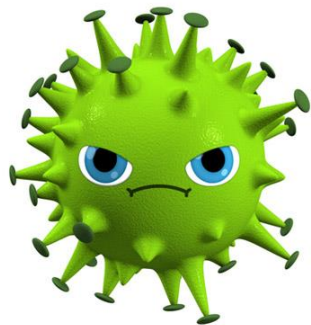




15 famiglie di virus
HPAI: H5N1 e H7N7, pH1N1, SARS



30% >15 anni hanno CKD
TIN è tra le cause principali di CKD

- CAUSE INFETTIVE DI CKD
- Leishmania
 - Leptospira

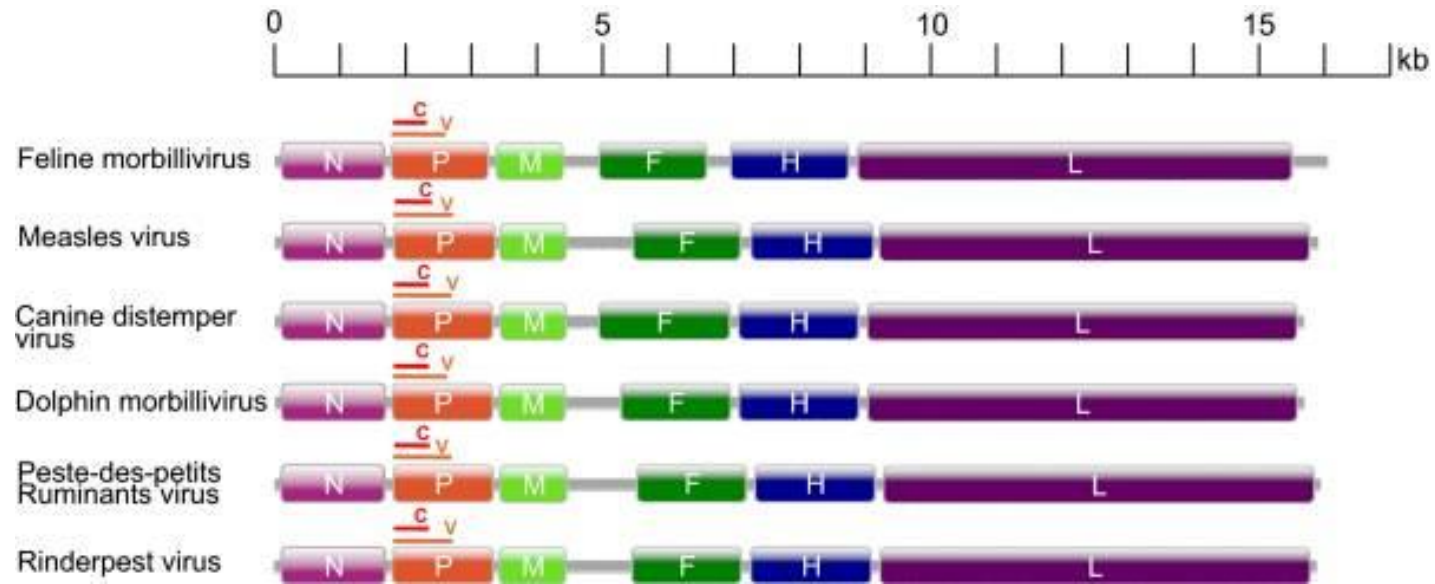
Feline morbillivirus, a previously undescribed paramyxovirus associated with tubulointerstitial nephritis in domestic cats

Patrick C. Y. Woo^{a,b,c,d,1}, Susanna K. P. Lau^{a,b,c,d,1}, Beatrice H. L. Wong^b, Rachel Y. Y. Fan^b, Annette Y. P. Wong^b, Anna J. X. Zhang^b, Ying Wu^b, Garnet K. Y. Choi^b, Kenneth S. M. Li^b, Janet Hui^e, Ming Wang^f, Bo-Jian Zheng^{a,b,c,d}, K. H. Chan^b, and Kwok-Yung Yuen^{a,b,c,d,2}

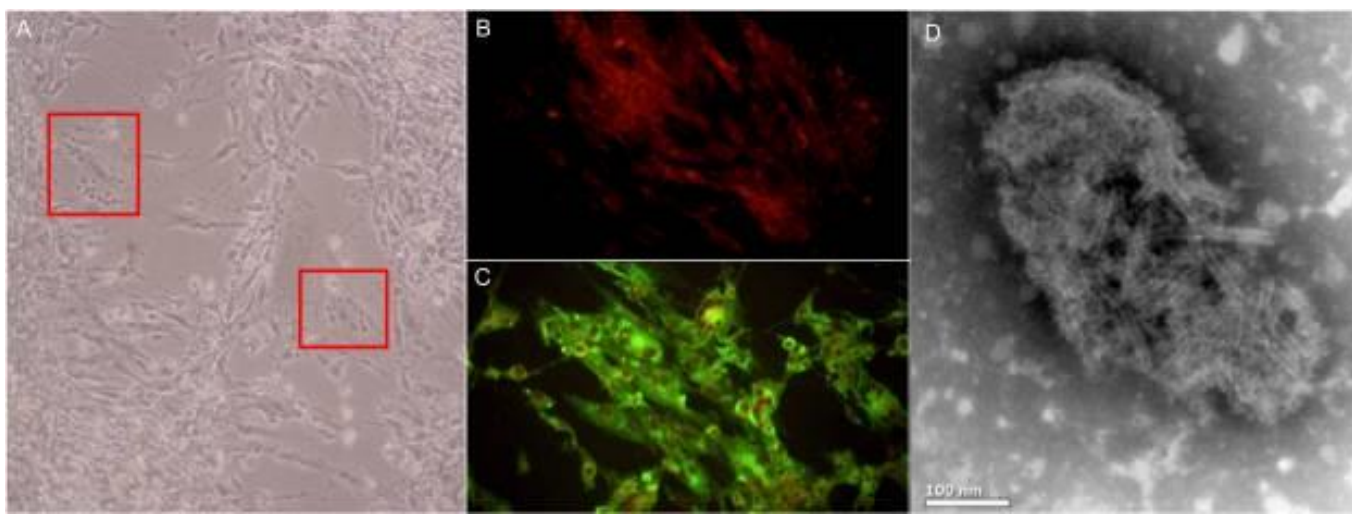
^aState Key Laboratory of Emerging Infectious Diseases, ^bDepartment of Microbiology, ^cResearch Centre of Infection and Immunology, and ^dCarol Yu Centre of Infection, University of Hong Kong, Queen Mary Hospital, Hong Kong Special Administrative Region, China; ^ePathLab Medical Laboratories, Hong Kong; and ^fGuangzhou Center for Disease Control and Prevention, Guangzhou, China

