

Cytogenetic Investigations of Biopsy Material from Irradiated Human Testes

In order to obtain estimates on the production of reciprocal translocations in human spermatogonial stem cells, Dr. R. J. Preston and I are collaborating with Dr. C. G. Heller on his program involving testicular irradiated inmates at the Oregon State Penitentiary. Our participation in the program involves obtaining biopsy material at the time the individuals are routinely biopsied by Dr. Heller, and making preparations of diakinesis and metaphase I cells.

At this time we have made preparations from three control, two 78R, two 200R, one 600 R, and two 100R plus 600R exposed individuals. Although this sample is too small to draw any firm conclusions from, one fact appears obvious. That is, if we are to make meaningful determinations of translocation frequencies we can not rely on single biopsy samples from each individual. The rationale for this conclusion is that at any moment in time there are very few cells in the proper stages for analysis in a small biopsy sample, and this small population undoubtedly comes from a very small population of surviving stem cells. Thus we feel that in order to avoid making any quantitative evaluation of the translocation frequency in only a few stem cells we should obtain repeated biopsy samples from each individual. I suggest four biopsies from each of the two testes of each individual, with a maximum of 25-50 cells analysed from any biopsy. I feel this will improve our chances of estimating the damage to the entire stem cell population and decrease the probability of basing our measurements on only a tiny fraction of the surviving stem cells.

Ideally, of course, only 10-20 cells from each of 10-20 biopsy samples should be scored to minimize clustering bias. This, however, is impractical and virtually impossible. Thus I suggest the compromise procedure outlined above.

J. G. Brewen

REPOSITORY: DOE-RICHLAND
COLLECTION: GSS HUMAN TEST SUBJECTS STUDIES
PRISONER STUDY

BOX: 046264

FOLDER: 1780 - HELLER PACIFIC NW RES. FOUNDA.

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