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Research Article

GENERATION OF MULTIPLE COPIES OF COMPLETE ORGANISM FROM SINGLE DROP OF BLOOD DURING THE WAR OF MAA KALI AND RAKTABIJA AND ROLE OF DNA AS *PANCHBHUTAS*

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ABSTRACT

The most interesting fact about cloning is that research regarding cloning was already performed thousands and thousands of years back in the era when there were no scientific instruments available but still the science and technology was too developed. This cloning was clear cut example of Biotechnology. This paper mainly establishes the relationship between religion and science. For this purpose, an example has been extracted from Shri Durgasaptashati, where the incidence of war between Maa Kali and Raktabija takes place. The process of cloning of multiple clones of Raktabija, the scientific techniques behind it, unique characteristics a of blood cells, role of media and sterile conditions and the basic components of life according to science as well as religious point of view have been explained here. This is world's first research paper in which the direct connection between *panchbhutas* and DNA has been established.

INTRODUCTION

Cell - the basic unit of life are primarily responsible for giving rise to minute as well as large organisms. Cells have certain qualities that make them the ultimate unit to live and survive. When these cells have specialized quality they may lead to the desired creation of tissues, organ or even organism -known as stem cells. It's been thought that this is a latest area of research and can prove to be very useful in a number of ways. But the story behind is totally different. This research; thousands of years back was something that is now a day been worked upon but still has not reached that level and efficiency. Modern era research has not developed in this field practically as it was approximately 1000 of years back. We are pretty much clear about the character, properties and the advantages of these cells but any full-fledged implementation of this work has not been developed by researchers. Scientists have discovered and preserved these cells and have determined their origin and effect they can have in improvement of health. The implementation of this work was done long time back by which is discussed in Hindu mythology in the form of war between Maa Kali and Raktabija.

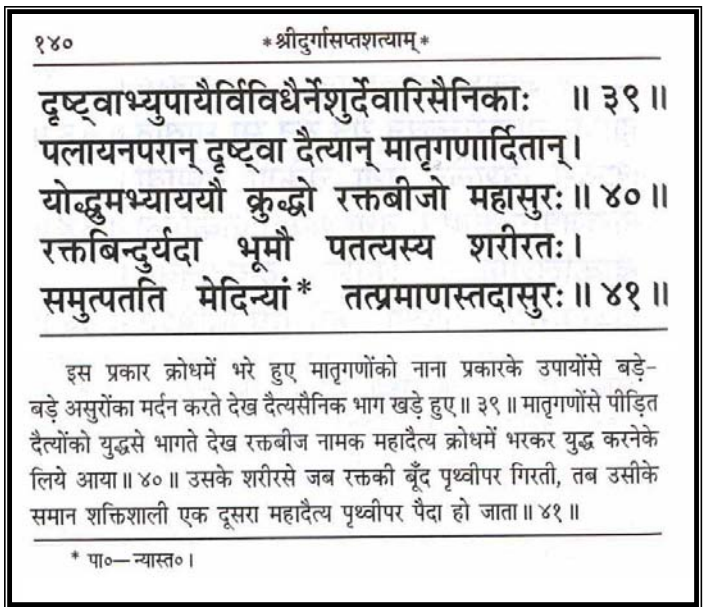
Religious prospects of war between Maa Kali and Raktabija

Goddess Parvati took the form of Devi Kali. In Kāli's most famous legend, Devi Durga (Adi Parashakti) and her assistants, the Matrikas, wound the demon Raktabija, in various ways and with a variety of weapons in an attempt to destroy him. They soon find that they have worsened the situation for with every drop of blood that is dripped from Raktabija he reproduces a clone of himself. The battlefield becomes increasingly filled with his duplicates making the situation more critical to win.

Maa Kali, also known as *shakti* - feminine energy, creativity and fertility - and is an incarnation of Parvati. Kali's name derives from the Sanskrit meaning 'she who is black' or 'she who is death', but she is also known as Chaturbhuja Kali, Chinnamastā, or Kaushika. As an embodiment of time Kali devours all things, she is irresistibly attractive to mortals and Gods, and can also represent (particularly in later traditions) the benevolence of a mother goddess. There are some sloks in Shri Durgasaptashati **[1]** which shows some information about the war in between Maa kali and Raktabeej.

