

Is GATTACA Already Here?

An Interdisciplinary Approach to the Forensic Landscape of Biobanks

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*“There is no gene for fate”
Vincent Freeman, GATTACA*

1. Introduction

In the movie GATTACA Andrew Niccol tells us about a dystopian society whose basic law is the genetic code. All citizens are cataloged in a database and, on the basis of genetic makeup, they are selected in both professional and personal relationships. In GATTACA society DNA is also used to conduct criminal investigations: because of a lash found at the crime scene the main character, Vincent Freeman, will be falsely accused of manslaughter...

For some years, this scenario no longer belongs to the realm of science fiction. With advances in technology, the double elix of DNA is showing an arsenal of potentialities in medical, scientific and social panorama. However, the use of genetics in the forensic field has raised several concerns from a legal point of view. On the one hand, the lawyer is called upon to face an ever-evolving technology that challenges his traditional categories; on the other hand technology itself offers to lawyers the possibility to pursue the objectives of the law in a more efficient way. This complex relationship can be appreciated only with a multidisciplinary approach, connecting esponents of the different disciplines that come into play (Pascuzzi, 2010).

Furthermore, different areas of law, that are often considered separate and uncommunicating worlds, have also been called in this particular context: private and criminal law. We shall see that the forensic use of bioinformation raises not only procedural and criminal law crucial aspects, but also several issues in civil law. Moreover, the interactions between these two branches of law could benefit the provision of a more efficient and homogeneous policy with regard to forensic biobanks, familial searching and the investigation access to research biobanks.

Hence, in the first paragraph we will outline a general overview on the use of bioinformation in the criminal investigation context. By reason of the fact that the biological samples and genetic data are stored in dedicated structures, we will analyze the legal landscape of forensic biobanks, as delineated by international and regional provisions, and we will explain the main models adopted in EU. After that, we will focus on the most crucial aspects emerging in criminal law with regard to the seizure of anonymised DNA samples, the procedures of DNA dragnets and familial searching, and the potential return to a deterministic trend in evaluating the social dangerousness of a person under investigation or already convicted of a crime. Finally, we will point out the possible impacts of such practises in a civil law perspective, with regard to the right to privacy and data protection. The map of the legal issues above mentioned will become more complicated if we consider the use for investigative purposes of non-forensic biobanks.

2. The use of bioinformation in criminal investigation

The introduction of DNA testing into criminal justice systems has modified the previous model of investigation, which was only based on the collection of fingerprints, a biologic two-dimension evidence, which permits the identification of an offender without the disclosure of sensitive information.

On the contrary, DNA is a far more reliable proof, not only because it is an excellent source of personal-data, but also because it could reveal a lot about health, genetic disorder and susceptibilities of the individual. All this information could have a great role even during the proceeding - i.e. in case of dragnet or familiar searching – since the Public Authorities can manage the whole sample, and not only the non-codifying part, thus obtaining clues even if the blood-print is

deteriorated. This is the reason why the results of the DNA tests must be kept under strict control in order to avoid abuses and illicit uses (Simoncelli and Krymsky, 2007).

Hence, according to the Council Resolution of 25 June 2001 on the exchange of DNA analysis results – now implemented from the Charter of Human Rights of the European Union – States should only use a specific list of seven DNA markers to create a DNA profile, which could be legitimately stored in a forensic biobank, specifically set up for the purpose of criminal investigation. The profile could be defined as a numerical representation of 10 regions of DNA sequence, traditionally called “junk DNA” because it allows only to verify the identity of an offender without any possibility to disclose information about genetic or hereditary characteristics. (Human Genetic Commission, 2001).

The problem rises when the terms DNA sample and DNA profile are considered interchangeable by national legislators, even if the storage and the subsequent test on biologic samples has a different influence on the criminal proceeding: on the one hand DNA samples allow the Public Prosecutor to easier identify the possible author of the crime, on the other hand their retention could increase the risk of infringement of rights and civil liberties of the offender and of his relatives, especially in those systems in which the discretionary power of the judge must supply the lack of regulation. Thus, in the field of genetic investigation the better solution would be the adoption of a policy directed to the unification rather than harmonization of DNA evidence-rules.

The European Data Protection Supervisor underlines that «the exchange should not relate to more types of data than strictly necessary, with a possibility of an anonymous exchange of data, and should take place under strict conditions of data protection» and it points out that in any case DNA profiles should be considered as dynamic, because «an innocent DNA profile at a certain moment in time, may at a later stage reveal much more information than expected and needed». (EDPS - Opinion 2006/C 116/04, par. 51- 57).

The Prüm Treaty gives a very wide discretion to Member States in the definition of the criteria that have to govern the factual conditions of the collection and the retention of DNA profiles; hence the real challenge in Europe is to avoid that, in any case, emergency-powers or a superior interest in crimes persecution overcome fundamental rights.

An unclear situation, as the one above mentioned, allows police agents to gain access to biobanks created for every kind of purpose, which store samples representing a full genetic mapping of the individual and not only a limited “geneticprint” (Picotti, 2003): this activity permits a constant mass screening of the population which, in the absence of provisions which can limit the retention of samples, will be treated as a “suspect” for their entire life.

