

## Building the Future of DNA Technology

# RCMP's DNA Data Bank Sets a World Standard

by Joanna Kerr

**C**anada's national DNA Data Bank is a technological wonder, combining state-of-the-art equipment with the country's top scientific minds. Down to the last detail, the facility at RCMP Headquarters in Ottawa has been designed with a zero margin of error. Researchers here have taken their time to get everything just right, building a customized system that processes DNA samples faster, with less staff, than similar facilities in the world.

"In the past 10 years we've witnessed incredible advances in DNA technology," explains Dr. Ron Fourney, the RCMP scientist in charge of the Data Bank. "This is really the third revolution of technology and it will be an important part of the arsenal we'll use for the administration of justice in Canada."

Despite the advances of this latest revolution, Dr. Fourney's Data Bank team undertook extensive research and development work, pushing their forensic field into new territory. Dr. Benoît Leclair, instrumentation specialist with the Data Bank's research and development group, says the customized system that automates much of the process at the Data Bank is flexible enough to handle many more samples than the expected 30,000 number of sample submissions per year. "This will be achieved with robotic equipment that performs nearly all the time-consuming work, and a Sample Tracking and Control System (STaCS) that handles all sample traffic and controls the robots," says Dr. Leclair. "Our operators work through and oversee the process, and carefully review the generated data. It's a very effi-



Canada's national DNA Data Bank at RCMP Headquarters in Ottawa.

cient use of the capabilities of our personnel and facilities."

The Data Bank's combination of new and specialized components is what makes the facility a one-of-a-kind operation. Even before a DNA sample makes it to the Ottawa labs, scientists here have had a hand in its collection. Police investigators across the country are equipped with specialized DNA sample collection kits, field-tested by RCMP labs during the Swissair Flight 111 air craft disaster in 1998. To assist in the identification of the victims, the collection kits were used to sample relatives of the 229 victims following the devastating plane crash. RCMP scientists had already started tests on a new sample collection card made of spe-

cially-treated paper that bonds biological material to its surface, neutralizes bacterial and viral contamination, and can be stored at room temperature. But RCMP scientists didn't yet know how well this product would work with mass sample collection in the field, such as required for the Swissair analysis. "It worked flawlessly," recalls Dr. Fourney.

A key component to the success of the Data Bank operations will be proper collection of the samples and complete confidence in the integrity of the biological and identification information. Each sample collection kit, when manufactured, is printed with a unique serial number that also appears on the card as a bar code. Sample collection officers randomly pick

## At a Glance

The *DNA Identification Act*, which came into force on June 30, 2000, establishes a national DNA Data Bank to be maintained by the RCMP. Canada's DNA Data Bank is part of the country's National Police Services, which are administered by the RCMP and provide support services to all law enforcement agencies throughout Canada. The Data Bank falls under the RCMP's Forensic Laboratory Directorate, which is also responsible for research and development of DNA technologies.

The DNA Data Bank has two components — the Convicted Offenders Index containing DNA profiles of offenders convicted of designated offences that are processed only in the National DNA Data Bank in Ottawa, and the Crime Scene Index, containing DNA profile data derived from evidence left at Canadian crime scenes. The crime scene evidence is first processed by operational forensic labs across Canada who send a simple condensation of genetic information, that looks like a series of two digit numbers, to the National DNA Data Bank in Ottawa. The Data Bank crime scene index data does not record any case-specific information but simply references the case file number, location, date, identification of the submitting laboratory and the simplified genetic profile data.

When new information is added to the Data Bank, the profile is cross-referenced with DNA profiles in the Crime Scene and Convicted Offenders Index. Matches in the system will link the crime scenes and potentially identify a repeat offender. Match information in the Crime Scene Index is automatically relayed to the forensic laboratories involved and the potential identification of a convicted offender match is cross referenced through the bar code identification number with RCMP Identification Services. Identification Services will then notify the laboratory of the individual's identification. Further processing of the case is handled by the operational laboratory, which generally involves processing a new sample from the alleged suspect and confirming the information. Although the approach may seem to add additional steps, the genetic privacy of the convicted offender sample is maintained and the laboratories generate a second confirmation analysis of the match to ensure that the Data Bank is truly an investigative tool.

