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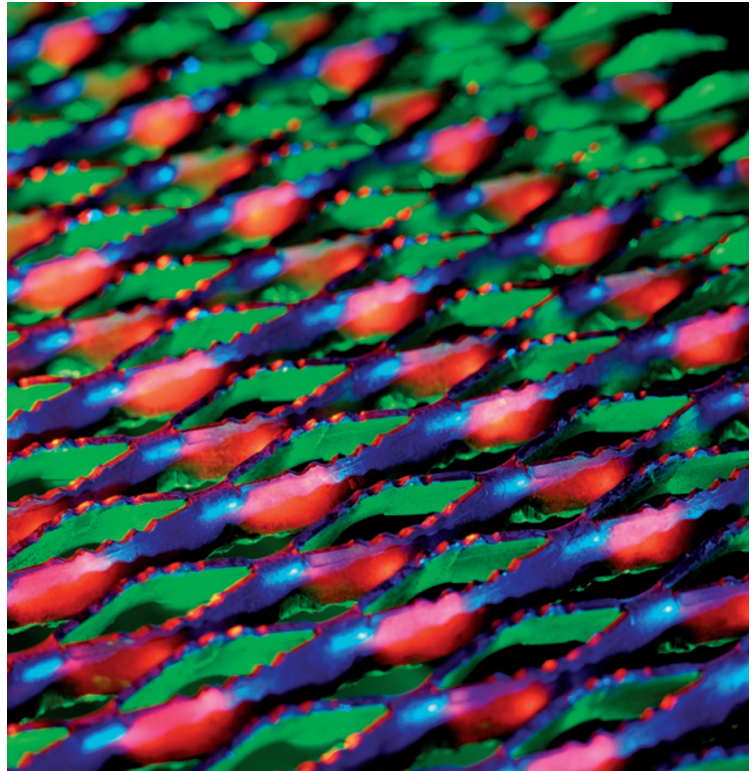
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# A repeat success

Following the discovery of the DNA structure in the 1950s, attention gradually shifted to the next big thing: finding those parts of the human genome that differed between individuals. In 1985, Alec Jeffreys, Victoria Wilson and Swee Lay Thein described a highly variable segment of DNA that would help in this quest: the minisatellite. This was not only a sensitive tool for human and other genetic studies but it also had applications in person identification, which opened it up for use in paternity analysis, immigration disputes and forensic science.

Molecular markers were already being used in linkage studies, for example, and in antenatal diagnosis. Yet the variability of these at-best dimorphic markers — made of DNA segments with variable length that were created by endonucleases — would not stretch to give the resolution needed to distinguish individuals easily.

In 1984, a tandemly arranged 33 base-pair sequence had been detected in an intron of the human *myoglobin* gene; the basis of the 1985 paper was the realization that a probe derived from this kind of repeat could pick up many variable-length segments in the genome simply by Southern blotting. Because of their repeated nature such sequences, or minisatellites, are prone to expansion and contraction, and so each locus can vary among individuals. Each



minisatellite has a 'core' motif of 6–100 base pairs: if more than one core sequence was used then a 'profile' or 'fingerprint' of an individual could be obtained that was, in effect, unique — as the paper reported, this allowed even close relatives to be unambiguously identified.

The authors were aware of the wide potential applications of 'DNA fingerprinting', although it is unlikely that they had predicted its runaway success in fields ranging from conservation biology to forensics. Minisatellites made their first appearance in court that same year, in an immigration dispute over the identity of a young boy returning to the UK from Ghana. Minisatellite profiling of the boy's alleged mother and three

siblings confirmed the relationship claim made by the defence, and he was granted permission to remain in the country.

Today, DNA fingerprinting is alive and well; if anything, it has grown in recognition. However, the name is one of the few things that have been preserved, given the large changes to the field brought about by new markers and technologies — not least the invention of PCR.

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**ORIGINAL RESEARCH PAPERS** Jeffreys, A. J., Wilson, V. & Thein, S. L. Hypervariable 'minisatellite' regions in human DNA. *Nature* **314**, 67–73 (1985) | Jeffreys, A. J., Brookfield, J. F. & Semeonoff, R. Positive identification of an immigration test-case using human DNA fingerprints. *Nature* **317**, 818–819 (1985)