



B137 Faux-Dis: An Online, Searchable DNA Database Available for Educational Purposes

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After attending this presentation, attendees will better understand a novel, publicly available educational tool.

This presentation will impact the forensic science community by introducing a powerful research and teaching tool.

The United States national DNA database, Combined DNA Index System (CODIS), contains more than ten million genetic profiles originating from convicted offenders, missing persons, and crime scene evidence and is searchable only by authorized governmental agencies. Due to the private nature of the data it contains, educators do not have access to this powerful database for teaching purposes. Therefore, there is currently a lack of a searchable human DNA profile databases available for use in the research laboratory or in the classroom. If it were available, such a database could be a valuable tool in the analysis of large data sets, for use in forensic laboratory exercises, and in answering questions about population genetics. Therefore, the development of a searchable DNA database modeled after CODIS that can be used by educators nationwide was initiated. Called Faux-Dis, it will allow students to gain hands-on experience and knowledge in the manipulation of large data sets, and it would support calculations in population genetics problems. The development of this database is a beneficial contribution to the field of forensic science because it has the potential to foster a nationwide collaboration and can be used for graduate and undergraduate education and training.

To initiate this project, human biological DNA samples containing buccal epithelial cells were collected from donors using a sterile cotton swab. DNA was isolated and purified using an organic extraction. Each sample was then quantified using the Qubit® fluorometer. The multiplex Polymerase Chain Reaction (PCR) PowerPlex® 16 was used to amplify the DNA at 16 loci, which were targeted by specific, fluorescently labeled primers. The PCR products were run through capillary electrophoresis on the 3130 Genetic Analyzer to generate a DNA profile. This profile was visualized as a plot of Relative Fluorescent Units (RFU) against size in base pairs (bp) for each of the 16 regions (loci) amplified by PCR. Each locus has two alleles, giving either one or two peaks. The size in bp determines which alleles are present. Each allele can be determined by comparing to an allelic ladder, thus allowing the profile to be genotyped. The generated profiles were entered into the database.

To date, a standard workflow for processing samples has been established and 100 profiles have been added to the database. In the future, the database will be transferred to an online searchable format, and collaborators from other universities and colleges will be invited to submit samples for analysis to form a large consortium of participants.

CODIS, Database, Education