In Hindu Mythology, **Raktabīja** was an asura (loosely translated as demon) who fought with Shumbha and Nishumbha against Goddess Durga and Goddess Kali (Chamunda). Raktabīja had a boon that whenever a drop of his blood fell on the ground, a duplicate Raktabīja would be born at that spot (*rakta*=blood, *bīja*=seed; "he for whom each drop of blood is a seed"). The eighth chapter of the Devi Mahatmya, *raktablja-vadh*, focuses on Durga's battle with Raktabīja as part of her battle against the asuras Shumbha and Nishumbha, who had disenfranchised the Gods from heaven**.** This demon was, like most demons, causing a great deal of trouble with people and Gods alike but even worse was his ability to produce more demons every time a drop of his blood spilt to the ground.

Therefore, each time when Raktabīja was wounded, drops of blood falling on the ground created innumerable other Raktabījas, and Durga was in difficulty. At this point, the Gods decided to work together and combine all of their *shakti* or divine energy and produce one super being that could destroy Raktabija; the result was Kali (Goddess Durga actually assumes the form of Goddess Kāli at this time). Given all the divine weapons of the gods, Kali swiftly sought out Raktabija and his demons and proceeded to swallow them all whole so as not to spill anymore blood in the process. Raktabija himself was killed when Kali lopped off his head with a sword and then drank all of his blood, making sure none fell to the ground and thereby ensuring no more demons could menace the world [2] . Pleased with her victory, Kali then dances on the field of battle, stepping on the corpses of the slain. In the Devi Mahatmya version of this story, Kali is also described as a Matrika and as a Shakti or power of Devi. She is given the epithet Cāṃuṇḍā (Chamunda), i.e. the slayer of the demons Chanda and Munda [3].

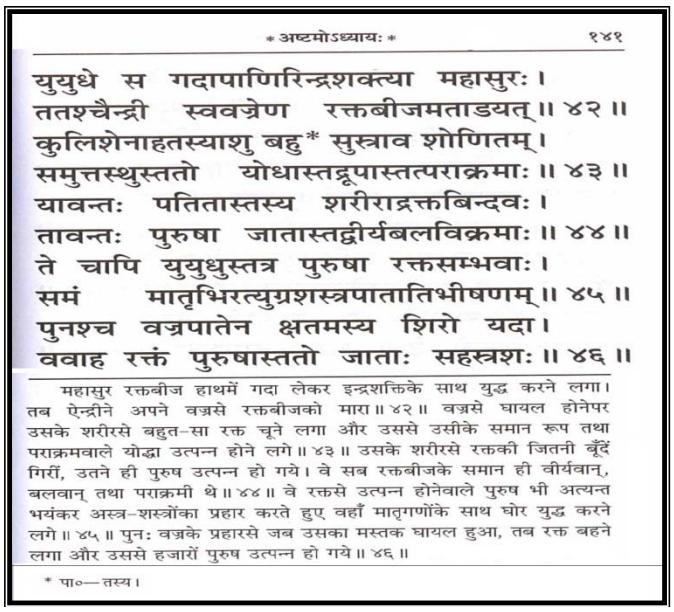


१४० *श्रीदुर्गासप्तशत्याम्*

दृष्ट्वाभ्युपायैर्विविधैर्नेशुर्देवारिसैनिकाः ॥ ३९ ॥
पलायनपरान् दृष्ट्वा दैत्यान् मातृगणार्दितान्।
योद्धुमभ्याययौ क्रुद्धो रक्तबीजो महासुरः ॥ ४० ॥
रक्तबिन्दुर्यदा भूमौ पतत्यस्य शरीरतः।
समुत्पतति मेदिन्यां* तत्प्रमाणस्तदासुरः ॥ ४१ ॥

इस प्रकार क्रोधमें भरे हुए मातृगणोंको नाना प्रकारके उपायोंसे बड़े-बड़े असुरोंका मर्दन करते देख दैत्यसैनिक भाग खड़े हुए ॥ ३९ ॥ मातृगणोंसे पीड़ित दैत्योंको युद्धसे भागते देख रक्तबीज नामक महादैत्य क्रोधमें भरकर युद्ध करनेके लिये आया ॥ ४० ॥ उसके शरीरसे जब रक्तकी बूँद पृथ्वीपर गिरती, तब उसीके समान शक्तिशाली एक दूसरा महादैत्य पृथ्वीपर पैदा हो जाता ॥ ४१ ॥

