VII. CONCLUSION AND SUGGESTIONS

The DNA technology was invented by Sir Alec Jefferys in Licester University, London in 1985. Initially, the DNA technology has been used for scientific research. Now, it is effectively used for identification purpose. The DNA technology is not only used to trace the real culprit but also to relieve the innocent suspect from the penal clutches of law. DNA or Deoxyribonucleic acid is a genetic blueprint of human beings. DNA of human beings cannot be changed throughout the lifetime. But, it varies from person to person except genetically identical twins. The uniqueness of DNA makes it as an effective investigative tool to find out the real culprit by the investigative machinery. The DNA can be collected from the sources of blood, semen, hair, fingernail clippings, tooth, body tissues, bones, saliva, urine, foetal material, postmortem samples, and other body fluids. It can also be possibly located from the handle of the weapon, bite marks, cigarette butts, glass, etc. The collected samples shall be duly preserved, parcelled, sealed, and properly transported to forensic lab. This is an important step for successful DNA analysis. Then, the forensic scientist will conduct the DNA analysis of samples which have been forwarded to the lab by the investigative authorities. The forensic scientists do not analyze the entire genome instead they analyze specific sites on the DNA molecule. Initially, in early 1900s, before the advent of DNA technology, three blood testing methods have been used for paternity identification namely Blood Typing, Serological Testing and Human Leukocyte Antigen (HLA). These methods were not satisfactory and it was very difficult to perform. After the advent of DNA technology, five methods were developed. They are:

- Restriction Fragment Length Polymorphism,
- Polymerase Chain Reaction,
- Short Tandem Repeats DNA analysis,
- Mitochondrial DNA analysis, and
- Y Chromosome DNA Analysis.

These methods produce conclusive results. These methods are used for identification of paternity issues as well as criminal identification. Depending on the quality and quantity of the biological sample, any one of these tests will be conducted. For example, when there is a large amount of un-degraded sample, then the biological sample can be analyzed through RFLP Analysis. RFLP is
mainly used for analyzing the paternity issues. When the crime scene samples are small and degraded, the PCR Analysis can be used. Many copies of DNA can be amplified from a small amount of DNA sample through this PCR Analysis. This PCR Analysis can be used for criminal identification as well as paternity identification. When the crime scene sample contains a very minute level, the STR Analysis can be used for getting identification. This STR Analysis can be used for criminal identification as well as paternity identification. In case, when the sample is more degraded or scarce, then the Mitochondrial DNA Analysis can be conducted. Samples that involve very old bones, teeth or hair shafts are not possible to analyze through RFLP or STR Analysis. Even the PCR Analysis cannot be done when the sample is more degraded. This Mitochondrial DNA Analysis can be used in anthropological research and for identification of maternal lineage. To identify the paternal lineage (male’s ancestry), the Y chromosome DNA test is conducted. For example, for identification of children without parents, then Y chromosome DNA test will be conducted. Because, the Y chromosome is passed down from the grandfather to father, father to son and so on, and thereby to whole generation. It can be used for identification of paternal lineage as well as criminal identification.

In India till now, there is no specific DNA legislation to regulate the collection of biological sample for DNA analysis. Sections 53, 54, 53A, 164A, 173(8), 293(2) & (4) of the Criminal Procedure Code, 1973, Sections 45, 112 of the Indian Evidence Act, and Section 27 of Prevention of Terrorism Act, 2002 deal with DNA test. Though the DNA test has gained a statutory recognition under the above mentioned laws, often disputes arise as to the powers mentioned under Sections 53 of the Criminal Procedure code, 1973 and the constitutional validity of Section 53 of the Criminal Procedure Code, 1973.

The judgments of the Supreme Court and various High Courts ruled that taking of biological samples from the accused for DNA analysis under Section 53 of the Criminal Procedure Code, 1973 does not face the constitutional hurdles under Article 21 and Article 20(3) of the Indian Constitution. The constitutional makers do not say that no person shall be deprived of his right or personal liberty under any circumstances. On the contrary, if such deprivation of right or personal liberty is in accordance with the procedure established by law, the same does not
violate Article 21 of the Indian Constitution. If only physical examination of the
skin and the body, is accepted without including taking of blood sample for
determination of his blood group then the very purpose of Section 53 of the
Criminal Procedure Code will be frustrated or defeated.\textsuperscript{545} Like that, a specimen
handwriting or signature or finger impressions by themselves are no testimony at
all being wholly innocuous because they are unchangeable except in rare cases
where the ridges of the fingers or the style of writing have been tampered with.
They are only materials for comparison in order to lend assurance to the court that
its inference based on other pieces of evidence is reliable. They are neither oral
nor documentary evidence but belong to the third category of material evidence
which is outside the limit of testimony. The makers of the constitution should not
have intended to put obstacles in the way of efficient and effective investigation
into crime and of bringing criminals to justice.\textsuperscript{546} Hence, the taking and retention
of DNA samples which are in the nature of physical evidence does not face
constitutional hurdles in the Indian context.\textsuperscript{547}

