

Intermolecular Dissulphide Bonds Formation in Spermatozoa During Epididymal Maturation

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During the epididymal transit, sperm structures become stabilized. Stabilization is achieved mainly through the oxidation of thiol groups (SH) to disulfides (SS). A correct degree of oxidation is required not only for sperm structure stabilization and induction of progressive sperm motility and fertilization; but also to prevent oxidative damage that can lead to infertility. The aim of this work was to investigate the formation of protein complexes by disulphide bonds in epididymal sperm. Sperm proteins extracted from caput and cauda epididymidis regions were submitted to SEC (size exclusion chromatography). In caput sperm samples it was possible to identify one major peak with a retention time next to 45 minutes and other smaller peaks eluting at 55 minutes. The same analysis was carried out with proteins from cauda epididymidis sperm. In this case, the main peak eluted earlier (15 minutes) and the second and third smaller peaks were eluted in 45 and 55 minutes, respectively. These results indicate that bigger molecules or protein complexes are present in mature spermatozoa from cauda epididymidis and absent or in less amount in caput epididymidis ones. To demonstrate if there is formation of protein aggregates linked by disulphide bridges, samples were treated with 5mM DTT. After this treatment it was possible to observe a subtle inversion in peaks of 15 and 45 minutes in spermatozoa from cauda epididymidis region, however a complete reversion was not accomplished. We conclude that these major components eluted first in cauda samples are partially composed of SS linked protein complexes that were formed during sperm epididymal transit. However the remaining constituents at this major peak may have other characteristics.

Key words: sperm maturation, proteins complexes, disulphide bonds
Supported by: FAPERJ