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JOURNAL ARTICLE

Comparative study of experimentally induced benign and atypical hyperplasia in the ventral prostate of different rat strains

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The induction of prostatic lesions in the rat by hormonal manipulation and/or chemical carcinogens in different strains is well documented in literature. However, the selection of a strain for such studies was merely based on the laboratory husbandry facilities rather than on the animal genotype. It is well accepted that the morphology and function of the prostate exhibit a marked species-specific differences that makes extrapolation to other animals and man difficult. Our group has developed an experimental model for the study of rat prostatic hyperplasia and/or dysplasia induced by citral -- a flavor constituent. Previous observations have revealed that the Wistar rat ventral prostate is reactive to citral, especially during its adolescent growth period as well as during the redifferentiation stage among postcastrated rats treated with exogenous testosterone. The present study presents data on the ventral prostate susceptibility of three additional strains selected by their interrelated endocrine morbidity. In order to facilitate an objective comparative analysis of the prostatic lesions a histopathological score chart was elaborated. The present findings showed that the Wistar and Sprague-Dawley strains were the most susceptible to developing benign and atypical prostatic hyperplasia both in intact and postcastrated rats. The F344 and ACI/Ztm rat strains remained refractory toward all of these treatments. Our data provide evidence that the strain genotype and, more precisely, their endocrine background, play a determinative role in the prostatic responsiveness towards citral. It is suggested that additional consideration be given to the selection of an adequate animal strain when studying experimental neoplastic transformation, especially when hormonal interactions might be involved.

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