

Poster presentation

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## MMTV-related sequences in feline breast carcinomas

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### Background

Mouse mammary tumor virus (MMTV) has a proven role in breast cancer (BC) in susceptible murine lines. MMTV-related sequences were also found in significant proportion of human sporadic and familial BC patients (17-52%). MMTV-homologous sequences were found in liver, thymus and spleen of wild commensal mice; in 63% animals analyzed the sequences were expressed [1-3]. However, the role and origin of MMTV-related infection in humans is unclear.

### Materials and methods

Earlier *gag* MMTV gene-related fragments were revealed in cats by other investigators [4]. We studied 9 female cats (7-15 years old) with BC treated at the Laboratory Animals Branch to search MMTV-homologous sequences in tumor cells of BC animals. Specific PCRs with primers for gp52-coding area of the *env* MMTV and *gag* MMTV genes were used. PCR-products were sequenced and partially cloned in pGEM-T vector followed by sequencing. All experiments were isolated from ones with mice or infectious MMTV to avoid DNA contamination.

### Results

MMTV-related sequences were revealed in DNA samples from tumor and adjacent breast tissues in 3/9 (33.3%) of BC animals. The sequences analysis by BLAST and DNA Star was shown 92-97% homology of the gp52 *env* MMTV-related area with exogenous MMTV (C3H and HeJ strains), 93-97% - with *Mus musculus* cDNA and 93-98% homology with human MMTV-related betaretrovirus. Homology of the *gag* MMTV-related area with exogenous

MMTV was 92-95%, with *Mus musculus* cDNA - 96-98% and with human MMTV-like betaretrovirus - 97-99%. Homology of the *env* and *gag* MMTV genes - homologous sequences between different animals was 92-93% and 97%, correspondingly; ORFs were found in sequenced PCR products.

### Summary

Preliminary data show high similarity between feline and human MMTV-related sequences revealed in BC tissues. Feline might to be intermediate host for viral infection and transmission from mice to human.

### References

1. Faedo M, Hinds LA, Singleton GR, Rawlinson WD: **Prevalence of mouse mammary tumor virus (MMTV) in wild house mice (*Mus musculus*) in southeastern Australia.** *J Wildl Dis* 2007, **43**(4):668-74.
2. Lushnikova AA, Kryukova IN, Peredereeva EV, et al.: **MMTV-related sequences in *Mus musculus* genome and human breast cancer tissue.** *Breast Cancer and Treatment, SABCS Abstracts*, # 3087 2008.
3. Imai Sh, Okumoto M, Iwai M, et al.: **Distribution of mouse mammary tumor virus in Asian wild mice.** *J Virol* 1994, **68**(5):3437-42.
4. Szabo S, Haislip AM, Traina-Dorge V, et al.: **Human, rhesus macaque, and feline sequences highly similar to mouse mammary tumor virus sequences.** *Microsc Res Tech* 2005, **68**(3-4):209-221.