2nd EXCHANGE International Conference

Contemporary Challenges to Forensic Genetics in Society

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BOOK OF ABSTRACTS

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Ethical Aspects of Forensic DNA Databases and Technologies: The Portuguese Case
Cíntia Águas, Portuguese National Ethics Council for Life Sciences, Portugal

The ability to analyze DNA has been hailed by forensic science as the most significant advance since the introduction of fingerprint identification. The process of assembling, analysis and processing of biological traces has become an essential part of processing crime scenes. The organization of information obtained in national databases has dramatically changed criminal investigation strategies, being prevailing in the identification of victims or the conviction or exoneration of suspects and, in the context of civil identification, the necessary identification in case of mass accidents or natural disasters.

As in other countries, the creation in Portugal of a Database of DNA Profiles for the criminal investigation purposes and civil identification, in the fulfillment of international commitments, was preceded by a reflection that demanded from the outset the need to balance the rights of the individual and the interests of society, namely on the adequacy and proportionality of the proposed goals in relation to the benefits effectively collected by the citizens, taking into account the allocation of the necessary resources for their constitution and sustenance.

Aspects such as privacy, dignity, the right to health and physical and moral integrity, presumption of innocence, autonomy, non-discrimination, confidence in the proper use of technologies, are confronted with objectives of reinforcing the security of citizens and increasingly effective contribution to combating crime, not only in national territory, but also in the face of the global threats such as organized crime and international terrorism.

Cíntia Águas graduated in Law from the Faculty of Law of the University of Coimbra, researcher and PhD student in Bioethics by the Bioethics Institute of the Portuguese Catholic University. Member of the Ethics Committee of the School of Health of the Portuguese Red Cross and of the Group of Ethical Reflection of the Portuguese Association of Palliative Care, among others. She is the author of publications and communications in the areas of ethics and citizenship, genetic databases and biobanks, ethical aspects of new technologies and problems of beginning and end of life. She is Executive Secretary of the National Council of Ethics for Life Sciences.
Genetic evidence: Evaluation and communication in the genomic era
António Amorim, University of Porto, Portugal

The statistical evaluation of classical genetic evidence (i.e., based upon a limited amount of DNA markers) is currently consensual for all conceivable forensic problems, from identification to complex kinship situations, and scientifically accepted standards or guidelines have been put forward. However this progress has not been accompanied by an equally satisfactory advance at the level of the communication of the genetic results, where some misunderstandings and fallacious interpretations persist. We alert for the new problems arising from the recent technological developments promising a flurry of genetic data that will revolutionize forensic genetics. We argue that (even considered as solved all ethical, economic, data quality, and technical validation problems, including mathematical, statistical and computational, some of which may be removed in the future, while others are to stay), the state of the art of population genetics theory is inadequate to deal with the forensic use of individual complete genomes. In consequence, in order to keep the compliance with the established standards, as they refer to both the quality and reproducibility of results as well as the way of statistically evaluating and reporting the results, it may be wiser to improve the already established approaches to a limited, amount of validated, ethically admissible genetic markers, amenable to a consensual biostatistical handling and reporting.

Sample collection and insertion and preservation of DNA profiles of convicted individuals

Maria João Antunes, Supervisory Board of the Portuguese DNA Database, Portugal

1. The collection of a defendant sample convicted in a sentence or security measure.


2. The insertion and preservation of the condemned’s DNA profile in sentence or security measure.


3. Competences of the Supervisory Board of the database of DNA profiles - Article 2 of Law No. 40/2013, of June 25.

Maria João da Silva Baila Madeira Antunes holds a Degree from the Law Faculty of the University of Coimbra and PhD in Juridical-Criminal Sciences from the Faculty of Law of the University of Coimbra. She is Associate Professor, Faculty of Law, University of Coimbra and the Coordinator of the Post-Doctoral Course of the Legal Institute of the Faculty of Law of the University of Coimbra. She is the appointed Chairman of the DNA Profile Database Surveillance Board, Member of the Superior Council of the Public Prosecution Service, Member of the General Council of the Center for Judicial Studies. Furthermore, she has been President of the Commission to monitor the implementation of the compulsory detention scheme between 1999 and 2002, Member of the Information Services Supervisory Board between 2000 and 2004, Judge of the Constitutional Court between October 2004 and March 2014, President of the Institute of Economic and European Criminal Law of the Faculty of Law of the University of Coimbra between January 2015 and January 2018. She has participated in legislative work in the areas of criminal law, criminal procedural law and mental health in Portugal, Macao and Angola. She is the author of books, chapters of books (national and foreign) and magazine articles (national and foreign).
DNA banks in humanitarian contexts: about mitochondrial geopolitics
Élisabeth Anstett, Centre National de la Recherche Scientifique, France

In contemporary post-genocide or mass violence contexts, DNA is now used as an essential tool for victim’s identification. In several countries concerned in the long run with mass exhumations or transitional justice processes (such as for example Bosnia, Argentina and more recently Spain), this has led to the creation of specific DNA banks. Storage spaces for DNA samples taken from exhumed human remains and living populations are indeed not referred to as “reserves”, “collections”, “archives” or “libraries”, but as “banks” that are, initially, the companies that make a business out of money. The creation in less than 20 years of several of these somewhat unusual “banks” invites us to reflect upon the strong ties between necro-economy and necro-politics or dead-governance (Mbembe, 2003, Stepputat 2014, Ferrandiz & Robben, 2015). These banks ask indeed essential questions on the political and geopolitical contexts in which they were created, as well as on their governmental versus non-governmental governance. The multiplication of DNA-banks in post-mass violence contexts raises more broadly crucial interrogations related to the very ownership of dead bodies or human body parts by an International Organization or a foreign States, suggesting that DNA collection, storage and control may also have directly to deal with the issues of political power and sovereignty for failed and week states (Schwartz-Marin & Restrepo 2013).