Edited* by Bernard Roizman, University of Chicago, Chicago, IL, and approved February 8, 2012 (received for review December 6, 2011)

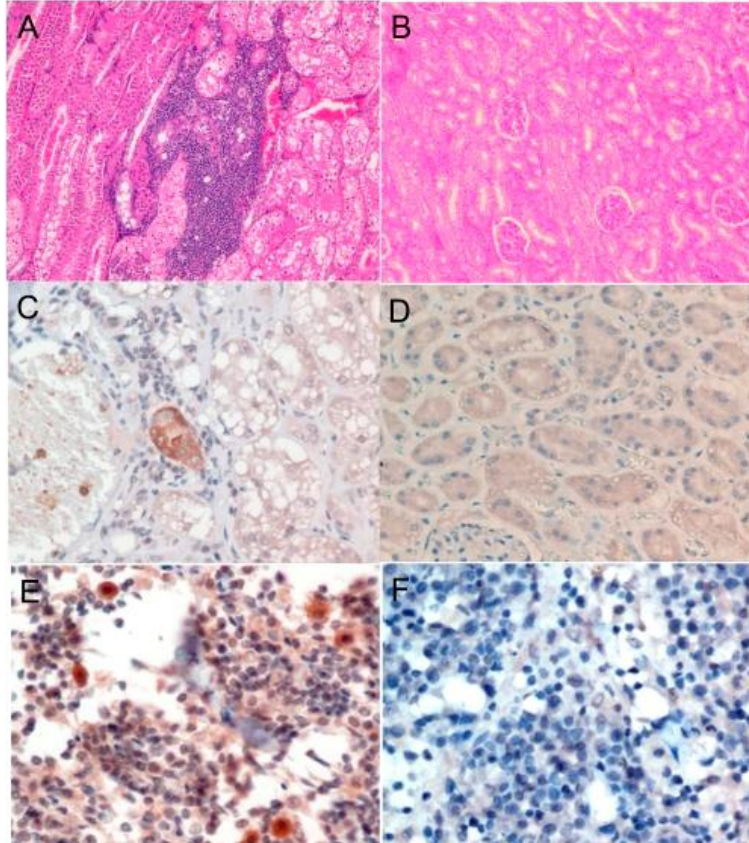




- **457 gatti**
- **53 campioni di urine, 4 tamponi rettali, 1 campione di sangue**
- **Titoli molto bassi**
- **Sequenze complete di 3 ceppi**
- **127 animali sierologicamente positivi, 49/56 erano positivi nelle urine**