On the 30th of June 2009 the Italian legislator adopted the law n. 85, which ratifies the Prüm Treaty and sets up the first official DNA biobank. Nevertheless it has not been enacted yet so, at the present time, each public or private institution – National Police, Arma dei Carabinieri – has an unofficial biobank that does not comply with the Prüm Treaty, but only with the guidelines of the Italian Privacy Authority. The DNA Investigation Unit of the Forensic Science Service «established its Combined DNA Index System (CODIS) program in January 1999 starting with the implementation of an STR population database» (Biondo, 2000).

The case of Zefi Ilir in 2004, which was about the supposed blood-weeping of the Virgin, caused a deep scandal and a strong reaction of the press that stigmatised the “illicit dossier activity” of the police for the illegal storage of biologic samples. The Privacy Authority in 2007 decided to search the database of the Unit of Forensic Science Service of Parma and found a collection of 19.000 DNA profiles, electronically and randomly stored: 5100 of them were anonymously collected at the crime scenes; 2.200 were taken from suspects and 11.700 derived from victims and from individuals identified during the investigation, but never charged (Gennari, 2011).

This overview shows that the decision of taking part in research-programs could seem a good one, but it is also unwise, because these collections may become an extension of the forensic biobanks. In Scotland, in the case of a man charged with recklessly infecting a partner with the HIV virus, the prosecution sought access to a blood test that the defendant had previously voluntarily provided, as

part of a health testing program in a prison. The defence assumed that the evidence was not admissible but the High Court pointed out that «the interests of everyone that serious crime should be effectively investigated and prosecuted outweighed any confidentiality concern so that the patient-doctor relationship does not permit doctors to decline to give evidence that may incriminate their patients» (*Her Majesty's Advocate v. Stephan Robert Kelly*).

The same conclusion was reached in Sweden, in the case of the murder of the Minister of Foreign Affairs, Anna Lindh: the Chief Prosecutor submitted an instance of confiscation in order to get the blood sample of a 24-year-old man, which was stored in the PKU biobank; this consists in a collection of blood tissue taken from almost every baby born in Sweden from 1975. The police already had a partial DNA profile of the man but they needed the entire sample to verify the matching with the traces found at the crime-scene. The offender was convicted thanks to the compliance of the Head of the biobank, who handed over the sample in clear violation of the Swedish Biobank Act, which states that all collected blood samples may be only used for research purposes and with the consent of the person concerned or in a pseudonymised form.

After the confiscation the National Board of Health and Welfare launched an investigation into the release of the sample; however, the Head of the PKU and his staff have not been subjected to any reprimand, although their excess of cooperation was deep criticized. Hence the Board proposed a review of the legislation suggesting the statement of a clear hierarchy «where the Biobank Law would enjoy a higher priority than the Rule of Legal procedure in case of conflict» (Hansson and Björkman, 2006). From a judicial point of view, since the police activity was not unlawful, the representatives of the biobank had to cooperate with the Authorities.

In this case as well as in similar ones, the real problem is the lack of criteria to strike a fair balance between the interest of the donor over the control of every future hypothetical use of his DNA and the interest of the State over prosecution and prevention of crimes (Häyry et al., 2007).

3. Legal aspects of forensic biobanks: a comparative overview.

From the notorious case of Colin Pitchfork (the first sentence based on DNA fingerprinting evidence, as a result of mass DNA screening, see Jobling and Gill, 2004), DNA analysis has become increasingly relevant for law enforcement purposes. More recently, it has been recruited into the fight against terrorism and cross-border organized crime. In fact, technological advances in molecular genetics, statistics and informatics have made more efficient and effective criminal investigations and automated searching, showing the importance of tools such as forensic biobanks. The latter allows the linkage of DNA-profiles from crime-related biological trace material to each other and to the possible donors of that biological sample (ENFSI, 2011): so, the main purpose is the identification of perpetrators and victims (Bárd, 2009).

Forensic biobanks are usually made up of: a) the DNA database, containing the DNA profiles (i.e. “a letter or number code which represents a set of identification characteristics of the non-coding part of an analysed human DNA sample”, see art. 2 lett. c) of Council Decision of European Union 2008/616/JHA); b) a central laboratory, that is the biorepository where are stored the biological samples from which the DNA-profile has been generated. It is important to stress this double nature of forensic biobanks, because the material dimension of the biorepository is often pushed into the background but, as we will explain in the next paragraphs, it entails relevant consequences from the legal point of view.

Unlike other types of biobanks, those forensic have received a precise regulation over the years. The first prototype was established in USA, where in the late 1980s started the project that would lead to the creation of CODIS (Combined DNA Index System), the DNA federal database funded by FBI. Later in Europe have been set up national databases which collect DNA profiles derived from biological samples culled from crime scene evidences or derived from suspects, convicted persons, arrestees, missing persons, relatives of missing persons, volunteers, victims, and unidentified remains. So, the UK National Criminal Intelligence DNA Database, well known as the United Kingdom National DNA Database (NDNAD), was created in 1995; the Netherlands and

Austria have set up a national DNA database in 1997, followed by Germany and France in 1998, Finland, Sweden and Norway in 1999, Switzerland, Belgium and Denmark in 2000, Spain in 2007. Finally, in 2008 the European Union converted the Treaty of Prüm into EU legislation, according to which, every Member State is required to set up a DNA database and to make it available to the other European countries in order to implement the exchange of DNA data - but also dactyloscopic data and vehicle registration – to enforce police and judicial cooperation in criminal matters.

