STATE OF NORTH CAROLINA

OFFICE OF STATE PERSONNEL

POSITION DESCRIPTION FORM (PD-102R-92)

APPROVED

EFFECTIVE

ANALYST:

CLASSIFICATION:

DATE:

(This space for Personnel Department Use Only)

1. Present Classification Title of Position
DNA Database Analyst I

2. Usual Working Title of Position
DNA Database Analyst I

3. Requested Classification of Position

4. Name of Immediate Supervisor
Michael Budzynski

5. Supervisor's Position Title & Position Number
Special Agent in Charge 3613-0000-0002-100

6. Name of Employee

7. Pres. 15 Digit Pos. No. Prop. 15 Digit Pos. No.

8. Department, University, Commission, or Agency
Department of Justice

9. Institution & Division
State Bureau of Investigation / Crime Lab

10. Section and Unit
Molecular Genetics Section

11. Street Address, City and County
SBI Laboratory, 121 E. Tryon Rd. Raleigh, NC

12. Location of Workplace, Bldg., and Room No.
Crime Laboratory, 2nd Floor

I. A. PRIMARY PURPOSE OF ORGANIZATIONAL UNIT:

The primary purpose of the Molecular Genetics Section is to accept and analyze evidence in criminal cases for the presence and source of body fluids and to report these findings to Law Enforcement officers and the courts. The primary purpose of the DNA Database, pursuant to NC State General Statutes 15-266, is to receive and analyze blood samples from convicted felons to produce a DNA profile to be maintained in a State and National DNA Database. These databases will be used to assist federal, State, and local criminal justice and law enforcement agencies in the identification, detection, and exclusion of individuals who are subjects of criminal investigations.

B. PRIMARY PURPOSE OF POSITION:

The primary purposes of this position include:
- Receipt and analysis of blood samples from convicted felons.
- Use of the CODIS system.
- Maintaining documentation of chain of custody and lab records
- Maintaining professional standards through training.
- Communicating with public officials.

C. WORK SCHEDULE:

160 hours/28 day cycle. The regular work hours are from 7:30 am to 4:30 pm.

D. CHANGE IN RESPONSIBILITIES OR ORGANIZATIONAL RELATIONSHIP:

A job study of the Section was completed by the Department of Justice Personnel Department in January, 2001, which resulted in the reclassification of several positions and the renaming of all positions in the section. This job description accurately reflects these changes.

II. A. DESCRIPTION OF RESPONSIBILITIES AND DUTIES:

Method used (Check One): Order of Importance: [x]
Sequential Order: [ ]

Place an asterisk (*) next to each essential function.

Time Description of Duties

***1. 73% - Receipt and analysis of blood samples from convicted felons**

The DNA Database currently receives approximately 100 to 150 convicted felon blood samples per week. It is the responsibility of the analyst to verify information on submitted blood tubes and attached database cards for any discrepancies. Blood stains are made of all received blood samples and the information on the attached cards is entered into the DNA Database Data Entry computer. These samples are subsequently packaged in heat sealed envelopes and stored in ultra cold freezers. Members of the DNA Database Unit are responsible for the STR testing of blood samples from convicted felons to obtain their DNA profile to enter into CODIS. The STR testing process is a complicated procedure demanding attention to detail and constant guarding against contamination of the samples. The process starts with the extraction of DNA from each bloodstain card. This is accomplished using a Qiagen BioRobot 9604, which processes 96 samples (including controls) in approximately 3 ½ hours. The extracted DNA is then transferred to the Qiagen BioRobot 3000, where DNA polymerases, primers, etc are added to each sample. A 96-well tray of samples can be processed in approximately one hour. Operation and maintenance of these robots requires extensive training and computer literacy to keep production running efficiently.

From the BioRobot 3000, the tray of samples is transferred to a DNA thermal cycler. The thermal cycler (PCR process) mimics natures mechanisms for replicating DNA and acts as a miniature DNA xerox machine in that billions of copies of DNA can be generated *in vitro* in a matter of hours. During this amplification/replication step, fluorescent dyes are incorporated into the DNA replicates. Needless to say, many negative and positive control samples are run along with the samples being tested. The DNA Database Unit Manager has designed quality systems, trained employees, and implemented policies and procedures for the unit to ensure that all Quality Control functions are covered and followed, and Database analysts are required to follow these quality control measures..

