

Telomere Position on the Cat Chromosome

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(Received 11 August 1995/Accepted 14 May 1996)

ABSTRACT. The telomere in the cat chromosome was detected by the fluorescence *in situ* hybridization method using all human telomere as a probe. In the metaphase chromosomes of cultured peripheral lymphocytes, telomere spots were observed in the terminal portions of the chromosomes. Although telomeres were confirmed in all chromosomes, the fluorescence intensity varied between the two homologues in some chromosomes. — **KEY WORDS:** chromosome, feline, telomere.

J. Vet. Med. Sci. 58(10): 1025–1026, 1996

Telomeres are situated at the terminals of chromosomes and contain a repeated sequence of 6 base pairs: (TTAGGG)_n [1, 3, 5]. This sequence is highly conserved beyond the species level [5]. The telomere plays a stabilizing role in the terminal portion of the chromosome, and is also implicated in chromosomal changes accompanying aging and malignant transformation [2, 4, 7].

The telomere is found at the end of the chromosome in almost all animals [6], but no report has confirmed a telomere signal on the cat chromosome.

We examined the position of the telomere on cat chromosomes by a fluorescence *in situ* hybridization (FISH) method using all human telomere as a probe.

Blood samples were collected from the veins of the forelegs of 4 Japanese crossbred cats (2 males and 2 females) and cultured according to the methods for peripheral lymphocyte culture. The cultured lymphocytes were harvested and used to prepare chromosome specimens [8, 10].

Giemsa staining was performed to confirm the cat chromosome number. G-banding staining [8, 10] was also performed to detect chromosomal structural abnormality.

The telomere signal was detected using a fluorescein isothiocyanate (FITC) labelled all human telomere probe,

following the methods of the *in situ* Hybridization System for Chromosome (Oncor Corp.) [11].

Similar results were obtained for both sexes. Figure 1 shows the karyotype of a male cat. Figure 2 shows the same karyotype arranged according to the San Juan system. The chromosome number was 2n=38, XY. No structural abnormality was detected.

Figure 3 shows the telomere signals detected by FISH. Telomeres were observed as yellow spots located at the terminal portions of the chromosomes. The red portion was due to propidium iodide (PI) staining of the main components of chromosomal DNA.

Our study demonstrated telomeres on cat metaphase chromosomes as definite spots located at the terminal portions of the chromosomes. The fluorescence of some

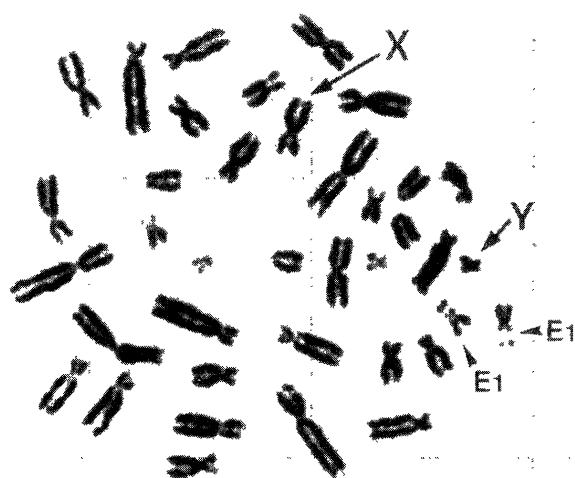


Fig. 1. Karyological characteristics of male cat.

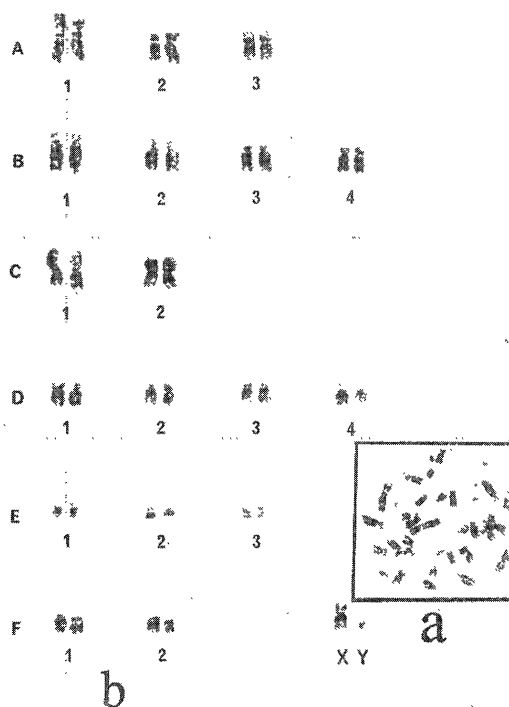


Fig. 2. Preparation of karyotype with San Juan system. Typical division image by G-band of normal male cat is shown in (a) and its karyotype is given (b).



Fig. 3. Spots of telomeres on metaphase chromosomes of a male cat, detected by the FISH method using an all human telomere probe.

spots was weak, and the fluorescence intensity varied between two homologues in some chromosomes. The

reason for these observations is unknown.

In the present study, telomeres on the cat chromosome were detected using the repeated sequence of human telomere as a probe. The detection of cat telomere using a human telomere probe suggests a high conservation beyond the species level of the telomere DNA base pair sequence.

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