

Biological study which reveals the basics for genetics and research development

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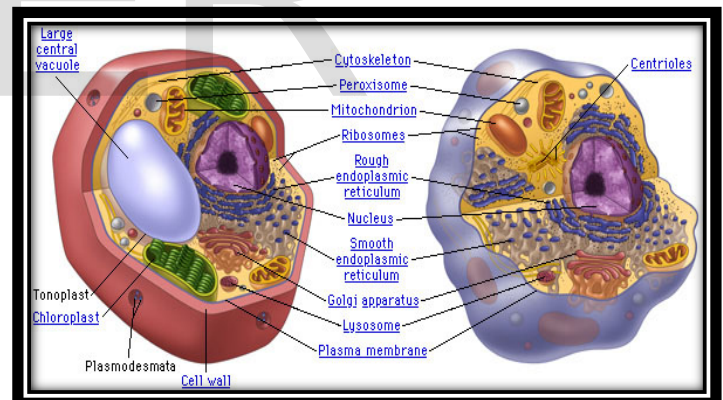
Abstract - Cell is the most focused object in majority research labs. Step by step functioning of cell is very difficult to explain accurately. Somehow, chemical processes as well as genetic based product such as protein released into body under specific stress, may give the idea about its working. But now science has been improved to explain the whole process of cell with maximum affinity. An individual is made up from various organs by building blocks i.e. atoms, molecules, tissues, and genetic expression of DNA fragments (genes) are vital role in all types of its working due to special events in routine life. Identification of genes in genomic pool due to molecular and genetic markers become easy to point out for further analysis in respective research and these markers also verified by other molecular techniques which give the authentication of data. In this review, basic biological issues and their aspects with appropriate knowledge (plant and animal) is described and the methodologies regarding genomic based research are explained. This study also covers the elementary individual level learning (complications of life) and their need to be improved in existing biosphere. We'll try to explain old and manual processes that replaced by fast, easy, less time consuming, efficient and cost-effective methods which are more reliable as well as acceptable worldwide.

Key words: Molecular markers, building block, genes, biological issues, molecular techniques and individual learnings.

1 Introduction

Cell is a basic unit of life. It is so simple sentence but having great complications. Whole life of an organism depends upon it and its all features i.e. internal processes, thinking and to find out facts and figures which are responsible to dig out the processes for identification and to reveal about linkage in different lives. For instance, a big house is made up of a strong base similarly an organism has its own base that is made by their parents by giving them helpful properties and characters which are important to go on in life and to maintain by the production of some real works that have not been originated by synthetically. The history of cell is old as man. Majority of old scientists, and scholars, philosophers, religious leaders, were believed that there were some bases on which whole organism stand and performed special exertions. Aristotle was one of the most beginner which had to say about cells and said them as bases for individual (cells) (Cavalier-Smith et al., 2006). Then there were numerous scientists came to explain the bases of organisms and Robert Hooke's was the first scientist which made very first hand made microscope and saw the structure of cell under it and told them Honey comb like structure which had many compartments and revealed them celleoles (its own term) (Gest et al., 2004). Later, numerous studies were come to know about cells, but the most authentic study was made by two scientists Schleiden & Schwann (Botanist and Zoologist), in 1938 and purposed theory about cells which had three main points as: 1-Cell is the basic unit of life for all plants and animals. 2-Cell has all necessary information for survival of life. 3- All cells are divided or increased by pre-existing cells.

There is great difference between animal and plant cell. They also have different properties and functions regarding to the compatibility of its environment. Cell wall is present in plant cells but in animal doesn't and plant cell has a large vacuole in their center except animal cell. Others are also differences which summarized in diagrams (Vasilet al., 2008).



Animal and Plant Cell

Cellular organization is the main step to find out the whole organism and it is step by step feature to admit an individual orientation plan. An atom has a million of particles that make it perfect but three are main i.e. electron, proton, neutron. And in case of cell, there is also some bases such as atom and subatomic particles that make marvelous to cell. About 92 elements are purely natural in the world but in them only 16 elements are called bio-elements that have a fabulous ability to make up of a whole organism's body to give them survive in harsh as well as in optimum environment. In which 99% of the body mass is enrolled by just 6 elements and 1% is completed by other 10

elements that meets basic atomic and subatomic level in the production of nature's plan (individual/organism) (Margulis et al., 1970).

Next level is aggregation of many elements in a different ratio to make molecules. Two types such as macro molecules and micro molecules having greater and lighter molecular weight respectively e.g. proteins, lipids, fats, carbohydrates etc. and water, glucose etc. are involved in the basic structure of an individual. These molecules are important to hold up as well as to carry work with constant production of energy. These molecules can be taken by orally (outside the body) and synthesized into body also (Margulis et al., 1970).

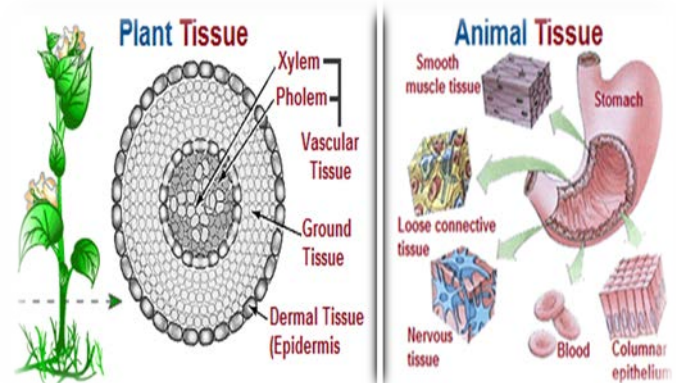
Vital force, this concept was released by great muslim scientist Bu-ali-cina that extracted urea from animal's urine and revealed theory about a marvelous force which is only produced into animals (also in humans) that has an ability to produce organic molecules into their body. But W.H wholar rejected it by synthetically produced urea into laboratory. By the rejection of vital force theory, there were no. of organic materials synthesized into the lab which helps people in their lives in many aspects. It means research is not limited to a specific point or at research but also has different ways and turns that allow people to get more and more knowledge about same thing that was already be going under research processes. Different research processes also shows that knowledge and study will never be completed, and not anyone can get confidence about something discovered by naked eyes but it depends upon molecular authenticaton (Brooke e al., 1968).