Difficile da isolare
8 passaggi ciechi



ASSOCIAZIONE TRA VIRUS E TIN

Rene, HE

Rene, IHC

Lymph, IHC

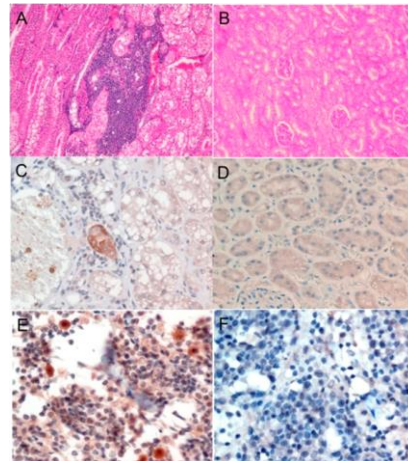
Study 1



5/82 RT-PCR



1/10 RT-PCR



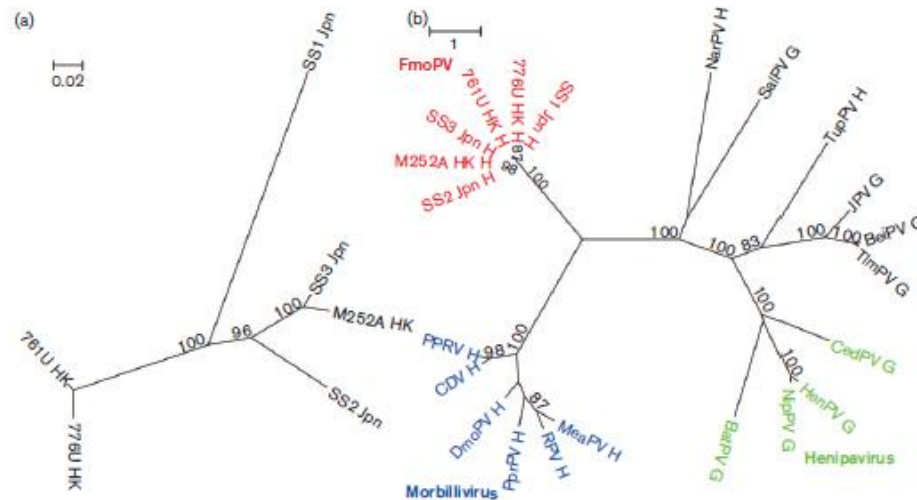
4/10 by RT-PCR, gatti con TIN

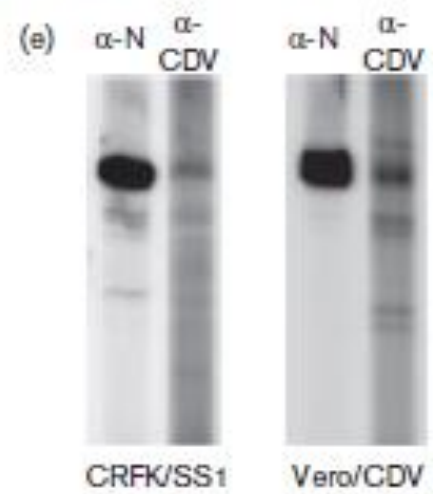
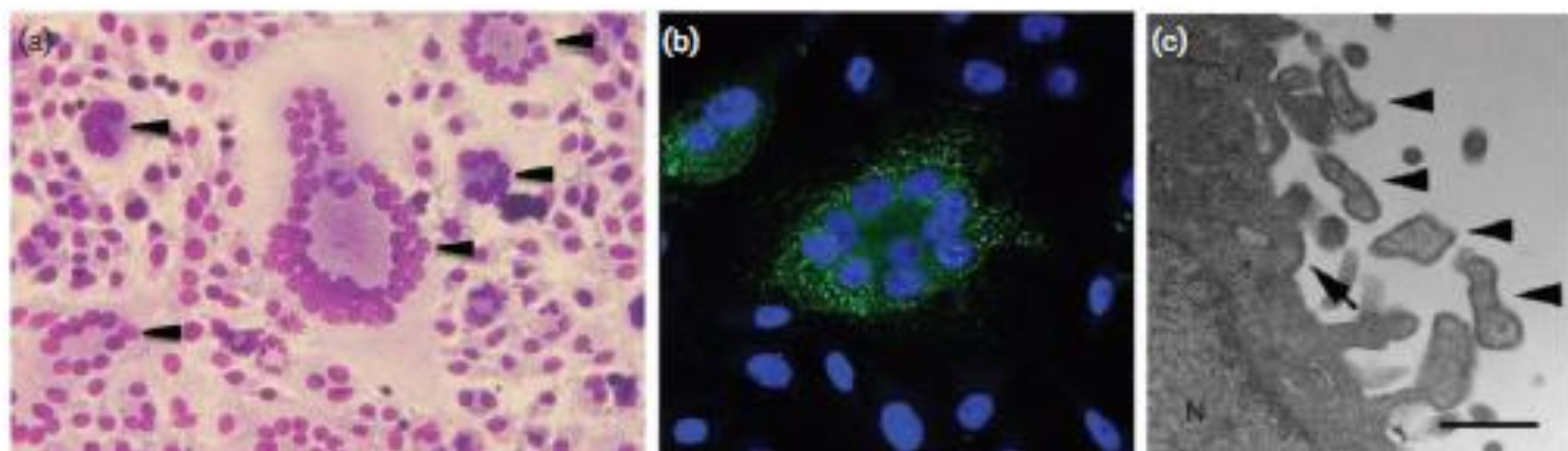
Study 2



