

Chromosome numbers in <i>Catarrhina</i>						
Taxa	Personal data			Literature data		References
	Number of animals studied		2n	Number of animals studied		
	♂	♀			♂	♀
CERCOPITHECIDAE						
Cercopithecinae						
<i>Macaca sylvana</i>	3	1	42			
<i>M. speciosa</i>	1		42			
<i>M. fuscata</i>	1	1	42			
<i>M. mulatta</i>	3	1	42	8	3	42 3,6-8
<i>M. assamensis</i>	1	1	42			
<i>M. silenus</i>	1	2	42			
<i>M. nemestrina</i>	1	1	42	1		42 6
<i>M. radiata</i>	2		42			
<i>M. sinica</i>		1	42			
<i>M. irus</i>	3	1	42	1		42 2
<i>M. maura</i>	1		42			
<i>M. niger</i>	1		42			
<i>(Cynopithecus niger)</i>						
<i>Papio sphinx</i>	1	2	42	1		42 3
<i>P. leucophaeus</i>	1	2	42			
<i>P. comatus</i>	2		42			
<i>P. cynocephalus</i>	2		42			
<i>P. doguera</i>	2		42	2		42 3
<i>P. papio</i>	2		42	1	1	42 6
<i>P. hamadryas</i>	1	3	42			
<i>Theropithecus gelada</i>	2	1	42			
<i>Cercocebus albigena</i>	1		42	1		42 9
<i>C. aterrimus</i>	1	1	42			
<i>C. galeritus</i>	2		42	1		42 9
<i>C. torquatus</i>	2	1	42	3		42 1,3
<i>Cercopithecus aethiops</i>	3	2	60	3	1	60 3
<i>C. cephus</i>	2		54			
<i>C. talapoin</i>	1		54			
<i>C. diana</i>	3	3	60			
<i>C. l'hoesti</i>	1		60		1	72 2
<i>C. mitis</i>	4	1	72			
<i>C. mona</i>	2	1	66		3	66 3
<i>C. neglectus</i>		2	60	1		60 9
<i>C. nictitans</i>	2	1	66		3	66 3
<i>C. nigroviridis</i>	2	1	60			
<i>Erythrocebus patas</i>	3		54	1	3	54 3,9
Colobinae						
<i>Presbytis obscurus</i>	1	1	44			
<i>Colobus polykomos</i>		1	44			
PONGIDAE						
Hylobatinae						
<i>Hylobates lar</i>	4		44			
<i>H. agilis</i>	1	1	44			
<i>H. moloch</i>	1		44			
<i>H. hooloch</i>					1	44 2
Ponginae						
<i>Pongo pygmaeus</i>	2	1	48			
<i>Pan troglodytes</i>	2	2	48	8	7	48 10
<i>Pan paniscus</i>	1		48			

Electron Microscope Observations on the Action of Vitamin E on the Uterine Smooth Muscle Cells

It is well known that the action of vitamin E on the uterine structures is similar to that of folliculine. Such action, which is evident in ovariectomized animals, is particularly important at the level of the circulatory system and the muscular wall of the uterus<sup>1</sup>. The development of the muscular layer may be due to either an

chromosomes of 54. In the genus *Cercopithecus*, different species have a modal number of 54, 60, 66, 72 chromosomes. It is noteworthy that all these numbers are multiples of 6.

While these data cannot be interpreted at the moment, they indicate that some evolutionary mechanism has been at work in changing the number of the centromeres. Some preliminary data made us think that the Robertsonian mechanism of centric fusion had played an important role in such a variation.

The difference between the data of CHU et al.<sup>2</sup> and my own concerning *Cercopithecus l'hoesti* may be due to misclassification or to racial variation. Taxonomic criteria which can be used to distinguish *C. l'hoesti* from *C. mitis* are not clear cut<sup>3</sup>. The difference in numbers (60 vs. 72) could thus be due either to uncertainty in attributing the animals used to the said species, or to chromosome variation within a species.

In addition to the chromosome numbers it is of considerable importance to examine the comparative morphology and size of chromosomes of the various species. This is the immediate purpose of the work I shall continue in the near future.

