Crime Lab Division Frequently Asked Questions (FAQ’s)

1. **What does it take to become a forensic scientist? What course of study should I take in college?**
   If you wish to work in a crime laboratory as a forensic scientist, you must have a solid educational foundation in the basic sciences of chemistry, biology, physics, and mathematics. Positions typically require a Bachelor of Science degree in a natural science (Biology, Chemistry, etc…), forensic science, or closely related field which includes a minimum of 20 semester hours or 30 quarter hours of chemistry and 5 semester or 8 quarter hours of physics. Examples of related fields, including but not limited to, are: pharmacology, medical technology, genetics or molecular biology, analytical chemistry, biochemistry, clinical chemistry, nuclear chemistry, or toxicology. **Note:** For DNA positions, applicants must have successfully completed at least one undergraduate or graduate level course in each of the following subjects: biochemistry, genetics, and molecular biology.

   Because of the nature of the work and security requirements, all Washington State Patrol applicants are subject to background investigations, including a polygraph examination.

   Additional information can be found on the Washington Department of Personnel website, [http://www.dop.wa.gov/Pages/default.aspx](http://www.dop.wa.gov/Pages/default.aspx), and more specifically: [http://www.dop.wa.gov/CompClass/JobClassesSalaries/Pages/ClassifiedJoblisting-F.aspx](http://www.dop.wa.gov/CompClass/JobClassesSalaries/Pages/ClassifiedJoblisting-F.aspx)

   Also the Washington State Patrol website: [http://www.wsp.wa.gov/employment/forencareer.htm](http://www.wsp.wa.gov/employment/forencareer.htm)

   To apply for a job, click here: [http://www.careers.wa.gov/](http://www.careers.wa.gov/)

   Another online resource with a variety of forensic information is the Academy of Forensic Sciences (AAFS): [http://www.aafs.org/](http://www.aafs.org/)

2. **How is CSI different from real world forensic science?**
   Television programs like “CSI” may be a wonderful source of entertainment for many people, but they are not a wonderful source of how forensic science works in the real world.

   One main difference is that, while on TV, you get analytical results and a solved crime within an hour, in the real world, an examination may take up to a week or more. And analysis can only begin after the evidence has been collected and submitted to the lab in a secure condition. Television shows are geared to a one hour program schedule, much faster and much more glamorous than real life. You will rarely, if at all, see a forensic scientist drive up in a Hummer or carry a gun, much less so wearing tight leather pants and high heels. Scientists do not interrogate suspects or “pound the pavement” investigating crimes. We are not involved in raids or arrests. Except for the Crime Scene Response Team members, scientists typically remain in the lab and examine evidence delivered by law enforcement agencies.
A forensic scientist may not always get a conclusive result from their testing, or a result that implicates the suspect. Not everything that is touched will leave a fingerprint or DNA. If a fingerprint or DNA is detected, it may not be of sufficient quality to lead to a definitive conclusion. Forensic analyses do not always deliver the solution to a crime. Rather, forensic results may lend corroborating evidence to the overall case, or potentially exonerate innocent suspects.

Another difference from TV is that when DNA, fingerprints or other types of evidence are compared for a common source, forensic scientists don’t get a flashy red computer alert declaring “MATCH!” More likely, results (sometimes multiple) are provided from such computerized comparisons that must be studied and verified by a trained and experienced scientist. In the end, the scientist determines the match, not the computer program. Furthermore, all analytical results, conclusions and reports are technically reviewed before the results go out to the law enforcement agency detective or investigator.

3. **How long does it take to complete a case?**
Case completion can take anywhere from an hour to several weeks. It will depend on a number of factors including:

- Type and quality of evidence;
- Complexity of examination;
- Whether all necessary controls and references are received;
- Number of tests involved in the examination;
- Existing backlog of evidence at the crime lab.