Though Section 53 of the Criminal Procedure Code, 1973 discloses that
the medical examination will have to be conducted at the instance of a police
officer not below the rank of sub-inspector, that does not prohibit other superior
officers or the Court concerned from exercising the said power if it is necessary
for rendering justice in criminal case. If medical examination of an accused can be
done at the instance of the police officer not below the rank of sub-inspector, then
such a power should be deemed to be impliedly possessed by a Magistrate or
Court trying the offense. There is no warrant for curtailing the scope of the
Section 53 of Criminal Procedure Code, 1973.\textsuperscript{548} At the same time, merely
because the accused is released on bail, he does not cease to be the arrested person
or person in custody and that therefore, the power conferred on the court/investigating officer under Section 53 of the Criminal Procedure Code can be
exercised. Until the accused is acquitted of the charges leveled against him, he is
the accused and under the custody of the court. The release on bail does not

\textsuperscript{545} H. M. Prakash Alis Dali v. State of Karnataka, 2004 (3) KarLJ 584
\textsuperscript{546} State of Bombay v. Kathikalu Oghud, AIR 1961 SC 1808; H. M. Prakash Alis Dali v. State of
Karnataka, 2004 (3) KarLJ 584; Thongorani Alias K. Damayanti v. State of Orissa and Ors,
2004 CriLJ 4003
\textsuperscript{547} Smt Selvi and Others v. State of Karnataka, (2010) 7 SCC 263
\textsuperscript{548} H. M. Prakash Alis Dali v. State of Karnataka, 2004 (3) KarLJ 584
change the reality and from that fact alone, it cannot be said that he is not a person arrested for an offense. A person released on bail is still considered to be detained in the constructive custody of the court through his surety. He has to appear before the court as and when required or directed. He is notionally in the custody of the court and hence, continues to be a person arrested. Therefore, to that extent, his liberty is subjected to restraint. Moreover, Section 173(8) of the Criminal Procedure Code, 1973 confers an express power to the investigating authority to carry out further investigation after the cognizance is taken by the court.\textsuperscript{549} Like that, a person released on bail in the event of arrest submits himself to the jurisdiction of the court and the law has taken control of such person. The person released on bail in the event of arrest has submitted himself to the jurisdiction of the court and, the term ‘anticipatory bail’ is a misnomer and the order directing bail in the event of arrest takes effect, the instant a person is arrested.\textsuperscript{550}

Though there is no specific DNA legislation in India, our Indian Judiciary is admitting DNA as one of the circumstantial evidences in criminal cases. In almost all the cases which have already been decided by the Supreme Court and the High Court show that the DNA evidence plays an important role to identify the criminal with an incredible accuracy. For instance, sometimes parties involve in sexual relationship without getting married. In such a case, the aggrieved girl files a maintenance claim for her child. Then, the court has to rely on DNA technology in order to resolve the dispute with accuracy.\textsuperscript{551} And, sometimes the marriage is subsisting between the parties but the parties are in separation. In the mean time, the girl files a maintenance claim for herself and her child. But, the husband denies the wife’s claim and pleads that he is not the father of that child. Here, the court relies on Section 112 of the Indian Evidence Act, 1872.