The National DNA Data Bank is a powerful new investigative tool designed to help law enforcement agencies solve crime by:

- linking crime scenes where no suspect has been identified;
- identifying new suspects;
- eliminating suspects where there is no match between crime scene DNA and the national DNA Data Bank;
- determining if a serial offender is involved.

The DNA Identification Act completes the federal government's DNA legislative strategy. The strategy began with the creation of the DNA warrant scheme in July 1995, through amendments to the Criminal Code to allow judges to issue warrants authorizing the police to take DNA samples from suspects in the investigation of a designated offence.

collection kits in their work so that each convicted offender gets associated with a random serial number. In the process of kit reception at the Data Bank, the fingerprints on the back of the collection card are examined to confirm a match to those appearing on the identification form. This system establishes the identity of the sample applied to the collection card. Once this has been established, the two pieces of information — genetic and personal — are split. The personal data form is then forwarded to the RCMP's Identification Services. The identity of the sample contributor is known only by his or her anonymous bar code number to Data Bank scientists. The first purpose of the random numeric identifier is to act as a privacy safeguard. The concept of separating the personal information from the genetic information makes Canada's forensic investigative Data Bank unique compared to other world data banks. Safe-

guarding genetic privacy was a key issue discussed during the legislative review of the Data Bank law by the Canadian Senate. The extra steps to conduct high output while maintaining confidential information is obvious throughout the Data Bank.

A second purpose of the random identifier is to allow Data Bank staff and the automated system to easily trace, through the bar code, the sample's journey in the analysis process, using an optical scanner at each step to read and verify the sample's identity. "The traffic management of very large numbers of samples can become a demanding task outside of an automated environment," explains Leclair. "In our field, we can't afford to lose track of any one sample." For this reason, the Data Bank process makes extensive use of bar codes on all of its containers and at each step of the procedure.

While introducing a bar coding system was an important part of establishing a reliable system, achieving control over sample traffic proved an added challenge. The Data Bank wanted a process to precisely track each sample — accounting for every minute of a sample's time spent in the Data Bank. To achieve this goal, the concepts of the sample tracking procedure and scientific safeguards were developed by the scientists of the Data Bank. The goal was to track each sample in a sophisticated forensic inventory that retains the history of all information pertaining to tasks that represent a blend of human and technological activities. A complete biological audit accountability, along with an automated machine interface is the final result, which can generate a work list for each day.

The innovative design of the Data Bank has since drawn widespread interest in the forensic community. To make those

## What is DNA?

Deoxyribonucleic acid is a molecule found in virtually every cell in the human body. It is the body's blueprint for development — the fundamental building block for a person's entire genetic makeup.

DNA is a powerful tool for identifying individuals because no two people have the same DNA (except identical twins) and this DNA remains the same throughout a person's life. The DNA molecule is also very stable and is often the only clue to a person's identity left at the scene of a mass disaster or explosion.

Technology developed in the last decade gives scientists the ability to extract DNA from small biological samples, such as a few drops of blood. This sample can be analyzed, creating a DNA profile that can be used for identification purposes, much like fingerprinting.

advances available to other forensic laboratories, STaCS (TM) is now being developed in collaboration with Anjura Technology of Ottawa into a full-featured, state-of-the-art commercial application that has the flexibility to incorporate new technology or equipment in the future.

When a sample starts the analysis process, it resides on a two millimetre-diameter paper disc at the bottom of one of the 96 wells of a process plate. Some of these samples are controls that must produce expected results to confirm to scientists that the system is working as it should. The exact location of each sample within each process plate (or batch) is known to the tracking software. The tracking system allows for the customization of the analytical process for each sample regardless of the large number processed. Since each step of the sample history is closely tracked it becomes a simple task to monitor the production sequence.