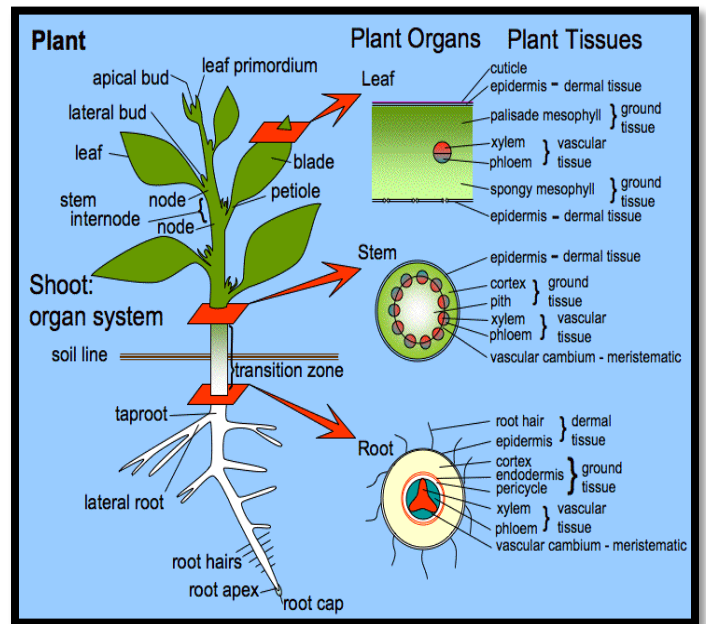
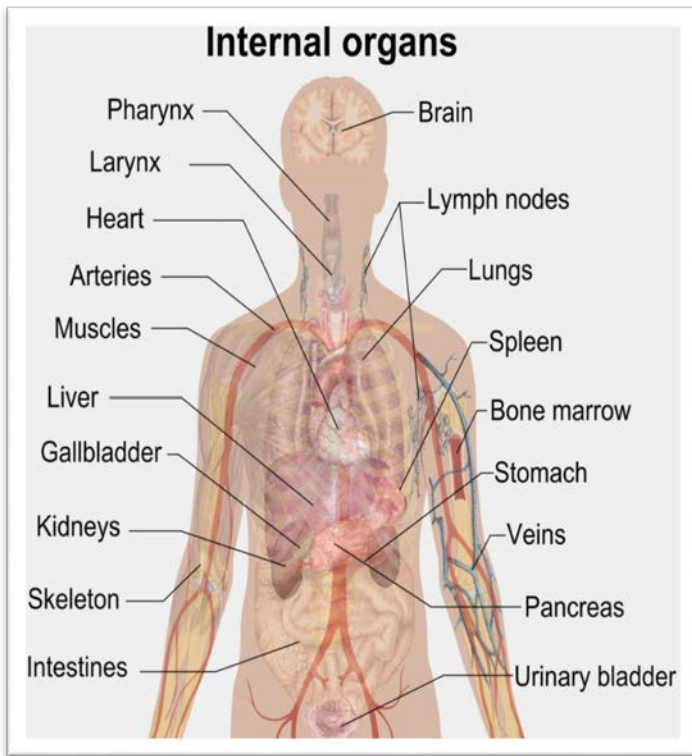
Further level is organelles and cell level. In this level, when macro and micro molecules are combined then usually some heavily, lighter, complex, small or large and some extraordinary components form that responsible for existence of life in a better way. Various qualitative and quantitative manners are used to sense as well as manage processes and compiling information's that are inherited by their parents. These components are unique and having versatility about their works and mode of action. When these are combined at a given point by having a barrier which doesn't allow them to escape out, called a cell. All works are done by cell and then build up a specific body and anomalous procedures can be eliminated by an automatism that is inherited to avoid from misconceptions. All metabolic, proteolysis, protein synthesis, traits transformation by genes and other processes are takes place into cell on which life depends.

	Animal Cell	Plant Cell
Cell wall	Absent	Present (formed of cellulose)
Shape	Round (irregular shape)	Rectangular (fixed shape)
Vacuole	One or more small vacuoles (much smaller than plant cells).	One, large central vacuole taking up 90% of cell volume.
Centrioles	Present in all animal cells	Only present in lower plant forms.
Chloroplast	Animal cells don't have chloroplasts	Plant cells have chloroplasts because they make their own food
Plastids	Absent	Present
Plasma Membrane	only cell membrane	cell wall and a cell membrane
Lysosomes	Lysosomes occur in cytoplasm.	Lysosomes usually not evident.
Cilia	Present	it is very rare

Comparison among plant and animal cells

At this stage, when many of same or different cells are aggregated then tissue is formed. Tissues are specific in their actions and having bigger mass than cell and many of the tissues are present in plants and animals. In plants xylem and phloem are the best performer tissues which regulate water and prepared food to all parts of body of plants respectively. And in animals i.e. in human biceps and triceps attached tissues, their contraction and relaxation are due to then that help in any work by arms of the body.





Plant's anatomy and morphology

Similarly, different or same types of tissues are sinking or combined to elaborate a specific organ. Organ is just like a house maker person that just put bricks on each other and to make a beautiful house but all over the work is mostly done by labors or workers that takes out all the bricks and cement to manufacturer; similarly, all work is done by different types of cells and tissues but counted it to be an organ. Organ has a variable feature that perform mostly all works into body and having ability to detoxify many of dangerous molecules and some of their or their attached parts are responsible for the production of hormones which are basically chemical compounds that responsible for the regulations of many works i.e. control of blood, sugar level in body and in plant; growth and development, vegetation, fruiting etc. are controlled. There are six (6) organs in human's body but some scientist considered the skin an organ which regulates temperature and water with salt mixture.

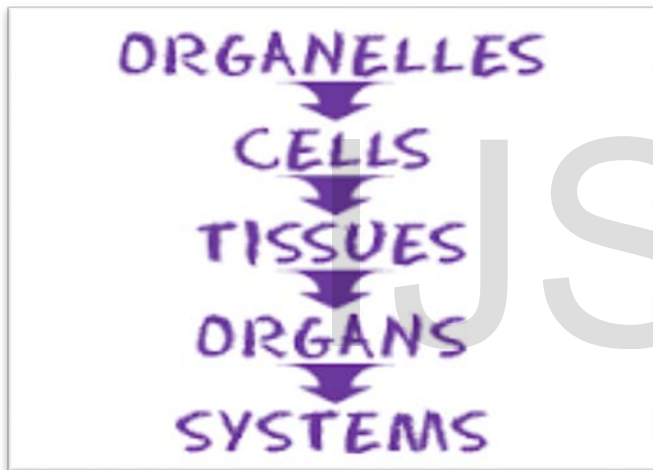
Tissue System and Its Functions	Component Tissues	Location of Tissue Systems
Dermal Tissue System • protection • prevention of water loss	Epidermis Periderm (in older stems and roots)	
Ground Tissue System • photosynthesis • food storage • regeneration • support • protection	Parenchyma tissue Collenchyma tissue Sclerenchyma tissue	
Vascular Tissue System • transport of water and minerals • transport of food	Xylem tissue Phloem tissue	

Plant's part functioning

When many of the organs are accumulated at a specific place and all are needed to be proceed necessary work in body, then this interconnected organ system is called, organ system level. All organs that make a cluster and network for regulation and maintenance of materials in body having constantly screwed the work for it. And if unevenly in system that must stop or slow their performance then whole system will destroy but nature must be induced efficiency to recover a small damage to it. A proper and well-defined organ and organ system level is combined in one body then body called to be an individual. An individual is unit of whole population or species by the

transformation of characters or traits to the next step of generation. Population or individual going to be increased and no. of incremental individuals depend upon reduction of harsh, un-optimal and unusual conditions that proliferates risk factors which is proceeded to create defective population.

