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Assignment: discuss the factors facillating the movement of sperm in the female reproductive tract.

The human body is comprised of 60 trillion cells that originate from a fertilized egg produced by the fusion of a spermatozoon with an egg. Mammalian spermatozoa are morphologically differentiated in the testis, but freshly ejaculated spermatozoa are incapable of fertilization. Ejaculated spermatozoa gain their fertilizing ability in the female reproductive tract. The process that renders spermatozoa competent to fertilize an egg is called sperm capacitation. These facts led to the possibility of performing in vitro fertilization (IVF) by mixing capacitated spermatozoa with eggs

Passage of sperm through the female reproductive tract is regu-lated to maximize the chance of fertilization and ensure that spermwith normal morphology and vigorous motility will be the ones tosucceed.Oocytes are usually fertilized within hours of ovulation (Austin,1957; Harper, 1994). On the other hand, in some species, spermmay be inseminated days (horses, cattle and pigs) or even months(some bat species) before the arrival of the oocyte. In humans,there is evidence that fertilization

occurs when intercourse takesplace up to five days before ovulation. Because sperm are terminally differentiated cells, deprived of anactive transcription and translation apparatus, they must survive inthe female without benefit of reparative mechanisms available tomany other cells. Sperm are subjected to physical stresses duringejaculation and contractions of the female tract, and they may sus-tain oxidative damage. Furthermore, because sperm are allogenicto the female, they may encounter the defenses of the femaleimmune system meant for infectious organisms (Menge andEdwards, 1993). Thus, sperm must somehow use their limitedresources to maintain their fertility in the face of numerous imped-iments.

The openings of the uterine tubes into the uterus (uterotubal junction) represent another barrier to sperm transport. With two uterine tubes and usually only one ovulated egg, any spermatozoon that enters the empty uterine tube is automatically doomed to reproductive failure. Roughly 10,000 or fewer sperm cells of the millions in the ejaculate enter the correct tube.

Two critical events occur during this period of attachment. The first is called capacitation, a reaction necessary for a spermatozoon to be able to fertilize an egg. The first phase of the capacitation reaction is the removal of cholesterol from the surface of the sperm. Cholesterol was introduced onto the sperm head to prevent premature capacitation. The next phase of capacitation is the removal of many of the glycoproteins that were deposited on the sperm head within the epididymis. After their removal, the spermatozoon is now capable of fertilizing an

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A second phenomenon occurring while the sperm are attached to the distal tubal lining is hyperactivation of the sperm. Hyperactivation is manifest by the increased vigor in their swimming movements and allows the sperm to break free from their binding with the tubal epithelial cells. Hyperactivated sperm are more efficient in making their way up the uterine tube and penetrating the coverings of the egg.