References
Elisabeth Anstett is a social anthropologist, senior tenured researcher at CNRS and member of Adès (Anthropologie bio-culturelle, Droit, Ethique et Santé), an interdisciplinary research unit at the medical faculty of Aix-Marseille University. Her research focuses on dead bodies management and care in mass violence contexts. She is co-editing the Human Remains and Violence book series and interdisciplinary journal at Manchester University Press.
International collaboration through ENFSI
Ingo Bastisch, Bundeskriminalamt, Germany

The European Network of Forensic Science Institutes (ENFSI) was founded as a platform to promote science, knowledge, quality and training by means of international cooperation and development of common scientific and quality standards. The DNA working group – one of several working groups within ENFSI – has been active in developing guidelines, recommendations and tools that are the foundation of commonly applied quality standards and European and international DNA data exchange. One of the latest projects, the EU funded project “Empowering forensic genetic DNA databases for the interpretation of next generation sequencing profiles (DNA.bases)” will be presented as an example in its relation to current forensic work practice and its value for the international forensic genetic community. It addresses the improvement and further development of two web-based platforms, EMPOP (https://empop.online) and STRidER (https://strider.online). The platforms host quality controlled international population databases for mitochondrial DNA (mtDNA) and short tandem repeats (STR) that are the backbone of forensic genetic casework. Both databases add value to forensic laboratories and as a consequence to the criminal justice system by providing data for evidence evaluation in a harmonized and transparent way taking into consideration latest developments and future needs.

Ingo Bastisch has been active in forensic genetics for two decades and currently holds the position of the director of the DNA laboratory at the Federal Criminal Police Office, BKA. He is an active member of several international working groups in that field. Besides his main task of running the laboratory he is interested in improving standards around quality, information sharing, interpretation and identification.
The Prüm system. Taking stock of over 10 years of transnational DNA data comparison and looking ahead

Kees van der Beek, Retired Custodian of the Dutch DNA database, The Netherlands

In 2005 the Treaty of Prüm was signed by Germany, Austria, Belgium, Luxembourg, the Netherlands, France and Spain. In 2008 the treaty was converted in EU legislation and hence became obligatory for all 28 EU countries. This presentation will show the present DNA implementation status of the Prüm operation, will show some interesting matches found in the Netherlands and will touch on issues which have to be kept in mind and/or need further attention to optimize the Prüm DNA operation.

Dr. Ir. C.P. (Kees) van der Beek is the retired custodian of the Dutch DNA database and leading scientist for DNA of the EU-Prum implementation working group (DAPIX). In this role he assisted the semi-annually changing chair of this group and the European Commission. He and his IT colleagues Mrs Margreet Kamp and Mr Marc Laman Trip also helped several European countries to become Prum operational for DNA.
The Database of DNA Profiles in Portugal
Ana Bento, Institute of Legal Medicine and Forensic Sciences, Portugal

The Law 5/2008 of 12 February established the creation of the database of DNA profiles in Portugal. Ten years after its creation it is important to appreciate its evolution, both in technical and legislative terms, a development that is accentuated by the amendments introduced by Law 90/2017 of 22 August.

It is intended to make known the internal structure of the database of DNA profiles, the connection to the entities involved as well as to other countries through the Prüm platform. It is also intended to present the operational status of the DNA profile database, through statistical data and to demonstrate how the Database can be an asset in supporting criminal investigation, both nationally and internationally, as well as in cases of civil identification.

Ana Margarida Bento holds a Master’s degree in Forensic Medicine and Forensic Sciences, Faculty of Medicine, University of Coimbra. She is Superior Specialist in Forensic Genetics and Forensic Biology of the Delegation of the Center of the National Institute of Forensic Medicine and Forensic Sciences since 2011. She is the co–coordinator of the database of DNA profiles at the National Institute of Forensic Medicine and Forensic Sciences since June 2018.
"Prüm Decisions" – technical, legal and operational aspects and governance

Georg Biekötter, Council of the European Union

The Council of the European Union adopted on 23 June 2008 "Council Decision 2008/615/JHA on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border crime" and "Council Decision 2008/616/JHA on the implementation of 2008/615/JHA ...". In doing so, the Council integrated the Prüm Treaty signed on 27 May 2005 in Prüm (DE) by seven Member States (BE, DE, FR, LU, NL, AT) into the EU legal framework by means of a Third Pillar Decision. The aim of the Prüm Decisions is to intensify and accelerate information exchange between national law enforcement authorities – making use of new technology and of a robust data protection regime. The very core is the automated exchange of DNA data, dactyloscopic data and vehicle registration data.

The Prüm hit / no hit system facilitates Member States’ searches on whether any other Member State, and if so, which, has the information needed for investigating purposes. The follow-up, that is supply of further personal data and other information following a hit, is governed by the law of the requested Member State. The basis of this exchange system are the principles of availability, reciprocity and equivalent access.

The Prüm rules are based on networking Member States’ national databases and no central database exists. Before a Member State may proceed to Prüm data exchange, the Council decides whether the relevant conditions are met. To that end, an evaluation visit is performed in each Member State for each data category. The Council takes the decision on the launch of data exchange on the basis of the positive outcome of such an evaluation and after having consulted the European Parliament. Once such a decision has entered into force, Member States connect bilaterally each other’s databases for search and comparison.

