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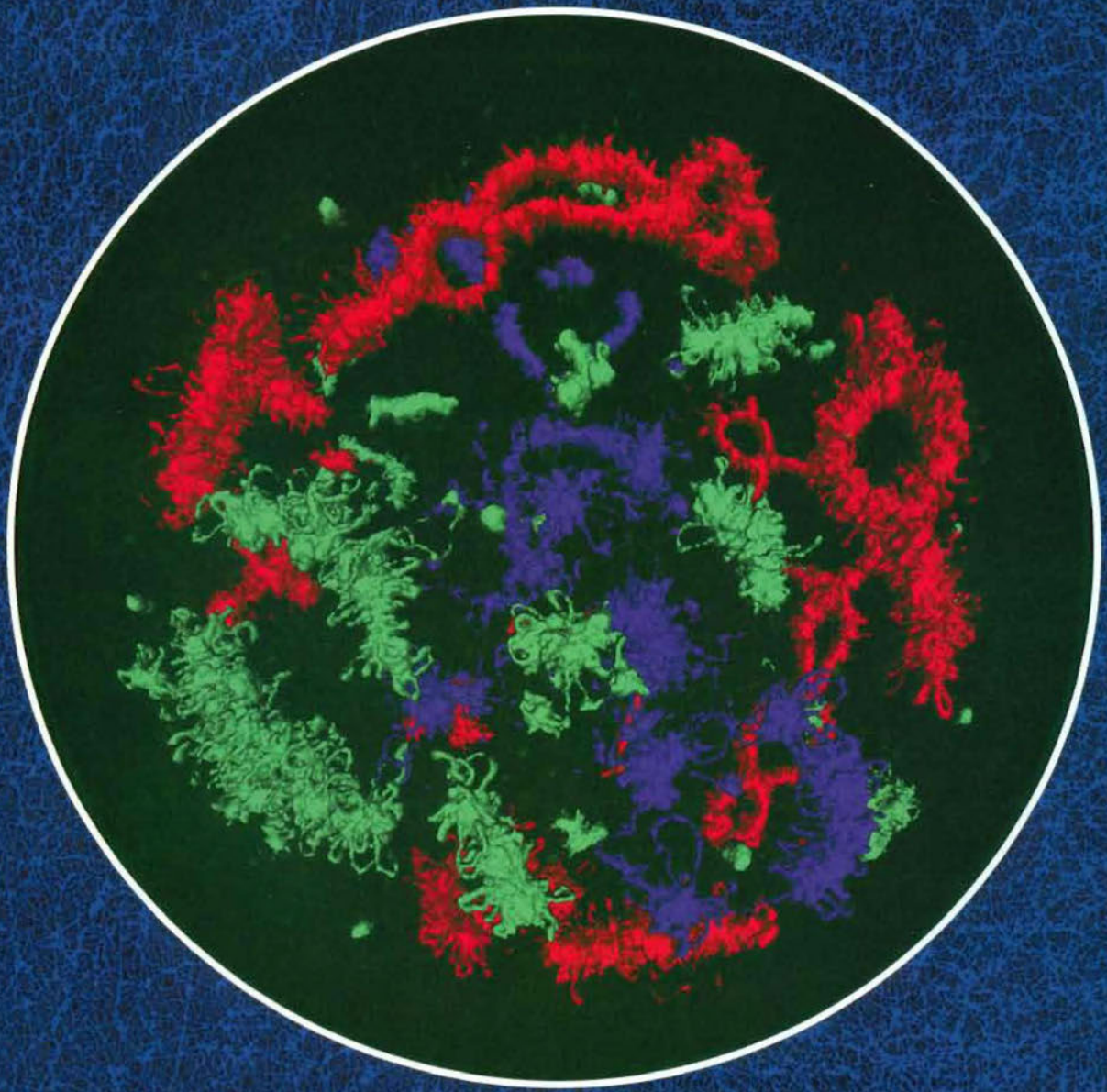
CHROMOSOME RESEARCH

The Biology of Chromatin and Chromosomes



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ABSTRACTS

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and thus the proportion of mortality caused by aneuploidy in a cohort of developing embryos is poorly reviewed.