Different or same types of species that are reside at a specific place, and specific time, called population. Populations which make an environment suitable as well as unusual by their activities some of good characters like give and take, is a healthy activity which makes it more powerful, and at a specific means that if one character in environment is fluctuated then what will be happened to them? For example, in the world, any country or city has a specific population that retain on some factors i.e. food, temperature, social behavior etc. which may increase or decrease with the passage of time by fluctuation in environment.



Organismal level

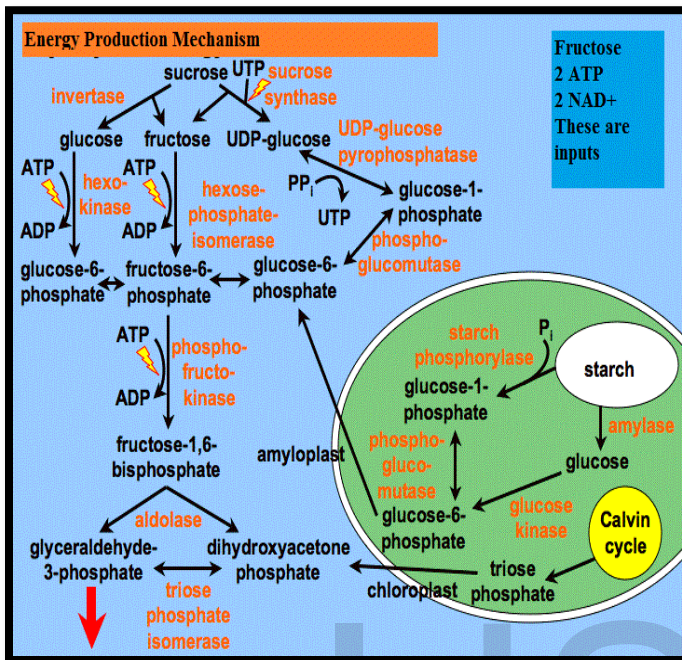
When different populations are worked together, walk together and feed together then community is formed. Community is properly defined as, "different populations at a same place and can interchange their materials, also having ability to produce fertile offspring, called community". Earth is a huge part of total universe and having different aspects for proceeding life with many important necessities, which also helpful in improving lives on earth. All types of community or populations that inbred flourish and reside on which part of earth called biosphere. Biosphere has a suitable, necessary, compatible and combined with many factors, which can improve and facilitate healthy life of large area of community. Only biosphere has healthy environment for all types of organisms but now its achievement to find out some hints about life existence on other planet.

2 Cell and its functions

As we discussed, cell is basic unit of life, then must be kept into mind that all types of activities, metabolism processes, energy production and its saving, regulations of materials, traits control etc. all of it, are done into cell, which is compulsory for life proceeding on biosphere. Numerous types of cell organelles i.e. mitochondria, Golgi complex, lysosomes, ribosome's, nucleus, cell wall, cell membranes, vacuole in plants, cytoplasm etc. which are helpful in all precious matters of cell that can make life easier. Much of marvelous and counterfeit works and traits are to be done in cells. In which; when food is taken up by stomach then no. of enzymes reactions starts for break down of food particles in the presence of oxygen, which helps in smooth digestion of huge and tough materials. Metabolism process starts into cytosol of cells. A huge amount of metabolic product; if is produced by this process, which is used currently in body and remaining energy store into mitochondria, and mitochondria is called the power house of cell. Energy production in the body is in the form of ATP (Adenosine triphosphate) after some usage of energy; store in mitochondria and when situations are critical, and food is not available in fasting time due to some reasons then internal energy in the form of energy currency (ATP) from mitochondria available in body for proper work. There are many functional enzymes that help in detoxification of unusual and toxic material in body for clearance of body works; also, cell has lysosomes that perform proteolytic activity or destruction of harmful matters.

Ribosome's are the factory of protein synthesis, there are 20 types of amino acids, by over lapping of these amino acids also with peptide linkage, different types of proteins are formed. They are related to energy release as well as involve in making tissues, organs and organ system level. As mentioned, nucleus is the most important and managing system which controls transmission, translocation, regulation, identification, targeting, and elimination of materials as well as production of new characters or traits that are involved in survival of individuals. By crossing over in DNA of two different parents, new entities emerge out that helps in organism's life. Cellular organization, is referred the term to be gradual make up of organism and their ability to find, get and unbeatable body for survival and competition with environment, to attain useful and more results regarding in living. But cellular respiration is another term that refers to get lots of energy from the optimal and authentic working of cell to break C-H bond with using oxygen for production

of ATP, and this ATP is used as an energy currency packet. We can also argue that functions of cell retain the whole life safe. Cellular respiration is over all present in whole types of organisms i.e. animals, plants etc.



ATP-production Mechanism

3 Genomics

It's the overall internal transcripts for entire life management, controlling and its short form is termed as genetics. And is defined as; transformation of genes, information or traits and variations. Another term is Inheritance; which defined as the putting up good characters or traits into descending generations. This is referred as internal information's which controls whole types of working, managing and directing the life with respect to internal as well as external environmental changes, that also have capacity to disturb and manipulate life of any organism.

Although this term is new but its evidences and working aspects showed from the day of initiatives. Man is trying to get answers of some critical questions which must improve the ability, to find out and to improve the study about life of an organism and their aspects. Aristotle was first man who revealed that; all organisms were descending from pre-existing ones and told about the reasons of differences and similarities between organisms. It means that some of components which responsible to convert information from one to another generation, that's why we can say, you are just looking like yours father, mother or say that yours eyes and hairs are same as your mother or

father etc. Similarly, the greatest scientist in the history of science was Charles darwin (the father of evolution), that explained a marvelous work on relationship between different organisms or plants and animals and explained about evolutionary perspective of them. He didn't take any hesitation to explained five (5) points in the survival of any organisms i.e. competition, fittest survival, gene flow, natural selection and population variation. There are microevolution points and agents such as mutation, genetic drift, gene flow, non-random mating and natural selection that help in finding out evolutionary relationship between different organisms on earth (Reece et al., 2012; Hruban et al., 1972).

Gregor Mendel was the first scientist that made novel and precious research on genetics and called as father of genetics. He experimented on pea plant and nearly 28,000 different pea plants species were to be chosen for determining genetic relationship among them. He also proposed two main important laws regarding genetics law of segregation and law of independent assortment. Going on the study, he had to describe about the concept of dominant and co-dominant genes concepts in all types of organisms. By these concepts many of morphological and biochemical studies were become easy to identify and helps in treatment of serious diseases i.e. blood relation identification and also eye problems more over genetic diseases will be cured now a days (Weldon et al., 1902).

