Journal of Andrology, Vol. 24, No. 2, March/April 2003

Breakthroughs in Andrology

Expression of Testicular Germ Cell Genes Identified by Differential Display Analysis

MATTHEW D. ANWAY*, YING LI*, NEELAKANTA RAVINDRANATH†, MARTIN DYM† AND MICHAEL D. GRISWOLD*

*From the * Center for Reproductive Biology, School of Molecular Biosciences, Washington State University, Pullman, Washington; and † Department of Cell Biology, Georgetown University Medical Center, Washington, District of Columbia.*

Correspondence to: Michael D. Griswold, School of Molecular Biosciences, Washington State University, Pullman, WA 99164-4660 (e-mail: griswold{at} mail.wsu.edu).

Using differential display reverse transcriptase–polymerase chain reaction (DDRT-PCR) we identified transcripts encoding for the RNA helicase mDEAH9, Ran binding protein 5 (RanBP5), and 3 novel complementary DNAs designated GC3, GC12, and GC14 in developing testicular germ cells. Sources of RNA for the initial DDRT-PCR screen were purified mouse type A spermatogonia, adult mouse wild-type testis, and W/W^v mutant mouse testis. We identified cDNA fragments for mDEAH9, RanBP5, GC3, GC12, and GC14 in testis and type A spermatogonia samples from wild-type mice, but not in samples from the W/W^v mouse testis. These same transcripts were absent in Northern blots of testis RNA from mice treated with busulfan 30 days prior, but were present in testis RNA from wild-type mice at 5, 15, 25, and 40 days of age. The mDEAH9 gene was expressed in many tissues, whereas RanBP5 and GC12 genes were expressed predominantly in the testis with much lower expression in other tissues. The expression of GC3 and GC14 were limited to the testis as evidenced by Northern blot and RT-PCR analyses. The mDEAH9 transcript was not detected in cultured interstitial cells but was found at low levels in cultured immature Sertoli cells, whereas the RanBP5, GC3, GC12, and GC14 transcripts were not detected in either cultured testicular interstitial cells or cultured Sertoli cells. RT-PCR analyses of isolated spermatogonia, pachytene spermatocytes, and round spermatids revealed that mDEAH9, RanBP5, GC3, GC12, and GC14 genes were expressed in all 3 cellular populations. In situ hybridization analyses of testis samples from 40-day-old mice localized expression of mDEAH9, RanBP5, GC3, GC12, and GC14 to the seminiferous tubules. RanBP5 expression appeared to be regulated during the cycle of the seminiferous epithelium, with the highest expression in stages III through VII. Expression of GC14 was greatest in the meiotic germ cell populations.

This article has been cited by other articles:

BIOLOGY *of* REPRODUCTION HOME

K. L. Loveland, C. Hogarth, A. Szczepny, S. M. Prabhu, and D. A. Jans
Expression of Nuclear Transport Importins beta 1 and beta 3 Is Regulated During Rodent Spermatogenesis
Biol Reprod, January 1, 2006; 74(1): 67 - 74.
[Abstract] [Full Text] [PDF]

Human Molecular Genetics HOME

P. J. Wang, D. C. Page, and J. R. McCarrey
Differential expression of sex-linked and autosomal germ-cell-specific genes during spermatogenesis in the mouse
Hum. Mol. Genet., October 1, 2005; 14(19): 2911 - 2918.
[Abstract] [Full Text] [PDF]

BIOLOGY *of* REPRODUCTION HOME

M. H. Modarressi, M. Cheng, H. A. Tarnasky, N. Lamarche-Vane, D. G. de Rooij, Y. Ruan, and F. A. van der Hoorn
A Novel Testicular RhoGAP-Domain Protein Induces Apoptosis
Biol Reprod, December 1, 2004; 71(6): 1980 - 1990.
[Abstract] [Full Text] [PDF]

Journal of ANDROLOGY HOME

A. L. Y. Pang, H. C. Taylor, W. Johnson, S. Alexander, Y. Chen, Y. A. Su, X. Li, N. Ravindranath, M. Dym, O. M. Rennert, *et al.*
Identification of Differentially Expressed Genes in Mouse Spermatogenesis
J Androl, November 1, 2003; 24(6): 899 - 911.
[Abstract] [Full Text] [PDF]

Proceedings of the National Academy of Sciences HOME

N. Schultz, F. K. Hamra, and D. L. Garbers
A multitude of genes expressed solely in meiotic or postmeiotic spermatogenic cells offers a myriad of contraceptive targets
PNAS, October 14, 2003; 100(21): 12201 - 12206.
[Abstract] [Full Text] [PDF]