Epigenetic data can provide information about accelerated aging that can be useful in forensics

Wojciech Branicki, Jagiellonian University, Poland

Recent studies have proven DNA methylation to be an accurate estimator of chronological age and recognised its predictive potential in forensic intelligence investigations. The available DNA methylation age prediction tests have reported prediction error of ~3 to 7 years in blood. The differences are not only related to accuracy of the analytical method and the number of predictors included in a model but can also be associated with the specificity of the markers involved. It has been found that the observed divergence between chronological and epigenetic age has a clinical significance. The positive age acceleration has been associated with various age related conditions and diseases. The available results indicate that particular markers may be more sensitive to detect accelerated biological aging. Further studies will explain whether these differentially methylated regions can be informative about accelerated age-related changes in appearance traits. However, prediction of accelerated aging can potentially boost prediction accuracy of many externally visible characteristics and thus measuring age acceleration may have a forensic value. This may at the same time raise some ethical questions.

Wojciech Branicki is a professor at Jagiellonian University in Krakow and forensic expert with specialization in forensic genetics at Central Forensic Laboratory of the Police in Warsaw. W. Branicki is experienced in leading research projects and has a good record of publications in forensic genetics, especially in the field of DNA-based prediction of appearance traits and age estimation. He is a member of International Society for Forensic Genetics (a chairman of the ISFG Polish Speaking Working Group) and Polish Society of Human Genetics and Polish Society of Legal Medicine and Criminology.
Emerging technologies in Forensic Genetics: lessons learned from the past
Angel Carracedo, University of Santiago de Compostela, Spain

The history of forensic genetics is characterized by a continuous evolution in the type of genetic markers and methodologies looking always for a better efficacy in discrimination power and applications. In this evolution we have tried to move to markers as less informative as possible in terms of medical related data but even non-coding DNA is not completely neutral regarding this type of information. An error in the past was the wrong identification of coding and not coding DNA variation with informativeness that now affects in some countries the introduction of forensic DNA phenotyping. Ancestry testing is an emerging field being used in some countries that can also benefit from lessons learned from the past such as the theoretical developments and concepts of population genetics during more than one century and it can be a source of errors if they are ignored. The same is true for the statistical evaluation of the evidence were recurrent errors and being done often forgetting what we should have learned such as the introduction of verbal predicates for the communication of the value of the evidence in criminal cases mimicking the mistakes done in paternity testing in the early 80’s.

Professor at the Faculty of Medicine (University of Santiago de Compostela). Director of the Galician Foundation of Genomic Medicine, director of the Spanish National Genotyping Center (Ministry of Health) and group leader at the Centre for Biomedical Network Research on Rare Diseases (CIBERER). Former director of the Institute of Legal Medicine (USC) from 1992 to 2013. Past president of the ISFG. President of the International Academy of Legal Medicine. Editor-in-chief of FSI: Genetics.
DNA and Scientific Police
Carlos Farinha, Portuguese Police Scientific Laboratory, Portugal

The scientific police as an activity of applied forensic science is an activity in support of criminal investigation and aid to the administration of Justice, having its conception, configuration and strategy on the basis of the paradigm of forensic science as a starting point and horizon to reach. The custody of evidence, the problem of contamination and hygiene and safety, are its structuring principles of intervention. The presentation is structured as follows: Trends in the Portuguese reality - the institutional developments verified and the possibilities of progression in the collection of problem samples; The relevance of the traces as a result of judicial inspection, according to the discipline of the criminal investigation organization; The importance of developing organizational processes in terms of comparison, guaranteeing greater effectiveness, without generating imbalances within the triad: freedom, security and justice; Databases - potentialities and limitations; Law 5/2008 and Law 90/2017; Problem samples and reference samples - the dialectics of comparison and the trend towards increasing portability and mobility of equipment; The international alignment required - reciprocity and quality are two imperatives, the relevance of international interaction demonstrated in the application of proficiency tests, which allows to gauge the quality of the results, compared to the results of similar entities; Casuistry - It is recognized that, nowadays, there are crimes that can call, in the perspective of the production of traces, eminently biological, due to its probability of generating traces of this nature, unforeseen contributions to eminently biological crime should be highlighted; Conclusions and proposals for new paths to follow.

Carlos Alberto Lopes Farinha, was born in Tomar, on December 10, 1958. He is the Deputy National Director of the Judicial Police since July 27, 2018. He holds a Ph.D in Criminal Sciences, at the Faculty of Law of the University of Coimbra. He joined the Judicial Police in 1981 as a Criminal Examiner; Agent in 1989; Coordinator of Criminal Investigation in 1995 and Senior Coordinator in 2008, having headed the Departments of Funchal, Leiria and Lisbon. He was the Director of the Laboratory of Scientific Police of the Judicial Police from April 2009 to July 26, 2018. Represented Portugal with ENFSI, AICEF and the Interpol Committee of Forensic Sciences. He collaborated as a trainer with several entities, having published studies and scientific articles. Carlos Farinha is the APCF Honorary Associate and the National Contact Point for the creation of the European Forensic Sciences Area 2020.
What Can Forensic Science Governance Govern? The Experience of England and Wales
Christopher Lawless, Durham University, UK

Concerns have recently been expressed by the Forensic Science Regulator of England & Wales over the health of forensic science in this jurisdiction. These concerns relate at least in part to the viability of forensic science providers in what is a largely commercial market, albeit one that may be shrinking in terms of work and revenue available to commercial providers. The Forensic Science Regulator has also expressed concern over the risks that crucial evidence may become lost in the event of a forensic science provider unexpectedly ceasing trading, the seeming lack of expert witnesses in certain forensic disciplines, and at least one high-profile case in which the quality standards of forensic testing were allegedly seriously compromised.