**13 gatti, anamnesi varia
3/13 urine positive**

Diversità Genomica





RICOMBINAZIONE TRA DUE CEPPI

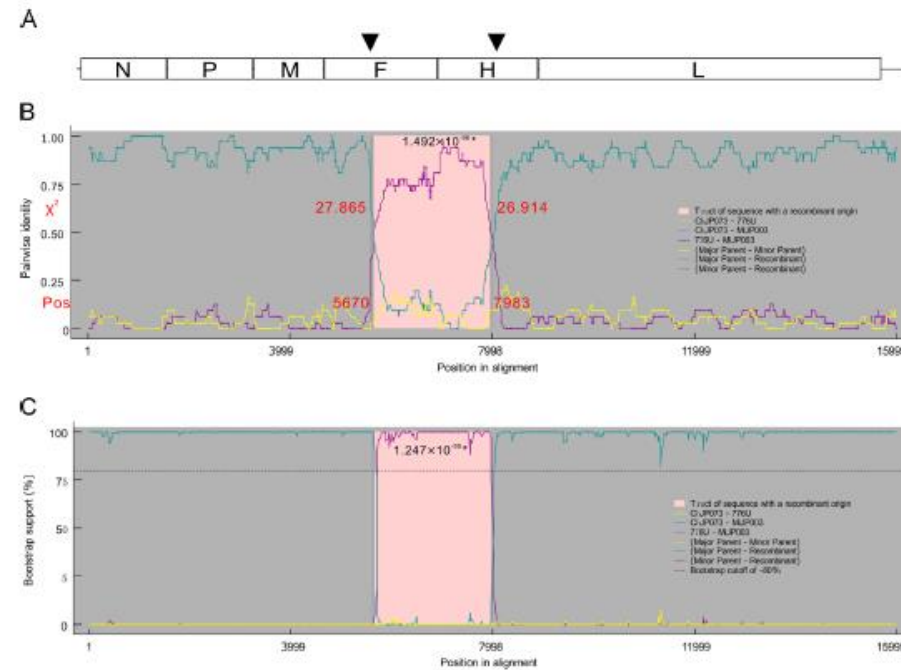
FeMV

STUDY 3

FeMV, prevalenza del 13,7%

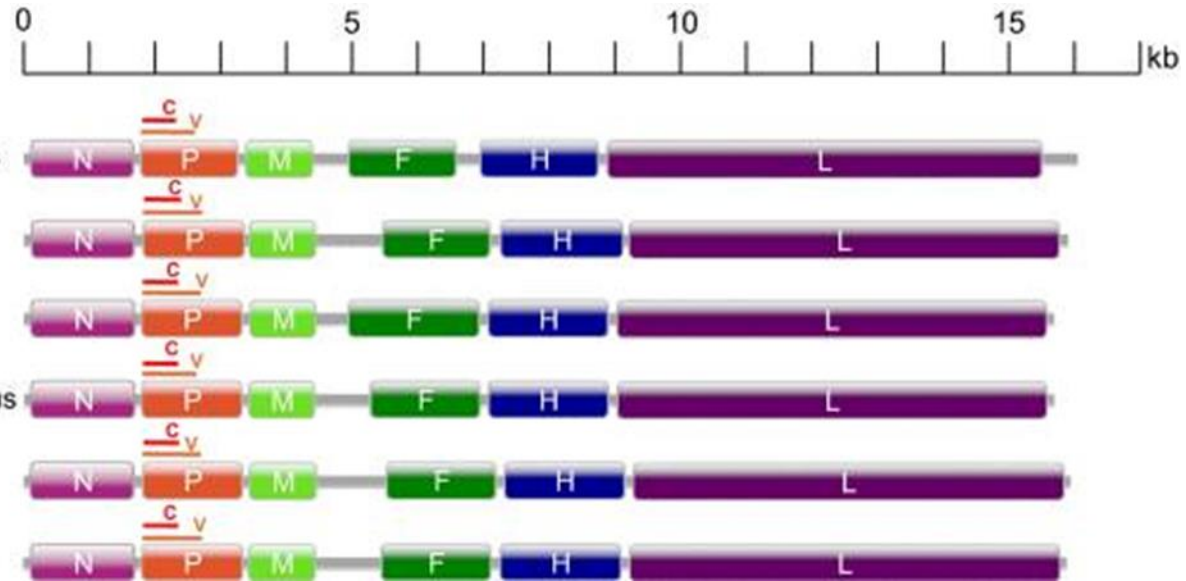


RICOMBINAZIONE TRA DUE CEPPI FeMV



- Infezione cronica aumenta possibilità di ricombinazione in corso di co-infezione ?

RICOMBINAZIONE NEI MORBILLIVIRUS E' RARA



First report of feline morbillivirus in Europe

Alessio Lorusso^{1*}, Morena Di Tommaso², Elisabetta Di Felice¹, Guendalina Zaccaria¹,
Alessia Luciani², Maurilia Marcacci¹, Giovanni Aste², Andrea Boari² & Giovanni Savini¹

¹ Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise 'G. Caporale', Campo Boario, 64100 Teramo, Italy.

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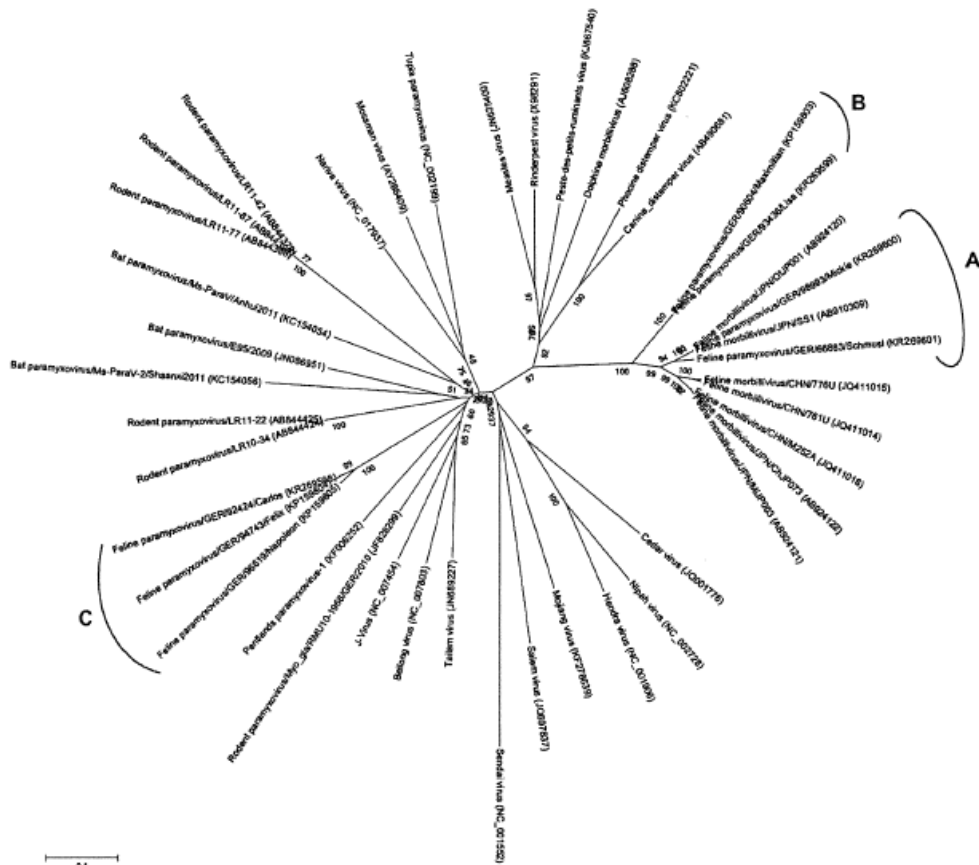


Negativo ai più comuni patogeni del gatto



Table 1 Characteristics of investigated cats

Characteristics	Diseased group	Control group
Number of tested urines samples	120	86
Clinical findings	FLUTD, nephritis, haematuria, urolithiasis, urostase, cystitis, chronic kidney failure, chronic nephropathy, proteinuria, bacteriuria	No clinical and laboratory (urine status) signs of urotract diseases
Sex (female/male)	42/79	36/52
Mean age (years)	8 (1–18)	10 (2–21)
RT-PCR positive	8 (~6.7 %)	0
Cole's coefficient of interspecific association	$\Phi_{\text{corr.}} = 1.0$	



