

Biochemical Identification of Dynein-ATPase Activity in Human Sperm

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Dynein-ATPase is the intracellular motor for sperm motility. In the present work we assayed the dynein-ATPase activity in an axoneme-containing fraction of human sperm, free of plasma membranes, in normozoospermic and asthenozoospermic donors. Axoneme-containing fractions were isolated from semen samples obtained from healthy donors with either normozoospermia or asthenozoospermia, as indicated by a sperm motility lower than 50% (WHO grade a + b). The dynein-ATPase activity was assayed and partially characterized. The dynein-ATPase activity in the axoneme-containing fractions was identified as Mg²⁺-dependent ATPase activity inhibited by 10 μM vanadate. This inhibition was not seen when the assay was done in the presence of 1 mM norepinephrine. The dynein-ATPase activity is Mg²⁺-dependent, Li⁺-sensitive, and insensitive to 2 mM ouabain, 1 μM oligomycin, and 1 μM thapsigargin. The dynein-ATPase activity was significantly lower ($p < 0.001$) for asthenozoospermic donors as compared to normozoospermic donors. This is a straightforward dynein-ATPase assay that can be used to obtain data of functional interest in clinical or experimental settings.

Key words: Human Sperm, Dynein-ATPase, Axoneme