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Flow cytometry in normal and abnormal pig karyotypes

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flow cytometry / chromosomes / pig

Flow cytogenetics is defined as the application of flow cytometry and sorting to chromosome purification. By this approach, the chromosomes are classified according to their DNA content and base composition, outside the context of the single cell. Flow cytogenetics and sorting techniques have facilitated the detection of numerical and structural chromosome rearrangements, gene mapping and construction of chromosome-specific DNA libraries.

In France, the search for chromosomal abnormalities in hypoprolific pigs led to the discovery of several reciprocal translocations. We have developed embryonic cell lines from normal pigs and from pigs carrying three different reciprocal translocations. The chromosomes of these lines were analyzed with a flow cytometer (EPICS V, Coulter). In normal pigs, a bivariate histogram shows five major peaks; in the flow karyotypes from pigs carrying reciprocal translocations, new peaks occurred corresponding to abnormal chromosomes. These peaks generated by rearranged chromosomes must be considered as tentative and need confirmation by banding studies or by hybridization with molecular probes of genes of known locations on sorted chromosomes.