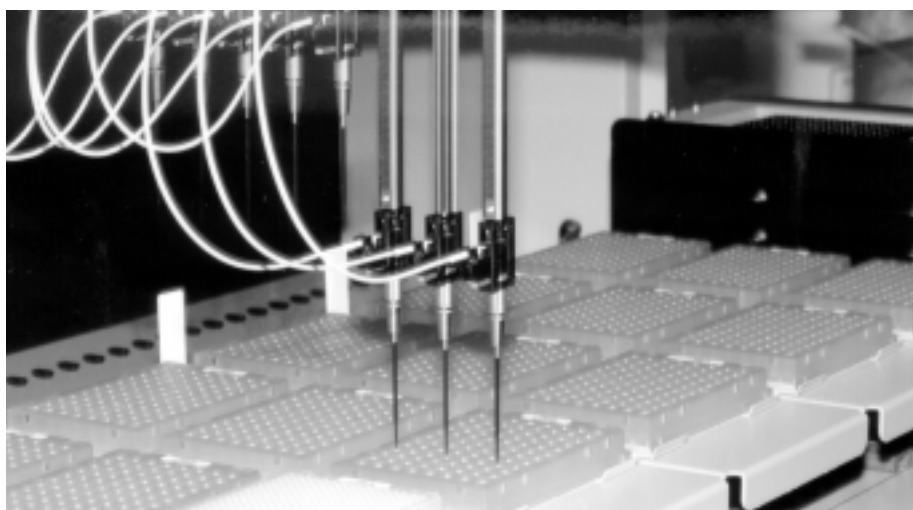
Even the amount of DNA scientists use for analysis is a Data Bank innovation. When one of the thousands of specially-trained police personnel across Canada

takes a DNA sample from an offender, they draw just a few drops of blood to include in their sample collection kit. Staff at the Data Bank use a punch machine to take small discs of this blood sample — about the size of the head of a pin. This initiates the analytical process. The rest of the biological sample on the collection card is stored in a secure location should it be needed in future. The Data Bank realizes cost savings in sample storage because the remainder of a sample can be stored indefinitely at room temperature. In the past biological samples destined for DNA analysis were generally stored frozen, requiring more space and energy.

The small paper disc containing the convicted offender's blood sample now moves to an automated process designed to extract the sample's DNA. The robot that takes on this task is a product of Swiss engineering and Canadian expertise. By working with the robotic instrument manufacturer, a customized set of tools were developed for the Data Bank robots. This reflects the entire approach taken in the construction of the Data Bank — if a process or tool did not exist, the Data Bank scientists invented it. The net result has been the creation of intellectual properties of interest to many data banks and the scientific community in general. Even the project management approach and the entire process used to implement and create the Data Bank was unique in its design and application due to the legislative imperative to become operational in 18 months.

Samples next enter the amplification room where an instrument known as a thermal cycler generates large numbers of copies from short segments of DNA, called STRs (short tandem repeats), spread out in 14 different locations (or targets) on the human chromosomes. The process is much like running the segments through a genetic photocopier that multiplies them a billion-fold. As these new copies are being generated, the process fluorescently tags those amplification products to make them easily detectable with laser-scanning equipment.

At the next stage of the analysis process, a second robot, again adapted for the Data Bank's use, loads each DNA sample onto one of the teeth of a specially-designed membrane sample comb. Scientists use the comb to introduce samples to a DNA sequencer that can detect each fluorescently tagged piece of DNA. The DNA is pulled from the sample comb by an electric field into a Jello-like substance called a gel. This begins a molecular race as the fragments move through the gel to finally reach the finish line, which is a CCD detector and a laser set up to detect the fragments as they exit the sequencer one by one, in order of increasing length. The use of standards (DNA fragments of known size) allows the detection software to measure the exact length of each of the unknown fluorescently-tagged DNA segments segregated by the sequencer. The profile of 28 bands is detected and displayed by the sequencer as a series of 28 coloured, horizontal bands that look



The robot at this first stage of automation uses a liquid reagent to extract DNA from the samples.

like a bar code. The collective combination of all DNA fragments becomes the forensic genetic profile and represents a genetic calling card for an individual and, with the exception of identical twins, would be unique in the world.