8/120 gatti con TIN in PCR

No controls

Positive association tra paramyx infections and TIN

Genome characterization of feline morbillivirus from Italy



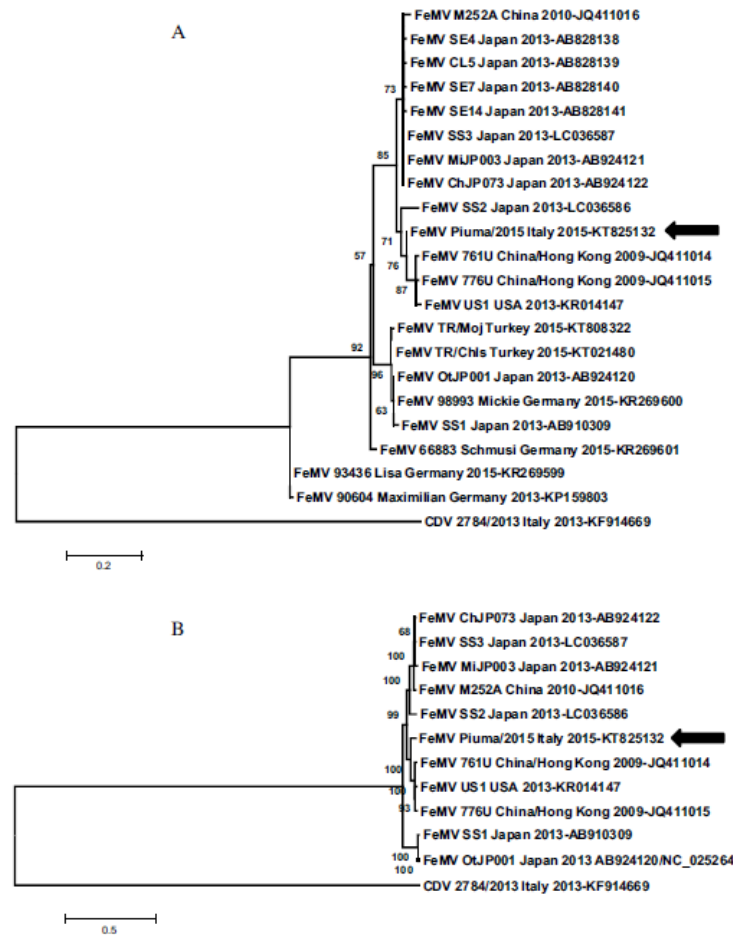
Maurilia Marcacci^a, Eliana De Luca^a, Guendalina Zaccaria^a, Morena Di Tommaso^b,
Iolanda Mangone^a, Giovanni Aste^b, Giovanni Savini^a, Andrea Boari^b, Alessio Lorusso^{a,+}

^a Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise (IZSAM), Teramo, Italy

^b Faculty of Veterinary Medicine, University of Teramo, Italy

M. Marcacci et al. / Journal of Virological Methods 234 (2016) 160–163

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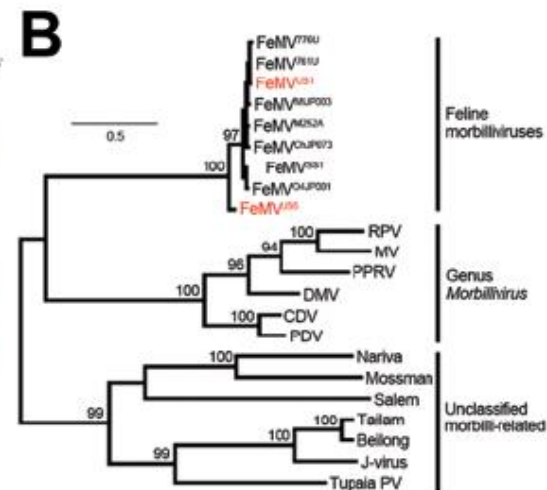
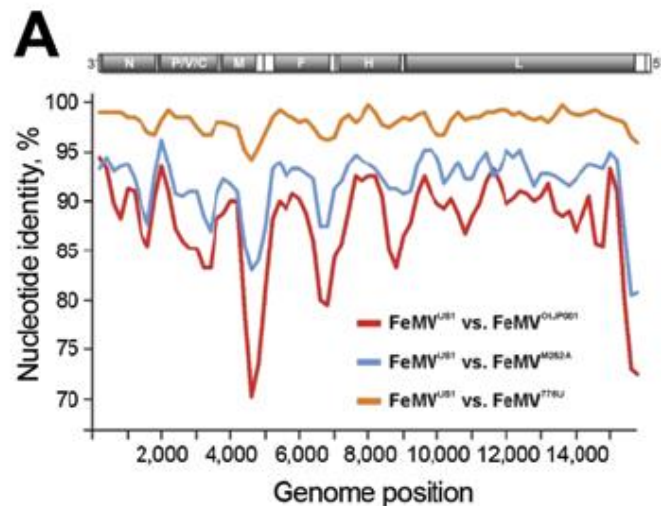
Chronic Infection of Domestic Cats with Feline Morbillivirus, United States

Claire R. Sharp, Sham Nambulli,
Andrew S. Acciardo, Linda J. Rennick,
J. Felix Drexler, Bertus K. Rima, Tracey Williams,
W. Paul Duprex

Author affiliations: Tufts University Cummings School of Veterinary Medicine, North Grafton, Massachusetts, USA (C.R. Sharp); Boston University School of Medicine, Boston, Massachusetts, USA (S. Nambulli, A.S. Acciardo, L.J. Rennick, W.P. Duprex); University of Bonn Medical Centre, Bonn, Germany (J.F. Drexler); German Center for Infection Research, Bonn-Cologne, Germany (J.F. Drexler); The Queen's University of Belfast School of Medicine, Dentistry, and Biomedical Sciences, Belfast, Northern Ireland (B.K. Rima); Zoetis LLC, Kalamazoo, Michigan, USA (T. Williams)

DOI: <http://dx.doi.org/10.3201/eid2204.151921>

- 10/327 campioni; 3 campioni da gatti con CKD and 7 da gatti senza CKD !!!!
- Gatto positivo allo shedding dopo 15 mesi dalla prima rilevazione





100 gatti campionati a Tokyo

- 17 positive nelle urine; 18 nei tessuti
- 13 gatti positive sia nelle urine che nei tessuti
- 4 positivi nelle urine ma negative nei tessuti
- 5 negative nelle urine, positive nei tessuti

4 GRUPPI DI GATTI

- RNA+/Ab + (14 gatti)
 - RNA+/Ab- (8 gatti)
 - RNA-/Ab + (7 gatti)
 - RNA-/Ab- (71 gatti)
-
- **29 sono stati considerati infetti con FeMV**
 - **14/29 erano positive nelle urine e Ab= persistentemente infetti**
 - **16/29 avevano TIN, 29/71 (neg) hanno TIN**
 - **Statisticamente significativa associazione tra virus e lesioni infiammatorie ma non tra infezione e TIN**