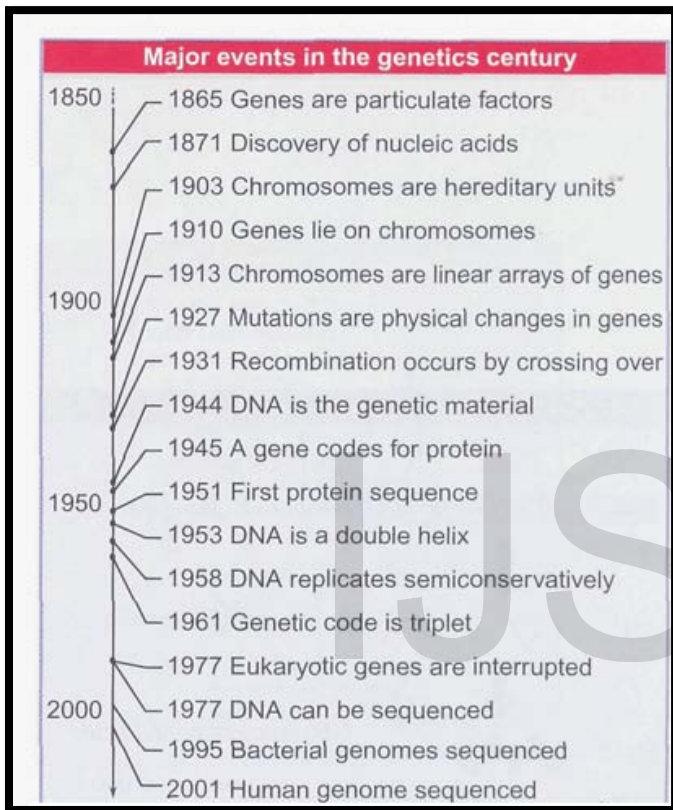
In 1900's there were few scientists revealed about materials which are transferred during parents mating and somehow 99% of properties and characters were same as parents. Then in 1920 properly DNA term was introduced, and genomic word elaborated to explain genetic characters in organisms. With the passage of time work being to be proceeded on genetics but molecular study on traits were studied when DNA (Deoxyribonucleic acid) structure properly identified by Watson and Crick. Watson and Crick was first two scientists that proposed DNA double helix model in 1959 and explained each of everything in DNA, its composition, nucleotide bases patterns which are involved in its composition. Also, they described central dogma which is basically replication, transcription, translation and protein production for specific action into the body.

There are four different types of bases i.e. adenine, guanine, cytosine, thymine. In DNA these four bases are bind by covalent bond or hydrogen bond and paired up adenine with thymine and cytosine with guanine by double and triple bonds respectively. Genes are small fragments of DNA and are the information benches or house which is transmitted from parents to offspring. Genes are the so specific in their actions and having specific and definitive

sequences which on transformation, can play an important role by inducing of some relative protein regards to work in the body. There are billions of nucleotide bases that reside into DNA and perform specific activities and each of them has totally different sequences for protein production. Sometime two or more bases have similar sequences but with slightly or by single nucleotide base change, production of protein will be apparently changed and also its work (Watson and Crick et al., 1953).

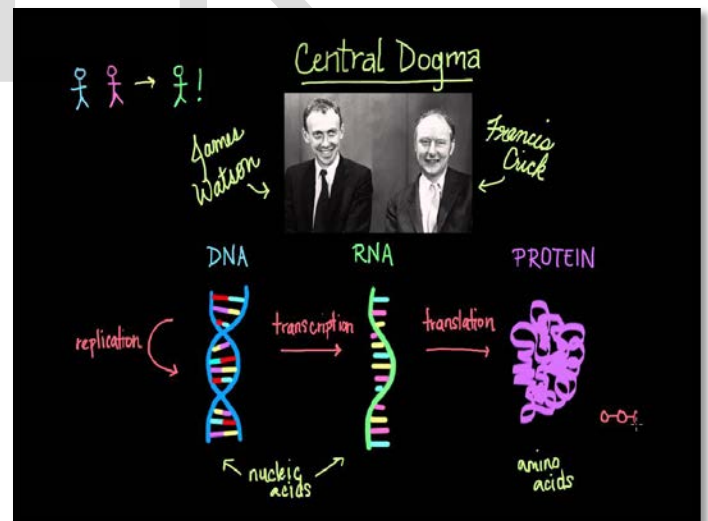
There are definitive (fixed) chromosome numbers in every organism that showed evolutionary pattern and if chromosomal numbers are increased or decreased then there will be a serious disease occur and sometimes mutations like insertion, deletion, translocation, and trans-version etc. of nucleotide bases; can also be the part of numerous diseases or defects. This is a modern era in which most of work must be done on genetics and there are no. of techniques or processes with improved tools also be developed for increase the knowledge about plants and animal's nature, their locomotion, mode of life and way to get their food.

Whole genomic pool is another term in which many of information is stored in the form of DNA or genes or chromosomes but also in it most of the irrelevant materials are present that may be called as junk DNA or junk genetic material that helps in proper functioning and the functionality of junk DNA or junk material is that it is non-functional. No one could find out these perceptions about junk DNA, but more over 30,000 human genes are identified with co-relative to their work. When genome word came out then as a whole identified and relevant or irrelevant materials must be discussed to characterize the organisms either plants or animals (Tyler-Smith and Willard et al., 1993).



Genetics history

Before going to study about characters and traits transformation; first we'll discuss about the term chromosomes that is more important in traits and gender identification. In chromosomes, there are two strands like projections which are called chromatids that might be sister or non-sister chromatids depending upon regeneration or crossing over which helps in new recombination during meiosis. When homologous chromatids are come close to each other to form compact information for the next generation, then called sister chromatids and when differently combined or heterologous then called non-sister chromatids. Chromosomes are attached with each other by centromere which is basically a central point of attachment of chromatids and whole DNA is wrapped up around chromosomes. Chromosomes are made up of chromatin protein which is used in traits or characters transmission in next generations.



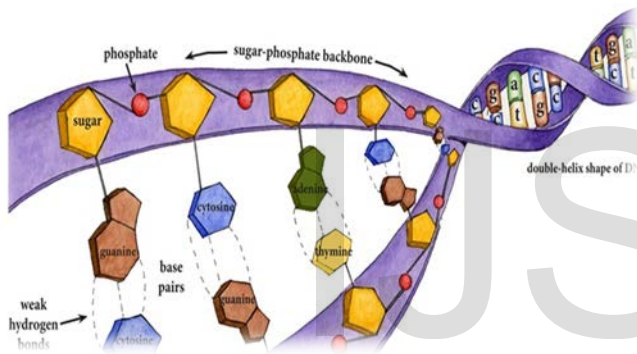
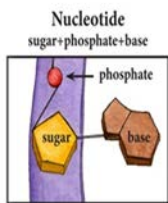
Watson and Crick model

Cellular organization also fulfills much of meaning about life and their bases; upon which ecosystem is moving on. Mostly three types of organism i.e. unicellular, simple multi-cellular and multi-cellular or if we want to classify them in another way then can say as prokaryotes and eukaryotes. In which; prokaryotes (pro means lack nucleus) are those that comprises on just single or one cell and don't have well defined nucleus and all other true organic

material i.e. mitochondria, ribosome's, lysosomes etc. for example bacteria, some fungi etc. In contrast to prokaryotes; eukaryotes are multi-cellular with having all organic materials which perform work as metabolism, photosynthesis in plants etc. for example animals, plants, birds etc. But although there are prokaryotes or eukaryotes resided then in all of them, there is needed to be handled transmitted characters or traits that must be controlled by genes.

