Expert evidence: the genetic chimerism and its implications for the world of law

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Proof treated generally, is the formal means of reaching the truth of the facts in the process, whether constitutive, hindering, modify or even barred the alleged fact alleged by the parties, however, not abandoning their fundamental reason in the process, this is weighted by the judge, who will resort to their cognition to the factual argument better addressed to the fair outcome of the dispute.

Meanwhile, questions are: the systemic principle of free legal conviction of the judge must be guided by their true cognitive or this "personal truth", even famous, calculated and axiologically neutral fit reservations when faced with the expert evidence based on the highest scientific and reliable shades?

The answer to this question and honorable routine discoveries and inventions in science, namely, the chimerism and genetic mosaicism and its consequences on the reliability of DNA testing (deoxyribonucleic acid), not yet discussed the courts in at least three situations like:

a) Congenital genetic chimerism: when an individual has two distinct genetic codes in their bodies, randomly distributed in various organs and tissues, from the merger of two different embryos;
b) The genetic mosaicism: when abnormality occurs in the initial cell division, a single fertilized egg, after repeated divisions, generating a gene sequence distinct and merges into the same individual;
c) The genetic microchimerism: a larger scope, occurs when there is exchange of cells by two individuals, are common in normal pregnancy, between mother and fetus, during pregnancy in dizygotic twins, in vitro fertilization, or so induced, the treatment certain leukemias in patients who underwent bone marrow transplantation.
A peaceful position in all spheres of the judiciary as to the reliability of DNA testing based on the possibility of the judge *a quo* considered the result as proof reliable but not infallible in clarifying the truth sought in the act and its consequent court justice.

However, the recurrent view is based only on two controversial aspects towards this proof: The *objective criterion*, the real possibility of human error when making the test is in the collection or analysis (negligence, imprudence or lack of laboratory and / or individuals involved in various stages of the procedure) or fraud (intent of the parties under any circumstances) and the *subjective criterion*, sitting in the free conviction of the judge, given its overall analysis of the case, its complexity, its power, whether by economic, social, or the ideal of justice in the pacification of conflicts.

In any case, there exists at least one focus to be considered, especially in criminal cases where the presumption of innocence of the accused must be reached on the principles, basic democratic and legal defense of the procedure, until the right verdict.

The *criterion* should be considered *a priori* probability of the existence of genetic abnormality of chimerism, even if their statistics are unknown (so far, only forty cases proven around the world, by accident), for the possibility of any error must be analyzed in all their variability, on pain of unjust greedy and consequent loss of the goal of a democratic state of law.

The error *in principle*, therefore, lies not in the test itself (*a posteriori*, using techniques known as effective investigative means), but the real and acknowledged the possibility of current methodology still disregard the existence of genetic chimerism, despite the scientific need be roughly the same as those used, only different in complexity and economic feasibility (it is necessary to take samples of various organs and tissues investigated, their first-degree relatives, including samples of some internal organs).

Thus, the error is evident insignificance on the gene pool placed under review for lack of legal practice or state monetary figures, for the sequences of DNA separate verification truly attest, in its various types (seen established methods: PCR: *polymerase chain reaction*, RFLP: *restriction fragment length polymorphism* of, and
VNTR: *variable number tandem repeats*, the date defined as normal or rule in humans, however, upon the occurrence of situations of enclosing, which until now was considered the greatest hits of the DNA test: a **negative**, it becomes the main object of error, because, regardless of the number of rebuttal and try-out made the same samples (or samples of the same organ or tissue) in the individual bearer of chimerism genetic, the randomness of their anomaly makes the test and its rebuttal and try-out a game of errors in infinite probability. The researcher literally turns into concentric circles.

From the logical point of view on the negative should be categorical, while the probability affirmations. However, the new fact reverses the poles of possibilities and make investigations more necessary, given the consequences, for example, to get rid of a suspect murder for lack of their genetic compatibility with a DNA sample collected at the crime scene, or a parent is exempt from the provision of food for his paternity exclusion, resulting in the loss of subjective rights of the true son, including inheritance and cruel demoralization of women at the end of the process.

To cite a case registered in 2002, the exclusion occurred relative to the mother of two who had her "motherhood" challenged in court, alleging fraud against public benefits, as well as suspected kidnapper of his own offspring. The mother, aged 26, Lydia Fairchild, a congenital genetic chimera, in requesting a welfare benefit in the Department of Social Services of the State of Washington, the **United States of America**, was ordered to submit to the pattern of kinship confirmation via DNA test, fell to surprise him when ordered to provide information, he found himself indicted for crimes cited and brought to trial, where he sunk a double sort of aware of this possibility by an assistant district attorney in that state, and a third pregnancy, which had been closely monitored by the judge, until the birth of her third child, under the supervision of a bailiff. In the latter, like their brothers, there was no maternal genetic compatibility, dissolving the doubt in part because the insemination could have been **in vitro**.

Two years after the tests started to confirm the genetic abnormality, it was reported that the genetic identity of their children was consistent with that of his father, that is, no matter how bizarre it may seem, the maternal grandfather was genetically "the mother of his own grandchildren".
This case and other plausible possibilities of error striking, due to the wide range of provoking factors of genetic chimerism, such as *in vitro* insemination, or even a higher incidence of bone marrow transplants requires the greatest possible discretion in making the tests DNA, regardless of the factors of complexity and cost involved, such factors are historically adaptable to the problems of society, especially from the judiciary, cannot excuse himself to open new frontiers, admitting that he was always "one step back" of society, to ensure you have the peace of justice coming from.

Only the repeated requests of the judges with the formulation of a new requirement, *sine qua non* of enclosing the mosaicism and chimerism genetic in tests of DNA, can create healthy reengineering, based on criteria more accurately scientific from laboratories for genetic testing today qualified for this goal.

These new requirements will, by its leverage (cognitive advantage) in their required by law, reorganization with a more professional sector laboratory diffuse paramount and reliability of forensic evidence obtained from technical reports of genetic screening.

The simple argument of the economic consideration, alluded to the negative of this new need, cannot (or should not) override the constitutional principle of presumption of innocence, coupled with legal defense and contradictory. One must remember that in the recent past, the same slogans were used in the financial burden that currently is called Test basic level, the most rudimentary method. It was also similar to what happened with the testing of positive HIV in blood samples and their derivatives. Visions outdated and that repeated decisions, delayed stimulation of new technologies, making them more reliable and less costly.

The vision of the courts about the reliability of current DNA testing should be considered by the facts now told. In a study in Brazil, was identified only the recommendation of the Ordinance of the Institute of Social Medicine and Criminology of São Paulo (Executive Order S - IMESC - 7, 29/08/2006, Published in the Daily Journal, 30/08/2006) regulating the procedures for collection of biological material, issuing reports and the methodology used in surveys of investigating the genetic link through the identification of DNA polymorphisms (point 3.4, Annex 1 - *in verbis*: "Individuals transfused with blood or derivatives or who received bone marrow
transplants in the last six months to collect, should have their survey done by collecting blood and buccal swab also, to refrain from the report is inconclusive by chimerism status.

Scientific advances cannot be discarded, as if there were, for the simple care to believe instead of know. It may be uncomfortable to open once again closing the rock cave, is always painful to open up the hand of a belief, especially when the daughter of science, but teaches how scientific knowledge, for its great thinkers, "science is the rule the transitory truth". And this is just another case where the linearity and absolutism, which is typical of legal positivism, produced on the classic example of DNA testing, like any "scientific truth" has been put in its final phase of transience.

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