MERS-CoV Infection of Alpaca in a Region Where MERS-CoV is Endemic

Technical Appendix

Technical Appendix Table. Overview of background data and study results of alpaca and dromedary cohorts.

				Arr	ay‡	MERS-CoV		PCR UpE§	
Animal	Age†	Sex	Origin	MERS-CoV	SARS-CoV	PRNT ₉₀	NS	OS	AS
Alpaca									
A1	Adult	M	Qatar	287	<20	80	Neg	Neg	Neg
A2	Adult	F	Qatar	122	<20	40	ND	ND	ND
A3	Adult	M	UK	135	<20	80	Neg	Neg	Neg
A4	Adult	M	Qatar	118	<20	80	Neg	Neg	Neg
A5	Juvenile	F	Qatar	403	<20	320	ND	ND	ND
A6	Adult	F	Qatar	275	<20	80	ND	ND	ND
A7	Adult	M	UK	509	<20	320	Neg	ND	Neg
A8	Adult	M	Qatar	49	<20	80	Neg	Neg	Neg
A9	Adult	M	Qatar	265	<20	320	Neg	Neg	Neg
A10	Adult	M	Qatar	451	<20	160	Neg	Neg	Neg
A11	Adult	F	Canada	513	<20	320	NĎ	ND	NĎ
A12	Adult	F	Canada	629	<20	320	ND	ND	ND
A13	Adult	F	Canada	117	<20	80	ND	ND	ND
A14	Adult	F	Canada	513	<20	320	ND	ND	ND
A15	Adult	F	UK	773	<20	320	ND	ND	ND
Dromedary									
D1	Adult	F	Unknown	≥1280	<20	≥2560	Neg	ND	ND
D2	Adult	F	Unknown	≥1280	<20	≥2560	Neg	ND	ND
D3	Adult	F	Unknown	≥1280	<20	≥2560	Neg	ND	ND
D4	Adult	F	Unknown	≥1280	<20	≥2560	Neg	ND	ND
D5	Adult	F	Unknown	≥1280	<20	640	Neg	ND	ND
D6	Adult	F	Unknown	≥1280	<20	1280	Neg	ND	ND
D7	Adult	F	Unknown	≥1280	<20	1280	Neg	ND	ND
D8	Adult	F	Unknown	≥1280	<20	≥2560	Neg	ND	ND
D9	Adult	F	Unknown	<20	<20	<20	Neg	ND	ND
D10	Adult	M	Unknown	≥1280	<20	640	Neg	ND	ND

^{*}MERS-CoV, Middle East respiratory syndrome coronavirus; Neg, negative result, ND, not done; NS, nasal swab, OS, oral swab, PRNT90: plaque reduction neutralization test (highest neutralizing serum dilution indicated); RS, rectal swab, RT-PCR, reverse transcription PCR; SARS-CoV, severe acute respiratory syndrome coronavirus; UK, United Kingdom.

[†]Juvenile = camelid age ≤2 years; adult = camelid age >2 years.

^{‡\$1} microarray titers. Titers were defined as the interpolated serum concentration that provoked a response half-way on a concentration-response curve between the minimum and maximum signal and were calculated from the inflection point of a 4-step dilution series (1:20 to 1:1280), as previously described (1)

[§]Results RT-PCR targeting MERS-CoV UpE gene.

Camelus Vicugna	MKTPWRVLLGLIGIAALVTLITVPAVLLSKGTDDATADSRRTYTLTDYLKNTFRLKVYTLQWVSDHEYLYRQENNILLFNAEYGNSSIFLENSTFDEFGHSINDYSVSPDRQYILFEYNY MKTPWKVLLGLIGIAALVTVITVPVVLLNKGTDDATADSRRTYTLTDYLKNTFRLKVYTLQWVSDHEYLYRQENNILLFNAEYGNSSIFLENSTFDEFGHSINDYSVSPDRQYILFEYNY ****:*******************************	
Camelus Vicugna	VKQWRHSYTASYDIYDLKKRQLITEERIPNNTQWITWSPVGHKLAYVWNNDIYVKSEPNLPSQRITWTGKKDVIYNGITDWVYEEEVFSAYSALWWSPNGTFLAYAQFNDTEVPLIEYSF VKQWRHSYTASYDIYDLKKRQLITEERIPNNTQWITWSPVGHKLAYVWNNDIYVKSEPNLPSQRITWTGEKDVIYNGITDWVYEEEVFSAYSALWWSPNGTFLAYAQFNDTEVPLIEYSF	
Camelus Vicugna	YSDESLQYPKTVRIPYPKAGAVNPTVKFFVVDTSTLSPNVNATSRQIVPPASVLIGDHYLCGVTWVTEKRISLQWIRRIQNYSIMDVCDYDESTGRWASSVGRQHIETSTTGWVGRFRPA YSDESLQYPKTVRIPYPKAGAVNPTVKFFVVDISTLSPNVNATSRQIVPPASVLIGDHYLCGVTWVTEKRISLQWIRRIQNYSIMDVCDYDESTGRWASSVGRQHIETSTTGWVGRFRPA	
Camelus Vicugna	EPHFTSDGSSFYKIISNEEGYKHICHFQTDKRNCTFITKGAWEVIGIEALTRDYLYYISNEHKGMPGGRNLYKVQLNDYTKVTCLTCELDPERCQYYSASFSKEAKYYQLRCSGPGLPLY EPHFTSDGSSFYKIISNEEGYKHICHFQTDKRNCTFVTKGAWEVIGIEALTSDYLYYISNEHKGWPGGRNLYKVQLNDYTKVTCLTCELDPERCQYYSVSFSKEAKYYQLRCSGPGLPLY	
Camelus Vicugna	TLHSSSSDKELRVLENNSALENMLQEVQMPTKKLDFINMHETKFWYQMILPPHFDKSKKYPLLIDVYAGPCSQKADTIFRLNWATYLASTENIIVASFDGRGSGYQGDKIMHAINRRLGT TLHSSSSDKELRVLENNSALENMLQEVQMPTKKLDFINMHETKFWYQMILPPHFDKSKKYPLLIDVYAGPCSQKADTIFRLNWATYLASTENIIVASFDGRGSGYQGDKIMHAINRRLGT	
Camelus Vicugna	The state of the s	
Camelus Vicugna	KALVDAGVDFQTMWYTDEDHGIASSTAHQHIYTHMSHFLKQCFSLP 766 KALVDAGVDFQTMWYTDEDHGIASSTAHQHIYTHMSHFLKQCFSLP 766	

Technical Appendix Figure. Alignment of DPP4 protein sequences of dromedary camel (*Camelus dromedaries*; seq.ID: AIG55259.1) and alpaca (*Vicugna pacos*; seq.ID: XP_006196278.1). Nonidentical sequences indicated in blue. MERS-CoV S1 interacting residues indicated in red.

Reference

 Koopmans M, de Bruin E, Godeke GJ, Friesema I, van Gageldonk R, Schipper M, et al. Profiling of humoral immune responses to influenza viruses by using protein microarray. Clin Microbiol Infect. 2012;18:797–807. PubMed http://dx.doi.org/10.1111/j.1469-0691.2011.03701.x