But, the courts are not allowing the claim of the husband for conducting DNA test to prove the non access with his wife when the marriage is subsisting.\textsuperscript{552} Earlier, the courts have taken conservative views with regard to the permission for allowing DNA test against the presumption laid down under Section 112 of the Indian Evidence Act, 1872. Because, our courts are mainly concerned about the

\textsuperscript{549} H. M. Prakash Alis Dali v. State of Karnataka, 2004 (3) KarLJ 584
\textsuperscript{551} Kunhiraman v. Manoj, 1991 (2) KLT 190.
\textsuperscript{552} Goutham Kundu v. State of West Bengal, AIR 1993 SC 2295.
child’s welfare and the reason is that the law leans in favor of the innocent child from being bastardised if his mother and her spouse were living together during the time of conception. Suppose the courts are allowing DNA test, and the DNA test results against the child then the courts are not admitting DNA evidence. In *Rohit Shekhar v. Shri Narayan Dutt Tiwari*, the child files a declaration suit and asked the permission of the court to conduct DNA test of his biological father when the legal father is existing. Here, the child was able to produce DNA evidence that excluded the possibility that his legal father was his biological father. In addition, photographic and testimonial evidence suggested that the respondent could be his biological father. On these grounds the Delhi High Court ordered the biological father to undergo a DNA test. This was upheld in an appeal to the Supreme Court. Now, the Supreme Court has changed to follow the presumption laid down under section 112 of the Indian Evidence Act, 1872 which has been followed from the date of enactment of the Act. For the first time in 2014, the Supreme Court favors the innocent husband to prove his paternity claim in maintenance proceedings. The DNA test is in favor of the husband. Here, the court gives priority to the DNA test under Section 45 of the Indian Evidence Act, 1872 over the legitimate presumption laid down under Section 112 of the Indian Evidence Act, 1872. In rape and murder cases, murder cases, the unnatural offenses and murder cases, and assassination cases, the DNA is considered to be one of the important circumstantial evidences. The court gives a judgment not only based on the DNA evidence but also based on the other evidences. The DNA is considered to be one among the other evidences. In all the cases which have been analyzed by the researcher in the fourth chapter, the DNA evidence corroborates the other evidences except in *Santhosh Kumar Singh v. State through CBI*.

In this rape and murder case, the DNA evidence corroborates all the evidences except the post-mortem report. Here, the post-mortem report ruled out rape but the DNA report has confirmed that the rape has been committed on the deceased and the biological samples have been collected from the deceased match with the accused. The Supreme Court based on the facts and circumstances of the

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555 Id
557 2011 4 SCC 80.
case and the evidence on record has taken the DNA report instead of the post-mortem report. In assassination cases, the identity of the deceased as well as the identity of the accused can easily be traced through DNA. The admission of DNA evidence in criminal cases does not affect the fair trial because the courts in India are admitting DNA based on the facts and circumstances of each and every case, the expert testimony, the expert report, cross examination of expert by the defense counsel and other evidences on record.

The United Kingdom is the first country to establish National DNA Database (NDNAD) in 1995. DNA application and the DNA database are mainly controlled by the Criminal Justice and Public Order Act, 1994. Now, the retention of fingerprints and the DNA samples can be regulated by the Protection of Freedom Act, 2012. In the United Kingdom, the courts admitted DNA evidence based on the ruling laid down in *R v. Doheny and Adams*.559

The United States of America currently contains the largest DNA database in the world. DNA identification Act, 1994 authorized for the establishment of National DNA Index System.560 The United States Code dealt with the DNA in the Federal Government.561 All the 50 states had their DNA legislations. The majority of states admitted DNA evidence based on the ruling laid down in *Daubert v. Merrell Dow Pharmaceuticals*.562 Some states admitted DNA evidence based on the entire Daubert trilogy, while some states admitted only certain elements of the Daubert trilogy. Some states admitted based on the ruling laid down in *Frye v. United States*,563 while some states applied Frye ruling only to new or developing science. There was no uniformity for admitting scientific evidence in the United States.

The United Kingdom is a low populated nation. So, they are maintaining DNA databases easily. They do not have any backlog vacancies of cases pending

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559 (1997) 1 Cr. App. R. 369
560 Title 42 United State (U.S) Code 14132
563 293 F. 1013 (D.C. Cir. 1923).
for DNA analysis till now. At the same time, the country is spending high funds for the promotion of DNA databases. The United States of America is high populated nation than the United Kingdom. But, they have backlog vacancies. Like the United Kingdom, the United States of America is also spending high funds for the promotion of DNA databases and for the elimination of backlog vacancies. The process followed by the United Kingdom and the United States of America are different and is much quicker in the United Kingdom than the United States of America. At the same time, the United Kingdom has more private labs and also has fully integrated productivity - enhancing technologies specifically, laboratory information management systems (LIMS) and automation than in the United States of America. The United Kingdom successfully uses advanced methods like familial searching and LCN DNA testing in the investigations. The United States of America successfully uses post-conviction DNA testing to the innocent convicts.

