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JOURNAL ARTICLE

Differential methylation in steroid 5 alpha-reductase isozyme genes in epididymis, testis, and liver of the adult rat

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DNA methylation has been largely involved in the regulation of tissue-specific gene expression. The aim of the study was to determine the methylation pattern of steroid 5 alpha-reductase genes 1 and 2 in two reproductive tissues (testis and epididymis) and a nonreproductive tissue (liver) that exhibit different contents of steroid 5 alpha-reductase isozymes. These isozymes induce the bioconversion of testosterone to dihydrotestosterone that in mammals is a key molecule for external genitalia development. Genomic DNA from the testis, the epididymis, and the liver from normal adult rats was used to determine cytosine and adenine methylation pattern of steroid 5 alpha-reductase genes 1 and 2 by restriction fragment length polymorphism (RFLP) analysis using restriction enzymes sensitive to adenine (Mbo I and Sau3A I) and cytosine (Hpa II and MSP I) methylation. We also evaluated the expression of both steroid 5 alpha-reductase genes by northern blot. When genomic DNA was digested with Hpa II or Msp I, we found that steroid 5 alpha-reductase gene 2 was less cytosine methylated in the epididymis and in the testis than in the liver. In contrast, when genomic DNA was digested with Mbo I or Sau3A I, we observed that gene 2 was more adenine methylated in the epididymis and in the testis than in the liver. 5 alpha-Reductase gene 1 presented the same adenine- and cytosine-methylation pattern in the studied tissues. We also found a differential expression of steroid 5 alpha-reductase genes. Gene 2 was expressed both in the testis and the epididymis but not in the liver; whereas gene 1 was only expressed in the latter. Our results suggest that the differential methylation pattern in 5 alpha-reductase gene 2 in reproductive and nonreproductive tissues should be involved in the regulation of its expression.

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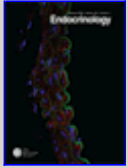
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