Using Drosophila melanogaster Y chromosome heterochromatic sequences as a model to construct complete oligopaints

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Abstract

Researches that focuses on understanding the sequence and organization of heterochromatin allows essential functions for the organism to be better understood. One of the main obstacles in studies with the Y chromosome is related to the heterochromatic state of this structure, which in Drosophila melanogaster is formed by approximately 41 Mb of highly repetitive sequences. With applications in cytogenetic studies, the protocol for constructing oligopaints probes does not usually include such sequences. Considering that there are only 1381 probes for the D. melanogaster Y chromosome, whereas for its other chromosomes this value is at least ten times greater, oligopaints for this structure do not allow analyzes as deep as for others. Using D. melanogaster Y chromosome as a model, we aim to identify unique repetitive sequences of it through the YGS (Y chromosome Genome Scan) method, increasing the number of known probes for this structure and allowing to construct its complete oligopaint. Thus, it is possible to compile the methodologies involved in the development of a new technique that will allow to construct oligopaints of the Y chromosome of any species of interest. The analyses of the results and the own efficiency and quality of the obtained oligopaints will be given through the direct comparison between these and those generated from the 1381 probes currently known for the Y chromosome.

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