

THE ADVENTURE OF TRANSLATING AN RFLP DATABASE INTO CODIS STR FORMAT: STRATEGY, ORGANIZATION, COST, INTERNAL VALIDATION AND NEW MATCHES

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When RFLP technology was replaced by PCR-STR-based profiling in October 1999, our RFLP database became useless. Effective since July 2000, Canada Bill C-3 enables us to file unknown DNA profiles from unsolved cases into the Canadian National DNA database (CODIS based). We felt that we had a moral obligation to identify all unsolved RFLP cases and process critical samples using the CODIS core loci.

One major problem was that we were short-staffed and that the project initially involved reviewing 1178 cases to select hundreds of samples for re-processing. Under the supervision of a senior analyst, a technician who was removed from normal lab duties for health reasons, worked through our case register and RFLP database and drew up a list of cases for which RFLP analysis had been performed. Information about the nature of the crime, the police organization who had requested the analysis, the presence of an unknown DNA profile and whether or not a suspect had been identified was also retrieved. The technician then phoned or faxed 133 individual police organizations in the Province of Quebec, asking them to provide information about the solved or unsolved status of their cases.

Requests were sent into two batches. The first included 288 cases where no suspects were known to us. We expected a quick response with a high proportion of unsolved cases. Cases with suspects (approx. 890 cases) were dealt with a few months later. For the process of requests and the clerical management of replies, the technician was assisted by a part-time employee hired specifically for this purpose. Replies were received for 281 cases from the first series, of which 66% were unsolved and 721 cases from the second series which yielded a lower but still impressive number of unsolved cases (24%).

We then took advantage of the final-year project of two medical biology students who spent 15 weeks in the laboratory. (Both had received basic training in DNA technology during their studies). Following a six-week training period, the students amplified selected DNA samples (for which separate aliquots had been prepared by experienced technicians). They also ran gels on 377 Sequencers and performed computer analysis, including raw data printouts. Two analysts were responsible for prior screening of the case files identified in the replies, selection of appropriate samples for PCR, providing training and supervision as well as data interpretation.

Profiles meeting the requirements (360) are currently being submitted to the forensic index of the Canadian National DNA Database. This project, initiated in fall of 1999, is almost completed with matches between old cases and contemporary ones already identified. This presentation will focus on the detailed management of the project, including cost efficiency and the extensive quality control procedures that were an integral part of the work at every stage.