Once the profiles are obtained, two analysts independently verify the results for each sample. STaCS then carries out one last critical test on the results. Since two separate sample discs are processed in parallel but independently for each separate card, verification of the final results for a profile can be made by reviewing the collective data. The two separate processing steps have a few common tests and the same results must be obtained in order to ensure sample integrity during the entire procedure.

**The FBI's Combined DNA Index System**

Although special processing for select samples can be conducted very rapidly, the majority of samples will be processed in a large batch for high throughput and cost efficiency. At the end of the analysis process — which normally takes from three to five days — each DNA profile enters a genetic library where it is automatically cross-referenced with other profiles in the Data Bank.

The technology behind this critical step in the Data Bank's operation — the Combined DNA Index System — is an American software program that the FBI and US Department of Justice provide at no charge to any law enforcement agency performing DNA profiling composition according to a similar code of quality assurance.

"CODIS is a very good system," says Lillian Mahoney, project manager consultant for the Canadian version of the software running at the DNA Data Bank. "The features are very friendly and all the instructions are in plain English."

Mahoney and colleague Sylvain Lalonde (CODIS Coordinator and Information Manager) train staff at the RCMP's six forensic labs, two provincial labs in Montreal and Toronto, so that from one end of the country to the other, scientists and analysts can share information using a common interface. "This gives clients at the local level a tool to manage crime

scene information," explains Mahoney. "Each lab inputs their crime scene DNA profile data and the system notifies them when it finds a match."

After just a few months of operation, the system is working well — after being designed and tested to handle the predicted traffic flow and maintaining a high level of security for its users. "Any new tool takes some getting used to," reports Mahoney. "But there have been no complaints."

The benefit for the FBI and RCMP in sharing this system is a common genetic currency that can help identify suspects operating on both sides of the border.

Looking to expand this data-sharing arrangement, Dr. Ron Fourney, the RCMP scientist in charge of the Data Bank, explains that Canada is "in the last phases of developing international agreements that could involve running cases [from other countries] through our Data Bank, once the agreement is signed."



(L-R): Superintendent Lee Fraser, Deputy Commissioner Curt Allen and Dr. Ron Fourney on opening day, at Canada's National DNA Data Bank, July 5, 2000. Supt. Lee Fraser runs the retroactive collections side of the Data Bank, and the initial training phase to ensure that police in the RCMP and other services across the country know how to get their samples to the national lab on their own. "Our goal is to catch criminals," he announced at the opening of Canada's national DNA Data Bank. "And in the game of crime, this will help to single out and link criminals irrefutably to their crimes." D/Commr. Curt Allen, head of National Police Services and Technical Infrastructure for the RCMP, praised the partnerships and technology that made the Data Bank opening possible. "We're thankful to the Government of Canada, the people of Canada and all Canadian law enforcement agencies," he said. "This Data Bank belongs to all of us." Dr. Ron Fourney, the RCMP scientists in charge of the Data Bank says this initiative represents 10 years of hard work and strong partnerships to put all the pieces into place — the right legislation, co-operation of government and the courts, privacy controls, standardized training for police, enthusiastic support from provincial partners and regional labs and some of the most sophisticated analysis equipment in the world. "Canada stands on firm ground as one of the forerunners in this area." The Canadian government's investment in the DNA Data Bank facility — \$10.6 million in the implementation and initial operation followed by \$5 million each subsequent year — represents a national commitment to a quality operation.