The Structure of DNA

1. Structurally, DNA is made up of nucleotides.
2. A nucleotide is made up of a sugar, a phosphate and a base.
3. Nucleotides hook together to make the sugar-phosphate backbone of every strand of DNA.
4. Bases pair up with opposite, matching bases on the other strand of DNA.
5. There are four kinds of base pairs made up of adenine (A), thymine (T), guanine (G), cytosine (C). A always pairs with T. G always pairs with C.
6. The two strands of DNA are linked together by weak hydrogen bonds and stacked like a ladder whose sides spiral around each other into their famous double-helix shape.



DNA-Structure

Mitosis is mostly present in all prokaryotes and they are regenerated from it. It means prokaryotes don't have variability to constitute with new combination to bring a change into their lives and processes so therefore; if accidentally one disease came into exposure to them then they all will be died because they don't have any new traits or information about that disease (resistance) in other words we can say, all they are identical to each other and unable to protect themselves. There is another reason of it, that they don't ever code for resistance against specific disease or environmental fluctuations (Kanhare and Bansal et al., 2005; Margulis et al., 1970).

Central dogma which regards to perform any work into and out of the body is controlled by some maintained and proper processes which may or may not include directly or indirectly to it. Because all works are done by already planned procedures and genes are the factories of such types of all properties.

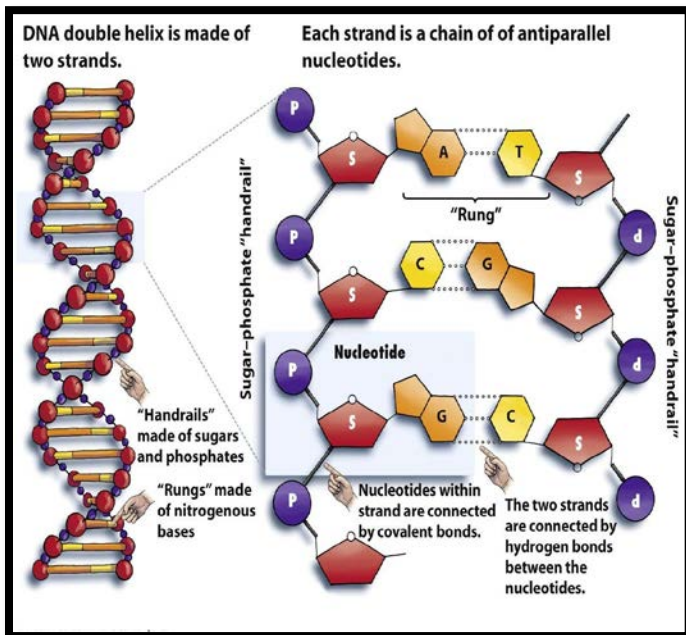
A very important term is replication; which is almost present in all types of organisms i.e. animals, plants, bacteria, fungi, algae etc. that helps to identify their population on earth and the reasons of their ascendants or descendants. Replication is defined as the increment of population or generation of respective parents or production of similar offspring by definitive process called as replication. This term is explained with the methods of reproduction that may be sexual or asexual. Mostly all prokaryotes are reproduced by asexual reproduction which is preceded by mitosis and mitosis is special in generating similar offspring. Also, there is big problem to asexual reproduced organisms to have less immunity against un-coded or unspecified stimulations and this is the reason for death of all identical species. The other is sexual reproduction, in which meiosis is involved i.e. a huge variability, lots of immunity against invades, extra traits unless transmitted etc. which is due to crossing over between two different chromosomes (Crick et al., 1970).

The Central Dogma

- Proposed by Francis Crick in 1959
- DNA codes for RNA
- RNA codes for protein
- Protein determines our physical makeup – phenotype

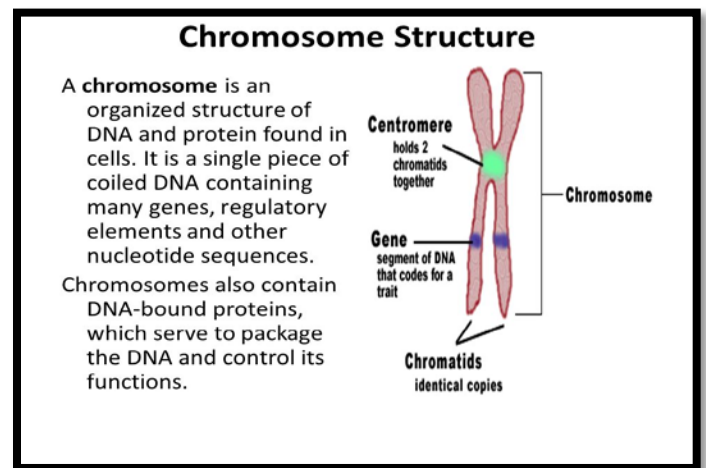
When replication is done then, double stranded DNA become single stranded, open like a zip and one is converted into two different strands and now, new upcoming strands or complementary strands are formed, and replication is done similarly. Sexual reproduction is transferring genes or chromosomes. If numbers of chromosomes increase or decreases then serious diseases must be produced during meiosis that may be Down syndrome, Turner syndrome etc. By replication and transformation of chromosomes; offspring may spend the life as normal or abnormal and will have the ability to live better or worse than parents, which is decided by nature according to situations and environmental conditions. Replication doesn't have such type of reason to produce similar characterized offspring; but it depends upon segregation and independent assortment laws which explained traits to be segregated into upcoming generation. Also, it means to produce different generation by doing mutation that may be severe and more than it. Sometimes mutations are favorable and un-favorable depending upon competition, stress, population variation, habitat,

environmental conditions or natural selection (Darwin's concepts). Finally, replication is necessary for survival of life for different aspects of work.

