Apr 25th, 10:30 AM - 4:30 PM

In Situ Hybridization Screening of a Lambda Library for Chromosome Specific DNA: The Isolation of a Rabbit Chromosome Number 9 Probe

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1 IN SITU HYBRIDIZATION SCREENING OF A LAMBDA LIBRARY FOR CHROMOSOME SPECIFIC DNA: THE ISOLATION OF A RABBIT CHROMOSOME NUMBER 9 PROBE

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3 Downs syndrome, a disease which effects 1 of every 783 newborns, is the result of anueploidy of human chromosome 21. The closely related rabbit chromosome 20 can be used as a model for the study of the cause of the misdistribution of this chromosome during meiosis. The procedure, called karyotyping, requires long hours behind the microscope; however, it can be replaced with the more accurate, time-efficeint restriction fragment length polymorphism (RFLP) assay. The purpose of this study was to test the feasability of finding a chromosome specific probe by searching a lambdda library using IN SITU hybridization. IN SITU hybridization involves annealing a radioactive DNA probe directly to metaphase chromosomes fixed to a microscope slide. A photographic emulsion is spread over the slides. Photographic grains appear over the chromosome to which the DNA has annealed thus identifying the chromosome from which the probe DNA originated (FIG. 1). Probe DNA was phenol extracted from lambda phage virus clones that carry rabbit DNA inserts. Inserts were purified by gel electrophoresis (FIG. 2). Using this procedure, a chromosome 9 probe was discovered in the 86 phage DNA clones isolated (FIG. 3). This suggests that a larger search would be capable of finding the chromosome 20 probe needed to develop a rabbit model for Downs syndrome.