinian AT | ME-SA/PanAsia-2/ANT-10 |
| 442228/ISR/2022* | n/a       | cattle  | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |
| ISR/1/2022       | n/a       | cattle  | WRLFMD | Israel         | ME-SA/PanAsia-2/ANT-10 |
| PAT/3/2021       | n/a       | sheep   | WRLFMD | Palestinian AT | ME-SA/PanAsia-2/ANT-10 |
| ISR/8/2022       | n/a       | cattle  | WRLFMD | Israel         | ME-SA/PanAsia-2/ANT-10 |
| JOR/609/2021*    | n/a       | cattle  | JUST   | Jordan         | ME-SA/PanAsia-2/ANT-10 |
| JOR/1/2021       | n/a       | cattle  | WRLFMD | Jordan         | ME-SA/PanAsia-2/ANT-10 |
| JOR/1/2021/JUST* | n/a       | cattle  | JUST   | Jordan         | ME-SA/PanAsia-2/ANT-10 |
| 445247/ISR/2022* | n/a       | cattle  | KVI    | Israel         | ME-SA/PanAsia-2/ANT-10 |

*continued on next page*

| label             | accession | host(s)       | lab    | country              | taxonomic information  |
|-------------------|-----------|---------------|--------|----------------------|------------------------|
| JOR/7/2021        | n/a       | cattle        | WRLFMD | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| ISR/7/2022        | n/a       | cattle        | WRLFMD | Israel               | ME-SA/PanAsia-2/ANT-10 |
| PAT/1/2021        | n/a       | cattle        | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| JOR/603/2021*     | n/a       | cattle        | JUST   | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| PAT/2/2021        | n/a       | cattle        | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| JOR/2T/2021*      | n/a       | sheep         | JUST   | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| ISR/10/2022       | n/a       | cattle        | WRLFMD | Israel               | ME-SA/PanAsia-2/ANT-10 |
| ISR/9/2022        | n/a       | cattle        | WRLFMD | Israel               | ME-SA/PanAsia-2/ANT-10 |
| PAT/5/2021        | n/a       | goat          | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| PAT/6/2021        | n/a       | goat          | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| JOR/10/2021       | n/a       | sheep         | WRLFMD | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| ISR/5/2022        | n/a       | cattle        | WRLFMD | Israel               | ME-SA/PanAsia-2/ANT-10 |
| 446115/ISR/2022*  | n/a       | cattle        | KVI    | Israel               | ME-SA/PanAsia-2/ANT-10 |
| PAT/2/2022        | n/a       | sheep         | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| PAT/1/2022        | n/a       | sheep         | WRLFMD | Palestinian AT       | ME-SA/PanAsia-2/ANT-10 |
| 446186/ISR/2022*  | n/a       | cattle        | KVI    | Israel               | ME-SA/PanAsia-2/ANT-10 |
| JOR/16/2021/JUST* | n/a       | sheep         | JUST   | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| JOR/15/2021/JUST* | n/a       | sheep         | JUST   | Jordan               | ME-SA/PanAsia-2/ANT-10 |
| PAK/13/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/14/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/4/2021        | n/a       | water buffalo | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/9/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/8/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/7/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/24/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/15/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/27/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/23/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/1/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/16/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/40/2021       | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/12/2021       | n/a       | water buffalo | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/3/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| UAE/1/2021        | n/a       | Arabian oryx  | WRLFMD | United Arab Emirates | ME-SA/PanAsia-2/ANT-10 |
| PAK/6/2021        | n/a       | cattle        | WRLFMD | Pakistan             | ME-SA/PanAsia-2/ANT-10 |

