Who Done It? Lab (Blood Typing) 31 total points

Mr. Meier was found dead in his classroom (☺...or ☹...?). He was found shortly after 8am, but apparent time of death was within the last two hours. Initial observation indicates he was killed by a large knife to the abdomen, as there is a large pool of blood under the body. It appears as though there was possibly a struggle, as many items were strewn about the room. In addition, a small knife (not capable of the wound) was found next to Mr. Meier. There was also blood on it.

Blood was collected from three different samples at the scene. The first was taken from Mr. Meier. The second sample was the pool of blood under Mr. Meier. The third test was done on the blood found on the knife.

In addition, four suspects were been taken in for questioning, and to provide blood for comparison to those found at the scene. For security concerns, those suspects are only being identified as Suspects W, X, Y, and Z. (Though it has already been leaked to the media that it was a planned attack by the ERA Humanities department in a developing feud over cases of gummy bears...Mr. O’Brien, Ms. Murray, Ms. Wegener-Venema, and Mr. Sutton – listed in order by suspect letter – are the rumored suspects.)

Blood typing has been completed on the samples at the lab and it was determined that Mr. Meier has type AB⁺.

In a typical procedure, blood plasma (sera) antibodies that have been isolated from a known blood sample can be used to show agglutinations, or clumping, of cells from unknown blood samples. For example, anti-A sera contains antibodies that will clump RBCs containing type-A antigens. Anti-b sera would clump type-B blood. Clumping will occur in both sera with type AB blood. Neither sera will clump with type-O blood.

In addition to the ABO antigen tests, Rh antigens are also tested. The Rh factors follow a simple dominant/recessive relationship, with Rh-positive (Rh⁺) being dominant. Remember, anti-Rh antibodies can only appear in Rh-negative (Rh⁻) individuals, but do not do so spontaneously. Instead, an Rh⁺ person only develops anti-Rh in response to exposure to Rh⁺ blood (transfusion or pregnancy with an Rh⁺ fetus).

Purpose (1 point)

Determine & indicate in your lab notebook

Materials

- Simulated Blood Typing Kit, including
  - Simulated Blood Samples
  - Slide Wells (Plastic Plates)
  - Toothpicks
  - Timer
**Procedure**

1. Label four blood typing slide wells – “W,” “X,” “Y,” “Z” using a marking pen.

2. Place 2-3 drops of blood sample “W” in each of the three wells (A, B, and Rh) on the proper slide well.

3. Repeat step 2 by placing drops of the remaining samples on their corresponding slide wells.

4. Add 2-3 drops of **Anti-A sera** to each slide in the Anti-A well
   - *Be EXTREMELY CAREFUL not to touch the bottle dropper to the blood sample – Keep it at least an inch above the wells*
   - Use a toothpick to mix the sample blood and antibody *being careful not to scratch the plastic*
   - As you continue through steps 5 & 6, let the slides sit for 2-3 minutes to ensure any possible interactions occur *(reactions may happen quickly, they may take a while...mix thoroughly, take your time)*

5. Add 2-3 drops of Anti-B sera to each slide in the Anti-B well
   - *Mix with a NEW toothpick*

6. Add 2-3 drops of Anti-Rh sera to each slide in the Anti-Rh well
   - *Mix with a NEW toothpick*

7. Observe each well against a white background *(paper)* and record results in your data table.

8. Rinse off the slide wells very well with hot water to clean any possible residue & return to the front.

9. Determine and record the blood types for the samples at the crime scene and of each suspect.

**Observations** *(10 points)*

<table>
<thead>
<tr>
<th></th>
<th>Anti-A Sera</th>
<th>Anti-B Sera</th>
<th>Anti-Rh Sera</th>
<th>Blood Type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blood Pool</strong></td>
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<tr>
<td><strong>Weapon</strong></td>
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<tr>
<td><strong>Suspect W</strong></td>
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<td><strong>Suspect X</strong></td>
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<tr>
<td><strong>Suspect Z</strong></td>
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</tbody>
</table>
**Analysis & Conclusion (20 points)**

1. What is Suspect W’s blood type? What antigens are present on the surface of the RBCs in this suspect? (2 points)

2. What is Suspect X’s blood type? What antigens are present on the surface of the RBCs in Suspect X? (2 points)

3. What is Suspect Y’s blood type? What antibodies are present in Suspect Y’s plasma? (2 points)

4. Suspect Z needs a transfusion. What blood types might Suspect Z safely receive? Explain. (3 points)

5. Could a man with type AB blood be the father of a child with type O blood? Explain. (3 points)

6. Could a child with type B blood with a mother of type A blood have a father with type A blood? Explain. (3 points)

7. Using the data collected from the scene and the suspects, provide a detailed summary of your findings that might be useful in an expert testimony. (5 points)