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## Area of Freedom, Security and Justice and Forensic Science

Tim J Wilson and Sophie Carr

A major success within the Area of Freedom, Security and Justice has been the enhancement of forensic science's contribution to criminal justice and security. This is seen very clearly in faster and more efficient forensic biometric information sharing within what a leading MP has described as the EU 'system' for international criminal justice and security cooperation (Neil, 2017). AFSJ initiatives have not equalled the scale and reach - particularly in research - of US government and bioscience commercial activity (Wilson, 2016). EU membership, however, has critically counterbalanced the neglect of forensic science by successive UK governments. Involvement in AFSJ funded projects has reduced the risk of professional isolation for British experts and protected earlier public investment in forensic bioinformation, especially DNA databases. The benefits of AFSJ participation extend beyond cross-border crime and offending (Wilson, 2015), with improvements also in the probative power of forensic sciences in British criminal proceedings and anti-terrorist/security activities that lack an international dimension.

Successful EU achievements in this domain reflect the power to pool -through comitologically managed implementation processes - the problem solving capabilities of member states and institutions (Wilson, 2018). This overcomes 'cooperation asymmetry': '... governments remain extremely reluctant to cooperate on security matters ..., terrorists have cooperated in networks since the onset of modern day terrorism ...' (Sandler, 2006). The algorithmically-enabled comparison of huge volumes of scientifically standardised data has commoditised forensic biometric cooperation. Such transformations have enhanced public protection through increased effectiveness and with greater efficiency (Wilson, 2016), for example, at approximately €27 for each Dutch international forensic DNA match (Taverne and Broeders, 2015).

For reliable, speedy, large-scale and efficient forensic biometric cooperation, there is no alternative post-Brexit to seeking continued access to the AFSJ system. This can be seen from comparisons of the scale of forensic biometric data sharing possible through the EU and Interpol systems (Soleto Muñoz and Fiodorova, 2014 and Wilson, 2016). The huge differences such comparisons reveal not only reflect technical choices and project delivery capabilities. Strong national control over data under EU criminal law, confidence in EU data protection law, a tendency to search for information within the EU/Schengen area first and above all mutual trust between member states, compared with the context in which the Interpol system operates, all account for the comparatively greater success of the AFSJ system for sharing DNA data (Soleto Muñoz and Fiodorova, 2014). Particularly with the emphasis on the Charter of Fundamental Rights and the Court of Justice (CJEU) within the EU 'system', it can be seen why the Prime Minister's 'red lines' on these aspects of the *acquis* were questioned early in the Brexit process (Commons Justice Committee, 2017b).

Sharing information is only the beginning of the story. The results of the comparative analysis have to be scientifically valid and interpreted accurately within a context determined by the totality of the evidence in any particular criminal case.

The first objective can be achieved both more reliably and cost-effectively through scientific standardisation. Over the last decade great strides have been made in forensic DNA multiplex convergence. The analysis (via multiplex kits) of only a few loci (markers) from the human genome

can determine whether cellular material recovered from a crime scene matches reference material donated by a known individual ('source attribution'). The UK, as a major partner in the EU funded research and an influential innovator in this process, benefited considerably from what became global convergence in selected multiplex loci (markers) (development through in effect a tri-continental process with parallel changes in the USA and China) towards this country's core biochemical standards (illustrated in Table 7.1).

[Table reset and IPR referenced by publisher]

The risk for the UK in this process was that new multiplex loci (markers) could have deviated significantly from the earlier UK loci selection. This would have made much of the data on its forensic DNA database increasingly obsolete for international cooperation purposes. The advantages for the UK – in terms of improving the discriminatory power of scientific results in investigations with no international dimensions - is that participation in EU sponsored multiplex research facilitated the introduction of multiplexes that improve scientific reliability when the recovered cellular material is either degraded or low in volume. The pending next generation of forensic DNA analysis will require the same EU and international co-operation.

The second objective (assessing probative value) can be much more challenging. This is because, contrary to traditional binary conceptions (e.g. a fingerprint analysis presented as an 'identification' or not), evidential reliability needs to be conceptualised within a continuum, particularly when scientific advances have enabled greater analysis of poor quality or quantity source material. Areas of questionable reliability may then be characterised as 'liminal zones': areas of transition where heightened scrutiny may be required. This is very much work in progress that requires further policy development to enhance evidential reliability, including devising standardised formats, assessments and terminology for expert reports and refining interpretational protocols (Carr et al., forthcoming). The forensic disciplines are international, universal adoption cannot be achieved by British forensic scientists working in isolation.

The UK pioneered the use of forensic bioinformation during the last century, implementing both fingerprint and DNA comparison methods. Mistakes during the marketization of forensic science (Wilson and Gallop, 2013) were compounded by deep cuts in funding, inadequate research and the failure to develop a national strategy for forensic science (House of Commons, 2011 and 2013). The increased fragility and fragmentation of the UK forensic science research and investigative capabilities (Wilson, Stockdale, Gallop and Lawler, 2014) have been partly counterbalanced by the active participation, including in multiplex research projects, by British forensic scientists in ENSFI (European Network of Forensic Science Institutions) (ENSFI) (Kjeldsen and Nueteboom, 2015). Many initiatives to improve forensic science begin within regular scientific fora such as the working groups of ENSFI, but professional implementation within national criminal justice systems often require support from Eurojust and Europol, and funding from the Commission. Thus, continued general access to AFSJ forensic science initiatives, is vital for the well-being and critical trust of forensic science in the UK, and its continued international role.

[All references consolidated for the entire publication.]