Despite these recent trends toward harmonization, the solutions adopted by single Member States are dissimilar. They differ in the criteria for the inclusion of DNA profiles, the storage time, the conditions for removal, the degree of involvement of the judicial authority (Stefanini, 2008). However, this “legislative geography” is referable to three main models: the English, the French and the German one (Novelli et al., 2011). NDNAD is the example that puts fewer restrictions. In addition to crime scene material traces and samples taken from volunteers, it receives DNA-profiles from anyone arrested and detained in police custody in connection with a recordable offence. In this case, the non-intimate samples (as a mouth swab) can be taken without consent (Murphy, 2006). Furthermore, before the ECHR decision in the *S. and Marper* case, samples and DNA-profiles could be indefinitely stored in the forensic biobank.

On the contrary, in the French model (*Fichier National Automatisé des Empreintes Génétique*) it can be collected only those samples coming from persons convicted of or charged with a serious offence, specified by law. The sample and the DNA profile can be retained for 40 years after the conviction or 80 years after the individual’s date of birth. If the suspect’s profile can be removed by motion of the public prosecutor or of the same individual when the storage is no longer useful for investigation purposes, on the contrary the sample has to be destroyed only after the acquittal of the suspect.

Finally, the German example is an intermediate solution, because as well as the profiles of people convicted of or charged with a serious offence, an additional entry criteria consists in a prognostic evaluation made by the judge about the risk that the convicted person could repeatedly commits the same minor offence. Profiles and samples are deleted when their retention is no longer necessary.

Beyond doubt, the promise of forensic genetics is enticing and DNA national databases offer greater efficiency in the investigation, timeliness in enforcement action, and saving in economic and human resources. (Novelli et al., 2011). Moreover, some governments justify DNA database provisions with the ‘no reason to fear if you are innocent’ argument (Levitt, 2007).

Nevertheless, forensic biobanking appears deeply troubling, because it refers to a sensible aspect such as the genetic identity of a person, posing complex legal, social and ethical issues. Potential risks for fundamental rights can come, on the one hand, from the functioning in itself of the biobank and, on the other hand, from the further extensions of its scope, such as in case of familial searching. This subject, as described by the Italian Privacy Authority, requires a «balance between two fundamental rights: the public security and the right to the individual e collective liberty of the citizen».

4. DNA: the silent eyewitness. A criminal law perspective.

The effect of DNA tests on criminal proceeding is not so revolutionary as one may think because DNA can not ground a charge alone, so that further evidence is still required to obtain a conviction; moreover, a match between crime scene DNA and a profile stored in a forensic database does not mean a plea of guilty because «a murder suspect might have acted in self-defence or there may be some other reason to account for the present of DNA found at the crime scene» (Rothstein and Talbott, 2006). Despite this, we can not deny that the chance to identify a potential offender will increase. Accordingly, it is easy to understand that the prosecutor has a great interest in gaining access to every kind of biobank – not only the forensic ones – in order to screen a larger number of samples, which can allow her to find a match and to collect other useful information, such as medical, racial or ethnic ones (Gennari and Piccinini, 2012).

This procedure rises a lot of issues related to the violation of fundamental rights and liberties because the routinely trawling of these data-base «renders the people whose personal data are included as suspects for any and all future crimes» and makes the set up of forensic – or criminal - biobanks totally meaningless (Simoncelli and Krimsky, 2007).

Looking at the constitutional framework, we can assume that the exploitation of the samples stored in biobanks for forensic purposes could violate the right to privacy, the dignity of a person, the presumption of innocence, the equality principle and the right not to testify – in the sense refusing to cooperate with the prosecution. It is interesting to point out that egalitarianism was paradoxically used to support the idea of the extension of State power in order to create universal databases because only a policy that applies to all citizens can be considered non discriminatory (Simoncelli, 2006).

The aim of the paragraph is to enshrine the effects that the overcoming policy of the “superior interest in persecution of crimes” is having on the above mentioned rights and liberties, through the focus on 4 main issues, depending on the exploitation of biologic samples - and not only profiles – available in a biobank: 1) seizure of anonymised DNA samples; 2) DNA dragnets; 3) familial searching; 4) the potential return to a deterministic trend in evaluating the social dangerousness of a person under investigation or already convicted of a crime.

4.1. Seizing genetic exceptionalism.

As it has happened in the Anna Lindh case, the Public Prosecution could decide to submit an instance of seizure or confiscation to get a DNA sample stored in a biobank, both when the State has not a forensic biobank and when it is not possible to find a match in it. Moreover, in case of serious crime investigation it is possible to predict that no judge would refuse to sign an order to scan a biobank even in the lack of a specific legal provision.

Nevertheless the main issue to face is the anonymising procedure: in order to protect the privacy of the donors, every stored DNA sample is characterised by an alphanumeric code that permits the future identification of the individual. The only person that holds the key for the “decryption” is the Head of the biobank.

According to that, several questions arise: can the Head of the biobank refuse to cooperate? Or has he a specific duty to disclose the information if requested by the police? Only if we assume that he has no duty to cooperate during the investigation, we can exclude his liability for aiding and abetting and for every other charge connected with data-retention.