This paper reflects on the current status of forensic governance in England and Wales, which is highly fragmented, and considers the possibility of governance reform. The paper offers two considerations: (1) which are the priority areas for reform, posing the question ‘what can forensic science governance govern?’, and (2) what are future scientific and operational challenges? The paper reflects on the achievements of forensic science regulation in England and Wales to date, and how they can be built upon. In addition to rapid technological developments in areas such as DNA profiling, the paper reflects on how the relationship between police customers and forensic science providers has evolved in the context of commercialization and the austerity agenda.

Dr Christopher Lawless is Associate Professor in the Department of Sociology at Durham University, UK. His research on the sociology of forensic science has explored such topics as: the political economy of forensic science, law-science interactions, forensic practice and public understanding of forensic science. He is the author of ‘Forensic Science: A Sociological Introduction’, published by Routledge in 2016.
The Prüm System: Challenges to the EU area of Freedom, Security and Justice
Helena Machado, University of Minho, Portugal

The European Union (EU) has invested in the creation of a pan-European system for the transnational exchange of forensic data between Member States for the purpose of combating cross-border crime, terrorism and illegal migration: the so-called Prüm System. It relies on the permanent and automated exchange of information between Member States, namely of DNA profile data, fingerprints, and vehicle registration data. While focusing on the role of forensic genetics and technology in the implementation of a so-called ‘area of freedom, security and justice’, the EXCHANGE project investigates the new and old challenges posed by this scenario to social control, citizenship and democracy in contemporary societies.

At a time when the vision of European integration is under strain, studying the ethical, legal, regulatory, societal and political challenges of the Prüm Decisions appears to be particularly relevant. The EXCHANGE project has the following general objectives: 1. to provide a general picture of the implementation of the Prüm Decisions in the EU; 2. to develop in-depth knowledge of forensic geneticists’ activities relating to Prüm, by resorting to interviews, ethnographic observation and analysis of criminal cases; 3. to understand national positionings in relation to Prüm by means of a comparative study involving the Netherlands, Poland, Portugal, Germany, and the UK. EXCHANGE stimulates interdisciplinary dialogue between the social sciences and the forensic genetics. This research tackles questions that are relevant to the actors involved in criminal justice cooperation in the EU. The results might be applied in governance and policy-making founded on a respect for human rights, transparency and public trust.

Helena Machado specializes in the ethical and sociological challenges emerging from the uses of genetics in contemporary modes of governance of criminality. She is the author (with Barbara Prainsack) of Tracing Technologies: Prisoners’ Views in the Era of CSI (Ashgate, 2012), a work that discusses how convicted offenders understand crime scene technologies and large police databases. She has also written extensively about public attitudes toward forensic genetic technologies. Her current research critically engages STS, bioethics, sociological and criminological perspectives to explore the collective identities and geopolitics emerging from the transnational sharing of DNA data in the EU.
Forensic DNA Databasing ‘Best Practice’: Full of Promise or False Premise?

Carole McCartney, Northumbria University, UK

With DNA profiling for forensic purposes becoming customary within criminal justice systems and DNA databases continuing to expand and interconnect globally, efforts to articulate ‘best practice’ are also proliferating. These take various forms, some focussed upon a particular forensic use or technique (such as identification of persons in mass fatalities), while other are ‘guidance’ documents espousing ‘principles’ or ‘standards’. For example, publically available there are currently ‘best practice’ documents from Interpol, NIST, ENFSI and the DNA Policy Initiative. Domestic documents covering national databases also abound, in addition to many more ‘memoranda of understanding’ and ‘policy’ documents that are not publically available. Identifying ‘best practice’ however, defined as: ‘procedures that are accepted or prescribed as being correct or most effective’ (Oxford English Dictionary, 2015) is beset by difficulties on a national level, and probably impossible at an international level. Most obviously, measurements of ‘effectiveness’ which ought to underlie such ‘best practices’ are notoriously absent, as well as mature and sophisticated (correct?) answers to legal and ethical questions. This paper highlights commonalities across such documents, where some agreement may be discerned, while prevalent omissions and obfuscation will be identified. With specific reference to the UK, this paper questions whether ‘best practice’ at national level has been determined. At supra-national level, it must be queried whether ‘best practice’ documents are full of promise, or are founded upon a false premise when, what is ‘best practice’ is transitory, contentious, and legally and culturally specific, so cannot simultaneously also be prescriptive and internationally accepted.

References

Carole McCartney is Professor of Law and Criminal Justice at the School of Law, Northumbria University. Carole has written on Australian justice, Innocence Projects, miscarriages of justice, policing cooperation, and DNA, forensic science and criminal justice more widely. She was project manager for the Nuffield Council on Bioethics report The Forensic Uses of Bio-information: Ethical Issues’ and the Nuffield Foundation project ‘The Future of Forensic Bioinformation’. She completed an EU Marie Curie international research fellowship (2009 - 12) on Forensic Identification Frontiers and continues to work on projects around forensic science and miscarriages of justice, biometrics, and science and justice. She is convenor of the Research Interest Group on ‘Science and Justice’ at Northumbria University.
At the interface between human and forensic genetics: some of the questionable uses of DNA outside of health care and research

Álvaro Mendes, University of Porto, Portugal

Recent technological advances have raised high expectations in relation to the uses of human DNA in forensics contexts, including DNA phenotyping, profiling and data-basing for criminal purposes. This presentation will provide a brief overview of how the PPPC – Public and Professional Policy Committee of the European Society of Human Genetics (https://www.eshg.org/pppc.0.html) have addressed issues related to some of the questionable uses of genetic and genomic testing information outside health-related and research purposes. It will draw on press releases and policy documents issued by the committee on topics such as the use of susceptibility genetic testing to ascertain criminal responsibility, state control and compulsory collection of DNA samples from populations, and the use for forensic purposes of genetic information available in the public domain and in non-forensic databases. These will be discussed in relation to recommendations and guiding principles, and some of the potential societal implications will be highlighted.