In 2007, the draft DNA Profiling Bill was drafted by the Center for DNA Fingerprinting and Diagnostics, Department of Biotechnology, Govt. of India. But, the Bill had many shortcomings. So, the Bill was not introduced in Parliament. Again in 2012, another Draft Human DNA Profiling Bill was drafted by the Department of Biotechnology. An expert’s committee was appointed under the Chairmanship of A.P. Shah, Former Chief Justice of Delhi High Court by the Planning Commission, Government of India to analyze the 2012 Bill. The committee submitted that the 2012 Bill contains many privacy violations. Again, the 2012 Bill lapsed. Till date, the Bill is pending.

The above study reveals the following conclusions:

1. The important factor for successful DNA analysis is not necessarily the size of the stain, or even its age but the conditions under which it has been stored. So, the reliability of this DNA analysis is based on proper sample collection, proper preservation of biological sample, the quality control maintained by the forensic labs, and the test conducted by forensic scientists.

2. This research work clearly shows that there is positive connection between the development of DNA technology and the prevention of crime.
3. Taking of biological sample from the accused for conducting DNA test does not violate article 21 and 20(3) of the Indian Constitution.

4. The Court can order for medical examination of the accused including DNA test under Section 53 of the Criminal Procedure Code, 1973.

5. The Court can also order for medical examination of the accused including DNA test in order to effectuate further investigation under Section 173(8) of the Criminal Procedure Code, 1973 even after the cognizance has been taken by the Court.

6. Though the accused is released on bail or released in the event of arrest, Section 53 of the Criminal Procedure Code, 1973 will be applicable.

7. Indian Judiciary is admitting DNA as one of the circumstantial evidences in the criminal cases.

8. Indian Judiciary has not given a judgment solely based on DNA evidence. But, at the same time it does not put any yardstick to accept the DNA. It has given a judgment depends on the facts and circumstances of each and every case.

9. The United Kingdom admits DNA evidence based on the ruling laid down in R v. Doheny and Adams.

10. There is no uniformity in admitting DNA evidence in the United States of America. The majority of the states follow the rule laid down in Daubert v. Merrell Dow Pharmaceuticals, Inc. Some states are following entire Daubert triology and some states are following certain elements of Daubert triology. And, some states are following Frye v. United States ruling.

11. In the United Kingdom, they are using latest methods of DNA technology like familial searching and LCN DNA testing. Like that, in the United States of America post-conviction DNA testing is being used to the innocent convicts.

12. Even though, both the United Kingdom and the United States of America are successfully doing DNA analysis, the United Kingdom is in the forefront than the United States of America.

13. India should take guidance from both the United States of America and the United Kingdom. The human DNA profiling bill, 2012 is having
post-conviction DNA testing. So, India can proceed from the United States of America for an effective post-conviction DNA testing. But, in speedy laboratory process for making DNA analysis, the latest techniques of familial Searching and LCN DNA testing the United Kingdom is forefront than the United States of America. These techniques and speediest procedure has been adopted from the United Kingdom. Even though the United States of America does not contain speediest laboratory process than the United Kingdom but it analyzes many DNA regions than the United Kingdom. When analyze many regions of DNA the reliability of DNA testing cannot be questioned. So, India can follow both the United States of America and the United Kingdom. Analyzing many regions of DNA like the United States of America and adopt speediest method from the United Kingdom because India is having vast majority of population than the United States of America.

14. In India, the Human DNA Profiling Bill is pending from 2007 to till date.

**SUGGESTIONS**

1. Section 53 of the Criminal Procedure Code, 1973 has to be amended.\(^564\)

The amended Section 53 of the Criminal Procedure Code, 1973 should be as follows:

**Section 53 of Criminal Procedure Code, 1973:** Examination of accused by medical practitioner at the request of police officer/Court trying the offense.