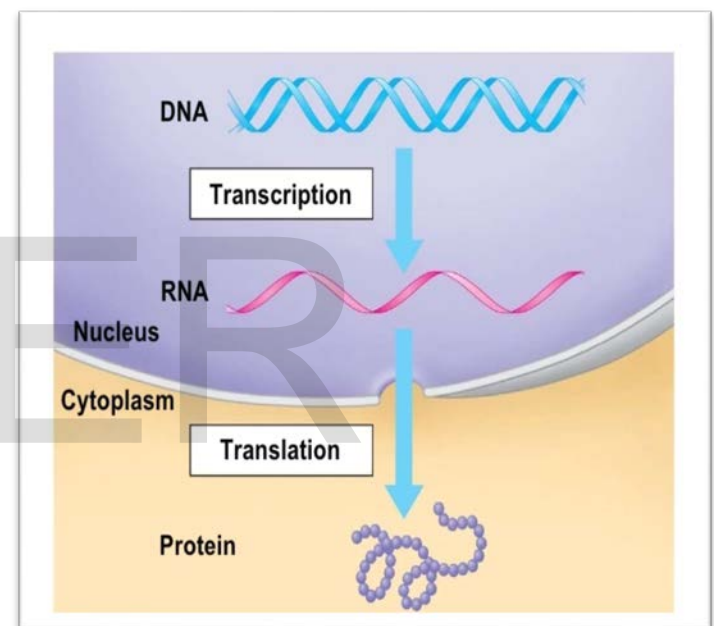


DNA-Basis Composition

Transcription is the process which responsible for any work and defined as the production of single stranded RNA with all necessary information regarding to that work, that is due to environmental and any chemical or physical change. DNA has all compulsory traits that transferred to next working process i.e. RNA which has complete coding regions and DNA has introns as well as axons. Introns are non-coding regions in DNA and by RNA-splicing method, eliminated or withdrawn to complete the coding regions (axons) and now RNA is ready to evaluate the product. As transcription, another jointed term is translation; which referred to completion of, managing and arranging final product with respect to body stimulation. Translation is defined as the production of protein from definitive coded by spliced RNA that is related to DNA. In a simple word, protein produced by transcript RNA (from DNA) is called as translation. These (transcription & translation) are joint term regarding any work by protein production for example insulin; which is a protein and produced by pancreas when blood glucose or sugar level increase. Also this protein (insulin) encoded by genes or DNA and taught them to release protein during any dangerous or fast situation into the body (Krause et al., 1995).



Chromosomal composition



Transcription-Translation Expression

4 Modern and advanced studies of genomics

There is a huge difference between old and modern studies to prevent and avoid from any loss in life either it is related to food and its preservation, medicine, health, water treatment, disease related etc. or with pollution. Much of the problems are to be solved by using advanced techniques but still also many problems are awaiting such a skilled and knowledge full techniques that have an ability to fill out these grooves or gaps to give relief from these problems. For resolving and note down these biological problems we must know about genetics and its functionality in the creation of good or bad wills. Molecular study of DNA gives the right answer about problems in living organisms. It doesn't mean molecular study gives the solution of defects in living organism, but it gives us the

points or sites that can cause some diseases or defects in them which are basically needing to be cure after identification. In this regards, DNA or genome study is very necessary to carry out for the betterment of mankind. Biotechnology in this field plays a very precious role for detection of genomic level problems or find out mutations in DNA structure that can cause serious diseases in descendent. So work of DNA in this aspect is very compulsory to be explained extensively by using different advanced and modern techniques (Muffato et al., 2010).

5 DNA based work

Numbers of scientists were trying to explain about DNA but originally debate was started in 1700's and it's not wrong to say that, it was started from 377 A.D by Aristotle. Work is going to be reached at high altitude but its reality that much of the people are un-aware about molecular studies of DNA. When DNA studies were grown up, many of the religiously people were stood in front of it to oppose its study, but it is special and non-refuse able fact that nature must decide to keep it up for the usefulness of humanity.

Plants are included in living organisms. Their studies are more valuable because food, medicines and important materials dependent on them. And it is also necessary to locate the problems regarding their diseases or for survival because its fact that more valuable thing must be examined frequently. Detection of diseases, mutations and cause of destruction of plants, is hardly needs to be practiced; predicting hazards for their better survival. Cotton, wheat, corn, barley, rye etc. are the most valuable crops in the world and needs to be secure them from many of different diseases, pests and insects. Plants and animals both are the international heritage for mankind and its requirements and needs, so that there is need to be secure them from any or every upcoming hazard. Animals give us food (meat and milk), wool, and some gives medicines and now a day we are trying to so much GMO's for the completion of food and medicines requirement. DNA of them can help us to study out their earlier defects and then able to be cure them efficiently (Doležel and Bartoš et al., 2005).

In 1865 worked had been started on genes but properly in 1959 by Watson & Crick, they explained the data on DNA, its double helix structure and importantly told about central dogma. After these modern studies numbers of projects were to be proceeded to find out the facts and figure for the survival of living organisms i.e. plants, animals, microbes etc. Studies tell that DNA can transmit their characteristics or traits but how efficiently

not? Can parents transform their all necessary and correct properties to their offspring's? How defects are produced in descendants? Can mutations occur? How can we identify the defects? Which is the best method to remove the relief about change? These are the real questions about DNA or genome transformation and mutations and also their methods of adapting to salt out and removal of defects (Portin et al., 2014; Watson and Crick et al., 1953).

To remove the defects of transmitted DNA, first we must take information about their family back ground and in case of plants and animals we just handled them at once at a time by using different techniques. After it, DNA extraction methods are used for further proceeding attached processes like gel run, PCR (primer designing) and then in the last markers are used to find out real factors for their defects. Numbers of molecular markers are used for identification of mutations, gene defect and their reasons (Ye and Ju et al., 2003).

Now the DNA work has been extended in vast and diversifies fields and, must be improved it as a locating agent by using its small fragments as a primers or probes. Many of the plants, animals and microbes are differentiated to identify their genome sequence. In a simple word genome or DNA sequences of plants, animals and microbes have been identified for the improvement and development of their growth. 30,000 human genes are identified for their different characters and in wheat, maximum genes are identified. In rice the whole genome has been sequenced and IRRI (International rice research institute) is the first research Centre for proving its steps in identifying the rice genome sequences. In conventional breeding system, whole genome is transferred to the recipient and desired traits are to be attained but it is more time consuming and costly and takes about 10 to 12 years for producing new targeted plants or crops variety. In biotechnological studies and methods; only 5 to 8 years are required for new characterized plants or crops variety with 100% surety of desired ones. Whole genome as well as DNA or part of DNA (genes) can be transmitted from one to another species for improving the life of organisms (plants, animals, microbes) (Ng and Kirkness et al., 2010).

6 GMOs and GM Crops

The main problem against these two products in the world have been their acceptance and their usage and two groups are prevailed or active in their way of success and these have viewed about ethical and security issues to GMO's (Genetically Modified Organisms) and GM crops (Genetically Modified Crops). Some of them told their source and origination are not proof able to use and some

are not ready to accept this revolution to compete the world's people need for their survival, they just believe on natural things that are produced by nature. But, world has threat to be about very large population and their death due to starvation, food reduction and shelters. So, scientists are trying to overcome these problems by production of very large quantity of food stuff and their relative products that are necessary for people and their survival and helpful to keep them healthy and alive. Basically, GMO's are generated by the transformation of genes from one species to another for their useful characters or traits because this can aid in producing desire, quick and more food items for people.

