***Lab Activity: II. Who Killed Shamari Davis?***

**Background**

**Shamari Davis** was a 20-year-old college freshman who was majoring in Physical Therapy. She paid for school by working as a personal trainer at a local gym. Shamari had been promoted to head personal trainer at the gym just before she was killed.

**Crime Scene**

The body was found in the women’s locker room of the gym at 1 am by the night janitor, **Harvey Willis**. The victim had been strangled and was wearing a robe. There were signs of a struggle in the room and the glass door of the shower was broken and had traces of blood on it. The victim was pronounced dead at the scene and the coroner suggested that the time of death was at least 3 hours before the body was found.

**Criminal Investigation**

Shamari’s co-worker **Daleesha Jones** told police that Shamari was a newer employee who did not deserve her recent promotion and only got it because she spent a lot of time with their boss, **Steve O’Hare**. When asked if he knew if Shamari had problems at work, Steve told Police that Shamari had complained to him that one of her fitness clients, **Mike Reed**, kept asking her out and wouldn’t take no for an answer.

**Blood Analysis**

Obviously a real crime investigation would use many clues, but your investigation will be based on the simplest type of blood testing, namely testing for blood types (A, B, O, and AB) using Rh factors (+ or -), for the blood sample found at the scene and for each of the possible suspects.

***No individual can change blood types, and blood type does not change with age. Explain why.***

In order to test blood type, you mix a sample of the blood with three different types of antiserum—one which contains anti-A antibodies, one which contains anti-B antibodies, and one that contains anti-Rh antibodies. The reactions between the antibodies in the antiserum and the corresponding antigens on the red blood cells in the blood sample result in clumping called agglutination (this will be observed as a precipitate or cloudiness in the sample well).

***Which types of blood have the antigens that will react with anti-A antibodies?***

***Which types of blood have the antigens that will react with anti-B antibodies?***

***When a blood sample reacts with anit-Rh antibodies, what does that mean?***

Before you carry out the blood type tests, fill in the following chart that will help you to identify the blood type of each individual.

|  |  |  |  |
| --- | --- | --- | --- |
| **Reacts with anti-A antibody** | **Reacts with anti-B antibody** | **Reacts with anti-Rh antibody** | **Blood type**  **(A, B, AB, O)** |
| **Yes** | **Yes** | **Yes** |  |
| **Yes** | **No** | **Yes** |  |
| **No** | **Yes** | **No** |  |
| **No** | **No** | **No** |  |

**Procedure**

1. Place your dish with the test wells on a piece of white paper, and put two dots of the blood of one suspect using your stir rod on the A, B, and Rh wells of the dish.
2. Place two drops of A antiserum on the drop of blood in the A well, place two drops of antiserum B on the drop of blood in the B well, and two drops of Rh antiserum on the drop of blood in the Rh well.
3. Mix the blood sample with the added A antiserum with one end of a toothpick. Mix the blood sample with the added B antiserum with the other end of the toothpick. Mix the blood sample with the added Rh antiserum with another clean end of a toothpick. Discard each toothpick after you use it for each suspect or victim.
4. Observe the reaction of the antiserums with each blood sample. Record the blood type of the individual in the table below.
5. Repeat the procedure, steps 1 through 4, for each blood sample.
6. Compare the blood types for the samples from the victim and each suspect to the blood type from the broken shower door glass at the scene of the crime. Use your observations to suggest who committed the murder.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Reacts with anti-A antibody (Yes or No)** | **Reacts with anti-B antibody (Yes or No)** | **Blood type**  **(A, B, AB, O)** |
| **Shamari Davis**  **Victim** |  |  |  |
| **Daleesha Jones**  **Co-worker** |  |  |  |
| **Harvey Willis**  **Janitor** |  |  |  |
| **Mike Reed**  **Client** |  |  |  |
| **Steve O’Hare**  **Boss** |  |  |  |
| **Blood on shower door** |  |  |  |

**Investigator’s Report – *(answer on your own sheet of paper)***

Describe the circumstances which you believe led up to the crime, the time of the crime, and the individual that you believe is guilty of the murder. What evidence supports your conclusions?