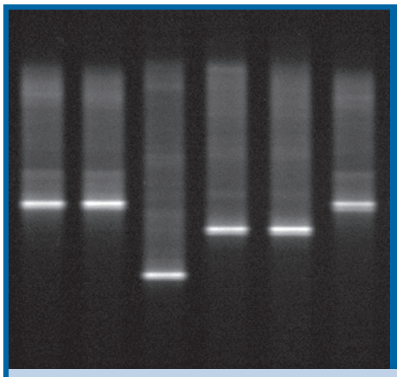


scope newsletter

science research innovation analytics engineering

June 2009

Focus on RPC's Forensic Biology Laboratory

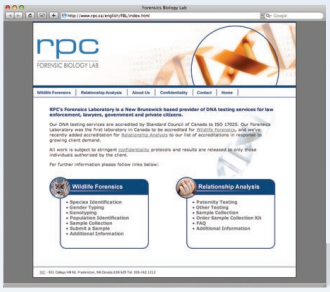
Over the last decade, RPC has worked closely with those in New Brunswick's Department of Natural Resources to develop DNA-based tools to enforce prosecution of poaching. The tools developed include highly sensitive and specific assays for species identification or, in the case of moose or deer, individual animal identification.

Although our initial work was largely enforcement-focused it showed the great potential for forensic technology for other natural resource management tasks in New Brunswick and elsewhere. In addition to providing evidence for prosecution of illegal kills, DNA-based forensic analyses can be used to monitor existing wildlife populations or monitor the success of re-introductions. Wildlife forensics can be used to distinguish between closely related species, or species hybrids, and can be used to study the impact of roads or other environmental events on existing populations. These analyses can also be used to study the mating structures of healthy and endangered species as a contribution to understanding populations, stocking populations and ecosystem interaction.

Eric Johnsen, Forensic Analyst, prepares a sample for DNA analysis from an exhibit sent to the laboratory for testing.

In the news...

April 2009
RPC launched the website for its new Forensic Biology Laboratory (http://www.rpc.ca/english/FBL/index.html). The lab specializes in wildlife forensics and human paternity and relationship testing.



April 30th, 2009
RPC's human paternity testing highlighted in the Daily Gleaner "RPC first in N.B. to offer relationship analysis" By Kyle Mullin, D1.

March 2008
RPC received accreditation from the Standards Council of Canada (SCC) for human paternity testing, gender typing and deer genotyping.

September 2006
RPC received accreditation from the Standards Council of Canada (SCC) for species identification, moose genotyping and isoelectric focusing.

rpc
SCIENCE & ENGINEERING

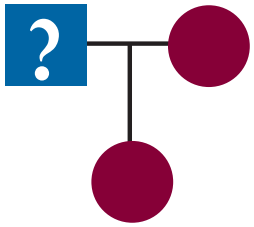
921 College Hill Rd Fredericton NB Canada E3B 6Z9 t 506.452.1212 f 506.452.1395

www.rpc.ca

scope newsletter

Human Relationship Testing

We use DNA–based analysis to determine the relationship between a man and a potential offspring. In this analysis a buccal swab is taken from the cheeks of each individual being tested. DNA is extracted from the sample and amplified with a suite of DNA microsatellite loci (ABI-Identifiler™) to determine a 16 loci genotype of each individual. The genotypes are compared to determine the likelihood that the man is the father of the child. This test is routinely performed using swabs from the mother, possible father, and child (or children) of interest, but can be performed in the absence of the mother.

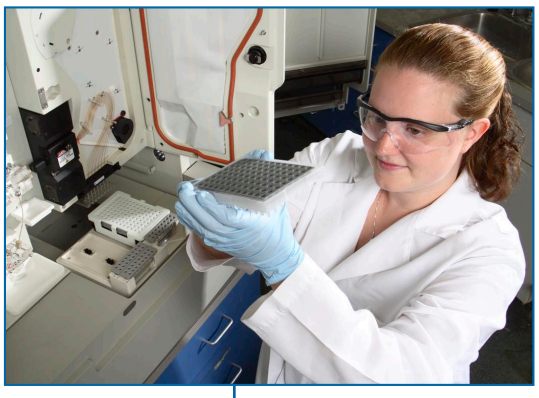


In addition we offer a range of other relationship testing such as sibling testing, twin testing and maternity testing. Complex relationship testing can also be performed upon consulation with the client.

We offer two types of analyses: An at home test and an in-laboratory test. An at home test, as the name suggests, can be sample collected in the privacy of your own home. Upon receipt of payment we send you a sampling kit along with an illustrated step-by step guide to collecting a sample, and a paid return envelope. Because the sample is not taken by a neutral third party and because sample handling cannot be verified, the chain of custody for these samples is not typically considered intact and these results should not be considered suitable for use in court of law.

In contrast, our In-laboratory test includes careful documentation of the chain of custody that would be required in court of law. To meet this requirement RPC forensic analysts perform sample collection and verify the identity of individuals providing samples.

Our strict adherence to client confidentiality means we release the result of our analysis to only people you specify. Further, all samples submitted for testing are destroyed one month after release of final report.



**RPC analyst, Sherry Binette,
prepares to load DNA samples into the ABI genetic analyser.**

TECHNOLOGY • corner

Species identification by mitochondrial DNA testing

Our species identification is based on analysis of DNA present in the cells of all living things. For this specific analysis we study a small region of the mitochondrial genome. This DNA is highly conserved within species yet shows variation between species. By determining the sequence of this region in our sample and comparing the sequence to those in a database we can determine the identity of the sample in question. Because there are many more copies of the mitochondrial genome than the nuclear genome, this technique is very sensitive and can be used on degraded samples or trace amounts of material. The process can generally be completed in 24-48 hours and is as follows:

1. DNA is extracted from the sample submitted for analysis. The DNA extraction process may be modified to suit the type of sample (cooked meat, blood, bone, etc) submitted.

2. Extracted DNA is subjected to amplification using short stretches of DNA specific to a region in the mitochondrial genome using PCR (polymerase chain reaction).

3. Amplified DNA is checked using gel electrophoresis to confirm its size and purity.

4. The DNA is then sequenced.

5. The sequence is compared to a database containing sequences from many different animals and an identification is made.