Chromosome counts are a necessary preliminary step in comparative karyology, but are not sufficient. The shape and size of chromosomes also needs to be taken into account. I propose to continue my investigations on this material along these lines<sup>11</sup>.

*Riassunto.* L'autore sta conducendo uno studio comparativo sui cromosomi dei Primati. Nella presente nota riferisce sulle variazioni numeriche riscontrate nelle Scimmie Catarrine.

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<sup>5</sup> N. TAPPEN, *Cur. Anth.* 1, 91 (1960).

<sup>6</sup> C. D. DARLINGTON and A. HAQUE, *Nature* 175, 32 (1955).

<sup>7</sup> K. H. ROTHFELS and L. SIMINOWITCH, *Chromosoma* 9, 163 (1959).

<sup>8</sup> P. I. SHIWAGO, *Boll. Biol. Med. exp. U.R.S.S.* 8, 3 (1939).

<sup>9</sup> N. TAPPEN, Quoted in CHU and BENDER (1961).

<sup>10</sup> W. J. YOUNG, T. MERTZ, M. A. FERGUSON-SMITH, and M. A. JOHNSTON, *Science* 131, 1672 (1960).

<sup>11</sup> *Acknowledgments.* I am indebted to the Director of the Zoos of Turin, Rome, Naples, Hannover, Gelsenkirchen, Amsterdam, Rotterdam, Paignton, Chessington, and Chester, for having put the animals at my disposal for the biopsy and to Prof. C. P. KOLLER of London and Prof. F. TWIESELMANN of Bruxelles for their kind hospitality in their laboratories during the preparation of the cultures.

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indirect action through an increase of the blood supply and hence to better nutritional conditions, or a direct action on the metabolism of the muscle cells. It is known that vitamin E plays a significant role in glucose utilization by the muscle cells through increased oxidative

<sup>1</sup> G. TUSINI and I. VANDELLI, *Arch. int. Pharmacodyn Thérap.* 86, 16 (1951).

phosphorylation; furthermore, it is known that proteins like miosine and actomiosine, which are of essential importance to the miofibrilles, cannot be built up in the absence of vitamin E, the vitamin which also prevents the oxidation of stored lipids and liposoluble vitamins<sup>2</sup>.

A possible correlation was considered between the biochemical modifications induced by vitamin E and the morphological changes inside the cell, which could be best detected by using electron microscope methods.

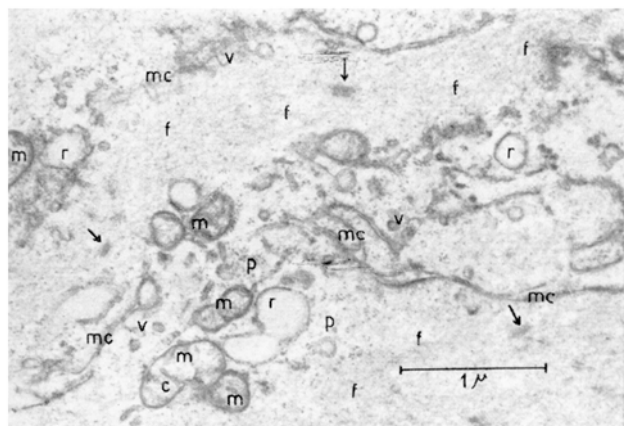


Fig. 1. Miometrial preparation from castrated rabbit,  $\times 20000$ .

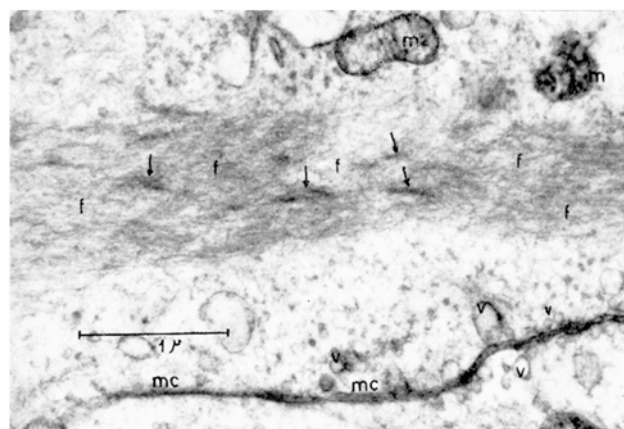


Fig. 2. Miometrial preparation from castrated rabbits treated with vitamin E,  $\times 20000$ . f miofilaments, m mitochondria, c mitochondrial crests, mc cell membrane, r endoplasmic reticulum, v pinoctosis vacuoles, p ribosomes.