### Data Bank Labs Prepare for Accreditation Review

It was a proud day for members of the RCMP's Forensic Laboratory in Edmonton. On July 11, the Standards Council of Canada's Program for the Accreditation of Laboratories Canada (PALCAN) bestowed its official certificate of accreditation on the western-based labs — a nod to the facility's high standards and quality work. While presenting the certificate, Peter Clark, Executive Director of the Standards Council of Canada, announced that "the RCMP's commitment to providing services that demonstrate consistency and conformity will serve to reaffirm Canadians' faith in the justice system." The Edmonton lab is one of six regional RCMP labs that provide forensic services, including DNA analysis, toxicology, firearms and toolmark examination.

Even though they've only been in operation a few months, staff at Canada's DNA Data Bank, housed at RCMP Headquarters in Ottawa, are looking forward to their chance to impress the national accreditation team. As scientists here test the technological limits of the fledgling Data Bank, says Pierre Gagnon, in charge of Quality Assurance, they continually take an outsider's view of their work. "We do have to meet certain standards issued by accreditation bodies but we go beyond that and try to be as critical of our work as possible," he explains. "If you successfully anticipate any criticism in your process design and improve on it, then accreditation becomes a lot easier to achieve."

The Data Bank will likely enter its accreditation process in late 2001 or early in 2002, after they've been running for more than a year. "They [the accreditation team] want to see you in action, see how you manage information, and examine your records," says Mr. Gagnon. By that time, staff at the Data Bank will be ready. "Anything we see that might be an issue we address right away," Mr. Gagnon reports. "We'll want to show the accreditation team that our setup is top notch."



### Government Partners Work Together to Collect DNA Samples from Canada's Most Dangerous Criminals

When the *DNA Identification Act* came into effect on June 30, it gave police the authority to take DNA samples from more

than 2,000 serious offenders whose crimes, in some cases, preceded the legislative change by more than a decade. Dealing with issues like the legality of taking DNA samples from offenders who had already been sentenced and then how to collect samples from such a large population was part of the mandate for partners like the Department of Justice, Correctional Service Canada and the RCMP. Federal departments worked together to develop a plan for DNA collection so that the offenders targeted by the legislation would join the Data Bank where their genetic profiles could be checked against any unsolved crimes. Offenders convicted of more than one murder committed at different times, Dangerous Offenders, and those convicted of more than one sexual offence and currently serving two years or more, fall under the retroactive sections of the new legislation.

The RCMP and CSC signed onto an agreement earlier this year, defining the duties of each under the retroactive

plan. "We met with the RCMP early on to hammer out what each agency's responsibilities would be and that cooperation continues today," says Denise Mainville-Vantour, senior project manager with CSC's Strategic Planning and Policy Division. Under this plan, the CSC supplies the RCMP with a list of offenders who qualify under the new DNA legislation. "The list was derived from a national CSC database but parole officers also reviewed their individual caseloads to ensure that no offenders were missed," explains Mrs. Mainville-Vantour. From there National DNA Collections Co-ordinator, RCMP Corporal Tracy Ramsay verifies the information with the Canadian Police Information Centre before sending the new file onto the Attorney General's office in the province of the offender's last DNA-qualifying conviction. "If the Attorney General's office agrees with the DNA sample request, the local Crown counsel will review the file and, together with the local police, seek approval from a

## Three Offender Groups Possible DNA Donors

Under Canada's new *DNA Identification Act*, designated offenders fall into three DNA sample collection schemes — prospective, retrospective, and retroactive. Offenders charged and convicted of a primary or secondary offence after June 30, 2000 fall under a prospective DNA sample collection scheme. In these cases, a judge *shall* issue a court order for DNA sample collection if the offender has committed a primary offence — including murder, rape, sexual assault, aggravated assault and kidnapping. A judge has the choice of issuing a court order for DNA collection if the offender has committed a secondary offence — including assault, indecent acts, child pornography, robbery, arson, hostage taking, breaking and entering with intent.