* पा०—न्यास्त०।



अष्टमोऽध्यायः १४१

युयुधे स गदापाणिरिन्द्रशक्त्या महासुरः।
ततश्चैन्द्री स्ववज्रेण रक्तबीजमताडयत् ॥ ४२ ॥
कुलिशेनाहतस्याशु बहु* सुस्राव शोणितम्।
समुत्तस्थुस्ततो योधास्तद्रूपास्तत्पराक्रमाः ॥ ४३ ॥
यावन्तः पतितास्तस्य शरीराद्रक्तबिन्दवः।
तावन्तः पुरुषा जातास्तद्वीर्यबलविक्रमाः ॥ ४४ ॥
ते चापि युयुधुस्तत्र पुरुषा रक्तसम्भवाः।
समं मातृभिरत्युग्रशस्त्रपातातिभीषणम् ॥ ४५ ॥
पुनश्च वज्रपातेन क्षतमस्य शिरो यदा।
ववाह रक्तं पुरुषास्ततो जाताः सहस्रशः ॥ ४६ ॥

महासुर रक्तबीज हाथमें गदा लेकर इन्द्रशक्तिके साथ युद्ध करने लगा। तब ऐन्द्रीने अपने वज्रसे रक्तबीजको मारा ॥ ४२ ॥ वज्रसे घायल होनेपर उसके शरीरसे बहुत-सा रक्त चूने लगा और उससे उसीके समान रूप तथा पराक्रमवाले योद्धा उत्पन्न होने लगे ॥ ४३ ॥ उसके शरीरसे रक्तकी जितनी बूँदें गिरीं, उतने ही पुरुष उत्पन्न हो गये। वे सब रक्तबीजके समान ही वीर्यवान्, बलवान् तथा पराक्रमी थे ॥ ४४ ॥ वे रक्तसे उत्पन्न होनेवाले पुरुष भी अत्यन्त भयंकर अस्त्र-शस्त्रोंका प्रहार करते हुए वहाँ मातृगणोंके साथ घोर युद्ध करने लगे ॥ ४५ ॥ पुनः वज्रके प्रहारसे जब उसका मस्तक घायल हुआ, तब रक्त बहने लगा और उससे हजारों पुरुष उत्पन्न हो गये ॥ ४६ ॥

* पा०—तस्य।

Biotechnological Prospect of this war

Cell, Nucleus, DNA

We want to start this paper from cell because a cell is the basic unit of life (Fig 1). All living organisms are composed of unicellular or more multicellular cells. In multicellular organisms, like humans, specific types of cells are bound to each other to create tissue, which makes up the organs of the vital body systems that together keep the entire organism alive.

The single cell is the vehicle for the hereditary information that define the species and specified by this information, the cell include the machinery to gather raw materials from the environment and to construct out of them a new cell in its own image, complete with a new copy of the hereditary information. All living cells on Earth store their hereditary information in the form of double stranded molecules of DNA –long unbranched paired polymer chains, formed always of the same 4 types of monomers i.e., A, T, G,C. and these monomers are joined together in a long linear sequence that code genetic information.

Near about all the molecules in a cell are based on Carbon [4]. Carbons have the ability to form large molecules because it can form 4 covalent bonds with other atoms. One carbon atom can join to other carbon atoms through highly stable covalent C-C bond to form chains and rings and hence generate large and complex molecules. The large and small carbon compounds made by cells are called organic molecules. If we talk about the religious aspects carbon is also a main component in ***panchbhutas.***

Cells of one tissue type can be completely different. Every cell is essentially an assortment of functional parts suspended in a liquid medium and enclosed in a slightly leaky bag. The functional parts are called organelles. The fluid inside the membrane is called cytoplasm and is composed of water, salts, and organic molecules. The enclosing material is called the cell membrane, which is semi-permeable to allow small molecules and dissolved gases to pass through (large molecules require special help from membrane-bound transport proteins).

All cells have for at least some part of their life either a nucleus or a nucleoid, in which the genome the complete set of genes composed of DNA-is stored and replicate.

The most important part of cell is nucleus. The nucleus is centrally located large, diameter of ~6μm and occupies about 10% of the total cell volume [5] often rounded organelle which control all the vital activities of cytoplasm and holds all of the genetic information (DNA) of the cell in the form of protein recipes. The nucleus contains mainly nucleoprotein composed of Nucleic Acid, contain histone proteins, enzymes and inorganic salts.