The samples are then placed in a vertical electrophoresis tank, where DNA is separated based on its molecular weight differences. The final stage of the process is the most complicated and requires the highest skill levels - the interpretation of results. The gel with the two or three dye labeled DNA is then placed on the Hitachi Gene Scanner and the results become visible on the computer screen. The analysis time on the computer system takes on average between 1 and 2 hours. Analysts have to perform color separations to ensure that dyes do not overlap the spectral range of each other, that all controls reacted as expected, that the samples can be called based on allelic ladders present, and that the visual calls match those generated by the computer. In case of disagreement, the analyst must edit the computer generated calls prior to saving the profiles to an Excel file (where the DNA Database Manager will check the data and upload it into CODIS).

Due to the extreme importance of the interpretation skills involved with STR testing, analysts have to complete a rigorous in-house training program, have a four year degree in a

biological science and have college course work in genetics and biochemistry. Correct DNA profiles are necessary since the results are used for police investigations, and for court by both prosecution and defense. 100% accuracy is required or justice is compromised, letting a guilty suspect go free to the detriment of public safety or sending an innocent one to jail or death. Results obtained by Database Analysts are relied on by the Special Agent In Charge when he obtains Search Warrants for known blood, hair, and saliva samples from convicted offenders identified as perpretrators of crime by CODIS hits between convicted offenders and unsolved cases.

2. 15% - Use of the CODIS System

The N.C.S.B.I. DNA Database is linked to the National DNA Database established by the FBI and will require periodic updating. The database will be updated with new DNA profiles by determined by analysis of blood standards of convicted felons. All analysts submitting DNA profiles for data entry are proficient at performing the DNA typing technique and will be trained through a course given internally or by the FBI in Quantico, VA to enter profiles of convicted felons into CODIS. Analysts must be proficient with computers, networks, and various types of software.

3. 8% - Maintaining documentation of chain of custody, lab reports, and reports stating the results of analysis

Chain of Custody

The DNA Database analyst must maintain the chain of custody of blood samples from convicted offenders by careful and accurate documents to ensure the admissibility of the evidence in a court of law. Chain of custody is a legal term which applies to the accounting of all the successive steps involved in the handling of a specimen from the time of collection to the time of trial.

Maintenance of the chain of custody includes the following duties which the DNA Database Analyst must be able to perform.

a. Proper packaging and identification of any convicted offender specimens submitted.
b. Signing the inventory form and providing the officer a copy as a receipt if sample is delivered to the lab.
c. Noting the condition (seals or unsealed) and how the sample is received at the lab if not hand delivered (First Class Mail, Certified Mail, UPS).
d. Identification of the sample submitted by cross checking the information on the identification card with the attached blood sample.
e. Providing proper storage (refrigeration for blood) and security for samples while in the lab.
f. Insuring that the remaining blood stain is stored in a sealed and secure manner.

Laboratory Records

The DNA Database Analyst must maintain records in the lab which provide information about the samples submitted to the laboratory, procedures and methods used in analysis of the samples and quality control of these procedures and methods.

a. Note taking - A DNA Database Analyst must maintain detailed notes describing

the specific test performed, and results of the test must be recorded. All tests must be done in accordance with the methods and procedures as outlined in the Molecular Genetics Technical Procedures Section Manual.

b. Quality Control - Records must be maintained which document that the tests were performed under the appropriate conditions (pH, time, voltage), that the reagents used in the performance of these tests worked correctly and that the control samples gave the correct results. Temperature charts of incubators, refrigerators and other equipment are also maintained.

4. 2% - Maintaining professional standards through training

Every DNA Database Analyst must complete an extensive training program conducted in the lab. This involves lecture material**,** demonstrations, practice runs, supervised runs, reading the literature, written tests, and proficiency tests. As part of this training, the DNA Database Analyst may be required to successfully complete several courses, including the following courses or their equivalent taught at North Carolina State University: Genetics, Biochemistry, GN 501, GN 502, GN 560. Proficiency tests must be passed with 100% accuracy. After being trained in the various methods of DNA analysis, the trainee then works samples under close supervision. Upon completion of all training the analyst starts independent analysis.

Every member of the Molecular Genetics section attends at least one professional meeting a year. Someone always attends the Southern Association of Forensic Scientists meetings which keep this laboratory in touch with other state labs. Workshops and conferences are also attended in order to keep the section current with the changing technology.

5. 2% - Communicating with public officials

Public contact requirements are an important part of this position. The analyst must project a professional image in dealing with the public, law enforcement officers, correction officers, and the news media by telephone, written communications. They must be courteous and aware of the legal consequences and Bureau policy. Even when not on official business, their conduct and demeanor must be tempered to reflect beneficially on the Bureau and their profession.

