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M-FISH in a rare hybrid foaled by a donkey and a zebra sire

Alessandra Iannuzzi¹, Viviana Genuardo¹, Angela Perucatti¹, Alfredo Pauciullo², Jorge Pereira³, Leopoldo Iannuzzi¹, Malcom Ferguson-Smith³

¹CNR-ISPAAM Agrifood Naples-Italy

²University of Torino Department of Agricultural, Forest and Food Science (DISAFA) Grugliasco (TO)-Italy

³Cambridge University Department of Veterinary Medicine Cambridge-United Kingdom

M-FISH (Multicolor fluorescence in situ hybridization) is one of the newest and powerful molecular cytogenetic techniques. It can be used as a source of information in many ways and for a precise description of chromosomal rearrangements in particular. In the present study, for the first time in a hybrid, we report a new way to study chromosome rearrangements on a male zonkey foaled by a donkey (*Equus asinus*, 2n=62, XX) and a zebra sire (*Equus burchelli*, 2n=44, XY) using M-FISH. We have established that the somatic cells of the hybrid possess 53 chromosomes, making very difficult pairing of homologous chromosomes. For this reason, we have applied the multi-colour Zoo-FISH using a total of 29 whole chromosome painting probes (wcps) obtained through flow-sorted zebra and horse chromosomes and, later DOP-PCR amplified and labelled. In this case, five different pools of six wcps each were prepared, making possible five sequential FISH performed on the same slide for the identification of almost all chromosomes. The acquired images were then superimposed enabling individual chromosomes to be classified based on the fluor composition, in accordance with the combinatorial labeling scheme of the M-FISH probe pool used. Finally, we have analyzed in detail these digitally acquired and processed images to make the identification of all chromosomes for the first time in this rare hybrid. We show that the zonkey has received a haploid set of chromosomes from each parent.

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