We hope this can contribute for the debate on the uses of human DNA in forensics, namely in its ethical, legal and social aspects. Further, we hope it will be relevant to stimulate ongoing professional guidance regarding the applications of genomic technologies and its associated benefits, limitations and uncertainties.

Álvaro Mendes is an associated researcher at UnIGENe and the Centre for Predictive and Preventive Genetics, at IBMC-i3S, University of Porto (Portugal, PT), where he investigates processes of family communication about genetic risk information. He holds a PhD in Health Sciences and Technology (Univ. Aveiro, PT) and a degree in Clinical Psychology (Univ. Coimbra, PT). He is a member of the Public and Professional Policy Committee of the European Society of Human Genetics.
Familial Searches: The U.S. experience  
*Erin Murphy, New York University, USA*

The primary use of DNA databases is to match a forensic crime scene sample with the DNA profile of a known person. But when such direct matches fail, investigators can turn to specialized software to conduct a search aimed at finding in the database persons whose genetic profiles so closely resemble the profile of the crime scene evidence that it is possible that they are related to the source of the crime scene stain. These “near-miss” matches are effectively gene-based leads: a way to potentially locate the perpetrator of the offense using a relative who was required to put a DNA profile in the database. Typically, investigators narrow down the list of leads using a variety of conventional techniques (e.g., examining criminal history, housing, social media and financial records), and may even engage in the surreptitious collection of DNA from persons related to the databased person. These “familial searches” have profound implications for individual privacy and for expanding the permissible scope of the use of genetic information for criminal justice purposes. Yet in the United States, these searches are largely unregulated and the ensuing investigations are clouded in secrecy. This talk addresses the privacy and civil liberties implications of this practice, drawing upon data from the U.S. experience.

*Erin Murphy is a professor at the New York University School of Law. Her book, Inside the Cell: The Dark Side of Forensic DNA was published in 2015 and explores the scientific, legal, and social policy questions presented by forensic DNA technologies. She has published widely on the topics of forensic evidence, criminal procedure, and technology in the criminal justice system, and her work has twice been cited by the U.S. Supreme Court.*
Ethical boundary work in the regulation of forensic DNA phenotyping
Gabrielle Samuel, Kings College London, UK

Forensic DNA phenotyping (FDP) is an emerging technology which seeks to make probabilistic inferences regarding a person’s ‘phenotype’ (their observable characteristics) from DNA left at a crime scene, to aid with the identification of an unknown suspected perpetrator in a criminal case. VISAGE, a large EU-funded academic consortium project, aims to develop, validate and implement a set of FDP prototype tools for making probabilistic inferences regarding appearance, age, and biogeographical ancestry. We, the authors of the paper, are part of VISAGE, exploring how best to implement FDP in a socially, ethically and politically responsible manner. We interviewed 36 experts in eight EU countries to explore how they defined FDP with relation to appearance, age, and ancestry prediction, and what implications this had on their views about the need for responsible FDP regulation. We show how our interviewees distinguished between those phenotypic tests that they perceived to raise ethical, social or political concerns, or to raise issues which were particularly socially sensitive within their society, from those that were viewed as less ethically and socially problematic. Phenotypic prediction tests in the latter category were considered to fall under the remit of FDP. FDP thus became an “ethical safe space” for phenotypic testing in the criminal justice system, reminiscent of the ethical boundary work done in the past for forensic DNA profiling. We discuss this here, and also the implications of this in terms of regulation.

Gabrielle Samuel is Research Associate in the Department of Global Health and Social Medicine at King’s College London, where she is exploring regulatory, ethical and social issues of forensic DNA phenotyping. She is a medical sociologist/ethicist whose main interests relate to (a) the ethical and social issues surrounding innovative biotechnologies, and (b) issues related to research ethics, especially when applied to new forms of health research such as social media data and AI.
From national forensic DNA database to transnational exchange of DNA data in the European Union and above

Reinhard Schmid, Federal Ministry of the Interior, Austria

Presentation give in line with the Austrian forensic DNA Analysis- and DNA database developments from 1992 to 2018 and with more than 10 years Prüm operative experience from Austria an overview, about the impressive development of DNA analyzing, from single crime case usage via construction and usage of national DNA databases and national DNA legislation to existing European Union and ongoing worldwide DNA database network cooperation.

It shows this development from in the Beginning sometimes smiled and as not relevant declared small DNA technology usage to the meanwhile most successful tool to fight national crimes as well international cross border criminality and terrorist attacks.

Especially the successful development of the “Prüm DNA and AFIS database network” from start as a quite small multilateral cooperation between seven EU countries to for all EU Member states binding EU legislation and powerful EU database network will be described.

This “Prüm development” is meanwhile the most successful biometric data base network in the world and was an outcome on seen practical efforts and benefits for LEA with thousands solved serious crimes and localizing wanted perpetrators each year. The Prüm development shows very good the further ongoing developments also above EU countries. It created a total new system of international police and justice forensic and investigative cooperation with worldwide influence to DNA forensic and DNA database technologies as e.g. new forensic quality standards and closer, faster and very targeted international LEA cooperation between national police and justice authorities and there central National Contact Points.

