

THE SPECIES IDENTITY “MEGAPLEX” FOR IDENTIFICATION OF UNKNOWN BIOLOGICAL MATERIAL IN FORENSIC CASE WORK

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Establishing that the species of origin is human is the first important step in the process of analysing DNA encountered at a crime scene. If the sample is not of human origin, it is often a difficult and complex process to establish the species contributing the DNA. The MegaPlex kit consists of a Short Tandem Repeat (STR) genotyping panel as a tool to identify species of origin in samples tested in forensic casework. Fifteen species specific STR microsatellite markers have been multiplexed into a single PCR reaction to detect DNA from Human and 6 domestic animal species. The non human species detected are Bovine, Canine, Equine, Feline, Ovine and Swine.

The markers were carefully selected based on polymorphic content, lack of cross-reactivity and size compatibility. A sex identifying marker was included for the species where information was available. The markers were labelled with fluorescent dyes (6FAM, VIC, NED, PET) to produce genotyping profiles easily analysed on an ABI 3130-xl Genetic Analyser. This species identity “MegaPlex” has been validated utilizing 50 DNA samples from each species as well as DNA mixtures constructed in-house with sensitivity as low as 1ng. We have successfully used the MegaPlex in 7 forensic cases where the source of the DNA was in question. We report the use of this panel in a dog attack, meat substitution and environmental contamination case.

The use of a pre-screening panel for species identification provides crucial information in forensic casework scenarios involving both human and potential non human DNA. The panel provides important information on which to base further analysis while reducing test costs associated with performing potentially uninformative tests. The MegaPlex has been shown to be a highly discriminating, reliable, reproducible and sensitive panel for species identification.