

## Supplemental Tables

**Supplemental Table 1. Percent identity of cat A3C introns**

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		<b>Percent Identity Introns feA3Cs</b>		
<b>Intron</b>		<b>Size (bp)</b>	<b>A3Ca</b>	<b>A3Cb</b>
<b>Intron 1</b>	<b>A3Ca</b>	3220		
	<b>A3Cb</b>	3216	99.192 (3216, 3)	
	<b>A3Cc</b>	1268	68.215 (1268, 9)	67.225 (1268, 7)
<b>Intron 2</b>	<b>A3Ca</b>	2429		
	<b>A3Cb</b>	2474	98.721 (2429, 6)	
	<b>A3Cc</b>	1613	85.581 (1613, 8)	84.864 (1613, 6)
<b>Intron 3</b>	<b>A3Ca</b>	230		
	<b>A3Cb</b>	230	98.696 (230, 0)	
	<b>A3Cc</b>	234	95.217 (230, 1)	96.087 (230, 1)

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(length, gaps)

**Supplemental Table 2. Ka/Ks of cat A3Ca versus other felid A3C cDNA sequences**

	Cat A3Ca	Cat A3Cb	Cat A3Cc	Puma A3C	Lion A3C#2	Lion A3C#1	Leopard A3C	Tiger A3C#1	Tiger A3C#2	Tiger A3C#3	Lynx A3C#1	Lynx A3C#2	Lynx A3C#5
Cat A3Cb	3.222												
Cat A3Cc	0.658	1.504											
Puma A3C	1.213	1.464	0.949										
Lion A3C#2	0.951	1.227	1.402	1.125									
Lion A3C#1	1.54	2.018	1.765	1.228	2.504								
Leopard A3C	1.56	2.044	1.807	1.388	2.538	infinity							
Tiger A3C#1	0.644	0.73	0.81	0.831	2.708	2.223	1.983						
Tiger A3C#2	0.797	0.903	0.976	1.052	4.16	2.727	2.478	infinity					
Tiger A3C#3	0.591	0.79	0.755	0.756	2.185	2.043	1.806	infinity	infinity				
Lynx A3C#1	0.911	0.949	1.434	1.372	1.431	2.534	2.536	1.163	1.349	1.096			
Lynx A3C#2	0.854	0.887	1.256	1.354	0.895	0.972	0.984	0.724	0.833	0.689	0.531		
Lynx A3C#5	0.897	0.925	1.239	0.998	0.678	0.803	0.863	0.581	0.68	0.549	0.599	2.299	
Lynx A3C#6	1.661	1.565	2.458	2.842	1.062	1.736	1.757	0.97	1.127	0.917	0.461	0.763	0.827

**Supplemental Table 3. Ka/Ks of cat A3H versus other felid A3H cDNA sequences**

	Cat A3H	Leopard A3H	Lion A3H	Puma A3H	Tiger A3H
Leopard A3H	0.829				
Lion A3H	0.83	infinity			
Puma A3H	0.794	1.564	1.564		
Tiger A3H	0.747	infinity	infinity	1.423	
Lynx A3H	0.886	3.383	3.383	1.755	2.964

Note: infinity means  $K_s=0$ ; Ka/Ks could not be calculated.

**Supplemental Table 4. Single nucleotide polymorphisms in APOBEC3C genes in eight domestic cat breeds**

<b>Breed</b>	<b>Sample Number</b>	<b>Gene</b>	<b>Exon</b>	<b>Nucleotide<sup>a</sup></b>	<b>Amino Acid</b>
Abyssinian	Fca6162	A3Cb	3	C324T	Silent <sup>b</sup>
Birman	Fca611	A3Cb	2	C35T	T12M
Birman	Fca611	A3Cb	4	G536C	G179A <sup>b</sup>
Birman	Fca611	A3Cb	4	T545C	F182S <sup>b</sup>
Birman	Fca611	A3Cb	4	A556G	K186E <sup>b</sup>
British Shorthair	Fca2588	A3Cb	2	C35T	T12M
British Shorthair	Fca2588	A3Cb	3	C324T	Silent
British Shorthair	Fca2588	A3Cb	3	C393A	D131E
British Shorthair	Fca2588	A3Cb	4	G515A	R172Q
British Shorthair	Fca2588	A3Cb	4	G536A	G179D
British Shorthair	Fca2588	A3Cb	4	C546A	F182L
British Shorthair	Fca2588	A3Cb	4	A556G	K186E
Egyptian Mau	Fca137	A3Cb	2	C35T	T12M <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	2	C162G	D54E <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	3	G231A	Stop <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	3	C324T	Silent <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	3	C393A	D131E <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	A469G	K157E <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	C472T	H158Y <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	G493T	D165Y <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	C496A	H166N <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	G515A	R172Q <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	G536A	G179D <sup>b</sup>
Egyptian Mau	Fca137	A3Cb	4	A556G	K186E <sup>b</sup>
Japanese Bobtail	Fca2673	A3Cb	2	C35T	T12M <sup>b</sup>
Japanese Bobtail	Fca2673	A3Cb	3	del261	Null <sup>b</sup>
Japanese Bobtail	Fca2673	A3Cb	4	G536A	G179D <sup>b</sup>
Japanese Bobtail	Fca2673	A3Cb	4	A556G	K186E <sup>b</sup>
Sphynx	Fca1497	A3Cb	2	C35T	T12M <sup>b</sup>
Sphynx	Fca1497	A3Cb	3	C324T	Silent <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	A469G	K157E <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	C472T	H158Y <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	G493T	D165Y <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	C496A	H166N <sup>b</sup>

