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JOURNAL ARTICLE

Immunocytochemical localization of the Ya, Yb1, Yc, Yf, and Yo subunits of glutathione S-transferases in the cauda epididymidis and vas deferens of adult rats

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Glutathione S-transferases (GSTs) are dimeric proteins grouped into five classes based on the degree of amino acid homology of their subunits. They are involved in cellular detoxification through the catalyzation of the conjugation of reduced glutathione with various electrophilic substances. In the present study, the distribution of Ya and Yc subunits from the alpha family, Yb1 and Yo subunits of the mu class, and the Yf subunit of the pi class were examined with light microscope immunocytochemistry in Bouin-fixed, paraffin-embedded tissue of different regions of the cauda epididymidis and vas deferens. In the cauda, principal cells showed high levels of expression of Ya, Yc, and Yo subunits, while in the vas deferens, staining decreased to moderate levels for the Ya and Yo subunits and to low levels for the Yc subunit. While Yf was maintained at low levels in principal cells of all cauda and vas deferens regions, Yb1 expression was more erratic, presenting a checkerboard-like staining pattern in the proximal vas deferens and showing moderate cytoplasmic but intense nuclear reactivity in all other regions. Basal cells in the cauda were intensely reactive for Yf, while in the vas deferens, they became unreactive. Conversely, basal cells were unreactive for Ya in the cauda and proximal vas deferens, while in the middle and distal vas deferens, they became moderately reactive. In the case of Yb1 and Yo, some basal cells were reactive while others appeared unreactive in all cauda and vas deferens regions. Yc elicited the display of both reactive and unreactive basal cells in the cauda regions, and while the cells were moderately reactive in the proximal vas deferens, they became intensely reactive in the middle and distal vas deferens. In summary, both principal and basal cells show varying degrees of GST expression in the different regions of the cauda and vas deferens, suggesting that these cells are subjected to a complex, changing environment of substrates. Furthermore, while expression often differs from principal to basal cells, the absence of reactivity of a given GST in one cell type is usually compensated for by expression in the other cell type in any given region of the cauda or vas deferens. Taken together, the data suggest that ample protection from harmful circulating electrophiles can be provided for sperm during their storage in the cauda and vas deferens. In addition, since principal cells of the vas deferens are involved in steroid synthesis, the presence of GSTs in these cells may also serve to bind steroids, or this presence may be involved in steroid isomerization.

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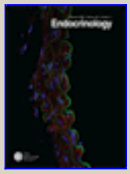

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