Reinhard Schmid is Head of the Central Identification Service and Deputy Head of Austrian Forensic Services in the Criminal Intelligence Service of the Federal Ministry of the Interior in Austria. He is a member of the “Prüm member state founding group” as Austrian delegate since the beginning of the Prüm project in 2004 and supports EU Member States, EU Council and EU Commission as Prüm evaluator and advisor. Dr Schmid represents Austria also in the relevant EU council working groups for EU data exchange “DAPIX” and “DAPIX Interoperability” and hold presently the Chair in those EU Council Working Groups.
Challenging forensic trace evidence requires innovation both regarding the technology as well as the type of markers suitable for forensic investigations. Over the last 30 years, the field of forensic genetics has been characterized by the continuous flow of technological innovations addressing casework challenges. Currently, casework is subjected to a transition by moving forensic tools from the laboratory to the scene of crime, e.g. by introducing fully automated "rapid DNA" typing systems, raising questions about competence and quality assurance. In the forensic genetic laboratory, massively parallel DNA sequencing (MPS) is being explored to develop new applications including both the refined and in-depth analysis of conventional short tandem repeat markers at the sequence level as well as the introduction of predictive genotyping markers suitable for "Forensic DNA Phenotyping". This raises questions about the scope and limitations of MPS to develop a balanced and proportionate approach in forensic genomics. The challenges need to be addressed prior to the widespread application of new technologies in casework, and on the background of a very heterogeneous legal landscape in Europe.

Peter M. Schneider is a full professor at the Institute of Legal Medicine, University of Cologne, Germany, where he is head of the Division of Forensic Molecular Genetics. He is responsible for the education of students in medicine, biology, and law, and, at the same time, for carrying out routine DNA typing of criminal evidence material, identification cases, as well as relationship testing. He served as coordinator of the multinational EU-funded 7th framework project "European Forensic Genetics Network of Excellence – EUROFORGEN-NoE" (https://www.euroforgen.eu) establishing a European research infrastructure in forensic genetics. He is an active member of expert commissions dealing with issues related to genetic typing and forensic DNA analysis, such as the National Gene Diagnostics Commission of the German Federal Ministry of Health, and the European DNA Profiling (EDNAP) Group. He is chairperson of the German Forensic Stain Commission organizing the annual proficiency testing GEDNAP (www.gednap.org), President of the German Society for Parentage Testing, as well as former President and current Secretary of the International Society for Forensic Genetics (ISFG).
Extended DNA analysis within Germany: Law reform projects and critical voices
Susanne Schultz, Gen-Ethisches Netzwerk, Germany

Since the end of 2016, there is a public debate about several law projects in Germany which aim to establish extended DNA analysis within German police investigation – including testing for hair, skin and eye colour, age and in some cases also biographic origin. As one of various actors, the Gene-ethics Network in Berlin has argued against these law reforms referring to various dimensions, including among others problems of data protection, the threat of discrimination of minorities, the history of institutional racism within the German police, and last but not least the way how the new so called phenotying technologies are communicated by politicians, within law projects and by the media. The presentation will introduce into these and more dimensions and give an overview over the critical debate within 2017/2018.

Susanne Schultz is working as social scientist postdoc at the Goethe University of Frankfurt and researching about demography, biopolitics, migration and family policies. She is board member of the NGO Gen-ethisches Netzwerk Berlin and published in 2017 (with Isabelle Bartrom): Erweiterte DNA-Analysen: Technische Aufrüstung mit rassistischen Verwicklungen, in: CILIP/Bürgerrechte & Polizei, Nr. 113, S. 69–88.
What race has to do with it? Bioconstitutionalism and the mobilisation of forensic and medical genetic bodies in nation building projects in Mexico and Colombia

Ernesto Schwartz-Marin, Exeter University, UK

It is old news that our bodies constantly betray us; without a second thought they incriminate us, shedding DNA everywhere we go. Because bodies behave in all sorts of unexpected and unruly manners—revealing more than what we want them to— they are at once the ultimate site for medical and criminal evidence, and an object of control and regulation. This is why genetic bodies have become so central to nation building projects in Latin America, yet these bodies come with a racial legacy that has to be carefully managed. In this talk, I will compare the crafting and regulation of genetic bodies in the medical to the forensic realm to interrogate the (post)racial logics at the heart of nation building projects in Mexican and Colombian science.

I argue that race is a form of bioconstitutionalism in these two Latin American countries, at once defining the objects of regulation and the rights citizens can enjoy when encountering these objects. At the same time race is an intense source of anxiety and conflict which threatens to undermine the legitimacy of science and law alike. By analysing race as a bioconstitutionalism I wish to challenge dominant assumptions in STS, and open up a different perspective on the relationship between law and science.

To illustrate my point I will examine the coming into being of the so called ‘Mexican Genome’ and how its postracial and postcolonial legal discourses provided the legal basis for the creation of the citizen-led forensic DNA database. I will examine why in Mexico, forensic and medical genetic bodies are materialised through the insistence of families looking for their disappeared loved ones to have their own independent genetic data, or scientists fighting against the future forces of global dispossession, to recover, collect, and protect ‘Mexicanhood’ and ‘Latin American’ mestizos. In contrast in Colombia, also facing the challenge of identifying thousands of disappeared persons, and with similar ambitions to create a genetic platform for public health race has given rise to another type of bioconstitutionalism, which produces Caucasoid and Afro mestizos, according to the region in which samples are taken, or corpses are found, yet as (genetic) bodies travel race acquires concreteness, or is erased completely. The examples I analyse show how in Mexico and Colombia unilateral, self-assertion acts, geared towards collecting biodata of human populations provide a window to understand how race shapes the political and scientific imagination of geneticised nations, but also how genetic bodies always afford spaces to subvert the order of global genomics and/or forensic science.

