Access number	Name	Submission date
KJ683871	A/swine/South Dakota/A01480750/2014	3/27/14
KY802128	A/swine/NorthCarolina/A01672751/2017	2/8/17
MF692781	A/swine/North Carolina/A01785281/2017	7/28/17
MF150370	A/swine/North Carolina/A02214775/2017	4/19/17
KY014451	A/swine/North Carolina/A01781336/2016	9/14/16
KY499597	A/swine Oklahoma/A01671948/2016	12/22/16
KX772389	A/swine/Iowa/A01778178/2016	8/3/16
KU379628	A/swine/Oklahoma/A01798209/2015	11/23/15
MF455481	A/swine/Iowa/A02216456/2017	5/23/17
MF359749	A/swine/Iowa/A01785264/2017	5/30/17
KX380247	A/swine/Illinois/A01775513/2016	5/19/16
KX185834	A/swine/Illinois/A01895276/2016	4/8/16
MF000481	A/swine/Missouri/A01672817/2017	2/6/17
KR265520	A/swine/Missouri/A01554380/2015	4/24/15
MF144718	A/swine/Iowa/A02215041/2017	5/19/17
MF348036	A/swine/North Carolina/A02215469/2017	5/17/17
KY744620	A/swine/Indiana/A01672825/2017	2/1/17
MG383438	A/swine/Iowa/A01678511/2017	1/11/17
KY995615	A/swine/Nebraska/A02214231/2017	3/22/17
MF289445	A/swine/Iowa/A02215255/2017	5/8/17
KY744614	A/swine/Iowa/A01672823/2017	2/2/17
MF348031	A/swine/Missouri/A02216048/2017	5/16/17
KX298117	A/swine/North Carolina/A01774921/2016	5/9/16
KU942633	A/swine/Indiana/A01732606/2016	2/29/16
KU877392	A/swine/North Carolina/A01731797/2016	2/17/16
KX518666	A/swine/North Carolina/A01776155/2016	5/31/16
KU942615	A/swine/North Carolina/A01732321/2016	2/22/16
KR863122	A/swine/Illinois/A01820485/2015	5/22/15
KU695675	A/swine/North Carolina/A01730376/2016	1/22/16

EU604689	A/swine/OH/511445/2007	4/1/08
KU680986	A/swine/Iowa/A01941927/2016	1/14/16
MF471674	A/swine/Iowa/A02217286/2017	6/15/17
MF613966	A/swine/Iowa/A02218176/2017	6/28/17
MF582488	A/swine/Nebraska/A01785277/2017	7/14/17
KX150858	A/swine/Oklahoma/A01676763/2016(H1N2)	4/27/16
MF455467	A/swine/Indiana/A02217290/2017(H1N2)	7/10/17
KY766094	A/swine/Minnesota/A01932042/2017(H1N2)	3/13/17
KY522887	A/swine/Iowa/A01672046/2017	1/5/17
MF375251	A/swine/Iowa/A02216454/2017	5/22/17
MF664424	A/swine/Oklahoma/A01785279/2017	7/18/17
KY941155	A/swine/Missouri/A01667101/2017	3/8/17
MF092725	A/swine/Michigan/A02214665/2017	3/28/17
MF092737	A/swine/Iowa/A02214655/2017(H1N2)	5/11/17
KM402870	A/swine/South Dakota/A01482581/2014(H1N2)	8/27/14
KY631495	A/swine/Iowa/A01672519/2017	1/20/17
KY412996	A/swine/Iowa/A01668923/2016	11/30/16
MF455505	A/swine/Iowa/A02216639/2017	6/7/17
MF488955	A/swine/South Dakota/A01678497/2017(H1N2)	7/14/17
KX602673	A/swine/Minnesota/A01678467/2016(H1N2)	7/25/16
MF150384	A/swine/Illinois/A02214842/2017	4/10/17
KY995593	A/swine/Indiana/A01667098/2017	3/3/17
KY210992	A/swine/North Carolina/A01782869/2016	10/27/16
MF455485	A/swine/Iowa/A02216640/2017	6/6/17
MF092761	A/swine/North Carolina/A02214480/2017	4/7/17
KY888291	A/swine/North Carolina/A01932634/2017	3/13/17
MF768424	A/swine/Pennsylvania/A02218034/2017	7/5/17
MF768426	A/swine/Iowa/A02217969/2017	6/28/17
KU877362	A/swine/North Carolina/A01731857/2016	2/11/16
KY744610	A/swine/North Carolina/A01672678/2017	2/3/17
KY593209	A/swine/North Carolina/A01672380/2017	1/19/17

KY465593	A/swine/Pennsylvania/A01671487/2016	12/12/16
KY873258	A/swine/North Carolina/A01932425/2017	2/16/17
KY631499	A/swine/North Carolina/A01672458/2017	1/20/17

ConH1 sequence:
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CTCCATTGCACTTGGGTAAATGTAACATTGCTGGCTGGCTTCTGGGAAATCCAGAGTGTGACTCA
CTCTCTACAGCAATCTCATGGTCTTACATTGTAGAAACATCTAATTCAGACAATGGAACGTGTTA
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AGGTTTGAGATATTCCCCAAGACAAGCTCATGGCCCAACCATGACACAGACAAAGGTGTGACGT
CAGCATGTCAACATGCTGGGAGAGGAAGCTTCTACAGAAATTTGTTATGGCTGGTCAAAAAAGA
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TGGTGCTATAAACACCAGCCTCCCATTTCAAAACATACACCCAGTCACAATTGGAGAATGTCCA
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CAACAGTCGCCAGTTCGTTGGTACTGGTAGTCTCCCTGGGGGCAATCAGTTTCTGGATGTGCTCTA
ATGGGTCGCTACAGTGCAGAATATGTATTTAA

Table S1. Set of the 63 HA sequences used for the nucleotide alignment that resulted in the conH1 sequence listed above.

