Bullet 'fingerprints' to help solve crimes



Criminals don't just have to worry about their own fingerprints these days: because of a young forensic scientist at The University of Western Australia, they should also be very concerned about their bullets' unique 'fingerprints'.

Anna Bradley (29) of Como is undertaking the world's largest bullet lead study, building on research the FBI started when US President John F. Kennedy was assassinated in 1963.

"Around 20 per cent of homicides and armed robberies in Australia involve the use of a gun," she said. "But if the firearm is not recovered or the bullet is fragmented, this can make things tricky for the physical examination. If a bullet from a crime scene can be 'fingerprinted', which means determining its elemental composition, then it can be compared to the composition of ammunition found in the suspect's car or house or in a recovered firearm."

Anna, who is studying at UWA's Centre for Forensic Science, is soon to submit her PhD in which she shows that by being able to determine up to 19 trace elements found in bullet lead - including arsenic, gold and mercury - she can trace a bullet back to its batch of origin, no matter where it was manufactured or where the lead was sourced. After shooting slaughtered pigs' heads with different ammunition, x-raying the skulls, extracting the lead shot and bullet fragments, Anna was able to match the extracted samples to their unique production batch with 97 per cent accuracy.

The FBI only determined seven elements present in bullet lead and dropped the practice of compositional analysis in 2005 because it lacked robustness - but Anna's improvements to bullet lead provenancing may see them adopt her methods.

Anna enlisted the help of two Australian ammunition manufacturers - one big, one small, each with different ways of making bullets - to test her hypothesis and found that the elemental signature of bullets remains unchanged throughout the manufacturing process. She also collaborated with the Western Australia Police Service who provided reference ammunition to build up a data base of different bullets.

"The ammunition I was most excited about analysing was three boxes of unopened military cartridges from 1942, wrapped in twine and date-stamped. We found they had many similarities with modern ammunition, not surprisingly, as bullets are often made from recycled lead."

Anna knew she wanted to be a forensic scientist when, at 15 and living in a small New Zealand town, she and her twin sister Sarah would spend time in the town library after school. "Sarah read the teen romances and I read about serial killers - who they were, how they were caught. I didn't really study chemistry at

high school but at Uni I discovered I was quite good at it - and decided to come to UWA to do a Masters and PhD in forensic science."

Provided by University of Western Australia

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