Ernesto Schwartz-Marin is Lecturer in Sociology at Exeter University, his research is characterised by the ethnographic engagement with large bioscientific endeavours in Latin America, such as the Mexican Genome or the Colombian Human Expedition. Since 2011 he has been involved in the creation participatory action research interventions in humanitarian crises via grass-roots DNA databases, and citizen-led science. Schwartz-Marin recent publications include: ‘Forensic civism: articulating science, DNA and kinship in contemporary Mexico and Colombia’ and ‘Pure Corpses, Dangerous Citizens: transgressing the boundaries between mourners and experts in the search for the disappeared in
Mexico’. He previously directed the ESRC transformative project ‘Citizen Led Forensics’ and is currently Co-directing the RCUK-CONACYT project ‘Mobile Solutions to the Mexican Kidnapping Epidemic’, and is the PI of a new ESRC funded project exploring Data Justice and Multiveillance in Mexico.
Race, Face and Place: Understanding the Discriminatory Potentials of Phenotype Prediction

David Skinner, Anglia Ruskin University, UK

A new wave of innovations in forensics seeks to support criminal investigations by making inferences about the racial or ethnic appearance of as yet unknown suspects using genetic markers of phenotype or ancestry. This paper argues that to grasp fully the potentials of these innovations they must be understood both in the context of established patterns of police–minority relations and as part of significant changes in the use of ‘race’ as an object of knowledge in science, policy, and politics. Socio-technical developments offer new means of identification through geneticization, datafication, and visualization and consequently heighten the visibility and valorisation of racial difference.

Two key preoccupations of new policing technologies are faces and places. The use of DNA to predict phenotype should be understood in association with the trialling of facial recognition software, and the development of databases containing millions of images. Together they make the automation and scientization of identification and description a police priority. Similarly ‘data driven policing’ seeks to know places, mapping and predicting patterns of criminality in order to rationally direct resources to the correct locations. Digital community intelligence initiatives aim to communicate with the public, gather information and measure collective sentiment in particular localities.

Despite their apparent neutrality and authority, new socio-technologies that claim to know faces and places (and by implication faces out of place) potentially both allow and legitimate differential treatment: categorization and discrimination are enmeshed in the workings of technical processes. Moreover, as their integration into the messiness of everyday policing illustrate, these systems operate alongside and are dependent on other kinds of arbitrary and discretionary activity; they create moments of affective judgement that invite or require operatives to enact a racialized common sense. Systems also crowd-source suspicion and measure public insecurity and as such they have the potential to validate and amplify secondary prejudice.

David Skinner is Reader in Sociology in the Department of Humanities and Social Sciences, Anglia Ruskin University, Cambridge, UK. He has a long standing interest in the changing politics of ‘race’ and science. Relevant publications include ‘Racialized Futures: Biologism and the Changing Politics of Identity’ Social Studies of Science (2006); Groundhog Day? The Strange Case of Sociology, Science and Race’ Sociology (2007); (edited with Richard Rottenburg and Katharina Schramm) Identity Politics After DNA: Re/Creating Categories of Difference and Belonging (2012); “The NDNAO has no Ability in Itself to be Discriminatory” Ethnicity and the Governance of the National Forensic DNA Database’ Sociology (2013); (With Amade M’Charek and Katharina Schramm) Topologies of Race: Doing Territory, Population and Identity in Europe’ Science, Technology & Human Values (2014); and ‘Race, Racism and Identification in the Era of Technosecurity’ Science As Culture (2018). He is currently writing a book about new policing technologies.
Identifying the misidentified in Bosnia and Herzegovina
Victor Toom, Goethe University, Frankfurt am Main, Germany

The Bosnian War (1992–1995) took the lives of approximately 100,000 persons. This number includes an estimated 31,500 missing persons. Since the early 2000s, the International Commission on Missing Persons (ICMP) made a substantial effort to find and forensically identify inter alia missing persons related to the Bosnian War. Writing in 2018, and despite successfully rolling out ICMP’s mechanisms, some 9,000 missing persons are still missing. While they are absent, their remains should be somewhere. More precisely, those remains are in undiscovered mass graves, in mortuaries throughout Bosnia and Herzegovina, or in family graves after being misidentified. My paper attends to an initiative by the ICMP and other organizations to reach out to families whose kin got killed and buried in the 1990s. Those families never participated in ICMP’s efforts to identify missing person because they had buried their kin—they were not missing, but death; not scattered around in Bosnia and Herzegovina, but in a grave nearby. In the 1990s, identification was based mainly on personal items found on a body (e.g. cloths, official documents, jewelry). But from research and records we now know that these mechanisms to identify remains are highly unreliable. Thus, it is likely that those killed and buried in the 1990s were misidentified. ICMP is now collecting reference samples from families whose kin got killed and buried in the 1990s based on the assumption that some victims were misidentified. The newly collected reference material will be compared with DNA profiles obtained from thus–far unidentified remains in the mortuaries. Would they find a match, it is likely that the person thought to be buried in a family grave actually are the remains of another person. Based on interviews with experts from the ICMP as well as other stakeholders in Bosnia and Herzegovina, this paper narrates the many hurdles encountered when a scientific organization involved in human rights work attempts to find more missing persons. As such, it addresses scientific, legal and emotional issues of identification, exhumation and repatriation.

