

## Quantifiler™ Human Identification Kit helps to speed up and simplify DNA testing procedures at the Technical & Scientific Police Force Laboratory, Toulouse.

### Application:

- Human Identification

### Applied Biosystems Technology:

- Quantifiler™ Human Identification Kit
- ABI PRISM® 7000 Sequence Detection System
- ABI PRISM® 3100 Genetic Analyzer
- AmpFℓSTR® PCR Kits

Until the early 20th Century, forensic science was little more than an unregulated system, which involved obtaining scientific assistance from experienced individuals during the course of their work. There were no dedicated laboratories or departments to perform testing and it was very difficult to know whom to approach. There were many calls for dedicated forensic laboratories to serve only the police force and it was France who took the vital step of setting up the World's first forensic laboratory in Lyon in 1910, although it took another five years before the rest of Europe began to follow suit.

France's forensic service has expanded considerably since then and, today, forensic investigations are the responsibility of the Criminal Investigation Department (CID) and, to a lesser extent, the National Gendarmerie, which operates a laboratory in Rosny-sous-Bois. In 1985, a special division of the CID was set up called the Technical and Scientific Police Force to unify all of the services the police force use in the course of its work. This division includes a central service laboratory that co-ordinates the activities of five DNA analysis laboratories (situated in Lille, Lyon, Marseille, Paris and Toulouse), implements new identity techniques and manages the large fingerprint, criminal process and searched person databases.

DNA analysis casework tends to be very similar in all forensic laboratories but caseload will vary according to the location and the regulations each country observes. Generally speaking though, caseloads are rising so having the right equipment to obtain optimum speed, accuracy and sample throughput is paramount. The Section Biologie of the Technical and Scientific Police Force has experienced first hand the difference the right equipment can make and has recently invested in a number of new Applied Biosystems instruments and reagent kits for DNA quantitation and sequencing.



Staff working in the laboratory.

Laurent Palet, Technical Manager in the Toulouse Laboratory, explained: “The laboratory performs a wide range of different forensic tests on over 2000 samples and references every month. These include enzyme activity assays for the detection of bodily fluids at crime scenes, extracting and quantitating DNA for analysing short tandem repeats (STR) and visualising comparisons of reference samples between victims and suspects. In addition we also analyse reference saliva samples for the French DNA database, the Fichier National Automatisé des Empreintes Génétiques (FNAEG).”

The laboratory has seen a ten-fold increase in the number of tests performed over the last year and keeping on top of this increased workload is imperative. Claire Chantrel, Technical Manager and Adjoint Chef de Section in the Toulouse Laboratory, explained how the new equipment has helped: “We switched to using Applied Biosystems’ Quantifiler™ kits in combination with the ABI PRISM® 7000 Sequence Detection System to speed up and simplify our testing procedures. Quantifiler kit allows us to quantify sample DNA much more quickly and easily than our previous method, which the analysts who perform the tests appreciate, and it has DNA standards that range from 23 pg/μl to 50 ng/μl, which means we can directly amplify our DNA dilutions rather than having to wait for the quantification results of a diluted DNA standard. In addition, Quantifiler kit allows us to easily detect PCR inhibitors so we can perform additional DNA purification steps before amplification, something which has significantly decreased our re-amplification rate.”

The laboratory has also experienced benefits in terms of sample throughput thanks to its ABI PRISM® 3100 Genetic Analyzer, which was purchased in 2003. “The system is very sensitive and, because it can run 16 samples at a time, we have been able to analyse a much greater number of samples than before. It would be impossible for us to achieve our current workload targets without using it.”

But it’s not just the right equipment that is important. Having strong relationships with instrument manufacturers is also vital for any forensic laboratory and the benefits are mutual. “Applied Biosystems lets us have information on new products that are in the pipeline and sometimes we evaluate new equipment and give feedback on any comments we have. For example, when we first began to work with the AmpFℓSTR® Identifiler® PCR Amplification Kit, we were able to talk to our Applied Biosystems application specialist about some PCR artefacts we had observed, such as a VIC® dye labelled artefact of about 120 bp and a PET® dye labelled artefact between the amelogenin and D5S818 locus. Because of the feedback received from us and other laboratories using the kit, Applied Biosystems was able to make minor alterations to both the test procedure and manufacturing process to overcome these artefacts.”



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