Offenders charged with designated primary and/or secondary offences before June 30 but convicted or sentenced after June 30, fall under a retrospective DNA collection scheme. In these cases, a judge uses his or her discretion in issuing a court order for sample collection, regardless of whether the offence falls into the primary or secondary schedule. Judges will consider the offender's criminal record, and the nature and circumstance of the offence in their decision to order a DNA sample.

The retroactive DNA collection scheme affects all offenders charged and convicted of certain offences before June 30, 2000 and who are currently incarcerated or on parole as of that date. Approximately 2,000 offenders qualify for DNA sampling as part of this scheme. These are offenders who have been declared by the courts to be dangerous offenders (high-risk violent offenders), or who have been convicted of more than one murder committed at different times, or who have been convicted of more than one sexual offence and are currently serving a sentence of at least two years for one or more of those offences. Offenders who fall under this scheme, and whose DNA profiles will be added to the Data Bank in the coming year include child-killer Clifford Olsen and Scarborough rapist Paul Bernardo.

provincial court judge to obtain the sample from the offender," explains Cpl. Ramsay.

To collect a DNA sample, police in the affected jurisdiction will work with CSC officials at parole offices and institutions. Within institutions, arrangements are made to have police attend the facility to collect the sample. For offenders currently on conditional release, local police will also work with parole officers to ensure they have the most up-to-date information with respect to the offender.

Partnership between prosecutors and the RCMP also developed early, with members of Crown counsel often attending DNA sample collection training

sessions along with police officers. "They [the prosecutors] can see what happens in the sample collection process this way," says Cpl. Ramsay. "It helps them understand what's involved and what a simple process it is."

Already, 1,200 police officers across the country are trained in DNA collection under the new *DNA Identification Act*. RCMP Staff Sergeant Dan Rahn, one of five regional DNA co-ordinators, says the goal is to reach every RCMP member by having trained members teach others. "When it's your turn to get a DNA sample, you've got to be able to grab that [collection] kit and go," he explains. "It's not that difficult — everything you need is in the kit, including a check list."

Larry Stein, Assistant Chief Crown Prosecutor in Calgary, says he's pleased with the co-operation that exists between his office and the RCMP, and specifically, "the dedicated and keen efforts of Staff Sergeant Dan Rahn. His willingness to do what has been needed, often in a creative and urgent way, has resulted in smooth courtroom applications."

It will take the next two years to complete the retroactive DNA sample collection. Cpl. Ramsay says she'll be happy at the end of the process just knowing that "we did our job and nobody was missed."

## Privacy and the Data Bank

**T**he question of privacy has been addressed in four ways in the design of the national DNA Data Bank.

- **Scientific processes** — The DNA analysis process used by the Data Bank examines only a small segment of the entire human DNA blueprint which encodes anonymous pieces of DNA. Apart from the ability to identify gender, there is no known link to physical or medical attributes.

- **Methodology** — By design, genetic and personal information will be separated. Each profile in the Data Bank has a unique identification number that can only be linked to the donor of the sample through secure access to the Canadian Criminal Records Information Service.

- **Physical Parameters** — Unauthorized persons cannot enter the Data Bank to view or retrieve data. For genetic DNA data to be linked to an individual, access to two separate and secure data bases, housed in separate locations would be required. The final identity is a match report with no genetic data associated with it.

- **Risk** — The *DNA Identification Act* specifies criminal penalties for unauthorized use of the DNA profile data or the samples themselves.

As an added measure of security, the DNA Data Bank will be subject to auditing by the Office of the Privacy Commissioner at any time.



The identity of the donor is known only by his or her bar code number to Data Bank scientists.

Small numbers, high standards

## Skilled Data Bank staff balance high-tech automation

**A**t 21 staff members, potentially rising to 31 in the future, Canada's national DNA Data Bank carries a light complement compared to its international counterparts. The UK, for example, employs more than 400 people to process its 300,000 plus DNA samples collected annually. The Canadian Data Bank is confident that current advancements in technology and new approaches developed in-house to process DNA samples should support much more than the estimated 30,000 samples per year for Canada. Automation of much of the DNA analysis process helps the Canadian Data Bank keep its staffing levels low and this streamlined operation frees the systems' operators to put their scientific skills to best use.