In Germany there is not a legal ban for security services to access a biobank and the possibility for third parties to gain such personal data raises central questions as to right of personality and privacy. This was the reason why the *Deutscher Ethikrat* in 2010 prepared an opinion on Human biobanks with research purposes, where they noted that «although there are no specific provisions for biobanks, there are models for this in current law that can be used, and suggest that there must also be provisions defining the right to refuse to give evidence for persons with a duty of professional discretion which prevents these persons from having to testify as witnesses and thus break their duty of professional discretion to state agency» (Santosuosso, forthcoming).

The main points of the Opinion are listed at number 29, 30 and 31, which state:

- «at the same time, the constitutionally guaranteed freedom of research under article 5(3) of the Basic Law suggests that data traffic within the domain of research should be given particular privileges and should be separated from other (non-academic) domains. (...) all persons who have de facto access to data keys and identifying data should be included in the group of person with a duty of biobank secrecy»;
- “biobank secrecy should include a right to refuse to give evidence and prohibition of seizure»;
- «(...) The right to refuse to give evidence is justified for the protection of the general right of personality and the right to informational self-determination (*Persönlichkeitsrecht*) under Article 1, in conjunction with Article 2 of the Basic Law».

A similar operation, aiming at creating a biobank secrecy in the Italian legal framework, could be done through an analogical interpretation of article 200 of the Code of Criminal Procedure that rules the “Professional Secrecy”; people like doctors, priests, lawyers, who can assume personal and sensitive information have not a duty to testify on them and are legally allowed to keep the secret.

4.2. DNA dragnet: a suspicious procedure.

In 2002 in Dobbiaco – Italy – an old woman was raped and killed in her home. The police officers collected a lot of biologic traces at the crime scene in order to obtain the DNA profile of the murderer. The profile did not match with the ones taken from the suspected individuals but, thanks to the analysis made, the prosecution noted the presence of genetic features, typical of that small community.

Voluntary blood samples were requested from all male residents to make a long-stringency search that permitted police to identify the murderer through the genotype of his father.

This kind of procedure is called DNA dragnet and it is a new method of investigating crimes which aims at the collection of samples, with their consent, from a large number of people who live or work near the crime scene, in order to find any proof – such as unjustified refusal or abnormal behaviours – that could direct investigations on a specific suspect.

The claim that DNA dragnet is based on a voluntary decision of the “donor” has been widely criticised because people who refuse to give the sample could be stigmatized by the society and treated as suspects. During “Operation Minstead”, 1.000 black men in south London were requested for a volunteer DNA test to investigate on a serial rapist. The 125 individuals who refused the blood sample received “intimidating” letters from the police to reconsider their decision and 5 were arrested and forced to give a biologic sample (McCartney, 2006).

This method could undermine the basic principle of a fair trial and in particular it could reverse the presumption of innocence because all people requested for a sample are considered and treated as suspects unless they decide to voluntarily cooperate.

A further crucial issue is deeply connected with the equality principle: all the tissues taken from “innocent” people are included in forensic biobanks, together with the ones of the offenders, but without any guarantee of future removal. There is no provision regarding the future of those samples because national laws, dealing with DNA samples which must be destroyed, refer only to DNA samples belonging to people not charged with a crime at the end of the investigations or acquitted. A possible solution could be based on a broad interpretation of the Marper decision in order to apply the principles and the limits of retention, which it establishes.

In the UK, from 1995 to 2005 the Forensic Science Service has made 292 mass screening, testing 80.000 DNA samples, but only in 62 cases (20 %) this measure provided useful results for the investigation; in the USA only one case among 18 investigated with mass screening tests was solved (Gennari, 2009).

4.3. How I met your relatives.

Another controversial procedure is the familial searching of databases, which is considered a method to create suspects in the absence of a direct matching between a crime scene sample and a stored DNA profile. This procedure relates on the theory, which states that siblings and related people share a specific common genetic material so that a “low stringency” analysis or a “rare allele” search could find a partial match between crime scene evidence and the offender’s profile. Afterwards, because this method of investigation only indicates that there could be someone belonging to that specific genetic group, whose DNA fully matches with the one found at the crime scene, close-relatives of the people, whose DNA partially matches, are tracked down and asked for a voluntary DNA sample (Simoncelli and Krinsky, 2007).

The greater problem arises if individuals, identified through familial searching, refuse to give their consent for DNA tests.

In the UK, for instance, starting from the 2001 reform of the Criminal Justice and Police Act, in case of mass screening, prosecution must collect the informed-written consent of people asked for a blood or other DNA sample if they are not suspected of a crime. In the USA this procedure is assimilated to a search and seizure, hence police must respect the provision stated in the IV Amendment. A judge-order based on probable cause, which recognises the presence of reasonable suspect of the commission of a crime, is necessary to take a sample from anyone.

On the contrary, in Italy individuals involved in a criminal investigation, even if not suspected, can be forced to provide a DNA sample.

In 1996, a defendant and his relatives refused to give their DNA samples to the police claiming that such procedure would violate their right to personal liberty (art. 13 of the Constitution) and the equality principle because of the indiscriminate possibility to force people under investigation as well as those who are not suspected, to provide a genetic tissue. The Italian Constitutional Court stated that such procedure would interfere with the personal dimension of individuals so that it must be specifically regulated by the law in order to define cases and procedures that legally allow police to do it (Fanuele, 2011).

