

Table S1: Fusion protein analysis in Pigeons:

Species	Genotype	Number of strains	Cleavage site (112-117)	Fusion peptide (117-142)	HRa (143-185)	HRb (268-299)	HRc (471-500)	Transmembrane domain (501-522)	Cytoplasmic tail (523-553)
Pigeon	XXI.1.1	7	KRQKRF				S486G, V491I (one strain)		T550A, T551A (one strain)
	VII.1.1	5	RRQKRF	I121V, S132A	N145K, A176S	H272Y, Q279H, N296Y (one strain)	D489E, K494R	V506I (one strain), V513I, F514S, I520A	I537L, T553A
	VII.2	1	RRQKRF	I121V, S132A	D170N, A176S	H272Y, V287I	R480K, A482T, K494R	V506A, V513F, A516V, I520G	I537L, T553A
	VI	1	RRQKRF		V179I	H272N, N294Y		V506I, V509I, I520V	I537L,
	II	1	RRQKRF		Incomplete				
	I	15	GKQGRL	F117L, S124G, S132A, A139S	Incomplete				

Fusion peptide	FIGAIIGSVALGVATSAQITAAAAALI
HRa	QANQNAANILRLKESIAATNEAVHEVTDGLSQLAVAVGKMQQF
HRb	LITGHPILYDSQTQLLGIQVNLPSVGNLNNMR
HRc	NNSISNALDRLAESNSKLDKVN VKLTSTSA
TMD domain	LITYIVLTVISLVFGALSLILA
CT domain	CYLMYKQKAQQKTLIWLGNNTLDQMRATTRT

Table S2: Fusion protein analysis in chickens and other birds

Species	Genotype	Number of strains	Cleavage site (112-117)	Fusion peptide (117-142)	HRa (143-185)	HRb (268-299)	HRc (471-500)	Transmembrane domain (501-522)	Cytoplasmic tail (523-553)
Chicken	VII.1.1	118	RRQKRF/ RRKKRF (one strain)	V121L, V121I, S124G, A126V, G128E, V129F, A130S, T136A (only in one strain)	N150S/K, I151T/L, L152H, L154F, V168I, D170N	L268R, N296Y (one strain)	D479G, N485S, K487R (one strain), E489K, N492K (one strain), S499P	I505M, F514S/C, L517F	K530T, L539F, N541D , N542I, Q546H, T550P (only in one strain), T551M
	II	4	RRQKRF	V121I, S124G/R, Q134L (one strain)	Q143P (one strain), S176A	Y272N, H279Q, N288T, L295I (one strain)	D479N, R480K, A482E, S486R (one strain), E489D, R494K	V509I, I510T, I513V, A516I, A520V (one strain)	T550A, R552K, A553M
		2	GRQGRL	F117L, V121I, S124G	Q143P (one strain), S176A	Y272N, H279Q, N288T	D479N, R480K, A482E, S486R (one strain), E489D, R494K	V509I, I510T (one strain), I513V, A516I, A520I (one strain)	T550A (one strain), R552K, A553M
Quail	VII.1.1	1	RRQKRF						
Cattle egret	VII.1.1	1	RRQKRF						
Teal	VII.1.1	2	RRQKRF						
	II	1	GRQGRL	F117L, V121I, S124G	S176A	Y272N, H279Q, N288T	D479N, R480K, A482E, S486R, E489D, R494K	V509I, I513V, A516I, A520I	R552K, A553M

Fusion peptide FIGAVIGSVALGVATAAQITAAAALI
HRa QAKQNAANILRLKESIAATNEAVHEVTDGLSQLSVAVGKMQQF
HRb LITGYPILYDSHTQLLGIQVNLPSVGNLNNMR
HRc NNSISNALDRLAESNSKLEKVVNVRTSTSA
TMD domain LITYIVLTVISLIFGALS LALA
CT domain CYLMYKQKAQQKTLLWLGNNNTLDQMRATTRA

Other birds had the velogenic motif RRQKRF except ostrich RNQGRL

Antigenic epitopes in CK, Pi, other birds: (Chen et al., 2001)

D72, E74 (except one D74 one VII.1.1), **A75**, R78 (except K78 in VII.1.1, II+ II teal, and VI, VII.2 pigeon), **A79**, S157, T161, **D170** (except 4 strains VII.1.1 CK), G171, L343, A378