

In the Hair Analysis event, competitors delve into microscopic analysis and scale castings to identify the characteristics of a hair sample. Participants will scrutinize cuticle patterns, medulla patterns, and pigment distribution to make their determinations. Following this, a comparative analysis will be conducted on the same hair sample to match it to one of three known samples. Each step of the analysis will be justified through detailed written reports.

Entry Requirements

- Teams must be composed of 2 members.
- Chapters can only register 2 teams to compete.

Materials

Only the below materials are permitted in the competition.

- **Slide Preparation Materials** (i.e. slides, coverslips, water, etc.)
- **Safety Equipment** (i.e. gloves, metal tweezers or forceps, scissors, etc.)
- **Writing utensil** (Blue/ Black inkpen)
- **Blank notebook paper for notes and summaries**
- **Permanent Marker to mark evidence tape and slides**
- **Photo Identification Reference** [the rulebook \(https://tpsa.info/rulebook\)](https://tpsa.info/rulebook) for details

Procedures and Timeline

- **Check In (10 min Time Limit)** Competitors must check in to their event at their designated **check-in time**. Competitors that arrive **ten (10) minutes** after their designated check-in time will be marked as no-shows and not be allowed to compete out of respect for the time commitment made by our judges and volunteers.
- **Pre-Event Briefing (5 min Time Limit)** After check-in, competitors will be guided to the designated event area. Once there, the moderator will provide a comprehensive briefing, detailing the event's instructions, rules, and procedures. This briefing ensures that each competitor is well-informed and prepared for the subsequent stages of the competition.
- **Part 1 (15 min Time Limit)**
 1. The competitors will have 15 minutes to complete part 1.
 2. When the moderator starts the timer and calls "start," the competitors will begin their analysis of the hair sample.
 3. Competitors will use proper technique to open the sample package containing evidence (hairs) for analysis.
 4. Competitors will conduct scale castings and microscopic analysis.
 5. The team will determine the characteristics of the hair sample and write a summary of their findings, detailing identified characteristics, such as medulla pattern, cuticle pattern, medullary index, pigmentation distribution, etc.
 6. The competitors will then clean their workstations and seal evidence using proper technique.
 7. The summary of findings, sample slide, and cuticle cast will be submitted to the judge's hands before the moderator calls "time" when the 15 minutes ends.
- **Moderator Part 2 (5 min Time Limit)** The room moderator will direct the team to a new workstation containing materials for part 2. The room moderator will provide the team with their sample from part 1. Instructions will be provided and a timer will be set for 15 minutes. The moderator will start the time and announce "start".
- **Part 2 (15 min Time Limit)**
 1. Competitors will compare their "suspect" sample from part 1 with 3 provided "known" samples.
 2. Competitors will open the sample packages, using proper technique, containing evidence (hairs) for analysis.
 3. Competitors will conduct scale castings and microscopic analysis for all unknowns.
 4. The team will determine which of the known samples is a match with the "suspect" samples from part 1.
 5. A written summary of their findings, detailing characteristics, such as medulla pattern, cuticle pattern, medulla index, pigmentation color and distribution, etc. will be prepared.
 6. The competitors will then clean their workstations and seal evidence using proper technique.
 7. The summary of findings, along with all sample slides and cuticle casts, will be submitted to the judge's hands before the moderator calls "time" at the end of 15 minutes.

- **Evaluation and Scoring (5 min Time Limit)** After the completion of the event, judges will convene to assess each competitor's/team's performance based on a standardized rubric. This stage is conducted without the presence of the competitors. Judges will evaluate the criteria outlined in the rubric to ensure a fair and objective scoring process. Once all assessments are finalized, scores will be recorded for each competitor/team.

Safety Protocols

- **Respect for Safety Regulations** Competitors are expected to adhere to all general safety regulations of the venue and any additional rules provided by the moderators or judges.
- **Fingernail Length** Competitors are required to maintain short fingernails to prevent any accidental punctures to gloves.

Judge Qualifications

- Experience with general microscopy.
- Experience with trace evidence analysis.

