The Evolution of DNA Databases: Expansion, Familial Search, and the Need for Reform

By Michael Seringhaus

Every human on earth – with the exception of identical twins – carries unique genetic material. Although the vast majority of this material, called the genome, is shared by all people, about 15 million nucleotides are not. It is this tiny fraction of divergent genetic material that makes forensic DNA analysis possible. The Federal Bureau of Investigation (FBI) Combined DNA Index System (CODIS) has been fully operational for just over a decade, built upon a set of just 13 genetic markers from a certain class of convicted felons. Very recently, this system of DNA databases has grown to include arrestees not convicted of any crime, and also to allow familial DNA searching: A type of partial-stringency matching designed to return close relatives of individuals profiled in the database. Through this ambitious expansion, the FBI may already have overstepped its legal authorization for the database: A once-solid Fourth Amendment justification that authorizes compulsory DNA collection based upon offenders' diminished expectation of privacy. This presentation summarizes the scientific and legal foundations for CODIS, examines the aforementioned developments, details other challenges to CODIS including racial bias, advances in phenotypic profiling and the related issue of sample retention, and argues both for an immediate expansion in CODIS markers, and more generally for a sample-free, records-only universal DNA database.