

BODY FLUIDS other than Blood ?

Read the following information and answer the related questions .

Part I: What is a 'Secretor' ?

There are body fluids and tissues other than blood which may be left a crime scene that can prove useful to forensic investigators. These include: **muscle tissue, skin, saliva, semen, sweat, tears, and vaginal secretions.**

Approximately 80% of the North American population are known as '**secretors**'. In a person who is a 'secretor' the antigens, antibodies, proteins and enzymes in his/her blood are also present in all other body fluids and body tissues. Remember that all red blood cells have distinctive protein-markers on their surface which determine a person's blood type (ie. A, B, Rh+). Therefore, the same anti-serum test that is used for the blood to identify whether it is type A, B, AB, or O can be used upon a 'secretor's' body tissues to yield the same results. An anti-serum test is useful because 'secretors' have the same protein-marker within the cells in their body fluids/tissues as they do in their red blood cells.

If it is determined that a suspect involved in an illegal act is a 'secretor', his/her body fluids can be very useful to help confirm identity. If the suspect is not a 'secretor' then investigators must find other evidence to help prove guilt.

Part II: What is Semen ? How can it be Identified ?

When a human male is sexually excited, his penis becomes engorged with blood, becoming erect in the process. At some point during intercourse (scientifically called coitus), when the male reaches the peak of sexual arousal, the penis will ejaculate about an average of 3 - 5 ml of semen.

Normal semen is composed of several hundred million sperm cells as well as seminal fluid. The sperm cells are created in each of the male's two testicles. These glands also create/secrete the hormone *testosterone*. The seminal fluid found in semen is created in three glands: seminal vesicles, the prostate gland, and the Cowper's gland. These three glands are found just below the intestines in the pelvic region. Seminal fluid is comprised of water, mucous, various minerals, and small amount of fructose. (*The fructose is used as an energy source for the fast-moving sperm!*)

An overwhelming majority of all sex-related crimes (ie. rape/sexual assault, molestation, pedophilia and other indecent acts) are committed by males. Thus, forensic investigators look for semen left behind by a suspect during the investigation of sex-related crimes. Semen can prove to be especially useful if the male suspect involved is a 'secretor'.

When investigators arrive at the scene of a sex-related crime, the victim is taken to a hospital for a physical examination, during which time a 'rape kit' may be used. During this examination, a nurse with specialized training will swab the victim's vulva (external genitalia), vagina (internal genitalia), and possibly even the anus for traces of semen and/or physical injury.

There are various other places that investigators will also check for semen evidence other than inside the victim's body - such as the victim's clothing or within the crime scene itself. Also, the suspect may have attempted to clean up after the assault, thus any towels or clothing in the vicinity of the crime may be taken as evidence.

When a male suspect commits a sexual assault, it should not be assumed that the victim is always a female. Sexual assaults are sometimes committed against males as well. However, it is suspected that male sexual assault victims rarely report the crime committed against them.

Various tests can be done to confirm that a substance is semen:

1. **Microscopy test:** This is simply a visual analysis under the microscope of the suspected fluid. Sperm cells are very unique in appearance as they are the only human body cells that have a long flagella or tail. Therefore, an investigator may simply confirm that the suspected substance is semen by looking for such cells. Sperm cells are very small though, so a magnification of 100x or higher is needed.

2. **'Fast Blue B' test:** A special protein called *acid phosphatase* is found only in secretions from the prostate gland. When a chemical called 'Fast Blue B' is combined with *acid phosphatase* it will turn from blue to a deep purple. If it does not change colors then the substance being tested is not semen. However, this test will also turn a deep purple when it is exposed to fungi and some fruit and vegetable juices as well.

Name: _____ Date: _____

Part III: Related Questions

1. Outline a **type of crime** and **crime scene** where you think each of the following body fluids/tissues would most likely be left behind:

- muscle tissue: _____
- skin: _____
- saliva: _____
- semen: _____

2. Explain how being able to prove that a suspect is a 'secretor' be helpful to investigators ?

3. Outline how a forensic scientist would determine a person is a 'secretor'.

4. Most sex crimes are committed by males. Why is this fact actually **helpful** to forensic investigators ?

5. Why do you think **male sexual assault victims** would be reluctant to contact the police?

6. When a forensic investigator arrives at a sex crime scene, **where** other than the victim's vagina could he/she check for semen ?

7. Identify and briefly describe **two tests** that can be conducted to determine if a substance is semen.