(1) When a person is arrested or is released on bail or in the event of arrest on a charge of committing an offense of such a nature and alleged to have been committed under such circumstances that there are reasonable grounds for believing that an examination of his person will afford evidence as to the commission of an offense, it shall be lawful for a registered medical practitioner, acting at the

\(^{564}\) The existing provision - Section 53 of Criminal Procedure Code, 1973: Examination of accused by medical practitioner at the request of police officer

(1) When a person is arrested on a charge of committing an offense of such a nature and alleged to have been committed under such circumstances that there are reasonable grounds for believing that an examination of his person will afford evidence as to the commission of an offense, it shall be lawful for a registered medical practitioner, acting at the request of a police officer not below the rank of sub-inspector, and for any person acting in good faith in his aid and under his direction, to make such an examination of the person arrested as is reasonable necessary in order to ascertain the facts which may afford such evidence, and to use such force as is reasonably necessary for that purpose.
request of a police officer not below the rank of sub-inspector or Court trying the offense, and for any person acting in good faith in his aid and under his direction, to make such an examination of the person arrested as is reasonable necessary in order to ascertain the facts which may afford such evidence, and to use such force as is reasonably necessary for that purpose.

2. Section 173(8) of the Criminal Procedure Code, 1973 has to be amended. The amended Section 173(8) of the Criminal Procedure Code, 1973 should be as follows:

Section 173(8) of the Criminal Procedure, 1973 - (8) Nothing in this section shall be deemed to preclude further investigation including the medical examination of the accused and the victim in respect of an offense after a report under sub-section (2) has been forwarded to the Magistrate and, where upon such investigation, the officer in charge of the police station obtains further evidence, oral or documentary, he shall forward to the Magistrate a further report or reports regarding such evidence in the form prescribed; and the provisions of sub-sections (2) to (6) shall, as far as may be, apply in relation to such report or reports as they apply in relation to a report forwarded under sub-section (2).

3. Section 112 has to be amended. Proper chance has to be given to the aggrieved person whoever either it may be the husband or the wife or the child to rebut the presumption lay down under Section 112 of the Indian Evidence Act, 1872 through DNA test. The amended Section 112 of the Indian Evidence Act, 1872 should be as follows:

Section 112 of the Indian Evidence Act, 1872 - Birth during marriage, conclusive proof of legitimacy: The fact that any person was born during the continuance of a valid marriage between his mother and any man, or within two hundred and eighty days after its dissolution, the mother remaining unmarried, shall be conclusive proof that he is the legitimate son of that man, unless it can be shown

565 The existing provision - Section 173(8) in The Code Of Criminal Procedure, 1973: (8) Nothing in this section shall be deemed to preclude further investigation in respect of an offense after a report under sub-section (2) has been forwarded to the Magistrate and, where upon such investigation, the officer in charge of the police station obtains further evidence, oral or documentary, he shall forward to the Magistrate a further report or reports regarding such evidence in the form prescribed; and the provisions of sub-sections (2) to (6) shall, as far as may be, apply in relation to such report or reports as they apply in relation to a report forwarded under sub-section (2).

566 The existing provision – Section 112 of Indian Evidence Act, 1872: Birth during marriage, conclusive proof of legitimacy.- The fact that any person was born during the continuance of a valid marriage between his mother and any man, or within two hundred and eighty days after its dissolution, the mother remaining unmarried, shall be conclusive proof that he is the legitimate son of that man, unless it can be shown that the parties to the marriage had no access to each other at any time when he could have been begotten.
that the parties to the marriage had no access to each other at any
time when he could have been begotten.

Explanation: Non-access between the husband and wife can be
proved by DNA test.

4. Advanced technologies like Laboratory information management
systems and automation (LIMS), familial searching, LCN DNA
testing can be adopted from the United Kingdom. The post-
conviction DNA testing can be adopted from the United States of
America.

5. At present, when compared to the United Kingdom and the United
States of America, India is highly populated and suffers from
insufficient lab facility, staff facility and funding facility. Proper
guidance should be followed from other nations which have been
successfully incorporating DNA legislation in their countries
especially from the United Kingdom and the United States of
America.

6. Specific DNA legislation should be enacted. The following provisions
should be incorporated in that legislation.

(i) Guidelines for the collection of biological samples;
(ii) Guidelines for preserving biological samples before DNA analysis;
(iii) Adequate laboratory facility;
(iv) Quality and standard of forensic laboratory;
(v) Adequate staff facility;
(vi) The test conducted by forensic laboratory;
(vii) Funds
(viii) Proper forum to review whether the admitted DNA test has been
conducted by forensic laboratories.
(ix) Compliance with the National Privacy Principles which were
recommended by Expert’s Committee under the Chairmanship of A.
P. Shah, the Former Chief Justice of Delhi High Court in 2012.