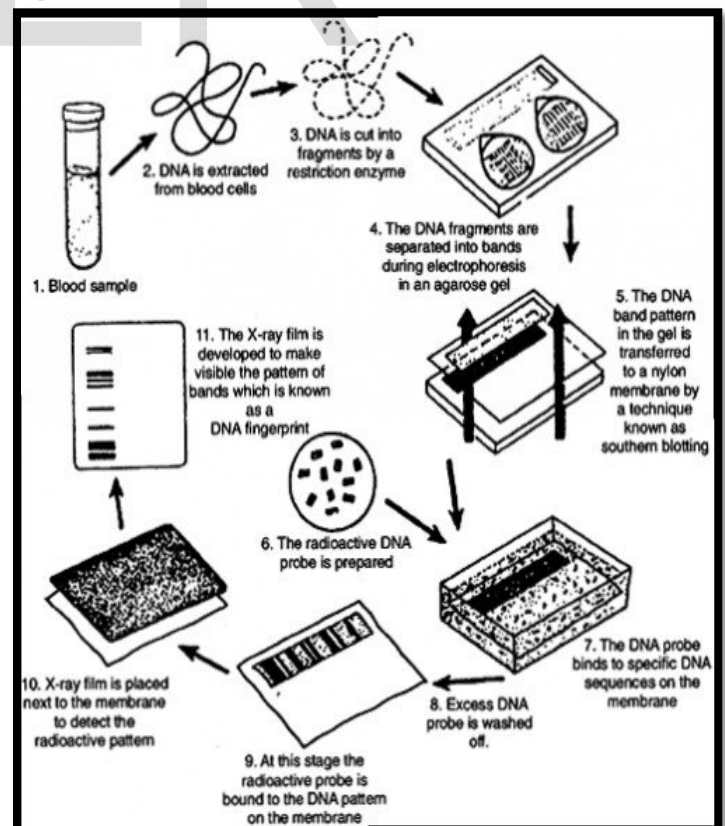
Genes are so important components which used for this purpose and in the production of GMO's and GM crops. First, basic step is to identify the desired gene in one species that may aid to produce large quantity, good food stuff, no ethical and security issues, good source, odorless products, easily modify able and easily accepted for all. When mostly these points are to be fulfilled then GMO's and GM crops are necessarily disputed to population for their use. There are number of products present in the world for betterment of people by genes transmission which are classified or counted as: wheat, cotton, banana, orange, lemon in plants for their improved taste, yield and disease resistance capacity. B.T cotton and corn mostly used GM crops and cow, sheep, hens, goat etc. in animal for their betterment of meat and milk quantity, eggs production and also wool enhancement for industries which are main component in the field of market products i.e. bags, jackets, bed sheets etc. and also in the field of medicines there is a revolution in controlling of serious diseases and also genetic diseases. Some of the plants and animals are modified in that way to get food as well as medicines i.e. banana is produced to treat diabetes in many patients etc. Now scientists are hardly trying to produce the modified products which are to be accepted by all people which are trying to objections about them (Meyer et al., 1999; Wagner et al., 1997).

7 DNA Finger Printing

It's another revolutionized field with respect to identify the people that must be involved in different problems. By the overpopulation, crimes and robberies also increased, so their identification is necessary for correct decisions in the court. Forensic science is the relative department for the identification of criminals and robbers. Many developed countries are going to be started this program for growing of experts to catch the thieves, criminals, robbers etc. There is also a great problem in developed countries is parentage; which are going on with

the speed of success and finger printing is helpful to find out the parents of children that may be accidentally resides in society. Terrorism is the main threat to world and terrorist when blasts somewhere; then their identification is to be done by forensic scientists and therefore, this department is rapidly growing in the world.

The I. D card or I. Card facility for people in the world is also due to the finger printing method which help the company or forces to find out its originality and bio-data. This finger printing method is based on nucleotide sequences in the DNA and every person has its own specific nucleotide sequence which help in their identification. DNA bases are more helpful for traits transmission as well as identification and used in production of GMO's. But it is importantly noted that nucleotide sequences are not remain same in life but shuffled in every five years nucleotide sequence of the people. Therefore, NADRA or other I.D card making institute worn to people to come again for their identification or to give new finger prints after five years expiry dates. Similarly, in big malls or industries thumb expression is necessary for entry and this is mainly for employers. To get out the relevant one by using finger printing, it's compulsory to have the wide range of data of people in the detection machine or having finger prints of all population of specific area that must be cleared with respect to find out criminals, thieves, robbers or terrorist.



Without this, it is impossible to find out them and parents as well. Scanners or specific devices are used for this purpose which is highly modified and not available for openly to everyone and these machines are used by government institutes or forces for specific matters with their respective country. So DNA and their bases play very important role in it (Kirby et al., 1992).

8 Markers affinity

Problems that are so predicted regarding to the identification of many desired and undesired places or points which may cause serious diseases or defects in living organisms. DNA is the most prominent component that retains high quality information and sites and number of nucleotide bases which have related origins that show specific sequences of diseases and/or other desirable characters into living ones. GMO's or GM crops or other genetic transformative products, in detection methods (forensic sciences), suitable traits finding and in diseases elaboration combinations with respect to genes, much of the problems are to be faces regarding their treatment or transformations because there is a large setup is required with longer benefits. Similarly there are more and more sites or markers that can help us about some important genes which may be generate revolution in molecular biological & biotechnological fields (Avisé et al., 2012).

9 Molecular markers

Here is the list of some acronyms that shows clear thought about markers or molecular markers and gives polymorphisms or differences regarding the target in DNA sites or specific sequences they highlight for target.

9.1 Isozymes

Specific sequences and variations that are to be identified or analyze by using some special and important genes that mostly called enzymes or Isozymes. Actually these are the changed enzymes that help in and work in controlling of much activity of other enzymes which aid in research work and also in traits relation to genes or DNA (Brewer and Sing et al., 1970).

9.2 RFLP

DNA has a very long chain of bases or genes which contain specific sequences along with varying lengths. And its concept is to be cut the different lengths of DNA fragments by using enzymes (restriction enzymes). Polymorphism of fragments (lengths) of DNA can be seen by hybridized

method to attach probes with them from already arranged DNA libraries (Powell and others et al., 1996).

9.3 RAPD

With the help of many short and varying DNA sequence primers are utilized to hold or point out desired sequences randomly in genome or DNA because these short primes bind to different genomic or sequence of DNA randomly and then can be attained by using PCR technique for further studies. This is the most appropriate marker which used to analyze sequences that we don't know about them in very large genome of living one's (Powell and others et al., 1996).

9.4 FLP

This marker also relates to RAPD. In which, restriction enzymes are used to cut DNA and then large number of very short sequence primers are utilized and then amplify the specific sequences with the help of binding to genome or DNA of living one's. It is used to already known sequence of DNA or genome and detected by PCR process (Powell and others et al., 1996).

9.5 SSR

These are also called microsatellite. In this marker description also explained large number of short sequences which are repetitive in nature e.g. CAA compare with CAACAACAA. In which PCR technique is used for differentiation of specific sequences through binding of specialized primers in DNA or genome and in each side of sequences that are usually repeats. In plants i.e. cotton, rice etc. this marker is used for wide research (Powell and others et al., 1996).

9.6 SCARP

In this marker there is no necessary to have repeats but shows by the two ways of PCR products. In which important primers are used that bind to each side of changed DNA or genome sequence. These products are usually produced from RAPD marker fine product or PCR-product and then with the help of this good product, specific primers are created which may use purely for RAPD-marker (Urasaki and others et al., 2002).