A straight-forward single item controlled substance case, such as suspected cocaine for example, may take about an hour. A DNA case may take a week or more depending on the number of items that require analysis, the condition of the evidence items, and whether necessary reference samples are submitted in a timely manner. Rush cases, such as those with upcoming court dates, are prioritized, and scientists always try to meet deadlines.

4. **How can I get a tour of the crime lab?**
Tours are often limited due to concerns for the integrity, security and privacy of the evidence, and due to trying to eliminate extraneous sources of contamination, particularly DNA. General public tours that are permitted are typically limited to group sizes no larger than about 8 to 10, to people over at least middle-school age, and are subject to lab personnel availability. You can contact the manager of your local lab for availability. Some labs are larger than others and may have even more limitations on tours.

5. **Can my high school student do a job shadow in the lab?**
Job shadows, much like lab tours, are often limited due to concerns for the integrity, security and privacy of the evidence, and due to trying to eliminate extraneous sources of contamination, particularly DNA. Job shadows that are permitted are typically limited to no more than a few hours and are subject to lab personnel availability. You can contact
the manager of your local lab for availability. Some labs are larger than others and may have even more limitations on tours/job shadows.

6. **Do you have internships and how can a student secure an internship?**
   We do try to use interns during the summer. We focus on students who have normally completed at least their third year of college, with a major course of study in a natural science. Many of our interns have already graduated from college. We ask the laboratory managers to develop projects for summer interns, and we try to place the intern with their preferred lab and forensic discipline. The internships are unpaid and competitive. The application for internships can be found on the Crime Lab Division website (http://www.wsp.wa.gov/forensics/crimlabs.htm). If you have questions on internships, you can send them to wspcrimelabinternship@wsp.wa.gov and we will get an answer to you. We start to accept applications for upcoming summer internships around December.

7. **What kinds of analysis can the laboratory perform?**
   The Washington State Patrol Crime Lab Division performs a wide variety of forensic testing and examines an even wider variety of evidence, from crimes involving controlled substance violations to rapes and major homicides. Areas of testing include DNA, body fluid identification, controlled substances, chemical analysis of unknowns, clandestine laboratory analysis, trace evidence (such as paint chips, fibers, tire and shoe impressions), fire debris, explosives, questioned documents, firearms and tool marks, latent prints and crime scene investigation.

   DNA – Evidence received from agencies for DNA analysis include sexual assault kits, victim and suspect clothing, weapons, and other items from crime scenes that may have biological evidence (blood, semen, saliva) associated with it.

   CODIS (Combined DNA Index System) – DNA samples from convicted offenders are typed and entered into the State DNA Index System. DNA profiles from the offender index are searched on a regular basis against unsolved crime scene samples. CODIS matches are evaluated by qualified forensic scientists and can result in an investigative lead to the submitting agency.

   Chemical Analysis – Evidence received for chemical analysis may include suspected drugs recovered from suspects or from crime scenes, undercover buys, drug distribution rings and manufacturers, and clandestine drug labs. Fire debris from suspected arsons can be analyzed for any residual ignitable liquids that may have been used as an accelerant. Residues from exploded pipe bombs may be submitted for explosives analysis in order to determine the type of device and explosive material used.

   Microanalysis – Types of trace evidence that can be submitted varies widely but can include clothing from suspects and victims, shoe or tire impressions found at a crime
scene, paint chips from a hit and run, and hairs and fibers. The evidence is examined to determine if there is any link between the suspect and victim and crime scene. We may also examine vehicle lamps in order to determine if they were on or off during a collision.

Questioned Documents – Evidence in forensic document cases may include forged checks, documents with questioned signatures or suspected alterations, and materials with possible indented writing.

Firearms/Toolmarks - Recovered bullets and expended cartridge cases are examined to determine the caliber of the fired ammunition, type of firearm used, and for comparison to submitted firearms to see if they were fired from a particular weapon. Firearms and other objects can also be submitted for serial number restoration. Fractured knife blades, cut padlocks, pry bars, and tool marks left at the entry to a burglary may be examined and compared for tool mark impressions.

