

## UNUSUAL PARENTAGE AND HUMAN IDENTIFICATION CASES

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This report details some parentage or kinship cases performed on unusual samples or in unusual circumstances.

Case #1: A variety of techniques sometimes are needed to answer questions of biological relatedness.

Y-chromosome analysis was critical in the following rape case, where standard STR analysis was not sufficient. A product of conception (from a rape case) yielded a mixture in which the STR analysis was inconclusive. Y-chromosome analysis of this sample, using Y-PLEX™6 gave results in 5 of the 6 loci tested, and was consistent with the suspect.

Case #2: This is a kinship analysis case attempting to determine paternity without any known relatives of the deceased alleged father. In this case, four mothers claimed to have had children by the same man, a wealthy and well known recently deceased individual. No known relatives of the deceased or a sample from the deceased were available for testing. A set of coded mother/child pair samples together with some additional mother/child pair samples were submitted to determine which of the children are possible biological half brothers. A clear result was obtained identifying the half siblings and their paternity was confirmed by obtaining a sample from the mother of the deceased alleged father.

Case #3: In a politically sensitive and very high profile case, mitochondrial DNA analysis was used to identify remains by establishing a maternal family relationship. We were asked to analyze remains found in Panama believed to be those of Father Gallego, a missionary who disappeared in 1971 during the military regime of Manuel Noriega. Mitochondrial DNA analysis of the remains linked them not to Father Gallego, but to his assistant.

Case #4: A tissue sample tested from a product of conception resulting from a rape was submitted to our laboratory. STR results were a mixture, the minor component consistent with the victim. The major component was homozygous at all loci, with the single allele matching one of the suspect's alleles at each locus. The product of conception was a hydatidiform mole, in which a single sperm fertilizes an egg lacking a nucleus, resulting in tissue containing only sperm donor DNA.

Case #5: A standard paternity case performed by RFLP analysis, indicated that the tested man was not excluded as the biological father of the child. The tested man claimed that he could not have fathered the child, because the child had sickle cell anemia and he was not a sickle cell carrier. Medical testing revealed that the alleged father was a carrier for another hemoglobin disorder, B-thalassemia. This genetic mutation at one allele, in combination with the sickle cell gene at the other allele, can result in sickle cell anemia medically indistinguishable from that caused by two copies of the sickle cell gene.

Details of DNA test results and paternity index calculations of some of the unusual cases will be presented.