A reliable technique bringing maximum information from an examined sample of gametes or embryos is required. In animal research, the so far used FISH technique is capable of analysis of only a few chromosomes and the examination of chromosome spreads derived from oocytes or embryonic cells suffer from low chromosome quality and spreading artefacts. By employment of Whole Genome Amplification (WGA) and Comparative Genomic Hybridization (CGH) techniques, it is possible to detect abnormalities of all chromosomes even from a single cell. Using this approach we examined the sample of 138 pig oocytes, 77 early pig embryos and 86 pig blastocysts. Due to the technical inability of CGH to detect polyploidy, we further assessed true polyploidy (polyploidy presented in all cells of the embryo) in 62 pig blastocysts by FISH.Screening of all chromosomes in porcine oocytes revealed approximately 10 % of them to be aneuploid. The incidence of aneuploidy increased in in vivo early porcine embryos to 14 %, however, decreased to 5 % when examining advanced stages of in vivo porcine embryos (blastocysts). The frequency of true polyploidy in in vivo porcine blastocysts detected by FISH was about 2 %. Based on scientific papers, embryo mortality was estimated to reach up to 40 % in pigs. The combined data from our study indicates that aneuploidy is not a major cause of the aforementioned pregnancy loss in pigs.

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O12

Preliminary observations on Sister Chromatid Exchanges (SCEs) induced by high dosages of BrdU in metaphase chromosomes of the Agerolese breed of cattle (*Bos taurus*)

Rubessa M.[a], Iannuzzi A.[b], Peretti V.[c], Pauciullo A.[a], Ciotola F.[c], Albarella S.[c], Cosenza G.[a], Ramunno L.[a], Iannuzzi L.[b], Di Berardino D.[a]

[a]DISSPAPA Dept., University of Naples "Federico II", Portici, Italy

[b]National Research Council (CNR), ISPAAM, Lab. of Animal Cytogenetics and Gene Mapping, Naples, Italy

[c]DISCIZIA Dept., University of Naples "Federico II", Naples, Italy

The present study reports on Sister Chromatid Exchanges (SCEs) in lymphocytes of the Agerolese breed of cattle exposed to BrdU dosages of 10 and 300 μg/ml, (f.c.) for two cell cycles. Peripheral blood was drawn from 3 healthy cows, and cultured in duplicate for 72 h in RPMI 1640 medium plus 10 % FBS, L-glutamine, antibiotic-antimicotic, and Concanavalin-A. After 36 h from the initiation, BrdU (Sigma) was added to the cultures, respectively at 10 μg/ml and 300 μg/ml (f.c.). Slides were stained with acridine orange solution (0.010 % in Sorensen buffer, pH=7.0). 20 metaphases were analyzed for each animal, for each dosage, with a total of 3,523 chromosomes. The mean rate of SCE/cell was 5.85±2.71 at the dosage of 10 μg/ml while it increased up to 33.93± 13.03 at the dosage of 300 μg/ml. The fraction of chromosomes 'with' exchanges was only 9 % at the dosage of 10, while it increased up to 41.51 % at the dosage of 300. The exchanges (SCEs) observed at 10 μg/ml were of type 1 (8.84 %), type 2(0.42 %) and type 3 (0.03 %), whereas at 300 μg/ml many more exchanges were observed as follows: type 1 (29.10 %), type 2 (9.54 %), type 3 (1.98 %), type 4 (0.77 %), type 5 (0.09 %) and type 6 (0.03 %). By increasing the BrdU final concentration from 10 to 300 μg/ml , the total number of exchanges visualized rised from 354 at 1,462 (4.13 times). These results encourage further insights into the SCE studies at high dosages of BrdU in order to better characterize the genome stability in the livestock species and breeds engaged in animal production.

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O13

Chromosome fragility in dioxin-exposed cattle (*Bos taurus*, 2n=60) and river buffaloes (*Bubalus bubalis*, 2n=50)

Genualdo V.[a], Perucatti A.[a], Iannuzzi A.[a], Giannico F.[b], Spagnuolo M.S[a]., Colonna M.A. [b], Caputi-Jambrenghi A[b]., Vonghia G.[b], Iannuzzi L. [a].

[a]Laboratory of Animal Cytogenetics and Gene Mapping, National Research Council (CNR) of Italy, ISPAAM, Naples

[b]Department of Animal Science and Food Inspection, University of Naples "Federico II", Naples