SUCCESS OF THE BREAK AND ENTER DNA PROCESSING UNIT (BEDPU)

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Convicted Offender DNA databases remain an effective crime fighting tool, with several DNA databases around the world adopting an automated approach for processing DNA samples. In June 2000, the National DNA Data Bank (NDDB) of Canada established a convicted offender (CO) database combining FTA® technology , liquid handling robotic workstations and a sophisticated Sample Tracking and Control System (STaCS™). After 5 years of operations, well over 81,000 convicted offender profiles have been entered in the Convicted Offender Index (COI), and over 22,000 crime scene samples have been entered in the Crime Scene Index (CSI) by the Royal Canadian Mounted Police (RCMP) forensic laboratories and provincial laboratories of Ontario and Québec. The NDDB has been successful in assisting law enforcement agencies throughout Canada by matching well over 3,600 convicted offenders to unsolved crimes and linking over 460 crime scene samples. Through innovation and technical expertise, the NDDB, in cooperation with the Case Receipt Unit (CRU), the Evidence Recovery Unit (ERU) and Biology Operations of the RCMP, took on the challenge of expanding its automated DNA processing capabilities to include high volume casework i.e. non-suspect Break & Enter (B&E) cases. The objective was to process non-suspect B&E samples in a high throughput manner in order to populate the CSI. The B&E samples are extracted using magnetic bead technology (DNA IQ™ system) and a TECAN GENESIS RSP 150 robot. The extraction procedure developed by the RCMP was optimized to enhance lysis and DNA binding to enable the processing of all types of B&E samples. Once extracted, the B&E samples are quantitated using Quantifiler™ and amplified using AmpFlSTR Profiler Plus™. The entire DNA typing process is integrated with STaCS™. Since the establishment of BEDPU in 2004, over 1000 cases have been submitted to the unit and over 1600 samples have been processed. Not all samples yielded sufficient DNA for typing by BEDPU. In fact, over 300 samples yielded no DNA and roughly 400 yielded insufficient DNA according to BEDPU's guidelines. Over 60 profiles were mixtures or partial profiles and deemed unsuitable for interpretation by BEDPU and inclusion in the CSI, whereas over 40 samples required some re-analysis. Over 700 single source profiles have been uploaded to CODIS. To date, 18% of the B&E cases processed have been matched to convicted offenders, assisting in the continuing investigations of these case files. In addition, B&E profiles have been found to match other crime scenes samples 26% of the time. Furthermore, over 70 B&E cases have been linked to more serious crimes such as murder, attempted murder, robbery, and sexual assault. With forensic laboratories experiencing high case loads, the use of automation to process high volume casework, as well as routine casework, is inevitably on the horizon for many forensic laboratories. The success of NDDB and BEDPU can only help to influence the future direction of DNA casework analysis in Canada.