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JOURNAL ARTICLE

Computer tracking of germ cells in the cycle of the seminiferous epithelium and prediction of changes in cycle duration in animals commonly used in reproductive biology and toxicology

R. A. Hess and P. Chen
Department of Veterinary Biosciences, University of Illinois, Urbana 61801.

A computer program called Stages was written to aid the tracking of germ cells and stages forward and backward through time in the cycle of the seminiferous epithelium. The program incorporates the basic kinetics of spermatogenesis in the rat, mouse, hamster, guinea pig, dog, rabbit, bull, stallion, ram, boar, quail, monkey, and man. The program is flexible and permits the user to alter the cycle duration time and the frequency of each stage. Compiled for use on personal computers and available on floppy disks free of charge, Stages is menu-driven and requires no knowledge of programming. The program was tested using published data of testicular toxicity and vitamin A synchronization of stages. In general, predicted cell types were similar to those observed; discrepancies between observed and predicted data are discussed. When cycle duration time was changed, predicted data for stage synchronization coincided with the observed data. This program will improve the speed and accuracy of studying factors that affect spermatogenesis. By using Stages, it is possible to predict the target cell types in a toxicity study and to track affected cells over long periods of time. Predicted cell types may also indicate which cells to examine biochemically as well as morphologically in subsequent experiments. The program will also be useful to beginning students learning the complex patterns of cellular associations and the progression of germ cells in the cycle of the seminiferous epithelium.

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