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JOURNAL ARTICLE

Detection of germ cell-derived proteins in testicular interstitial fluid: potential for monitoring spermatogenesis in vivo

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The aim of the present study was to assess whether proteins secreted by the seminiferous tubules (ST) can be detected in testicular interstitial fluid (IF) and testicular (TV), spermatic (SV), and peripheral venous (PV) plasma from adult rats. An antiserum was raised against seminiferous tubule-conditioned medium (STCM) prepared from adult rats and used in conjunction with Western blot analysis to screen IF and blood samples resolved by one-dimensional (1-D) and two-dimensional (2-D) sodium dodecyl sulfate-polyacrylamide gel electrophoresis (SDS-PAGE). Samples of IF and PV were analyzed from control adult rats and rats exposed to scrotal heating (43 degrees C for 30 minutes) 24 hours earlier to ascertain whether damage to spermatogenesis would affect 'leakage' of proteins from the seminiferous tubules. In all control rats, the STCM antiserum specifically detected three proteins in testicular IF with molecular weights of 24, 16, and 14 kDa, respectively. Heat treatment increased the abundance of these proteins and induced the appearance of several other less-abundant proteins, all with molecular masses below 25 kDa. Two of the proteins present in IF were identified, the 24-kDa protein as phosphatidylethanolamine-binding protein (PEBP), and the 14-kDa protein as an androgen-regulated protein (ARP-2). Both of these proteins have been shown in previous studies to be secreted by round spermatids. Our results suggest that germ cell secretory products can gain access to the interstitium under both normal physiological conditions and more easily after induction of damage to spermatogenesis. The antiserum was unable to detect any ST-derived proteins in blood, although it is likely that this result may be due to insensitivity of the presently used techniques. The development of specific immunoassays for germ cell-secreted proteins (e.g., PEBP and ARP-2) should enable more definitive assessment of whether proteins secreted by the seminiferous epithelium can be measured in blood and thus provide a potential means of monitoring spermatogenesis.

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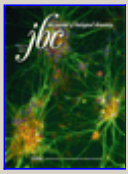
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