Sphynx	Fca1497	A3Cb	4	G515A	R172Q <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	G536A	G179D <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	C546A	F182L <sup>b</sup>
Sphynx	Fca1497	A3Cb	4	A556G	K186E <sup>b</sup>
Norwegian Forest	Fca2156	A3Cb	2	C35T	T12M
Norwegian Forest	Fca2156	A3Cb	3	C324T	Silent
Norwegian Forest	Fca2156	A3Cb	3	C393A	D131E
Norwegian Forest	Fca2156	A3Cb	4	G515A	R172Q
Norwegian Forest	Fca2156	A3Cb	4	G536A	G179D
Norwegian Forest	Fca2156	A3Cb	4	C546A	F182L
Norwegian Forest	Fca2156	A3Cb	4	A556G	K186E
Turkish van	Fca2417	A3Cb	2	C35T	T12M <sup>b</sup>
Turkish van	Fca2417	A3Cb	2	C162G	D54E <sup>b</sup>
Turkish van	Fca2417	A3Cb	3	C324T	Silent <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	A469G	K157E <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	C472T	H158Y <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	G493T	D165Y <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	C496A	H166N <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	G536A	G179D <sup>b</sup>
Turkish van	Fca2417	A3Cb	4	A556G	K186E <sup>b</sup>
Abysinnian	Fca6162	A3Cc	2	G63T	Silent
Birman	Fca611	A3Cc	3	T293A	W65R
Birman	Fca611	A3Cc	3	C387G	F129L
Birman	Fca611	A3Cc	3	A389G	Y130W
Birman	Fca611	A3Cc	3	C390G	Y130W
Birman	Fca611	A3Cc	3	C391G	H131D
Birman	Fca611	A3Cc	4	C486T	Silent
British Shorthair	Fca2588	A3Cc	3	T293A	W65R
British Shorthair	Fca2588	A3Cc	3	C387G	F129L
British Shorthair	Fca2588	A3Cc	3	A389G	Y130W
British Shorthair	Fca2588	A3Cc	3	C390G	Y130W
British Shorthair	Fca2588	A3Cc	3	C391G	H131D
British Shorthair	Fca2588	A3Cc	4	C486T	Silent
Egyptian Mau	Fca137	A3Cc	3	T293A	W65R <sup>b</sup>
Egyptian Mau	Fca137	A3Cc	3	C387G	F129L <sup>b</sup>
Egyptian Mau	Fca137	A3Cc	4	C486T	Silent <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	2	G63T	Silent <sup>b</sup>

Norwegian Forest	Fca2156	A3Cc	3	T293A	W65R <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	3	C387G	F129L <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	3	A389G	Y130W <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	3	C390G	Y130W <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	3	C391G	H131D <sup>b</sup>
Norwegian Forest	Fca2156	A3Cc	4	C486T	Silent <sup>b</sup>
Sphynx	Fca1497	A3Cc	4	C486T	Silent <sup>b</sup>
Turkish van	Fca2417	A3Cc	3	T293A	W65R <sup>b</sup>
Turkish van	Fca2417	A3Cc	3	C387G	F129L <sup>b</sup>
Turkish van	Fca2417	A3Cc	3	A389G	Y130W <sup>b</sup>
Turkish van	Fca2417	A3Cc	3	C390G	Y130W <sup>b</sup>
Turkish van	Fca2417	A3Cc	3	C391G	H131D <sup>b</sup>
Turkish van	Fca2417	A3Cc	4	C486T	Silent <sup>b</sup>

<sup>a</sup> SNPS are numbered relative to the first base of the translational initiation codon