In 2009, with the ratification of the Prüm Treaty, the Italian legislator introduced art. 224-bis in the Code of Criminal Procedure, with the aim of promoting a new procedure for the collection of DNA samples without consent of individuals. This provision states that the individual can be forced only with a judge order that certifies the necessity of the collection and in case of particularly serious offences. The provision does not solve the main problem so that prosecution continues to take DNA samples even from people who do not have any connection with the crime, such as relatives of the offender.

In the Explanatory Memorandum of Recommendation No.R (97)5 on the protection of medical data (par. 58), the Committee of Ministers to Member States pointed out that «the collection and processing of genetic data involves the storage of data concerning third parties. These third parties may be constituted by members of the data subject's genetic line or collateral relatives or members of his/her social family». Moreover it stated that «the drafters agreed to accord an intermediate status to members of the data subject's genetic line so as to distinguish them from third parties in the strict sense of the term and to grant them a hybrid legal protection».

The human-body could be considered a declaratory evidence because it is able to provide information very similar and maybe more reliable than the ones obtained from a witness (Fanuele, 2009). This is the reason why it is necessary to grant every hypothetical “donor”, in case of partial match found out with a low stringency search, the same right recognised from the national law to the relatives of the offender: for instance, article 199 of the Italian Code of Criminal Procedure allows closed relatives of the defendant not to testify in trials; similarly art. 378 of the Italian Criminal Code, which refers to the felony of aiding and abetting, rules out the punishment for offender’s relatives if they decide to help him to avoid the arrest.

To afford an “hybrid legal protection”, the general right not to cooperate during the investigation, recognized to the members of the suspect’s family in case of testimony or aiding and abetting, should be analogically applied in case of DNA testing: it means that an individual asked for a sample by security officers must be informed about the future use of it and the scope of the drawing, in order to prevent that an unaware act of cooperation leads to the conviction of a relative. Only with this systematic interpretation the protection accorded to a traditional witness could be applied to “genetic witnesses”.

In Germany, where there is a constitutional right to informational self-determination, in 1997 the legislator introduced a specific provision for the collection of DNA evidence: §81 of the *Strafprozessordnung* allows prosecution to take samples from third parties without their consent only if they could be considered witnesses of the crime under investigation and if the genetic analysis does not require the action of specialised doctors. Accordingly, blood samples and DNA tests involving “innocent people” are legally banned.

Only if the purpose of the test is to find a familial connection among people, does the German Procedure Code allow every kind of genetic tests, but in this case the information gathered have no connection with a criminal trial.

Moreover, §81e section 1 states that every DNA sample collected during investigations should be used only to analyse genetic status, to investigate the criminal fact and to verify if the DNA traces at the crime scene belong to the offender or to the victim. Every other kind of test is expressly forbidden to avoid the possibility that evolution in science could lead to the exploitation of genetic analysis for the purpose of estimating genetic predisposition to violent behaviour or to recidivism (Orlandi and Pappalardo, 1999).

4.4. A genetic version of Lombroso's general theory.

In Italy, the Bayout case (2007) made people think about a new deterministic trend in the criminal justice system and about the possible application of the hereditary claim of eugenics: a man convicted for a murder was sentenced to 9 years of jail, but the Court of Appeal, admitted the claim, reducing the punishment to 8 years because of the "genetic vulnerability" of the defendant.

The Court stated that the DNA test, provided by the defence, proved the presence in the gene pool of the offender of two alleles, which, according to international studies, are responsible for the predisposition to violent and aggressive behaviours: in particular, gene MAOA could make people predisposed to hostility if they are provoked.

In this case the results of the genetic test had a positive effect on the defendant's position, but is it possible to imagine which kind of risks could such an analysis create if it leads to results against the defendant/sentenced person?

According to determinism «genes directly determine – in a significant way – a large number of human social and behavioural traits» but the scientific community does not agree with this assertion because the genetic development of people depends on the interaction between genes and environmental factors (Garland, 2004). Despite of the lack of rigor in the analysis of eugenic data and the assumed mythical correlation between genes for criminality and human criminal behaviour, it is not possible to exclude that genetic predisposition would be used as an argument to support a claim of social dangerousness and to obtain a judicial order for preventive detention or other security measures.

Genetic pool should hold a clue to a specific "criminal type" and could provide a justification for discriminatory measures related to the risk of recidivism and for the creation of a criminal policy influenced by current stereotypes, which associate crimes with race (Nelkin and Andrews, 1999).

Looking at this problematic framework, some national Courts state that in genetic investigation, which include the use of DNA tests it is necessary to comply with the proportionality principle. The German Federal Constitutional Court, facing this issue, recognised the "principle of proportionality of renunciation": the pros and cons are compared and analysed in order to strike a fair balance between security and fundamental freedoms and to determine whether it is proportional to limit basic rights for the greater benefit of the society. The same approach is adopted by the Spanish Constitutional Court, who demands that any body intervention must be adequate, essential and proportional in a strict sense (Guillén et al., 2000). Accordingly, States should promote a review of their legislation in genetic field in order to define a specific standard of protection for the offender's and third parties' position: not every procedure used to collect evidence is to be considered proportional if the effect is to limit dignity or individual rights. In the highlight of this assumption it is important once more to underline the decision of the European Court of Human Right in *S. and Marper v. the United Kingdom*: «an interference will be considered "necessary in a democratic society" for a legitimate aim if it answers a "pressing social need" and, in particular, if it is proportionate to the legitimate aim pursued and if the reasons adduced by the national authorities to justify it are "relevant and sufficient". While it is for the national authorities to make the initial assessment in all these respects, the final evaluation of whether the interference is necessary remains subject to review by the Court for conformity with the requirements of the Convention».