Età dei GATTI

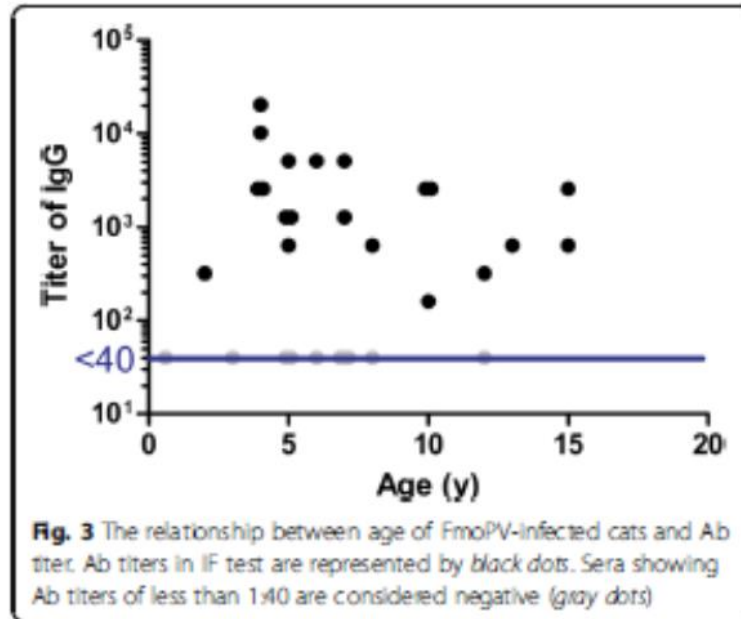


Table 3 The relationship between the grade of lesions and the infection of FmoPV

Infection of FmoPV	Grade of lesions				Total
	1 ^a (n)	2 ^b	3 ^c	4 ^d	
FmoPV-positive	3	10	16	0	29
FmoPV-negative	25	15	29	2	71

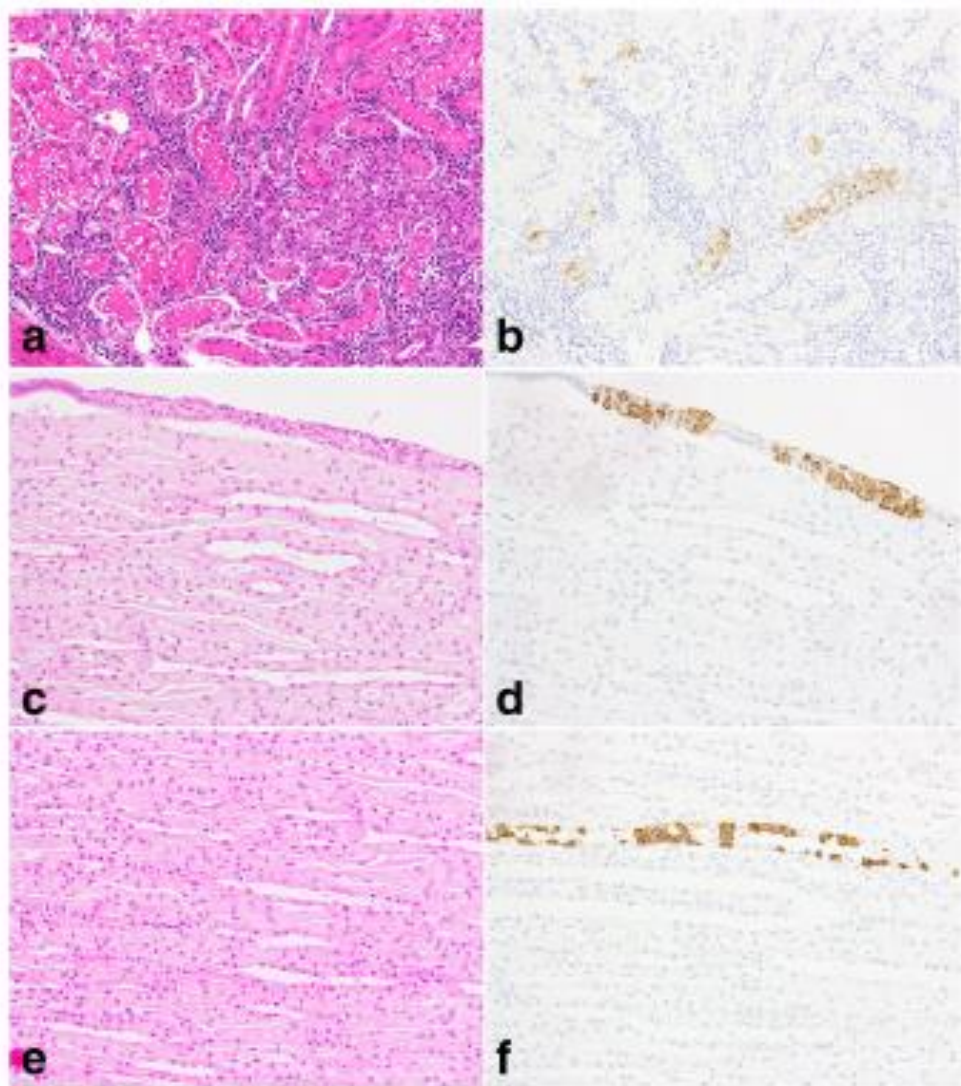
^a No lesions

^b Mild infiltration of inflammatory cells

^c Moderate to severe TIN

^d et al

Grado delle lesioni



Indagine epidemiologica di FeMV in Abruzzo

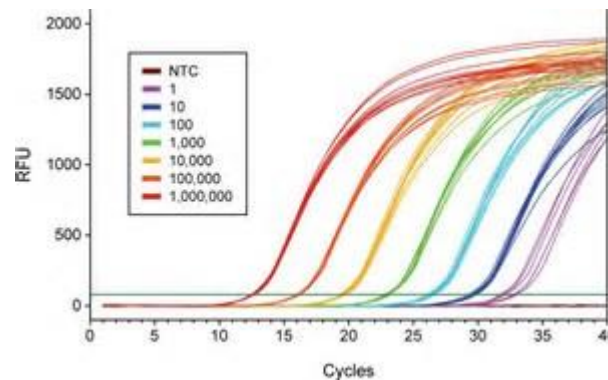
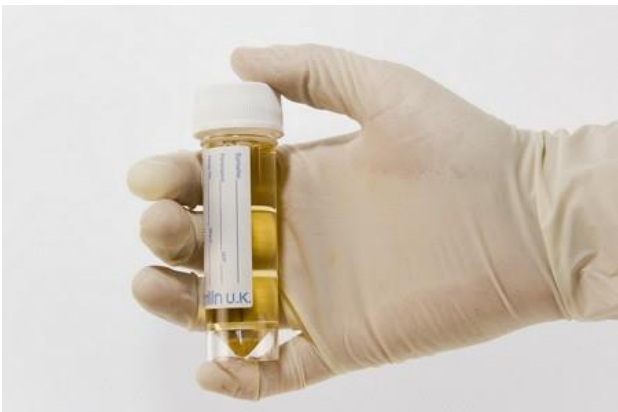