Criteria	Unattempted	Unsatisfactory	Satisfactory	Proficient	Exemplary	Points
Professionalism						
Dress Code	<p>0</p> <p>Does not fulfill the dress code requirements.</p>		<p>10</p> <p>Fulfills the dress code requirements.</p>			Opts
Safety						
Safety Competitor dons gloves.	<p>0</p> <p>Did not wear gloves</p>		<p>2</p> <p>Competitor donned gloves.</p>			Opts
Part I: Characteristic Determination						
Evidence Packaging/Handling Evidence should be opened using proper technique and handled without unnecessary loss or destruction.	<p>0</p> <p>Did not open correctly or wasted evidence.</p>	<p>2</p> <p>Evidence was not opened using proper technique but was handled without unnecessary loss or destruction.</p>	<p>3</p> <p>Evidence was opened using proper technique but did cause unnecessary loss or destruction.</p>	<p>4</p> <p>Evidence was opened using proper technique and handled with minimal unnecessary loss or destruction.</p>	<p>5</p> <p>Evidence was opened using proper technique and handled without unnecessary loss or destruction.</p>	Opts
Slide Preparation Slides prepared correctly using a wet mount technique. (1) The proper amount of hair is placed on the slide. (2) Tweezers/forceps are used to handle evidence. (3) Correct amount of water is used. (4) Cover slip is used. (5) Slide is labelled.	<p>0</p> <p>Slide was not prepared correctly.</p>	<p>1</p> <p>Only 1-2 requirements were met.</p>	<p>3</p> <p>Only 3 requirements were met.</p>	<p>4</p> <p>Only 4 requirements were met.</p>	<p>5</p> <p>All 5 requirements were met.</p>	Opts
Microscope Use Microscope is used correctly. (1) Slide placed on stage correctly. (2) Focusing begins on low power. (3) Stage is moved using knobs, not hands. (4) Competitor refocuses with each power increase. (5) Competitor uses appropriate knobs (fine focus/coarse focus).	<p>0</p> <p>Did not use microscope properly or at all.</p>	<p>1</p> <p>At least 2 requirements were met.</p>	<p>3</p> <p>Only 3 requirements were met.</p>	<p>4</p> <p>Only 4 requirements were met.</p>	<p>5</p> <p>All 5 requirements were met.</p>	Opts
Cuticle Cast Competitors correctly completes a cuticle scale cast. (1) Uses clean slide. (2) Paints thin layer of clear nail polish on slide. (3) Uses tweezers to correctly place hair. (4) Allows time to dry. (5) Gently removes hair from polish.	<p>0</p> <p>Did not attempt or met 0-1 requirements.</p>	<p>3</p> <p>Only 2 requirements met.</p>	<p>5</p> <p>Only 3 requirements met.</p>	<p>7</p> <p>Only 4 requirements met.</p>	<p>10</p> <p>All 5 requirements met.</p>	Opts
Summary Written summary completed containing (1) proper spelling, grammar, and complete sentences, (2) description of medulla structure, (3) medullary index, (4) pigment distribution, and (5) description of cuticle scale pattern.	<p>0</p> <p>No written summary submitted or no requirements were met.</p>	<p>4</p> <p>Only 1-2 requirements were met.</p>	<p>8</p> <p>Only 3 requirements were met.</p>	<p>12</p> <p>Only 4 requirements were met.</p>	<p>16</p> <p>All 5 requirements were met.</p>	Opts
Evidence Returned to Packaging Evidence is returned to packaging and packaging is sealed using proper technique.	<p>0</p> <p>Evidence not returned to packaging or packaging not sealed properly.</p>		<p>2</p> <p>Evidence returned to packaging but packaging not sealed properly.</p>		<p>4</p> <p>Evidence returned to packaging and packaging sealed properly.</p>	Opts

Criteria	Unattempted	Unsatisfactory	Satisfactory	Proficient	Exemplary	Points
Clean Up Work area returned to pre-arrival condition, all trash thrown away.	0 No clean up attempted.		2 Some clean up attempted, but not completed.		4 Clean up completed and all trash thrown away.	Opts
Part II: Matching						
Evidence Packaging/Handling Evidence should be opened using proper technique and handled without unnecessary loss or destruction.	0 Evidence was not opened using proper technique and was not handled without unnecessary loss or destruction.	2 Most evidence was opened using proper technique but was not handled without unnecessary loss or destruction.	3 All evidence was opened using proper technique and most was handled without unnecessary loss or destruction.	4 Most evidence was opened using proper technique and handled without unnecessary loss or destruction.	5 All evidence was opened using proper technique and handled without unnecessary loss or destruction.	Opts
Slide Preparation Slides prepared correctly using a wet mount technique. (1) The proper amount of hair is placed on the slide. (2) Tweezers/forceps are used to handle evidence. (3) Correct amount of water is used. (4) Cover slip is used. (5) Slide is labelled.	0 No slides were correctly prepared.	1 Most slides met at least 2 requirements.	3 All slides met at least 3 requirements.	4 All slides were correctly prepared, meeting at least 4 requirements.	5 All slides were correctly prepared, meeting all 5 requirements.	Opts
Microscope Use Microscope is used correctly. (1) Slide placed on stage correctly. (2) Focusing begins on low power. (3) Stage is moved using knobs, not hands. (4) Competitor refocuses with each power increase. (5) Competitor uses appropriate knobs (fine focus/coarse focus).	0 Slides were not observed under the microscope or did not meet at least 3 requirements.	1 Most slides were observed under the microscope and at least 3 requirements were met.	3 All slides were observed under the microscope and at least 3 requirements were met.	4 All slides were observed under the microscope and at least 4 requirements were met.	5 All slides were observed under the microscope and all 5 requirements were met.	Opts
Match Unknown to Known	0 Unknown sample was not matched to correct known sample.		6 Unknown sample was matched to correct known sample.			Opts
Match Summary Written summary completed containing (1) proper spelling, grammar, and complete sentences, (2) description of medulla structure, (3) medullary index (4) pigment distribution, and (5) description of cuticle scale pattern.	0 No written summary submitted or no requirements met.	3 Written summary submitted, correctly addressing 1-2 requirements.	5 Written summary submitted, correctly addressing at least 3 requirements.	7 Written summary submitted, correctly addressing at least 4 requirements.	10 Written summary submitted, correctly addressing all 5 requirements.	Opts
Evidence Returned to Packaging Evidence is returned to packaging and packaging is sealed using proper technique.	0 No attempt made to return evidence to packaging or reseal.		2 Some evidence returned to packaging or all returned, but not correctly sealed.		4 All evidence returned to packaging and resealed using proper technique.	Opts
Clean Up Work area returned to pre-arrival condition, all trash thrown away.	0 No clean up attempted		2 Attempted to clean up, but not completed		4 Clean up completed and all trash thrown away	Opts

Total Score: 0 /100 pts