Hairy Whodunnit?: Introduction to Forensic Analysis Using Scanning Electron Microscopy

Learning Outcomes

- Learn the basic functions and capabilities of a scanning electron microscope (SEM)
- Use the SEM to image known and unknown hair samples collected at the crime scene
- Use forensic analysis and critical thinking to determine the identity of the hairy culprit

Background

The local CSI unit has collected hair samples from the scene of a crime. We know that one of the samples belongs to the person responsible for the break-in, but are unsure of who it belongs to. In order to determine the guilty party, a collection of hair samples were gathered from all possible suspects who had access to the scene of the crime that evening. Using your forensic skills, along with images you will obtain using the SEM, you will determine who was responsible for the crime and dispense justice as you see fit!

Materials

- Unknown hair sample from the suspected culprit
- Known hair samples collected from the possible suspects
- Aspex Explorer Scanning Electron Microscope

Observations

Draw pictures of each sample as you view them with the SEM. Make sure you make note of the hair diameter, roughness, whether or not there is a follicle attached, and any other defining characteristics you can see. Use the ruler tool next to the imaging window to make precise measurements.

Unknown Culprit	

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Suspect 1	
Suspect 2	
Suspect 3	
Suspect 4	

Conclusions

1. Which suspect sample do you believe most closely resembles that of the unknown culprit?

2. What characteristics about the hair led you to your conclusion? Describe your thought process.

3. What tools in the SEM did you find the most useful in examining the samples?