Latent Prints – Evidence such as paper currency, documents, envelopes and weapons, can be examined for latent print processing and comparison.

8. Who can submit evidence to the lab?
Any law enforcement agency can submit criminal cases to the laboratory for examination. Typically this is city and county police and sheriff’s departments, and fire departments. We also receive state agency cases (such as from the Washington State Patrol, Department of Corrections, Department of Fish and Wildlife), and some federal cases (such as from ATF and ICE).

9. What can you tell from someone’s DNA profile?
A forensic DNA profile is a set of numbers corresponding to a person’s combination of specific DNA markers. Each person’s DNA contains two copies of these markers, one copy inherited from the father and one from the mother. At each stage of development, nearly all of the cells forming the body contain the same DNA. This allows forensic DNA profiling for all types of samples including cells from the cheeks collected using buccal swabs, blood or other types of biological samples. A forensic DNA profile is NOT a specific physical description of a suspect and does not reveal any medical conditions.

While approximately 99.9% of human DNA sequences are the same in every person, there is sufficient variation in DNA to distinguish one individual from another, unless they are identical twins. While a lot of DNA contains information for a specific function, the DNA used in forensic applications does not code for a particular protein but is still useful for human identification. Specific locations (called loci) of an individual’s DNA are used by forensic scientists for obtaining DNA profiles. The standard method of DNA analysis conducted by the Washington State Patrol Crime Laboratory for criminal cases and for the convicted offender database is the analysis of 15 Short Tandem Repeat (STR) regions plus a sex determination region utilizing the Polymerase Chain Reaction (PCR). In addition, analysis of STR regions of the Y chromosome present in male individuals only can be employed at the Crime Laboratory. PCR is a method used for the amplification of a specific DNA segment such that only small quantities are required for
analysis. The PCR reaction is repeated for a number of cycles and results in the exponential accumulation of the specified DNA segment.

By entering a DNA profile into a DNA database, that profile can be compared with millions of other DNA profiles for potential matches.

10. What do you see when you get a ‘hit’ to the felon database?

Qualifying DNA profiles from evidentiary items are entered into a database (Combined DNA Index System or CODIS) which contains other evidentiary DNA profiles, as well as individuals convicted of a felony and certain gross misdemeanors/misdemeanors. CODIS profiles are compared to one another on a regular basis to search for matching DNA profiles. A hit occurs when a two or more profiles in the database match and provides an investigative lead on a case(s). All CODIS hits are confirmed by qualified DNA analysts.

11. What do we do when we attend a crime scene?

Various law enforcement agencies may call out the Washington State Patrol Crime Scene Response Team (CSRT) to assist in their investigation of major crimes or scenes that overwhelm their own resources. The CSRT consists of forensic scientists and latent print examiners and is a free service available for response 24 hours a day. Each scene is unique, but in general, CSRT members may do all or any combination of the following:

- Meet and consult with the requesting agency and gather information.
- Take responsibility for scene processing
- Take highly detailed field notes of observations made, items collected, and chemical tests performed
- Extensively photograph the scene and any items of interest with overall, midrange, and close-up photography.
- Scan the scene with a Leica 3D scanner.
- Thoroughly document bloodstains for blood spatter pattern analysis and possible reconstruction.
- Record any bullet trajectories and bullet defects.
- Perform chemical presumptive tests for blood, semen, copper, and lead (gunshot residues).
- Perform chemical blood enhancement techniques to aid visualization of any potential latent blood.
- Process scenes for friction ridge skin impressions, such as latent fingerprints. This may include the use of chemical enhancement techniques.
- Evidence item recognition and collection including trace (hairs, fiber, paint, shoe and tire impressions), DNA, firearms and tool marks.

After the scene, CSRT members provide the requesting agency with a written report and testimony as needed.