The first stop for a DNA sample when it arrives at the Data Bank labs is at kit reception, in the hands of Rubiane Thorpe and H el ene Lacombe. The two act as technical consultants to the front line. They are part of the team that assesses the quality and integrity of each collected sample and have set up the front end of Data Bank operations so that those submitting samples from the field, and scientists who conduct their analysis, are linked and the complex technical process of DNA analysis begins. Understanding the needs of each is a very important part of their job, says Rubiane Thorpe. "We're lucky to have learned the science and collection side," she says. "Since everything is new, we've had the chance to work on the design of the DNA collection kits and take part in the initial training of collection personnel. And we're in constant contact with officers for referrals or advice — we're like an encyclopedia to them."

When Rubiane Thorpe and H el ene Lacombe receive a new sample, they confirm the identity of the sample donor with a fingerprint comparison, and then

separate the personal and genetic information to comply with privacy provisions in the DNA legislation. The biological sample, soon to be turned into the forensic genetic DNA profile, is forwarded to the scientists in the Data Bank. The other record information relating to the donor of the sample — name, offence, and fingerprints — are sent to the RCMP's Identification Services. The two samples are now only linked by bar code number and the potential of fingerprint analysis if needed in the future. Some statistical data is also collected, which will become part of the annual report for the Data Bank. "From the information we have, we'll be able to create a report saying how many male or female [samples we have], how many murderers and other types of offenders, so that we can put the statistics together," explains Thorpe.

Kathy Bowen, Manager, DNA Analysis, looks after the team that processes DNA samples. She says last year, when the Data Bank went looking for analysts with a background in biology, genetics and DNA typing, 400 applicants turned up. From these candidates, four DNA analysts were initially hired. "We had a really great pool to draw from," she says, "so we're getting the cream of the crop."

The Data Bank hired two more analysts this summer to help process samples and

upload DNA profiles to the national system, and if the number of samples coming into the Data Bank increases beyond initial estimates, says Kathy Bowen, two more analysts will be brought in to join the team. "We can bring in people and have them up in running in four or five months after training," she explains. "We're lucky to have so many great applicants and we already have an excellent team that's a pleasure to work with."

As applicants must be able to demonstrate their ability to work with small quantities of material in an environment where microlitres are standard units of measurements, excellent manual dexterity is a necessity. Candidates who go on to join the Data Bank group attend a series of lectures as introduction to this high-tech environment. They then apply their knowledge in the labs, learning the protocols and practicing new techniques for several weeks before starting to work with complex robotics equipment. This is followed by practical lab tests and a written exam to test their developing skills. Analysts must pass a final qualifying exam before processing any convicted offender samples.

Even after staff members are fully qualified, the high standards of DNA processing required by the Data Bank demands that each analyst must pass proficiency tests every six months. To con-



At 21 staff members, potentially rising to 31 in the future, Canada's national DNA Data Bank carries a light complement compared to its international counterparts.

duct these tests, Data Bank managers will add control samples to various DNA batches. The control samples are processed along with all other convicted offender samples but have the important distinction that they will act as the measuring device for validity and reliability of the overall process. As an added safeguard in the DNA analysis process, analysts follow the same batch of DNA samples throughout the process.

Before a finished DNA profile makes it into the Data Bank's inventory, two analysts independently verify the analysis results. If a discrepancy exists, the sample will go back to be reworked.

Mathew Cheriyan, one of six analysts at the Data Bank, qualified for his position this past September, after just six months here, and says it's an honour for him to be part of this new team. "When I first came here, I thought 'Wow, what a great lab' — the people are great, the equipment is top of the line and everything is at our fingertips. It was overwhelming."