- Gruppo A, gatti domestici, 47 campioni di urine
- Group B, carcasse
- Group C, gatti di colonia



Gruppo A

- Gatti di ambulatorio con anamnesi varia, 47
- Urine, Siero, Sangue
- qPCR urine e sangue, sequenziamento
- IFI sierologico
- > gatti adulti
- altri patogeni



Gruppo C, 2 colonie di gatti (52 e 14)

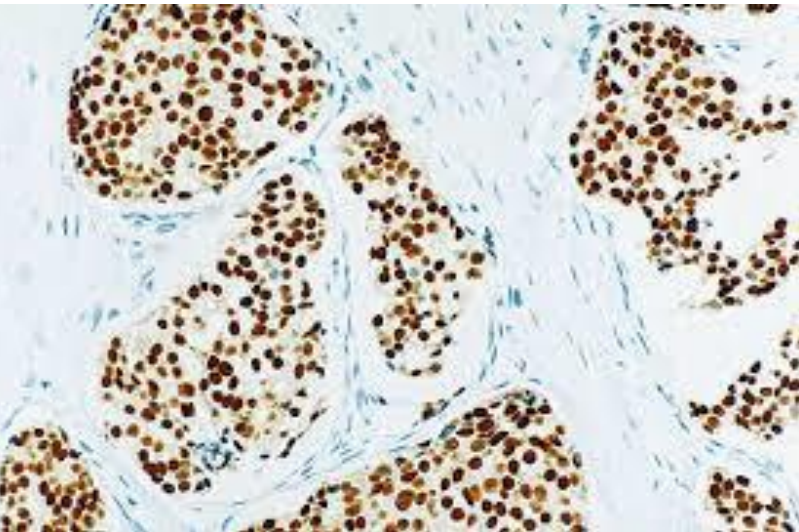


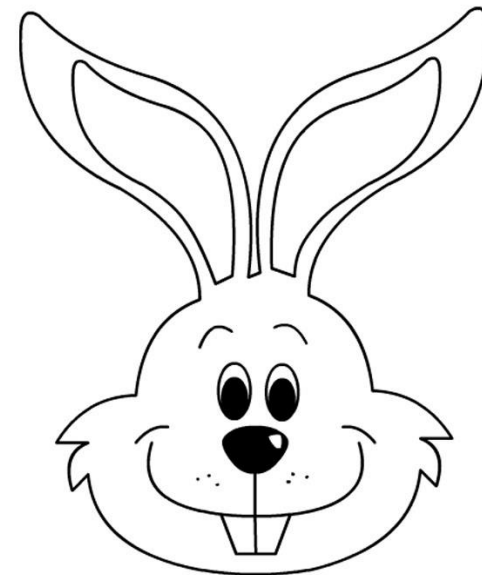
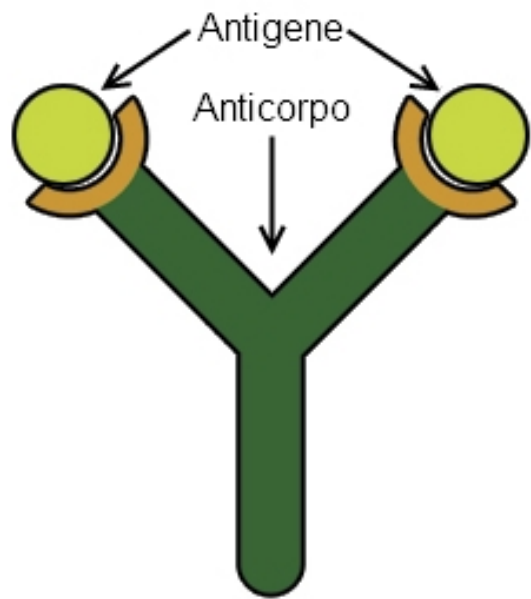
Giovani e Adulti

Gruppo B



35 carcasse IZSAM e colonie





www.disegnidacolorare.me



Gruppo A

- 7/47 erano positivi in qPCR; P 14%, CI 95%: 7-27, nessuno con CKD conclamata?
- Sequenze diverse