12. What does a typical day look like?
Because a primary activity of a forensic scientist is to help prove or disprove the elements of a crime that may lead to the identification of the person(s) responsible, the primary functions include: examination and/or collection of evidence; analysis of the physical evidence using accepted and validated methods and analytical instrumentation; preserving evidence according to laboratory procedures; maintaining chain of custody, i.e., documentation establishing the receipt, handling, and disposition of evidence; interpreting observations and test results; preparing written opinion reports; testifying as an expert witness in courts of law; participating in proficiency testing; and receiving on-going training and professional development. A typical day may involve all of those duties, but evidence analysis constitutes the bulk of one’s duties. Detailed documentation must be kept in all phases of testing and numerous quality measures must be implemented and maintained along the way.

13. How often do you testify?
The number of times a forensic scientist testifies varies widely and depends on the type of casework they perform and the number of cases they complete. Not every case completed goes to court, and not every court case demands the testimony of a scientist. Counties and jurisdictions also vary in how frequently they call scientists to court. Because of the relatively large number of controlled substance cases a typical forensic scientist completes (these cases don’t take as long to complete), and the sheer volume of drug crimes across the state, these scientists testify more frequently. That may be on average once per month. Due to the much larger length of time it takes to complete a DNA case, DNA scientists may only testify a couple of times per year.

14. What is the pay range for a forensic scientist?
Pay ranges shown below are approximate and depend on level of experience and length of time with the agency.

- Forensic Scientist 1 (Entry level) $35,000 to 45,000
- Forensic Scientist 2 (Intermediate level) $40,000 to 53,000
- Forensic Scientist 3 (Journey level) $51,000 to 68,000
- Forensic Scientist 4 (Technical Lead) $54,000 to 71,000
- Forensic Scientist 5 (Supervisor level) $58,000 to 77,000

15. Do you work on property crimes cases?
Yes, the Crime Lab does work property crime cases, but there are restrictions. Current staffing and caseload require us to carefully evaluate requests we receive for DNA analysis as the number has increased and our staffing has not kept pace. If the examination involves DNA, there are limitations to the types of cases we will accept. Submissions for DNA are limited to cases:

- Involving substantial property loss;
- Are part of a series;
- Have a sexual component;
- Involve crimes against government agencies;
- Are associated with sentencing enhancements;
- Involve thefts of large quantities of dangerous or hazardous materials; or
• Indicate a public safety threat (the victim is home at the time of occurrence).

If accepted, property crime submissions for DNA will generally be limited to 2 evidence items and require any suspect reference samples and a completed Authorization for Consumption of DNA evidence form.

The Firearms, Materials Analysis, Questioned Documents, and Latent Print sections remain unaffected by this policy; these sections will work on property crime cases. For cases involving multiple examinations, the above described limitation will only apply to evidence on which DNA analysis is requested.

16. Does the Crime Lab examine computer evidence?

The Crime Lab does not examine computer crimes but another section of the Washington State Patrol does. The Special Investigations Section of the Investigative Assistance Division consists of the High Tech Crimes Unit (HTCU), Missing and Exploited Children Task Force (MECTF), Missing and Unidentified Persons Unit (MUPU), Special Weapons and Tactics Team (SWAT). The HTCU provides computer forensic technical support and training along with recovering relevant evidence that may exist on computer hard drives and other storage media for use in related criminal and internal investigation.

HTCU is a full service computer evidence retrieval and analysis unit. Evidence is sought in a varied field of computer related issues involving computer crime. HTCU computer crimes detectives are experienced professional investigators that can retrieve evidence without damaging or altering the original data. The data can be recovered from deleted or damage file structures. HTCU can provide an independent, impartial, and secure investigation while revealing and preserving important evidence, which agencies use to ensure an appropriate outcome to important computer criminal investigations.

HTCU Services

• Recovery of e-mail files
• Recovery of deleted files
• Recovery of Internet History files
• Recovery of financial records
• Recovery of photo/video files
• Recovery of text documents
• Training in computer seizures