

Kansas Bureau of Investigation Begins Using STRmix to Interpret DNA Evidence

Sophisticated forensic software which is capable of resolving mixed or degraded DNA profiles will be used for scientific testing of crime scene evidence.

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STRmix™ Co-Developer John Buckleton DSc, FRSNZ

Bureau of Investigation (KBI) has begun using STRmix™ – sophisticated [forensic software](#) capable of resolving mixed [DNA profiles](#) that previously were regarded as too complex or degraded to interpret – in its scientific testing of [crime scene evidence](#).

The KBI provides professional investigative, laboratory, and criminal justice information services to criminal justice agencies throughout Kansas to promote public safety and prevent crime. With over 300 employees, the KBI is headquartered in Topeka, has offices in Wichita, Great Bend, Lenexa, Pittsburg, and Garden City, and laboratories

in Topeka, Great Bend, Kansas City, and Pittsburg.

With the addition of the KBI, STRmix™ is now being used in 100 forensic laboratories worldwide, including 74 in the U.S. (including those operated by the FBI and the Federal Bureau of Alcohol, Tobacco, Firearms and Explosives), all nine state and territory forensic laboratories in New Zealand and Australia, and 17 forensic labs in Europe, the United Kingdom, Asia, the Middle East, Canada, and the Caribbean.

Since its introduction a decade ago, STRmix™ has established a highly successful track record of producing usable, interpretable, and legally admissible DNA evidence in more than 380,000 cases. That includes more than 210,000 cases in North America, 30,000 in Europe and the United Kingdom, and 135,000 in Australasia.

“STRmix™ has proven to be particularly effective in resolving violent crime and sexual assault cases, as well as cold cases in which evidence originally dismissed as inconclusive was able to be reexamined,” notes John Buckleton DSc, FRSNZ, Principal Scientist at the New Zealand Institute of Environmental Science and Research (ESR) and one of the developers of STRmix™.

Dr. Buckleton explains that STRmix™ works by assessing how closely multitudes of proposed DNA profiles resemble or can explain an observed DNA mixture, relying on proven methodologies routinely used in computational biology, physics, engineering, and weather prediction.

“The probability of the observed DNA evidence can be calculated by assuming the DNA originated from either a person of interest or an unknown donor,” says Dr. Buckleton. “These two probabilities can then be presented as a likelihood ratio (LR), inferring the value of the findings and level of support for one proposition over the other.”

The latest version of STRmix™ was introduced in fall 2021. STRmix™ v2.9 contains such new features as a batch maker mode, which allows multiple interpretations to occur simultaneously and database search templates; memory usage improvements, which are important in dealing with higher order DNA profile mixtures; and biological modelling calculation upgrades, designed to improve stutter peak modelling.

The team behind the development of STRmix™ has also launched two related products which, in combination with STRmix™, complete the full workflow from analysis to interpretation and database matching: DBLR™, an application which allows forensic labs to undertake superfast database searches, visualize the value of DNA mixture evidence, and carry out mixture-to-mixture matches, allowing kinship analysis; and FaSTR™ DNA, expert forensic software which rapidly analyzes raw DNA data generated by genetic analyzers and standard profiling kits, and assigns a number of contributors (NoC) estimate.

For more information about STRmix™, visit <http://www.strmix.com>.

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