

Journal of Andrology, Vol 20, Issue 3 415-429, Copyright © 1999 by The American Society of Andrology

JOURNAL ARTICLE

Cell- and region-specific localization of lysosomal and secretory proteins and endocytic receptors in epithelial cells of the cauda epididymidis and vas deferens of the adult rat

S. Andonian and L. Hermo

Department of Anatomy and Cell Biology, McGill University, Montreal, Quebec, Canada.

The epithelial cells lining the cauda epididymidis and vas deferens are active in endocytosis and have an abundance of lysosomes and a well-characterized secretory apparatus. However, little is known about the nature of lysosomal proteins contained within lysosomes, the types of receptors on the cell surface, and the types of proteins secreted by these cells. In the present study, cathepsins A, D, B, and sulfated glycoprotein (SGP)-1, well-characterized lysosomal proteins, as well as SGP-2, a secretory protein and low-density lipoprotein receptor-related protein-2 (LRP-2), an endocytic receptor, were immunolocalized at the light-microscopic level within epithelial cells of the cauda epididymidis and vas deferens. Principal cells showed numerous intensely reactive lysosomes for cathepsins A, D, and SGP-1 in all regions of the cauda and vas deferens and for cathepsin B only in the cauda epididymidis. Basal cells were intensely reactive for cathepsin A, unreactive for cathepsins D and B, and weakly reactive for SGP-1 in the cauda region. In the vas deferens, these cells were intensely reactive for cathepsin A and SGP-1 and unreactive for cathepsin B; in the case of cathepsin D, basal cells were weakly reactive in the proximal vas deferens but intensely reactive in the middle and distal vas deferens. Clear cells, present in the cauda region and proximal vas deferens, were intensely reactive for cathepsin A, weakly reactive for SGP-1, and unreactive for cathepsins D and B, while narrow cells found mainly in the proximal vas deferens were intensely reactive for cathepsins A, D, and SGP-1 and unreactive for cathepsin B. Thus, the expression of different lysosomal enzymes in the cauda epididymidis and vas deferens is not only cell- but also region-specific, suggesting differences in the type of substrates internalized by these cells. SGP-2, a secretory protein, showed a checkerboardlike staining pattern in the cytoplasm of principal cells of the cauda epididymidis, while the cytoplasm of all principal cells were intensely reactive in the vas deferens. This type of reaction, as well as staining of sperm, suggests that SGP-2 is secreted into the lumen, where it functions in relation to sperm. The endocytic receptor LRP-2 was noted only on the apical surface of principal cells of the cauda and vas deferens and in spherical structures indicative of endosomes suggestive of their role in the uptake of various ligands, including SGP-2, for which it has a high binding affinity. Thus SGP-2 in the cauda and vas deferens is not only secreted but endocytosed by principal cells, suggestive of an

This Article

- ▶ [Full Text \(PDF\)](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)

Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)

Citing Articles

- ▶ [Citing Articles via HighWire](#)
- ▶ [Citing Articles via Google Scholar](#)

Google Scholar

- ▶ [Articles by Andonian, S.](#)
- ▶ [Articles by Hermo, L.](#)
- ▶ [Search for Related Content](#)

PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by Andonian, S.](#)
- ▶ [Articles by Hermo, L.](#)

active turnover in the lumen. In summary, the epithelial cells of the cauda and vas deferens show marked differences in expression of lysosomal proteins, SGP-2, and LRP-2 suggestive of differences in their functional activity while sperm are stored and protected in these regions.

This article has been cited by other articles:



Journal of **ANDROLOGY**

▶ HOME

L. Hermo, D. Krzeczunowicz, and R. Ruz
Cell Specificity of Aquaporins 0, 3, and 10 Expressed in the Testis,
Efferent Ducts, and Epididymis of Adult Rats
J Androl, July 1, 2004; 25(4): 494 - 505.

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



Journal of **ANDROLOGY**

▶ HOME

S. Andonian, K. Jarvi, A. Zini, and L. Hermo
Ultrastructural Features of the Vas Deferens From Patients
Undergoing Vasectomy and Vasectomy Reversal
J Androl, September 1, 2002; 23(5): 691 - 701.

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



BIOLOGY of REPRODUCTION

▶ HOME

S. Metayer, F. Dacheux, J.-L. Dacheux, and J.-L. Gatti
Comparison, Characterization, and Identification of Proteases and
Protease Inhibitors in Epididymal Fluids of Domestic Mammals.
Matrix Metalloproteinases Are Major Fluid Gelatinases
Biol Reprod, May 1, 2002; 66(5): 1219 - 1229.

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



BIOLOGY of REPRODUCTION

▶ HOME

C. Reyes-Moreno, M. Boilard, R. Sullivan, and M.-A. Sirard
Characterization and Identification of Epididymal Factors That
Protect Ejaculated Bovine Sperm During In Vitro Storage
Biol Reprod, January 1, 2002; 66(1): 159 - 166.

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

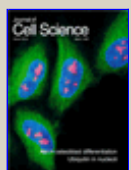


BIOLOGY of REPRODUCTION

▶ HOME

K. M. Jervis and B. Robaire
Dynamic Changes in Gene Expression along the Rat Epididymis
Biol Reprod, September 1, 2001; 65(3): 696 - 703.

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



Journal of **Cell Science**

▶ HOME

P Sutovsky, R Moreno, J Ramalho-Santos, T Dominko, W. Thompson, and G
Schatten
A putative, ubiquitin-dependent mechanism for the recognition and
elimination of defective spermatozoa in the mammalian epididymis
J. Cell Sci., January 5, 2001; 114(9): 1665 - 1675.

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



C. C. Luedtke, S. Andonian, S. Igdoura, and L. Hermo
Cathepsin A Is Expressed in a Cell- and Region-specific Manner in
the Testis and Epididymis and Is Not Regulated by Testicular or
Pituitary Factors

J. Histochem. Cytochem., August 1, 2000; 48(8): 1131 - 1146.

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

[HOME](#) [HELP](#) [FEEDBACK](#) [SUBSCRIPTIONS](#) [ARCHIVE](#) [SEARCH](#) [TABLE OF CONTENTS](#)

[Copyright © 1999 by The American Society of Andrology.](#)