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JOURNAL ARTICLE

Gene expression in the aging brown Norway rat epididymis

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The mammalian epididymis is the site where spermatozoa are matured and then stored. Though many studies have described epididymal functions and their regulation, little is known about how aging affects this tissue. The Brown Norway rat, which does not show the many age-related pathologies common to other rat strains, was used as a model to study aging of the epididymis. The present study was designed to determine the effect of aging on the mRNA levels for selected markers of epididymal function. Brown Norway rats ranging in age from 6 to 30 months were examined at 6-month intervals; epididymides were sectioned into caput-corporis and cauda regions. Relative mRNA concentrations were assessed using Northern blot analysis and specific cDNAs for the rat 5 alpha-reductase isozymes, types 1 and 2; proenkephalin; the androgen receptor; epididymal proteins B/C and D/E; and sulfated glycoprotein-2 (SGP-2, clusterin). Northern blots were quantitated by densitometric scanning. In the caput-corporis epididymidis, 5 alpha-reductase type 1 and type 2 mRNA levels decreased significantly by 43% and 33%, respectively, between 6 and 12 months and by 64% and 40%, respectively, between 6 and 30 months. No significant change, however, was found in the expression of the 5 alpha-reductase mRNAs in the cauda epididymidis. Interestingly, proenkephalin mRNA was only detected in the caput-corporis epididymidis of 6-month-old rats. In marked contrast to the 5 alpha-reductase isozymes and proenkephalin, no significant age-related changes were observed in the mRNA levels for the androgen receptor, protein B/C, or protein D/E. No age-related changes in mRNA expression for SGP-2 occurred in the caput-corporis epididymidis. However, in the cauda epididymidis, SGP-2 mRNA levels rose by twofold between 6 and 18 months and then decreased sharply by 75% between 18 and 30 months. We conclude that as the epididymis ages, the expression of genes for certain specific markers of epididymal function is affected in a region-specific manner. Further, the decrease in the concentrations of the mRNAs for the 5 alpha-reductase isozymes and proenkephalin in the epididymis between 6 and 12 months is thus far the earliest marker for aging in the male reproductive tract of the Brown Norway rat.

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Endocrinology, August 1, 2008; 149(8): 4209 - 4217.

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E. Dube, P. T.K. Chan, L. Hermo, and D. G. Cyr
Gene Expression Profiling and Its Relevance to the Blood-Epididymal Barrier in the Human Epididymis

Biol Reprod, June 1, 2007; 76(6): 1034 - 1044.

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S. A. Jelinsky, T. T. Turner, H. J. Bang, J. N. Finger, M. K. Solarz, E. Wilson, E. L. Brown, G. S. Kopf, and D. S. Johnston
The Rat Epididymal Transcriptome: Comparison of Segmental Gene Expression in the Rat and Mouse Epididymides

Biol Reprod, April 1, 2007; 76(4): 561 - 570.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)



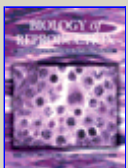
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N. A. Henderson, G. M Cooke, and B. Robaire
Region-specific expression of androgen and growth factor pathway genes in the rat epididymis and the effects of dual 5{alpha}-reductase inhibition.

J. Endocrinol., September 1, 2006; 190(3): 779 - 791.

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K. M. Jervis and B. Robaire
The Effects of Long-Term Vitamin E Treatment on Gene Expression and Oxidative Stress Damage in the Aging Brown Norway Rat Epididymis

Biol Reprod, October 1, 2004; 71(4): 1088 - 1095.

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Reproduction

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M Jara, R Carballada, and P Esponda
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Reproduction, March 1, 2004; 127(3): 359 - 366.

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A. M. Silva, D. B.C. Queiroz, E. F. Castro Neto, M. d. G. Naffah-Mazzacoratti, R. O. Godinho, C. S. Porto, G. Gutierrez-Ospina, and M. C. W. Avellar

Segment-Specific Decrease of Both Catecholamine Concentration and Acetylcholinesterase Activity Are Accompanied by Nerve Refinement in the Rat Cauda Epididymis During Sexual Maturation

J Androl, May 1, 2002; 23(3): 374 - 383.

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