<sup>b</sup> Validated by clonal sequencing

### Supplemental Table 5. Identities of A3C cDNAs and predicted proteins

	<i>Cat A3Ca</i>	<i>Cat A3Cb</i>	<i>Cat A3Cc</i>	<i>Cat A3Ca</i>	<i>Cat A3Cb</i>	<i>Cat A3Cc</i>
	<i>id. nt. (%)</i>			<i>id. aa. (%)</i>		
Puma A3C	98.0	97.3	97.6	95.6	94.0	95.1
Tiger A3C#1	95.3	95.3	95.3	91.2	90.7	90.1
Tiger A3C#2	94.9	94.9	94.9	90.1	89.5	89.0
Tiger A3C#3	95.3	95.3	95.3	91.2	90.7	90.1
Lion A3C#1	94.0	94.0	95.1	85.7	85.2	87.9
Lion A3C#2	94.5	94.5	94.5	88.5	87.9	87.4
Leopard A3C	94.0	94.0	95.1	85.7	85.2	87.9
Lynx A3C#1	96.5	96.2	95.1	92.9	92.3	89.0
Lynx A3C#2	94.9	94.5	94.2	89.6	89.0	87.4
Lynx A3C#5	94.2	93.8	93.4	87.9	87.4	85.7
Lynx A3C#6	96.5	96.2	95.1	92.3	91.8	88.5

Note: Sequences of the PCR primers were excluded.

## Supplemental Table 6. Identities of A3H cDNAs and predicted proteins

	Cat A3H	
	<i>id. nt. (%)</i>	<i>id. aa. (%)</i>
Puma A3H	98.0	96.2
Tiger A3H	97.0	95.2
Lion A3H	96.8	94.7
Leopard A3H	96.8	94.7
Lynx A3H	97.8	95.7

Note: Sequences of the PCR primers were excluded.

## Supplemental Table 7. Results of different evolutionary models

### A: PAML result of the A3H tree of different Felids

Model used	Neg. log likelihood	Transition/transversion ratio	Ratio parameters	Omega values	Sites under pos. selection (NEB, pr>.99)	Sites under pos. selection (BEB, pr>.9)
neutral(M1):	-844.994230	kappa (ts/tv)=3.48054	p: 0.41690 0.58310	w: 0.00000 1.00000		
positive(M2):	-844.338667	kappa (ts/tv)=3.78332	p: 0.71526 0.00000 0.28474	w: 0.00000 1.00000 2.77319	7 V, 10 C, 42 H, 56 M, 64 A, 89 E, 127 A, 151 Q, 154 S, 159 P, 160 N, 162 D, 166 K, 177 T	
model7(beta):	-844.996538	kappa (ts/tv)=3.50121	p=0.00749 q=0.00500			
model8(beta,w>1):	-844.338751	kappa (ts/tv)=3.78448	p0=0.71747 p=0.45987 q=99.00000	w=2.78214	7 V, 10 C, 42 H, 56 M, 64 A, 89 E, 127 A, 151 Q, 154 S, 159 P, 160 N, 162 D, 166 K, 177 T	

### B: PAML results of the A3C tree of different Felids

Model used	Neg. log likelihood	Transition/transversion ratio	Ratio parameters	Omega values	Sites under pos. selection (NEB, pr>.99)	Sites under pos. selection (BEB, pr>.9)
neutral(M1):	-1420.997435	kappa (ts/tv)=2.83247	p: 0.45858 0.54142	w: 0.00000 1.00000		
positive(M2):	-1405.413360	kappa (ts/tv)=3.74936	p: 0.77850 0.06323 0.15828	w: 0.45723 1.00000 7.19982	18 N, 21 R, 55 R, 67 R, 130 W, 136 E, 139 C, 157 K, 158 H, 168 G, 174 R, 186 E	18 N, 21 R, 130 W, 139 C
M7(beta):	-1421.131363	kappa(ts/tv)=2.77448	p=0.00502 q=0.00500			
M8(beta,w>1):	-1405.413679	kappa (ts/tv)=3.74942	p0=0.83983 p=32.96643 q=34.27576	w=7.15846	18 N, 21 R, 55 R, 67 R, 130 W, 136 E, 139 C, 157 K, 158 H, 168 G, 174 R, 186 E	18 N, 21 R, 130 W, 139 C

Note: Only sites inferred under selection at the 95% level or above are listed. In case of A3C there are several additional sites at lower levels. The numbers of the sites correspond to the po-

sitions in the cat A3H protein or cat A3Ca protein. For the detailed description of the models, see [77, 78].