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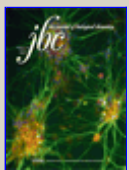
SP22: a novel fertility protein from a highly conserved gene family

J. E. Welch, R. R. Barbee, N. L. Roberts, J. D. Suarez and G. R. Klinefelter

United States Environmental Protection Agency, National Health and Environmental Effects Research Laboratory, Reproductive Toxicology Division, Research Triangle Park, North Carolina 27711, USA.

Three nucleotide sequences encoding SP22, a protein originally identified in detergent extracts of cauda epididymal sperm, were isolated from a rat testis cDNA library. While two of these cDNA sequences differed only in their 5' untranslated regions, a third cDNA was predicted to contain an additional 13 amino acids of coding sequence. Amino acid sequences obtained following Edman degradation of purified SP22 protein and cDNA sequence data both indicated that SP22 was a member of a highly conserved and widely expressed gene family found in organisms as diverse as human and *Escherichia coli*. Interestingly, while a 1-kb mRNA transcript was widely expressed in somatic tissues, a unique pattern of testicular expression was observed, including the appearance of a novel 1.5-kb transcript and an increase in the abundance of the 1-kb transcript during spermatogenic cell development. Anti-SP22 peptide antiserum was shown to recognize a family of 22-kDa proteins on western blots of detergent-extracted cauda epididymal sperm protein, suggesting that multiple charge variants of SP22 coexist. Moreover, affinity-purified anti-SP22 peptide immunoglobulin localized in a highly specific manner to the anterior-ventral surface of the equatorial segment of the sperm head. This is an extremely intriguing finding as SP22 was originally shown to be highly correlated with, and predictive of, the fertilizing ability of cauda epididymal sperm. Although no conclusive function has been attributed to any members of the SP22 gene family, the localization of SP22 over a discrete region of the sperm head suggests a pivotal role in sperm-egg interactions.

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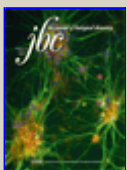
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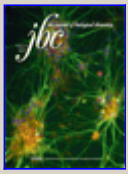
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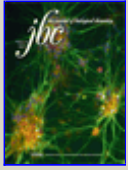
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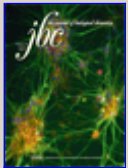
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