

ND CRIME LABORATORY DIVISION

The North Dakota Crime Laboratory provides scientific support to the state's criminal justice system through the analysis, identification, and comparison of physical evidence used in the investigation and prosecution of criminal offenses. Services provided by the Crime Lab include:

BIOLOGY

The Biology Unit conducts several types of biological screening examinations on evidentiary materials, including the indication of blood, semen, and urine. Biological screening examinations may consist of color tests (urine), immunological tests (blood and semen) or microscopic examinations (semen). Additionally, biological material such as hair, tissue, and skin cells may be collected from evidence.

Once biological material has been detected, DNA analysis is then performed using capillary electrophoresis in order to determine the possible sources of the biological material. This involves comparing DNA profiles obtained from the questioned stains with the DNA profiles obtained from known blood or saliva samples collected from the victims and/or alleged perpetrators.

DNA profiling is also performed on all felony arrestees, convicted and registered offenders, and court ordered samples submitted by law enforcement agencies and correction facilities as mandated by the North Dakota Century Code. The DNA profiles are imported to the State DNA Index System (SDIS) database, which are then searched against DNA profiles obtained in unsolved criminal cases. Offender DNA profiles are also uploaded to the National DNA Index System (NDIS) database for searching against DNA profiles uploaded by other states. SDIS and NDIS are two components of the Combined DNA Index System (CODIS). Searches are also performed to compare DNA profiles developed from casework samples with other casework profiles in the database.

BREATH ALCOHOL

The Breath Alcohol Unit maintains the instrumentation for breath alcohol analysis statewide. North Dakota currently has three instruments used for breath alcohol analysis, the Alco-Sensor FST[®], Intoxilyzer S-D5 and the Intoxilyzer 8000. The Alco-Sensor FST[®] and Intoxilyzer S-D5 are non-evidential hand held screening devices. The Intoxilyzer 8000 is an evidential instrument that is located in law enforcement agencies around the state. The Intoxilyzer 8000 is also portable so it may be moved for use at sobriety checkpoints when needed. The Breath Alcohol Unit also provides the necessary training for officers across the state to become certified operators for these instruments.

DRUGS

The Drug Unit analyzes items of evidence submitted by law enforcement for the detection of controlled substances. Drug evidence may be in the form of plant material (such as marijuana, synthetic cannabinoids, salvia, and khat), solids (such as methamphetamine, powder cocaine, crack cocaine, and pharmaceutical or clandestine tablets), liquids (such as clandestine laboratory samples), or paraphernalia (such as smoking devices, straws, or spoons).

An amount determination (such as grams, milliliters, or units) and a qualitative identification is performed for any controlled substance identified. Drug examinations may consist of color tests, microscopic examinations, chromatographic techniques, and instrumentation such as a UV-VIS spectrophotometer, a Fourier Transform Infra-red Spectrophotometer, and/or a Gas Chromatograph Mass Spectrometer (GC/MS). For federally prosecuted methamphetamine cases, the laboratory may also perform quantitative examinations to determine the concentration of methamphetamine. The Drug Unit is also a resource for controlled substance information for the courts and other state agencies.

FIRE DEBRIS

The Fire Debris Unit examines materials from fires to determine the presence or absence of an ignitable liquid. If an ignitable liquid is present, the scientist will categorize the ignitable liquid and give suggestions as to possible sources.

Materials are analyzed for ignitable liquids in the Fire Debris Unit using a Gas Chromatograph Mass Spectrometer (GC/MS) to detect any volatile compounds present. The data generated is analyzed to identify those compounds and their possible source. While most materials to be tested for ignitable liquids consist of debris from a fire, other items that can be tested include clothing from a victim or suspect, suspected liquids, soil or vegetation from around building exteriors, or empty containers that may have been used to carry an ignitable liquid to the scene.

FIREARMS/TOOLMARK UNIT

The Firearms/Toolmark Unit conducts an examination of firearms related evidence submitted by law enforcement agencies. Most of the analyses are subjective in nature, meaning that the examiner relies heavily upon observation rather than instrumentation to make a determination. The analysts examine expended cartridge cases and bullets from crime scenes to determine if they can be linked to a specific firearm. If the firearm is not available, examination of the bullets and/or cartridge cases also allows a determination of the type of weapon used. Comparisons of the bullets and cartridge cases are conducted using a specialized light microscope that allows the examiner to view both the evidence sample and the test sample simultaneously. Other examinations performed by examiners in the Firearms/Toolmark Unit include function tests, trigger pull measurements (the force required to fire the weapon), and muzzle-to-target distance determinations.

LATENT PRINT

The Latent Print Unit employs a variety of techniques to develop latent prints on items of evidence submitted to the laboratory by law enforcement agencies. A latent print is an impression of the friction skin of the fingers or palms of the hands that has been transferred to another surface. The permanent and unique arrangement of the features of this skin allows for the identification of an individual based on a latent print. Many types of surfaces are submitted to the laboratory for latent print processing including porous surfaces (such as paper, cardboard, and untreated wood), non-porous surfaces (such as glass, plastic, and metals), and other types of surfaces (such as adhesive tape, and waxy or glossy surfaces). The examiners in the Latent Print Unit use a variety of different processing techniques to develop latent prints, depending on the specific type of surface involved.

TOXICOLOGY

The Toxicology Unit analyzes blood, urine, and other biological samples for the presence or absence of drugs and volatile compounds. The Toxicology Unit provides support to law enforcement agencies conducting investigations across the state, as well as the County Coroners and the State Medical Examiner Office. Examiners in the Toxicology Unit analyze for volatile compounds, such as in blood alcohol determinations, using a technique of Headspace Gas Chromatography (HS GC). Blood, urine, and other samples are screened for the presence of drugs using Liquid Chromatograph Mass Spectrometer Mass Spectrometer (LC/MS/MS) and confirmed by Gas Chromatograph Mass Spectrometer (GC/MS).

TRACE

The Trace Unit performs examinations and comparisons of fiber samples submitted by law enforcement agencies primarily to determine if the samples could have had a common source. Examiners in the Trace Unit analyze the chemical, physical, and optical characteristics of the evidence, often involving a microscopic examination, and then draw conclusions based on their findings. Trace evidence can be useful by linking together people, places, and items involved in a crime based on the microscopic materials they transfer through contact with one another.

The laboratory will select the appropriate methods to analyze submitted evidence. Specific methods regarding the analysis of evidence are available upon written request to the laboratory.