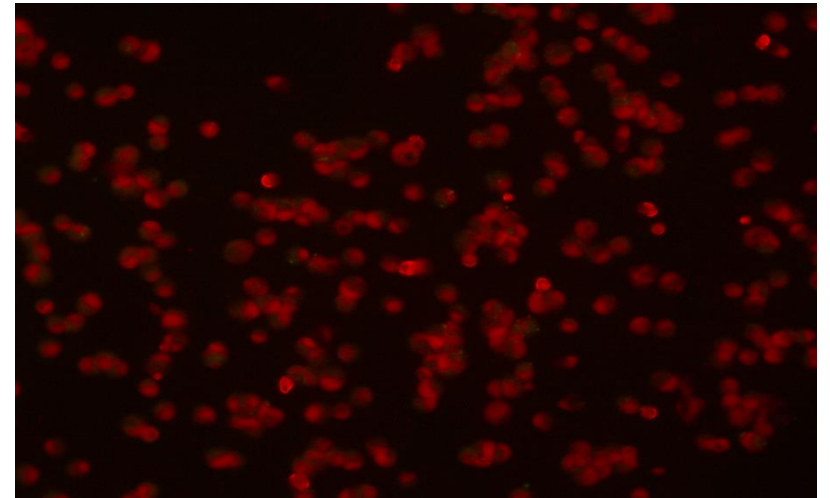
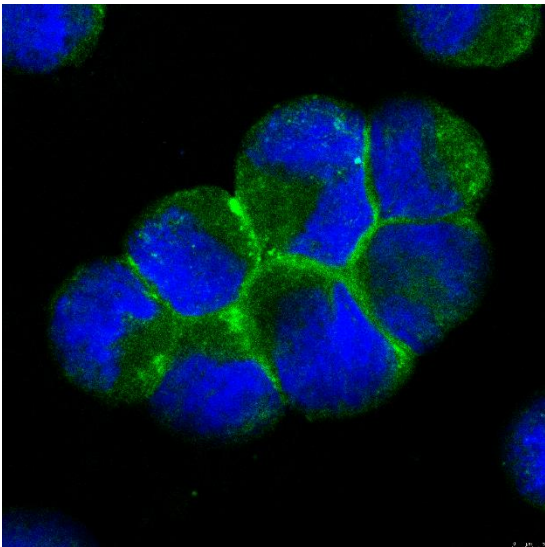
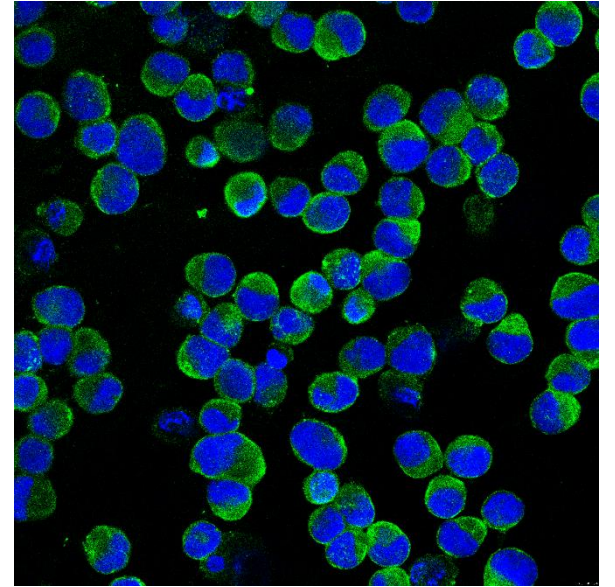




In Group C, 20/72 positive (P: 30%, CI 95%: 18-39), no CKD in vita???
2 variant virali in C1, 98% id (seq parziale), una di queste presente in C2

IMMUNOFLUORESCENZA (IFI)

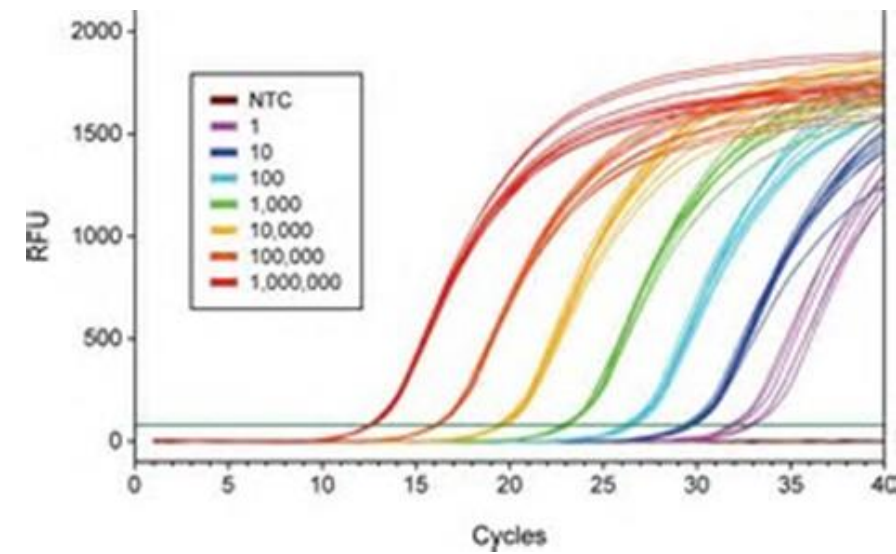
- Campioni di siero da gatti positivi alle urine sono stati testati per valutare la presenza di IgG anti- FeMV-N protein
- 17/27 gatti (RNA+ urine) sono risultati Ab+; fase subacuta/cronica? Dieci non testati



- **Organi delle carcasse (Group B, n=35) testati per FeMV**

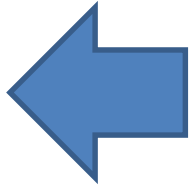
- **4 Gruppi**

- **B1 (RNA+/IHC+/lesioni+),**
- **B2 (RNA-/IHC+/lesioni+),**
- **B3 (RNA-/IHC-/lesioni+) and**
- **B4 (RNA-/IHC-/lesioni-) per analisi statistica**

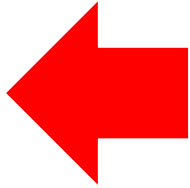


RISULTATI

B1
+ RNA
+ IHC
+ LESIONS
(N°7/35)



B2
-RNA
+ IHC
+ LESIONS
(N° 5/35)



ALTRI ORGANI

B3
-RNA
-IHC
+ LESIONS
(N°11/35)

NEGATIVI 12/35

ALTRI ORGANI

Milza (RT-PCR e IHC) anche in assenza di virus nei reni

Cervello RT-PCR ma non in IHC

Linfonodo

Vescica

Ricerca di altri comuni patogeni del gatto

NRG	ETA'	GROUP	FIP	FIV	FeLV	FPV	LEPTOSPIRA	LEISHMANIA
24961 Margarita 2016	2 a	C1	-	-	+	+	-	-
29045 Chicco 2016	2 a	C1	-	-	-	+	-	-
1734 Luna 2017	2 a	C1	-	-	-	+	-	+
11441 Athos 2016	5 a	C2	-	-	+	-	-	-
9216 Batuffolo 2016	14 a	RC	-	-	-	+	n.a.	-
9257 Monk 2016	5 a	RC	-	-	-	-	n.a.	-
12807 Arpio 2016 7	5 a	RC	-	-	-	-	n.a.	-
28321 Pedro 2016	2 a	C1	+	-	-	-	-	-

CONCLUSIONI

- **Associazione tra virus e lesioni? Campione poco rappresentativo, indagini ancora in corso**
- **FeMV ha prevalenza > nelle colonie**
- **Prevalenza del 14% nei gatti Gruppo A**
- **Oltre a FeMV ci sono altri Paramyxoviridae (FeMV RNA-, IHC+)**
- **Diversità genomica tra i FeMV in Abruzzo**