Dr. Victor Toom has been studying forensic practices for 15 years, and published articles in many journals, including FSI: Genetics, Science, Technology and Human Values; British Journal of Criminology; and Medical Anthropology. Over the years, his research interests expanded from forensic genetics in the criminal justice system to similar technologies being deployed to identify victims of disaster and atrocity. Victor currently is a Marie Curie Research Fellow in the Faculty of Social Science at the Goethe University in Frankfurt am Main, Germany.
Penal Governmentality, Resistance and Genetics in France: The Politicisation, Veridiction and Jurisdiction Effects

Joëlle Vailly, École des Hautes Études en Sciences Sociales, France and Yasmine Bouagga, CNRS, Triangle, France

The use of genetic databases by the police and justice system has risen dramatically, particularly in France. In this context, the presentation aims to study the ‘governmentality’—in Foucault’s sense—of individuals and populations that makes use of genetic analysis, in a penal context, in France. More specifically, we adopt a line of investigation that builds out from forms of resistance to different types of power. Our methodology draws on a series of interviews and observations of legal proceedings against people who have refused to give DNA samples. Firstly, we present the politicisation effects through which opponents to current uses of the French DNA profile database contest these uses, in terms of public and legal opposition. We then go on to analyse the ‘veridiction effects’ at work among social actors, in terms of the medical information/information related to origin that is conveyed (or not) by DNA profiles. Finally, we focus on the ‘jurisdiction effects’ of the DNA database extended to populations, showing that the judicial classifications constitute a central issue for these opponents. In conclusion, we show that genetic analyses applied in a penal context to populations, and not only to individuals, shift individual and collective conducts through this triple-fold effect.

Joëlle Vailly is an anthropologist and sociologist. She is Director of Research at the French National Center for Scientific Research (CNRS) and Deputy Director of the Institute for Interdisciplinary Research on Social Issues in Paris (CNRS - Inserm - EHESS - University Paris 13). Her work focuses on the social, political, and moral issues at stake in genetics, biomedicine, and health. She recently published “The Birth of a Genetics Policy. Social Issues of Newborn Screening” (Routledge, 2013) and she is the coordinator (PI) of the project “Genetic Databases and Witnesses. Genealogy, Social Issues, Circulation” funded by the French National Research Agency (2015-2018).
Forensic science, commerce, & ethics. Intersecting logics & dynamics in Forensic DNA Phenotyping

Matthias Wienroth, Newcastle University, UK

Commercial forensic science providers have become an important resource for the criminal justice system in many countries. Since the 1990s, and in the UK especially since the Forensic Science Service lost its preferred supplier status in 2002, private companies have competed for police contracts and increasingly delivered a significant share of forensic services. The demand for greater efficiencies and effectiveness (e.g. National Audit Office [UK] 2003) has driven this development. Increasingly, the availability of a wide offer of – at times experimental – forensic technologies, such as the DNA-based prediction of appearance and biogeographical ancestry of an unknown person, for hard-to-solve serious criminal investigations has further raised interest in specialised commercial service provision. Some commentators have raised concerns over potential issues arising within a for-profit model for forensic service provision in the balancing of efficiency concerns with the reliability and quality of forensic science analyses (e.g. National Research Council [USA] 2009; Roberts 1996). Focusing on this tension field, this paper explores the intersection of ethics, commercial drivers and notions of robust science in the provision of emerging forensic technology. On the example of Forensic DNA Phenotyping (FDP), two debates are compared: (1) around an experimental commercial service offered to the police in the USA, and (2) the German debate on considerably broadening the use of forensic genetics in the criminal justice system.

References

Dr Matthias Wienroth is a Science and Technology Studies (STS) scholar at the Policy, Ethics and Life Sciences (PEALS) Research Centre, Newcastle University (UK). In his work he approaches sciences and technologies as social phenomena within a programme of understanding what constitutes and fosters ethical research and innovation, and how knowledge production and valuation practices intersect. To that effect, Matthias is particularly interested in the social and ethical aspects of technology, as well as the governance mechanisms through which scientific knowledge and technological application are organised. He applies this analytical gaze to new and emerging socio-technical developments in the life sciences in different social domains, including forensics and health. An integral part of his work is cross-disciplinary collaboration with social and ethical analysts, geneticists, practitioners, and policy makers.
Beyond ‘technologies of hubris’? Rapid DNA solutions in the UK

Dana Wilson-Kovacs, University of Exeter, UK

Rapid DNA represents an important technological development in forensic science, with potential major consequences for the criminal justice process, for the law’s ability to dissect and question the credibility and epistemic authority of evidence, and for the public understanding of and engagement with forensic science. It refers to several technologies which carry out the fully automated extraction, amplification, separation and detection of DNA material from swabs taken at crime scenes or in custody. Providing test results in under two hours, it has direct and practical implications for the speed of DNA processing, the potential costs-savings to police forces and the extended use of police national databases.

This paper explores the ambiguities that emerge around the investigative value and use of these technologies in major and volume crime investigation in the UK. Drawing on literature on the promissory dimensions of forensic innovation, policy documents analysis and interviews with key stakeholders, the argument examines understandings of the potential role and impact of Rapid DNA. Comparing the imaginaries of this technology with the practical and economic realities of implementing it, the paper highlights the ways in which overlapping repertoires of risk, uncertainty, efficiency and economy are articulated, and distinct rationales in relation to scientific knowledge and the practical dimension of the application of technology in criminal investigation emerge.

Dana Wilson-Kovacs is a qualitative sociologist with a longstanding interest in the application of new forensic technologies in policing and processes of professionalisation in relation to scientific and technical innovation and organisational change. Her work to date has focused on the ways in which the uses of such technologies are justified and made sense of by various stakeholders. Dana’s current research examines the development of digital forensics in crime investigation in England and Wales.