# NAME; ONI JOY OLAMIDE

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# DEPARTEMENT ;NURSING DEPARTEMENT

# COURSE; PHYSIOLOGY

# QUESTION

factors that facilitate the movement of sperm in the female reproductive tract

## ANSWERS

Sperm transport within the female reproductive tract is a cooperative effort between the functional properties of the sperm and seminal fluid on the one hand and cyclic adaptations of the female reproductive tract that facilitate the transport of sperm toward the ovulated egg. It involves the penetration by the sperm of various barriers along their way toward the egg.

Direct measurements have shown that within 8 seconds from the introduction of semen the pH of the upper vagina is raised from 4.3 to 7.2, creating an environment favorable for sperm motility. Another rapid event is the coagulation of human semen through the actions of semogelin by a minute after coitus. it may play a role in keeping sperm near the cervical os. Thirty to 60 minutes after it coagulates, prostate-specific antigen, a proteolytic enzyme, degrades the coagulated semen. Within the semen and altered vaginal fluids, the sperm have begun to swim actively. A critical element in sperm motility is the availability of fructose, a nutrient provided by the seminal vesicles, within the semen. Because of their paucity of cytoplasm, spermatozoa require an external energy source. Unusually for most cells, spermatozoa have a specific requirement for fructose rather than glucose, the more commonly utilized carbohydrate energy source.

The next barrier facing sperm is the **cervix**. The cervical entrance is not only very small, but it is blocked by cervical mucus. During most times in the menstrual cycle, cervical mucus is highly sticky and represents an almost impenetrable barrier to sperm penetration. Around the time of ovulation, however, the estrogenic environment of the female reproductive system brings about a change in cervical mucus, rendering it more watery and more amenable to penetration by sperm. Of the huge numbers of sperm that enter the female reproductive tract, almost all fail to reach the uterine tubes. The unsuccessful sperm are removed by the infiltration of white blood cells into the cavities of the vagina, cervix, and uterus. These cells, along with certain immunoglobulins, inactivate and degrade foreign invaders, in this case, the excess sperm. Fortunately, the uterine tubes are not subject to this sort of cellular infiltration.