5. The forensic use of bioinformation. A private law perspective.

The treatment of personal and genetic data for forensic purposes raises several concerns from a legal point of view. It potentially affects fundamental rights such as the principle of non-discrimination, the rights of the child, the right to an effective remedy before a tribunal and a fair trial. However, the most prominent concern is about privacy at different stages. In particular, it is possible to identify at least three profiles of friction with respect of the processing of personal data: 1) the storage of biological samples and DNA profiles within forensic biobanks; 2) the conducting of familial searching procedure; 3) the use of human tissue collected in “medical” or research biobanks for investigation purposes.

5.1. The role of privacy in forensic biobanks

As is well known, the concept of privacy has evolved from the traditional principle of the «right to be let alone» (Warren and Brandeis, 1890) toward the protection of the integrity of the individual's body and, more recently, with the spread of ICT, until the right of control over personal information (Rodotà, 1995 and 1999; Buttarelli, 1997; Pardolesi, 2003; Ubertazzi, 2004; Resta, 2005).

In the matter of forensic biobanks, we can identify the two different faces of privacy: the first one concerns the drawing of biological samples and involves personal liberty (bodily privacy); the second one refers to the storage and use of samples, DNA profiles or personal data, so related to the information privacy, with respect of the processing of personal data. Many studies focus primarily on the first problem. Most underrated, but not least, is the second aspect. The aim of the paper is precisely to investigate the latter.

First, it is necessary to outline the regulatory framework regarding the forensic use of personal data. The legal pillars at European level are: art. 16 TFEU, the Convention 108, the Recommendations of the Council of Europe R (87)15 and R(92)1, Regulation (EC) No 45/2001, Decision 2008/977/JHA of 27 November 2008, and art. 8 ECHR.

Art. 16 TFEU is a general clause on the protection and the free movement of personal data, which also includes police and judicial cooperation in criminal matters.

The Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data (so called Convention 108), opened for signature by the Member States of the Council of Europe on 28 January 1981, is a prelude to some concepts which echo in Directive 95/46/EC (that expressly does not apply in the area of criminal law), such as: the fair and lawful process of personal data; the specified and legitimate purposes of the storage; the adequacy, relevance and non excessiveness in relation to the purposes; the preservation of data «in a form which permits identification of the data subjects for no longer than is required for the purpose for which those data are stored» (art.5). The Convention also devotes special attention to “more sensible” categories of data, such as those able to reveal racial origin, political opinions or religious or other beliefs, as well as personal data concerning health or sexual life. This provisions also apply to personal data related to criminal convictions. A derogation to these principles can be allowed only if it is provided for by national law or necessary for guarantee State security, public safety, the monetary interests of the State, the suppression of criminal offences, the data subject or the rights and freedoms of others (art.9).

The Recommendations, although not binding, indicate a set of guiding principles for the collection, storage, use and communication of personal data and DNA analysis within the framework of the investigation and prosecution of criminal offences. In particular, they reaffirm the principle of necessity in relation to the purpose, the length of storage and the criteria for the deletion of personal data, and the rule of law in the matter of sample taking and DNA analysis.

Regulation (EC) no 405/2001 concerns the protection of individuals with regard to the processing of personal data by Community institutions and bodies, and it sets up the European Data Protection Supervisor (EDPS), as independent authority.

Also the Council Framework Decision 2008/977/JHA declares the principles of lawfulness, proportionality and purpose in the collection and process of personal data by competent authorities of member State, unless the scope of the Decision is considered limited, being the result of an agreement on the «lowest common denominator» (Bárd, 2009). However, such provisions could be repealed by the new Directive on data protection, which is currently under discussion. In particular, the proposal “on the protection of individuals with regard to the processing of personal data by competent authorities for the purposes of prevention, investigation, detection or prosecution of criminal offences or the execution of criminal penalties, and the free movement of such data” is interesting because introduces new definitions such as ‘personal data breach’, ‘genetic data’ and ‘biometric data’. In addition, it provides a special protection for particularly sensitive data like the genetic ones: according to Article 8 there is a general prohibition of processing special categories of personal data, influenced by the ratio decidendi of *S. and Marper v. the United Kingdom*.

The judgment rendered by the Grand Chamber of the ECHR on 4 December 2008 originated from the contrast between the Police and Criminal Evidence Act (1984) - allowing an indefinite retention of fingerprints, DNA profiles and samples from someone suspected or convicted - and art. 8 ECHR. In the case, two subjects, S. - 11-year-old boy charged with attempted robbery and later acquitted - and Michael Marper - guilty of harassment whose process was discontinued – claimed for the removal of their data from the NDNAD. The Court, chronicling its case law, outlined a very broad notion of private life. So, art. 8 must be adapted to the case, which concerns three types of personal data: genetic data, biological sample and fingerprints. The mentioned decision is relevant because affirmed that, given the differences in the level of information that biological samples could be revealed, the storage itself is *per se* an unlawful interference with private life. Also DNA profiles contain «substantial amounts of unique personal data», allowing, thanks to the automated processing, to go beyond the neutral purpose of identification (if we consider, for example the procedure of familial searching). The Court found the violation of art. 8 ECHR, establishing that «the blanket and indiscriminate nature of the powers of retention of the fingerprints, cellular samples and DNA profiles of persons suspected but not convicted of offences, [...] fails to strike a fair balance between the competing public and private interests and that the respondent State has overstepped any acceptable margin of appreciation in this regard». So, the Court recognized a “power to destroy”, as a sort of remedy of “specific performance” with respect to the violation of the right to privacy (Abrusci, 2010).

