DNA IDENTIFICATION OF VICTIMS OF THE MASS DISASTERS IN LAC MÉGANTIC AND ISLE VERTE, QUÉBEC

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Attendees will learn about the DNA typing operational process used for the identification of the victims of the Lac Mégantic and Isle Verte disasters. DNA testing, as well as other identification methods, is a part of the DVI (Disaster Victim Identification) program.
In the last twelve months, two mass disasters struck the Province of Québec making respectively 47 and 32 casualties.

On the night of July 6th 2013, a train consisting of five locomotives and 72 tanker cars filled with 7.2 million liters of light crude oil, proceeding from North Dakota to an Oil refinery in Saint John, New Brunswick, derailed in the middle of a small town of the eastern townships called Lac-Mégantic. Most of the downtown area was flooded with crude oil and destroyed by the subsequent explosions and fires that burned for the next 40 hours. It was not until then that the site could be accessed by crime scene investigators and Laboratory personnel. Weather conditions with temperature in the mid 100s made the victims recovery effort challenging.
The second event occurred in the night of January 23rd, 2014, with outside temperature reaching -30F. That night, a fire destroyed a seniors home and 32 residents perished. Harsh weather conditions and the several inches of ice that had formed during the firefighting effort again made victims recovery challenging.

Joint efforts by the *Sûreté du Québec* (Provincial Police), Quebec coroner's office and the *Laboratoire de sciences judiciaires et de médecine légale* (LSJML, Québec's Public Forensic Laboratory) were deployed for missing persons investigations and victims recovery and identification.

The bodies recovered from the scenes of these disasters were severely burned, fragmented and commingled. Some of the victims were also family related. As a result, the DNA identification process used by the Biology Department of the LSJML was tested on multiple levels. The urgency of the situation forced us to adapt our procedures. A task group composed of Forensic Biologists experienced in human remain identifications and/or statistics, and CODIS administrators was rapidly put in place. Our local databank, the pedigree manager module of CODIS 7, the Famillias software and an evolutive statistical approach were used to identify the remains with a high degree of certainty. The final DNA identification was done by indirect (next of kin) and also direct means (personal object), except in cases where the house and belongings of a victim were completely destroyed by the fire. Another challenge faced was the parallel processing of our regular forensic cases that was never interrupted. Team work proved to be an essential asset.

In the case of the Lac Mégantic tragedy, three weeks after the first sample arrived at the LSJML, 39 identifications had been completed, 36 of which confirmed by nuclear DNA. As for the Isle Verte tragedy, within 10 days, 28 identifications had been completed, 26 of which confirmed by nuclear DNA.