The experiments were carried out on ovariectomized rabbits. A group of operated animals were injected subcutaneously daily with vitamin E, at the dose of 60 mg for 20 days. Samples of the uterus wall were fixed in osmic acid according to the method of PALADE<sup>3</sup> and included in Vestopal<sup>4</sup>; sections obtained with a Porter-Blum microtome were examined under a Philips EM 100A electron microscope.

Animals treated with vitamin E show morphological differences from ovariectomized controls both in macroscopic and microscopic examinations of the uterus: the muscular layer is enlarged, and this to a considerable extent.

Samples from the two groups of animals also differ markedly at electron microscope level. The behaviour of the miofibrilles is the most impressive feature: in smooth cells of the castrated control animals, these structures are reduced to a fine fibrillary network with no specified distribution and no microfilaments visible singly. This aspect is probably due to the fact that the muscular proteins are not completely developed and oriented. Dark bodies are always present and they can be interpreted either as non-contractile proteins, or as fusion points of several fibrilles (Figure 1).

In vitamin E treated animals, uterine smooth cells are well-developed: they run along the whole length of the cell, are well-organized in compact bundles and miofilaments show a well-defined resolution. Dark bodies are increased in number and size (Figure 2).

In conclusion: Vitamin E exerts an elective stimulus on the synthesis and organization of muscular contractile proteins of the uterine wall.

These morphological data are in very good agreement with the biochemical evidence already available of such action of vitamin E.

**Riassunto.** Il trattamento con vitamina E di conigli ovariectomizzati determina una ipertrofia dell'utero alla quale corrisponde a livello ultracellulare uno sviluppo particolarmente evidente delle proteine contrattili muscolari.

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<sup>2</sup> M. ALOISI, *Vitamin E*, Atti 3. Congr. Int., Venezia (1955), p. 175.

<sup>3</sup> G. E. PALADE, *J. exp. Med.* 15, 285 (1952).

<sup>4</sup> A. RYTER and E. KELLENBERGER, *J. Ultrastr. Res.* 2, 200 (1958).

## Behavior of Human Carcinoma Reminiscent of Virus<sup>1</sup>

Histological evidence for transformation of normal liver cells located in the neighborhood of carcinomatous neoplasms, be they of hepatocellular origin (hepatoma) or metastatic to the liver has been reported in a total of 58 cases by ELIAS<sup>2-4</sup> and by ELIAS, SHERRICK and BOULDIN<sup>5</sup>. The epithelial cells of renal tubules behaved identically in the one case of a metastasis to the kidney which was studied. The metastatic growths (22 cases) included in the above mentioned observations had originated at the following primary sites: oesophagus

epithelium, stomach, colon, lung, prostate, breast, endometrium, pancreas, and vulva epithelium.

Histological sections of these tumors including large portions of the host organ were submitted to three stains: hematoxylin and eosin; WILDER's uranium and

<sup>1</sup> Presented at the 75th Meeting of the American Association of Anatomists, March 22, 1962, Minneapolis, Minnesota, U.S.A.

<sup>2</sup> H. ELIAS, *J. Nat. Cancer Inst.* 15, 1151 (1955).

<sup>3</sup> H. ELIAS, *Acta hepatosplenologica* 7, 65 (1960).

<sup>4</sup> H. ELIAS, *Wiener klin. Wschr.* 73, 898 (1961).

<sup>5</sup> H. ELIAS, J. C. SHERRICK, and R. BOULDIN, *Acta hepatosplenologica* 9, in press.