Since the ECHR, as interpreted by the Strasbourg Court, is binding for our legal system, it is possible to note some incompatibilities with the Italian legislation regarding forensic biobanks (Bargis, 2011; Gennari, 2009). According to art. 13 of Law 85/2009 DNA profiles and biological sample are destroyed *ex officio* only in case of full acquittal (i.e. with the formula of art. 530 co.1 c.p.p.). In any other case, until it will be issued the implementing regulation, the DNA profile is stored up to 40 years and the biological sample is kept up to 20 years. The Italian law does not make any distinction among data belonging to suspected, convicted or innocent person.

Such provisions leave many questions unanswered: what happen in case of acquittal for reasons different from art. 530 co.1 c.p.p., compulsory non-suit ruling or dismissal of the case? What about the sample of the victims? Are these measures proportionate in a democratic society? Probably, we just have to wait for the implementing technical regulation, hoping to solve this situation of "interregnum" and clashes with the European judgments.

However, if it appears justified to preserve the DNA profile for a reasonable time as provided by art. 8 ECHR, it is unclear the reason of retaining the biological sample after the DNA-profile has been extracted. In fact, if the scope of a forensic biobank is just the identification of offenders and victims, and for that function the DNA profile is sufficient, then the retention of a potentially "dangerous" material seems in contrast with the European standards of adequacy, relevance and non excessiveness in relation to the purposes: biological sample is a source that allows to obtain several times and over time not only the DNA profile but also genetic data. The latter is a “supersensible” data (Buttarelli, 1997), because it «can provide insight into personal family relationship, disease

predisposition, physical attributes, and ancestry» (Simoncelli, 2006). In the context of forensic biobanks, concerns about discrimination and stigmatization can take two different dimensions. First of all, one of the greatest threats to fundamental rights depends on the amount and type of information that DNA can reveal and on the possibility that such information could be used for purposes other than law enforcement. It is not an abstract concern because, as a result of the study which reported 48 cases of genetic discrimination in the area of life insurance and employment (Barlow-Stewart and Keays, 2001), the Australian Federal Government decided to conduct an inquiry into the Protection of Human Genetic Information.

The second problem is related to ethnic information. In fact, the overrepresentation in a forensic biobank of certain minority groups can reinforce discrimination trends (Bárd, 2009) or racist policy of the police (Patyn and Dierickx, 2009).

Nevertheless, even the storage of the mere DNA-profile is unable to ensure adequate protection of privacy and other fundamental rights in a dynamic perspective; some authors, in fact, argue that the non-coding DNA, with the advances of technology could not be “junk DNA”, but, on the contrary, a source of new information that today we cannot predict (Bargis, 2011; Gennari, 2009).

In conclusion, if we can affirm that the retention of biological samples is not a necessary measure in order to ensure the criminal identification, but it could only constitute a source of legal and social damage, also the maintenance of DNA-profiles in forensic biobanks has problematic aspects. We took the example of Italy, which legislation makes little distinctions between heterogeneous situations and allows the storage of DNA-profiles up to forty years. Moreover, even if domestic law complied with the principles enunciated by the Court of Strasbourg, this would represent a contingent response to a need necessarily *in fieri*.

5.2. Dearest relatives, poisonous relations.

As we have already said, the procedure of familial searching is an extension of the scope of a forensic biobank. This technique - currently practised in UK, the Netherlands, New Zealand, and some states of US - looks for near perfect matches in order to find people who share a significant portion of the perpetrator's DNA profile (Murphy, 2010; Chamberlain, 2012). Once again, the balance is between law enforcement needs and privacy, but in this case it involves the rights of suspects' relatives. This is made possible by the peculiar nature of DNA that is an inherited data shared among all members of a biological family.

Familial searching offers the possibility of extending the scope of the research, maximizing the defensive effort in the investigation, also permitting the acquittal of innocents erroneously accused (Epstein, 2009), but at the same time it can «generate false starts or cast suspicious on wholly innocent people solely on account of biological relatedness» (Murphy, 2010). As affirmed by Tania Simoncelli: «if practiced routinely, we would be subjecting hundreds of thousands of innocent people who happen to be relatives of individuals in the FBI database to lifelong genetic surveillance», with the result that the criminal suspicion depends on «the bad luck of having a black sheep in family» (Gennari, 2009). Moreover, familial searching is based on the slippery premise of biological determinism: such a searching works if there is a matching with a sample that is already filed in a forensic biobank, as if the relatives of the offenders had a greater propensity to crime than people who have relatives uncensored (Murphy, 2010). This thesis was also supported by eminent authors (Bieber and al., 2006).

In any case, the practice is highly problematic for two other reasons. Firstly, the accuracy of familial searching is still in development and the overconfidence in the infallibility of technology could lead investigators to forget traditional and tested investigative methods with awful results (as in the case of the wrongful identification of the Madrid subway bomber); secondly, the suspicions created by this practice could cause indirect damage to professional and private life (Murphy, 2010).

