REGULATED EXPRESSION OF mRNAs ENCODING NUCLEAR TRANSPORT PROTEINS DURING SPERMATOGENESIS

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During spermatogenesis, the germ line stem cells undergo a complex series of cellular transitions to form mature male gametes. These transitions require regulated nucleocytoplasmic shuttling of transcription factors and cell cycle regulators, mediated in part by proteins known as importins. The importins bind to specific cargo proteins in the cytoplasm and transport them into the nucleus via interactions with components of the nuclear pore. There are two families of importins, termed the αs and the βs, with five different importin α members identified in the mouse genome. In this study, we examined the mRNA expression patterns of importin α s in the rodent testis using *in situ* hybridization and Northern blotting. Each *importin α* displayed a distinct expression pattern in the adult mouse testis. *Imp α1* mRNA was detected in spermatogonia through to early pachytene spermatocytes. *Imp α4* mRNA was detected in pachytene spermatocytes, α 6 in round spermatids and *α2* in both of these cell types. Northern blotting with *in situ* hybridization probes on total testis RNA from adult rat and mouse and 10 dpp (days postpartum) rat revealed distinct transcript sizes for *imp α 1, 2, 4* and *6*. For all importin αs, the mRNA signal level in the 10 dpp rat sample was lower than in the corresponding adult sample. The distinct expression patterns for each *importin α* family member in germ cells of the adult rodent testis suggests these importins are required to carry specific cargo at distinct stages of spermatogenesis. These data extend our previous analysis of importin β 1 and β 3 expression in the fetal and adult testis, which also demonstrate developmentally regulated importin expression. Ongoing studies are examining the cellular localization of importin α proteins and investigating their specific functions. We predict they each carry cargo required for distinct transitions in spermatogenesis.

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