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Spermatogenetic Expression of RNA-Binding Motif Protein 7, a Protein That Interacts With Splicing Factors

TAYLOR B. GUO*, LASZLO G. BOROS†, KAM C. CHAN*, AMIYA P. SINHA HIKIM*, ALAN P. HUDSON‡, RONALD S. SWERDLOFF*, AARON P. MITCHELL§ AND WAEL A. SALAMEH*

*From the Departments of * Medicine and† Pediatrics, Harbor-UCLA Medical Center and Research and Education Institute, Torrance, California;‡ Department of Immunology and Microbiology, Wayne State University School of Medicine, Detroit, Michigan; and§ Institute of Cancer Research, College of Physicians and Surgeons of Columbia University, New York, New York.*

Correspondence to: Wael A. Salameh, MD, Division of Endocrinology, Harbor-UCLA Medical Center, Box 446, 1000 West Carson St, Torrance, CA 90509 (e-mail: wsalameh{at}gcrc.rei.edu).

We have previously shown that a ubiquitously expressed RNA splicing factor, RNA-binding motif 7 (RBM7), cloned from a testis complementary DNA library, enhances messenger RNA (mRNA) splicing in vitro and is expressed in a cell-restricted fashion. Herein, we detail its mRNA and protein expression in the rodent testis. RNA in situ hybridization shows that Rbm7 expression in rat germ cells closely parallels the entry and progression of meiosis. The expression commences in type B spermatogonia, it rises during the preleptotene stage, peaks in leptotene spermatocytes, and declines afterward, but increases again in stage-associated pachytene spermatocytes. An affinity-purified polyclonal antibody raised against a peptide corresponding to amino acids 202–224 of the mouse RBM7 recognized the predicted 35 kd protein both in testicular lysates and in in vitro translation reactions. Consistent with the in situ hybridization results, RBM7 immunoreactivity was also detected in type B spermatogonia, spanned the entire period of spermatocyte development, and extended to round and early elongated spermatids. Moreover, RBM7 appeared nuclear up to the mid pachytene stage and became cytoplasmic thereafter. Consistent with its role in RNA splicing, yeast 2-hybrid and glutathione S-transferase pull-down assays show that RBM7 interacts with splicing factor 3b subunit 2 (SAP145), and with the splicing regulator, SRp20. These interactions and the nuclear localization of RBM7 provide insights into its function in pre-mRNA processing in developing spermatocytes during entry into meiosis and progression through the meiotic prophase.

Key words: Testis, spermatogenesis, meiosis, RNA processing, RNA-binding protein