II. B. OTHER POSITION CHARACTERISTICS:

1. ACCURACY REQUIRED IN WORK

One hundred percent (100%) accuracy is required in all results. Determinations must be conclusive and unequivocal since an error can cost an innocent individual his life or liberty and allow a guilty offender to possible commit his crime again. Also, the reputation of the analyst, his job, and the credibility of the lab is in jeopardy when one is not exact in his work. Constant proficiency testing is undergone to assure that each analyst produces accurate results and interpretations.

2. CONSEQUENCE OF ERROR

As noted above, the greatest error is to report an erroneous result which would assist in the conviction of a falsely accused individual. This could deny the person several years of freedom (if not his life) and could also result in a lawsuit for the State.

3. INSTRUCTION PROVIDED TO EMPLOYEE

The procedures used by the employee are well established and validated.

4. GUIDES, REGULATIONS, POLICIES AND REFERENCES USED BY EMPLOYEE

The policies, guidelines, and procedures used by the employee include the NC General Statutes, the SBI Policy and Procedures Manual, the SBI Crime Laboratory Policy and Procedures Manual, the SBI Molecular Genetics Section Policy and Procedures Manual, the SBI Molecular Genetics Section Safety Manual, NC Department of Justice Policy and Procedures, ACSLD-LAB Certification Standards, and SWGDAM Quality Assurance guidelines, and CALEA Accreditation guidelines

5. SUPERVISION RECEIVED BY EMPLOYEE

The work of the employee is formally reviewed by the Unit Manager twice a year. However, informal review by the Molecular Genetics DNA Database Manager is conducted on a daily basis by observing the employee conducting his analysis and reviewing data on all samples completed.

6. VARIETY AND PURPOSE OF PERSONAL CONTACT

The employee is in daily contact with members of the law enforcement community, members from the general scientific community, and members of the forensic molecular genetics community from across the U.S.

7. PHYSICAL EFFORT

Although the employee may be required to perform light to medium work at times, the physical effort of this job primarily manifests itself as stress from having too much work to do and too little time to do it in, or not enough personnel to perform the work.

8. WORK ENVIRONMENT AND CONDITIONS

One hundred percent (100%) of the analyst's time involves working with blood and body fluids from an individual who may be carrying viruses for AIDS, hepatitis, herpes, VD, TB, etc. In addition, contact is also made with several carcinogenic and/or embryo toxic chemicals on a routine basis.

9. MACHINES, TOOLS, INSTRUMENTS, EQUIPMENT, AND MATERIALS USED

State owned automobiles, Perkin-Elmer Thermocyclers, Hitachi FMBIO Laser Scanning devices, Qiagen BioRobot 9604, Qiagen BioRobot 3000, PC and MacIntosh computers with sophisticated operational software, electrophoresis tanks and power supplies, autoclave, incubators, vacuum oven, microwave oven, hot plates/stirrers, heat blocks, vortex, rotators, balances, centrifuges, pipettors, pouch sealer, solution dispensers, hybridization incubators.

II. B. OTHER POSITION CHARACTERISTICS:

10. VISUAL ATTENTION, MENTAL CONCENTRATION AND MANIPULATIVE SKILLS

In analyzing samples, the visual senses are used predominantly and close attention to detail is needed. This is primarily the case when examining PCR scans, ensuring that samples match their respective case numbers, etc.. This position requires that the individual be attentive and mentally alert at all times for mistakes can be dreadfully consequential. One must continually check the work being performed to make sure each task is correct and can be accountable before superiors and courts of law.

SAFETY OF OTHERS

Extreme care must be taken to prevent the spread of contamination by hazardous materials. Special care is taken to avoid contamination of all analysts casework by amplified DNA product.

12. DYNAMICS OF WORK

The forensic analysis of evidence using DNA techniques is currently in a state of change and most likely will remain so for several years to come. The basic methods in use today will gradually be phased out in the near future to incorporate use of newer DNA methodology than currently in use or being implemented/validated now.

III. KNOWLEDGE, SKILLS & ABILITIES AND TRAINING & EXPERIENCE REQUIREMENTS

A. KNOWLEDGE, SKILLS AND ABILITIES

1. Ability to work in a laboratory environment and a working knowledge of the methods, procedures and practices used in the forensic analysis.
2. The ability to establish and maintain favorable working relationships with other law enforcement agencies and officers.