9.7 CAP

RFLP-marker is used to make this type of markers. And explain change or difference in DNA between the products of PCR, which is based on absence or presence of cutting sites by restriction enzymes. It means that restriction

enzymes cutting sites are the most important components by regarding to use of CAP (Gupta and others et al., 2001).

These are separated by agarose gel electrophoresis and visualize through Ethidium Bromide (EtBr) stain (Michelmore and others et al., 1991).

Table for comparison of different molecular markers with their characters

PARAMETERS	AFLP	RAPD	ISSR	MACROSCOPIC IDENTIFICATION	MICROSCOPIC IDENTIFICATION	CHEMICAL ANALYSIS
Cost	High	Low	Low	Low	High/low	Medium
Time	High	Low	Low	Low	low	Low
Reproducibility	High	Good	Good	Good	Medium	Good
Accuracy	High	Good	Good	Good	medium	Good
Starting material	Any part preferably young and fresh material	Any part preferably young and fresh material	Any part preferably young and fresh material	Whole root, leaves, fruit etc.	Whole, fragmented or powdered	Botanical extracts
Database	Electronic	Electronic	Electronic	Herbarium	Text	Text
Identification level	Intraspecific differences	Intraspecific differences	Intraspecific differences	Might not allow to the species level	Might not allow to the species level	Might not allow to the species level
Storage space	Low	Low	Low	Very high	Low	Low
Possible problems	DNA damage, affected by secondary metabolite	DNA damage, affected by secondary metabolite	DNA damage, affected by secondary metabolite	Require plant in particular development stage	Lack of references for comparison	Seasonal, environmental and individual variation affect chemical profile

10.4 AFLP

These are amplified by PCR by labeled probe, separated from polyacrylamide gel electrophoresis (PAGE) and visualized by autoradiography (Michelmore and others et al., 1991).

10.5 SSR

These are separated from agarose gel electrophoresis, amplified by PCR and visualized with Ethidium Bromide (EtBr) (Michelmore and others et al., 1991).

10.6 SCARP

These are separated from agarose gel electrophoresis, amplified by PCR and visualized with Ethidium Bromide (EtBr) (Michelmore and others et al., 1991).

10.7 CAP

These are separated from agarose gel electrophoresis, amplified by PCR, digest with restriction enzymes and visualized with Ethidium Bromide (EtBr) (Michelmore and others et al., 1991).

10 Detection steps of markers

Each marker has its own specificity and way of action similarly, has its own way to detect or identify for their proper use in research work. Different detection or identification method of molecular markers which allows for generating variation list by comparing them to each other.

10.1 Isozymes

These are separated by stain and starch gel (Michelmore and others et al., 1991).

10.2 RFLP

These are separated by agarose gel electrophoresis, hybridize by labeled probe, transfer DNA to membrane and visualize through autoradiography and digest with restriction enzymes (Michelmore and others et al., 1991).

10.3 RAPD

Molecular Marker	Type of Inheritance	PCR-Based?	Strengths	Limitations
Isozymes	Co-dominant	No - enzyme activity base	Fast relative to RFLP	<ul style="list-style-type: none"> Limited number of loci Limited alleles per locus Protein is measured (therefore not exact measur of genotype) Tissue specificity/ environmental regulation
RFLP	Co-dominant	No	<ul style="list-style-type: none"> Fast Large number of loci 	<ul style="list-style-type: none"> Pre-screen for single copy sequences to be used as probes Slower than Isozymes Assumption that when samples share a fragment, they share flanking cleavag sites
RAPD	Dominant	Yes	<ul style="list-style-type: none"> Fast Measures phenotype in out crossing species Multiple loci can be scored in single reaction 	<ul style="list-style-type: none"> Sensitive to reaction conditions (reproducibility issues) Assumption that when two samples share a fragment, it is the same locus
AFLP	Dominant	Yes	<ul style="list-style-type: none"> Detects large number of bands and therefore polymorphism 	<ul style="list-style-type: none"> Multi-step, therefore high technical requirements
SCAR	Co-dominant	Yes	Fast	<ul style="list-style-type: none"> Requires sequence data, therefore expensive to develop primers
CAP	Co-dominant	Yes	None	<ul style="list-style-type: none"> Requires restriction enzyme digestion of PCR product, enzymes can be expensive Requires sequence data, therefor expensive to develop primers
SSR	Co-dominant	Yes	<ul style="list-style-type: none"> Fast Commercially available for some crops Detect multiple alleles 	<ul style="list-style-type: none"> Requires sequence data, therefore expensive to develop primers

11 Mapping

DNA is valuable for identification and locating some specific regions that help in to make transgenic for getting desire products or to treat the many genetic diseases. OR it may be defined as the distance of different loci on same or other genes and it helps in detection of many regions which can cure genetic disorders and will make plants and other organisms' desirable product. If we find out the locus on a gene, then it can help in manipulation of genes. Different types of mapping techniques are in used but the most one is QTL mapping and Associate mapping (Adams and Kelley et al., 1991).

11.1 QTL (Quantitative Trait Loci) Mapping

This term is correlated with phenotypic characters of the plants and as the name shows is to concern about quantity of some characters or traits. When talks about QTL, then some specific genes are present that control typical traits or quantity and markers are also applied for detection (AFLP or SNP's) of mapping of observing traits. This is relatively an old but reliable method (also use in these days i.e. rice, wheat etc.) for sequencing or mapping

of actual or real genes that permit polymorphism. It is also related to the products of gene which is produced under different environmental conditions, and that phenotypes may be varied which is actually a polygenic character or effect (Collard et al., 2005).

11.2 Association Mapping

This is related to historical back ground of gene expression or change in phenotypes of gene in two different eras. Simply it is linkage disequilibrium that shows advantages of historically changed phenotypes to its genotype (phenotype to genotype) and it is used in QTL mapping method for finding out differential stage characters. This mapping is the big source for knowledge about the linkage between two or more genes for same as well as different phenotypes (McCarthy et al., 2008).

12 Conclusion

In this review, biological data arranged in a manner which fulfil the requirements of research and development. Information regarding cell to biosphere level and constitutive expression of population contribution in a community is also explained in it. Central dogma is very important to hold up the genetic research such as transcription, translation are basic concepts to increase the knowledge against specific topic. There are great difficulties to understand the biology, its aspects and its application. There is also a big problem about the contents or components of biology to elaborate its beneficial aspects to people.

Now a day research is prevailing at its peak for solution of population serious problems and this paper may also helpful for many of those who doesn't know about the basics of biology. Here is elaboration of data connection between different contents of biology and use the easy way to give understanding about history and present work on much of biological research concerns. A brief history might be helpful for those who looking for evolutionary data connection between different organisms and new emerging technologies described for the research concerns and their benefits to use them as a tool for their project as a valuable component.

In a modern research, molecular based studies are compulsory to explain all the features with protein products. In this study, we described all the molecular markers structures, feasibility, effectiveness, detection methods, isolation, and results which make the research more reliable and acceptable. There is an effort to compile the necessary biological data at single step with an easy

translation. Arrangements of the data in this study will make the research more formal and valuable.

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