A positive team atmosphere and great teachers helped overcome a steep learning curve in the beginning, says Mathew Cheriyan, who is very happy to be putting his four-year biochemistry degree to work in a very competitive field. "We covered the theory in school

but there's a lot to learn about the way things work here," he admits. "The RCMP is known around the world for its work in forensic science, so it's an honour to be a part of this group."

The Data Bank's official opening in July was "exhilarating" for Ann Hale, a recent addition to the analyst group who started at the labs in June. "We were all smiling that day," she recalls. "But it's going to be ten times more exciting when we get a [sample] match. It could happen tomorrow or next month, we don't know, but just to know I'm part of making that happen is an incredible feeling."

## Protecting the innocent

# Crimes against children included in new DNA Act

In sentencing a child sex offender this past July to 10 years in jail for molesting 19 boys, a Quebec Court judge also ordered the man to provide a DNA sample to be added to Canada's national DNA Data Bank. "[He] is a sexual predator who fashioned a lifestyle out of such acts," Judge Lucien Roy told the courtroom. Crown prosecutor Josée Grandchamp said she had asked for the DNA order to make it easier to catch the offender if he ever re-offends, reported the *Montreal Gazette*.

Judge Roy's order came just weeks after the federal government enacted its *DNA*

*Identification Act*, which includes a list of primary offences that allow judges to issue a court order for the collection of a DNA sample. The offences include murder, rape, sexual assault, aggravated assault and kidnapping.

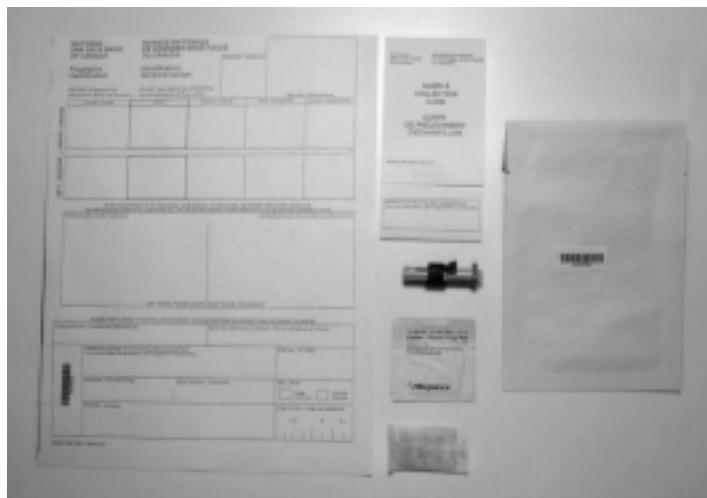
A Charlottetown man convicted of the sexual touching of a six-year-old boy was sentenced to 30 days in jail, also this past July, and ordered to allow the local police service to take his DNA sample and send it to the Data Bank. As reported by the *Charlottetown Guardian*, Crown attorney Kathy Flanagan remarked that, "the offence is at the lower end of sexual

offences but he meets the criteria."

A Nova Scotia man sentenced this past August to two years in prison for sexually touching a

young boy has a history of sex offences dating back to the 70s, with two prior convictions. At the time of sentencing, Judge Clyde MacDonald ordered the sex offender to provide a blood sample for the national Data Bank.

Judges across the country can also issue DNA orders for secondary offences, including assault, indecent acts, child pornography, arson, hostage taking, and breaking and entering with intent. A number of these cases involving child-related offences have surfaced in the short time the new legislation has been in effect. This past summer, a Calgary Crown prosecutor made an application for a DNA order in the case of a man who had earlier pleaded guilty to possessing child pornography. The man faces up to six months in jail and will appear in court this October for sentencing, at which time the judge will decide whether or not he must submit a DNA sample.



What's in the DNA collection kit? Each kit includes fingerprint form, lancet for blood sampling, sample collection card to prevent contamination, and a shipping pouch with drying packet. Bar codes on all information allows the Data Bank to track samples throughout the analysis and storage process.

Photos by Joanna Kerr