

Press Release

Eurofins' Scientists Discover Genetic Differences Between "Identical" Twins

Eurofins' Genomics and Forensics laboratories develop first twin DNA test for forensic and paternity testing.

Ebersberg, Germany, December 10, 2013 - Eurofins Scientific (EUFI.PA), a European leader in Genomics Services, Forensics and Paternity Testing, announces a milestone in genetic and forensic research. A multidisciplinary Eurofins team in the Eurofins flagship Genomics laboratory in Ebersberg, Germany, has successfully completed a research project to genetically discriminate "identical" monozygotic twins.

So far there have been only theoretical considerations against the experimental finding and dogma that monozygotic twins are genetically fully identical. Statistically, around 6 of 1,000 males are identical twins. Up to now, forensic DNA fingerprinting testing could not be used in crime or paternity cases involving identical twins, as there was no possibility of genetically discriminating between them. Such cases are regularly discussed in the World's press, including murder, child custody and heritage cases.

Forensic laboratories around the world had accepted these analytical restrictions, but Eurofins scientists wanted to push these limits of DNA testing. They used the unique combination of leading forensics and genomics labs available at Eurofins to reach this milestone.

Technically, the Eurofins scientists applied Eurofins' ultra-deep next generation sequencing and associated bioinformatics techniques. They sequenced DNA from sperm samples of two twins and from a blood sample of the child of one twin. Bioinformatics analysis revealed five mutations, so called Single Nucleotide Polymorphisms (SNPs) present in the twin father and the child, but not in the twin uncle. The SNPs were confirmed by classical Sanger sequencing. The results give experimental evidence for the hypothesis that rare mutations will occur early after or before the human blastocyst has split into two, the origin of twins, and that such mutations will be carried on into somatic tissue and the germ line.

The genetic differences found and the method used provide a solution to solve forensic and paternity cases involving monozygotic twins as originator of DNA traces in crime, or as alleged fathers. Eurofins is the first to offer such a test.

The peer-reviewed study “Finding the needle in the haystack: Differentiating “identical” twins in paternity testing and forensics by ultra-deep next generation sequencing” is published in the renowned journal *Forensic Science International: Genetics*, Available online 8 November 2013, ISSN 1872-4973, <http://dx.doi.org/10.1016/j.fsigen.2013.10.015>.

Bruno Poddevin, Senior Vice-President of the Genomic Services division and head of the Forensics laboratory at Eurofins, comments: “Eurofins scientists are the first to proof that monozygotic twins are genetically not absolutely identical. As the only provider worldwide Eurofins can now offer DNA forensic and paternity testing to discriminate identical twins to authorities, courts and individuals. Our leading genomic and forensic services team has provided the basis for reaching this milestone. As the first provider of next generation sequencing services in Europe, Eurofins also has proprietary, long expertise in the professional handling and analysis of the enormous amount of data involved in such a project. The dataset in this project equaled a total of 241 human genomes, resulting from up to 94 fold genomic coverage of the involved three individuals.

The Eurofins “Twin Test” is available at all laboratories of the Eurofins Genomics and Eurofins Genetics Division. The test will be performed at the Eurofins DNA Campus in Ebersberg, at the laboratories of Eurofins MWG Operon and Eurofins Forensics.

About Eurofins MWG Operon

Eurofins MWG Operon, a member of the Eurofins Group with facilities in Europe, the United States and Asia, is an internationally leading provider of DNA sequencing services, genotyping services, DNA synthesis products and bioinformatics services for academic and industrial research and applications. As one of the first service providers for next generation sequencing, Eurofins MWG Operon has established profound know-how and proprietary protocols to cover a broad range of applications. The company’s strength is its strong customer orientation, fast service and high quality. For further information, please visit our website at eurofinsgenomics.com.

About Eurofins Forensics

Eurofins Forensics, a member of the Eurofins Group, is an internationally leading provider of DNA forensic and paternity testing services for the police forces, the legal system and for industry and private clients. The tight integration with Eurofins MWG Operon enables Eurofins Forensics to offer innovative technologies and comprehensive marker sets to efficiently solve even challenging DNA forensic and relationship testing tasks. Eurofins Forensics is ISO 17025 accredited and part of the international Eurofins’ network of forensic DNA and toxicology laboratories. For further information, please visit our websites at eurofins-forensics.com.

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