According to this scenario we can provide only two alternatives: the legislative ban of familial searching (as Canada did) or its admission with correctives measures. In the latter option, it should

be necessary to reflect on whether familial searching should be used to pursue any or only certain types of offences. Secondly, it will be crucial to draw a dividing line between conducts that are considered a violation of privacy and those which are not. In this sense, a cost benefit analysis could be a useful element in order to evaluate the complex balance between the sacrifice imposed on privacy and the expected benefits for criminal investigations and social security.

5.3. Odin's eye and the forensic use of research biobanks.

The needs of criminal investigation may in some cases cross the boundaries of forensic database and reach out to other types of biobanks. The thesis is not weird because this “trespassing” happened in the already mentioned Swedish case. In order to solve the murder of the Minister of Foreign Affairs the competent authority granted the access to a national research biobank, collecting the blood samples of the newborns from 1975 (Wendel, 2007). The strategy proved to be effective as the murderer was identified, but at the same time raised a whirlwind of controversy not only in Sweden.

Compared to the forensic biobanks where potential violations can involve “only” individual or familial privacy, in the context of research biobanks come to be other interests, such as the right of self-determination, the right to health, scientific research, social well-being (Macilotti et al., forthcoming). The matter must be addressed simultaneously taking into account these factors.

The ecosystem of research biobanks is essentially based on trust (Kaufman et al., 2009). Patients and participants donate tissues and information unselfishly to the biobank, which is able to maximize these resources for research purposes while ensuring fundamental rights of donors. The latter, in fact, through the instrument of informed consent, can exercise the autonomy of the donors and the control over their information, for example, deciding to allocate the samples for every type of research or only for specific protocols. At all times, participants may withdraw the consent: its data and samples will be destroyed (Faden, 1986; Ferrando, 1998, Kaye and Stranger, 2009; Kaye et al., 2012). A further guarantee that feeds the circle of trust is the anonymization. Although it has been shown that a complete anonymization cannot technically be realized (Lunshof et al., 2008), however biobanks have mechanisms of double encoding that does not make the participant identifiable when its sample is transferred to researchers (Caplan and Elger, 2006). In this way, donors are shielded from potential illegal or discriminatory treatments.

The forensic use of research biobanks could jeopardize this delicate balance. First, it would deprive of any significance the informed consent and, at the same time, it would be able to cross the guarantee of anonymization. The loss of trust in biobank is likely to lead to a drastic decrease in donations. Moreover, since genetic data is a shared information, many donors may decide not to donate as precaution, fearing to harm their relatives now or in the future.

In addition, the use of biobank's bioinformation for investigative purposes constitutes a bypass of the logic of Marper's case: biological samples are stored for the time necessary for the research (hence, also for years), then potentially available to the judicial authority indefinitely.

This provision would trigger a dangerous vicious circle. The decrease of donations would have a negative effect on the functioning of biobanks which would no longer be able to ensure a critical mass of samples for research purposes. Biomedical and translational research, that is based mainly on massive molecular analysis of tissues, would suffer a dangerous stalemate or would be forced to obtain the necessary resources addressing additional costs. If the research is unable to progress or its results are too expensive, the damage will finally affect the whole society.

On the other side, DNA testing is not yet able to guarantee certainty and cannot be decisive in a trial in the absence of a solid framework of probative evidences. Considering the negative externalities that may arise and the possibility to ensure the persecution of crime with traditional investigative methods, it would be more efficient that privacy requirements prevail over criminal investigation needs.

6. Conclusion

The ethical and constitutional issues related to the access by prosecution into biobank, DNA dragnet, forced-drawings and familial searching are deeply connected to the problem of how to govern risks fighting terrorism and transnational crime. In order to provide an efficient criminal policy, modern democracies have introduced the right to security in the constitutional framework, but the effect of the enhancement of the standard of social defence has involved a partial collapse of the criminal law system, traditionally focused on the respect for the offenders' rights and on the principle of fair trial (Donini, 2008).

Granting a superior level of protection to the victim means that Public Authorities are authorized to use a more repressive approach to serious crimes, reducing in some cases both the fundamental rights that criminal law recognises to the offender and the basic liberties of "innocent" people. Indeed the fear for serious crimes induces individuals to waive a portion of their freedom in exchange for a grater safety and make them more willing to be kept under surveillance by the State, allowing it to breach their privacy in order to prevent illegal acts (Vico Valentini, 2011).

The use of bioinformation raises several concerns also in a private law perspective, because the storage of biological samples and DNA profiles within forensic biobanks and the practice of familial searching can affect genetic privacy both of individual and his biological family. From the foregoing, it emerges the need to rethink the current framework considering the European standards of adequacy, relevance and non-excessiveness in relation to the purposes and the principles outlined by ECtHR in S. and Marper case. This tension between security and privacy is exacerbated in the use of human tissue collected in research biobanks for investigative purposes, as it fits into the complex ecosystem of biomedical research. The access by the judicial authorities to research biobanks could reduce the trust in the institution, producing a dangerous chain reaction that would cause incalculable harm to drug discovery and scientific progress.

Note

Rossana Ducato is author of paragraphs 1, 3 and 5

Ilaria Marchi is author of paragraphs 2, 4 and 6

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