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| label                           | accession | host(s)       | lab      | country              | taxonomic information  |
|---------------------------------|-----------|---------------|----------|----------------------|------------------------|
| UAE/2/2021                      | n/a       | Arabian oryx  | WRLFMD   | United Arab Emirates | ME-SA/PanAsia-2/ANT-10 |
| PAK/17/2021                     | n/a       | cattle        | WRLFMD   | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/21/2021                     | n/a       | cattle        | WRLFMD   | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/18/2021                     | n/a       | cattle        | WRLFMD   | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/8/2019                      | n/a       | cattle        | WRLFMD   | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Jhang2/PUN/PAK/2018*   | MK342190  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Bhakhar5/PUN/PAK/2017* | MK342188  | water buffalo | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Bhakhar4/PUN/PAK/2018* | MK342187  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Bhakhar1/PUN/PAK/2017* | MK342184  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Bhakhar2/PUN/PAK/2018* | MK342185  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Lodrah1/PUN/PAK/2017*  | MK342179  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| AFG/23/2017                     | n/a       | cattle        | WRLFMD   | Afghanistan          | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Gujrat/PUN/PAK/2017*   | MK342182  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Gujrat2/PUN/PAK/2017*  | MK342183  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| AFG/16/2017                     | n/a       | cattle        | WRLFMD   | Afghanistan          | ME-SA/PanAsia-2/ANT-10 |
| AFG/44/2017                     | n/a       | bovine        | WRLFMD   | Afghanistan          | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Sahiwal1/PUN/PAK*      | MK292143  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| NIAB/PUN/PAK/218/2017*          | MH085204  | n/a           | NIAB     | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| NIAB/PUN/PAK/205/2017*          | MF140436  | water buffalo | NIAB     | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Faislabad1/PUN/PAK*    | MK292142  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| VRI/CAMB/Bhakhar3/PUN/PAK/2018* | MK342186  | cattle        | VRI-CAMB | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| AFG/35/2017                     | n/a       | cattle        | WRLFMD   | Afghanistan          | ME-SA/PanAsia-2/ANT-10 |
| AFG/54/2017                     | n/a       | bovine        | WRLFMD   | Afghanistan          | ME-SA/PanAsia-2/ANT-10 |
| NIAB/PUN/PAK/222/2017*          | MH085206  | n/a           | NIAB     | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| NIAB/PUN/PAK/223/2017*          | MH085207  | n/a           | NIAB     | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| IRN/31/2016                     | n/a       | cattle        | WRLFMD   | Iran                 | ME-SA/PanAsia-2/ANT-10 |
| IRN/11/2017                     | n/a       | cattle        | WRLFMD   | Iran                 | ME-SA/PanAsia-2/ANT-10 |
| IRN/37/2016                     | 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/36/2016                     | n/a       | sheep         | WRLFMD   | Iran                 | ME-SA/PanAsia-2/ANT-10 |
| IRN/35/2016                     | 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 |
| NIAB/PUN/PAK/226/2017*          | MH085208  | n/a           | NIAB     | Pakistan             | ME-SA/PanAsia-2/ANT-10 |
| PAK/7/2016                      | n/a       | cattle        | WRLFMD   | Pakistan             | ME-SA/PanAsia-2/ANT-10 |

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| label         | accession | host(s) | lab         | country        | taxonomic information  |
|---------------|-----------|---------|-------------|----------------|------------------------|
| IRN/88/2009   | KY091282  | n/a     | WRLFMD      | Iran           | ME-SA/PanAsia-2/ANT-10 |
| BHU/3/2009    | KM921814  | cattle  | WRLFMD      | Bhutan         | ME-SA/Ind-2001/d       |
| UKG/35/2001   | AJ539141  | porcine | PIADC       | United Kingdom | ME-SA/PanAsia          |
| PAK/16/2010   | KY091285  | cattle  | WRLFMD      | Pakistan       | ME-SA/PanAsia-2/PUN-10 |
| IRN/18/2010   | KY091283  | cattle  | WRLFMD      | Iran           | ME-SA/PanAsia-2/BAL-09 |
| 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/264/2009* | n/a       | n/a     | FMDI-Ankara | Turkey         | ME-SA/PanAsia-2/SAN-09 |
| TUR/257/2008* | n/a       | n/a     | FMDI-Ankara | Turkey         | ME-SA/PanAsia-2/TER-08 |
| NEP/1/2015    | MN276045  | cattle  | WRLFMD      | Nepal          | ME-SA/PanAsia-2/KAT-15 |
| 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