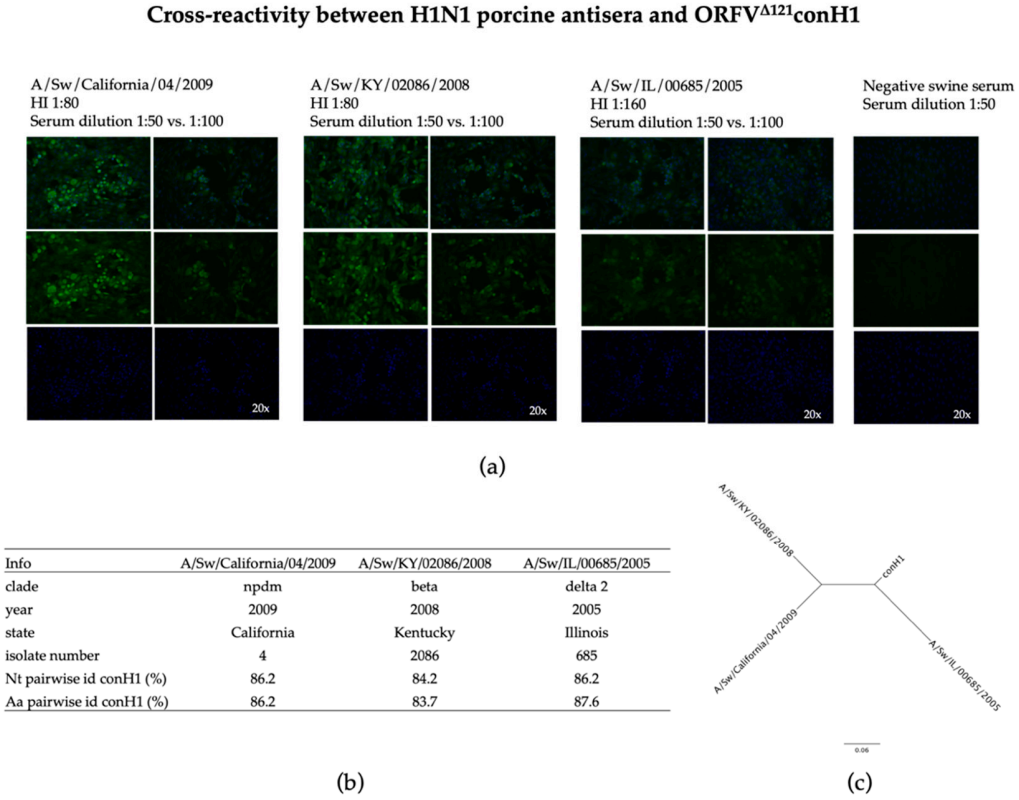

Figure S1. Cross-reactivity between divergent porcine antisera and ORFV$^{\Delta 121}$conH1**.** (a) The cross-reactivity between serum of pigs infected with 3 different strains of H1N1 IAV-S and conH1 expressed on the cell surface of OFTu permeabilized cells was assessed by IFA. Positive cross-reactivity is showed by the green fluorescence, suggesting that the conH1 expressed by the recombinant ORFV$^{\Delta 121}$conH1 virus was recognized by the host serum from infected animals. (b) Informative table about the IAV-S isolates used for the cross-reactivity sera assay, including the pairwise identities (c) Phylogenetic tree based on the nucleotide sequences of the HAs from these same isolates to evaluate genetic distance of with the conH1.

Immune cell phenotypes	**Animals challenged with A/Sw/OH/24366/2007**	**Animal challenged with A/California/04/2009**
IL-17A$^+$ CTLs in PBMCs [CD3$^+$CD4$^+$CD8α^+CD8β^+IL-17A$^+$]	*P < 0.05	*P < 0.05
IL-17A$^+$ T-helper/Memory cells in PBMCs [CD3$^+$CD4$^+$CD8α^+CD8β^-IL-17A$^+$]	-	****P < 0.0001.
IFNγ^+ T-helper/Memory cells in PBMCs [CD3$^+$CD4$^+$CD8α^+CD8β^- IFNγ^+]	*P < 0.05	***P < 0.001
IFNγ^+CTLs in PBMCs [CD3$^+$CD4$^+$CD8α^+CD8β^+ IFNγ^+)	*P < 0.05	*P < 0.05, **P < 0.01
IL-17A$^+$ T-lymphocytes in BAL cells [CD3$^+$CD8α^+CD8β^+IL-17A$^+$]	*P < 0.05	*P < 0.05

IFNγ^+ T-lymphocytes in BAL cells [$CD3^+CD8\alpha^+CD8\beta^+IFN\gamma^+$]	***P < 0.001	-
IL-$17A^+$ T-lymphocytes in TBLN MNCs [$CD3^+CD8\alpha^+CD8\beta^+$IL-$17A^+$]	-	*P < 0.05
IFNγ^+ T-lymphocytes in TBLN MNCs [$CD3^+CD8\alpha^+CD8\beta^+IFN\gamma^+$]	-	***P < 0.001

Table S2. Summary of significantly upregulated immune cells,