Nucleus contain genes, genes are located on the chromosomes which exist as chromatin network. Chemically, the chromatin contains a single DNA molecule equal amount of 5 basic types of histone proteins. Most animal and plant cells have a nucleus, which contains a copy of the DNA of the organism (a notable exception would be mammalian red blood cells, which lack a nucleus). Chemically coded on the DNA are the instructions to produce every protein an organism needs to make new cells, digest foods, produce necessary chemicals, move, and all other cell-level life functions. The exact sequences are copied inside the nucleus by molecules of messenger RNA (mRNA), which pass out of the nucleus to ribosomes for production. The primary functions of the nucleus are to store the cell's DNA,

maintain its integrity, and facilitate its transcription and replication.

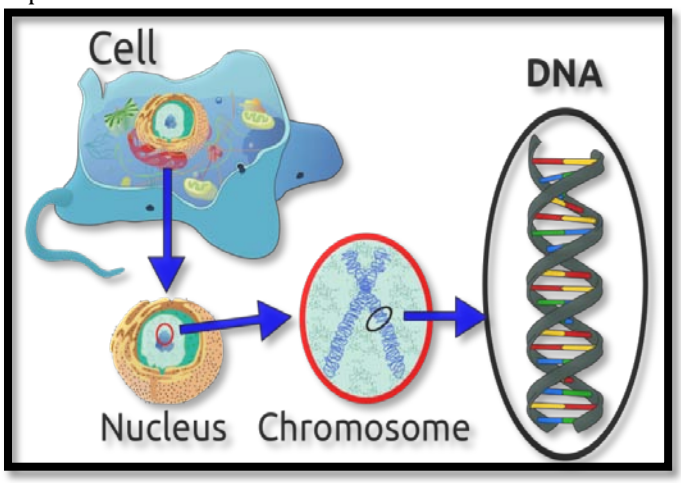


Fig 1:- Shows the cell, nucleus, Chromosomes an DNA (Source- https://en.wikipedia.org/wiki/DNA#/media/File:Eukaryote_DNA-en.svg)

DNA in a eukaryotic cell is sequestered in a nucleus. The primary genetic material is double stranded DNA. It is used as a genetic material because genetic information may need to function in a living organism for up to 100 years or more i.e. DNA carries genetic information from generation to generation.

The DNA molecule must be capable of replication, to permit dissemination of genetic information as new cells are formed during growth and development It was hoped that knowledge of the structure would reveal how DNA carries the genetic messages that are replicated when chromosomes divide to produce two identical copies of themselves [6]. An important property of DNA is that it can replicate, or make copies of itself. DNA molecule fulfill all the criteria of stability, replicability and mutability [7]. Each strand of DNA in the double helix can serve as a pattern for duplicating the sequence of bases. This is critical when cells divide because each new cell needs to have an exact copy of the DNA present in the old cell [8]. During the course of evolution DNA is preferred as more suitable molecule for long term repository of genetic information.

DNA encodes information through the order or sequences of the nucleotides along each strand. Each base A, T, G, C carry biological messages in the chemical structure of the DNA. They have different nucleotide sequence and carry different biological messages. At each cell division, the cell must copy its genome to pass it to both daughter cells. DNA also revealed the principle that makes this copying possible: because of each strand of DNA contains a sequence of nucleotides that is exactly complementary to the nucleotide sequences of its partner stand, each strand act as a template, or mold for the synthesis of new complementary strands. If we say the 2 DNA stands as S and S', strand S can serve as template for making a new strand S. Thus, the genetic information in DNA can be accurately copied by the beautifully simple process in which strand S separates from strand S' and each separated strand then serves as a template for the production of new complementary partner strand that is identical to its former partner. [4]

In this section, this point is very much clear that nucleus plays very important role in cell. One more point can be determined from this information, that a cell is capable to reproduce or to clone themselves only when it contains its own nucleus. During the war of Maa Kali and Raktabija, if we discuss of new organisms coming to life than it is only possible by blood cells falling down on ground (Earth), having the nucleus that further contains DNA carrying genetic information of the entire organism to be produced.

In the next section we are giving informative idea about composition and properties of blood because in this war blood plays an important task for development of new individual.

Biochemistry of Blood *[9] [10]*

Blood is so precious that is also called "red gold" because the cells and proteins it contains can be sold for more than the cost of the same weight in gold [11].

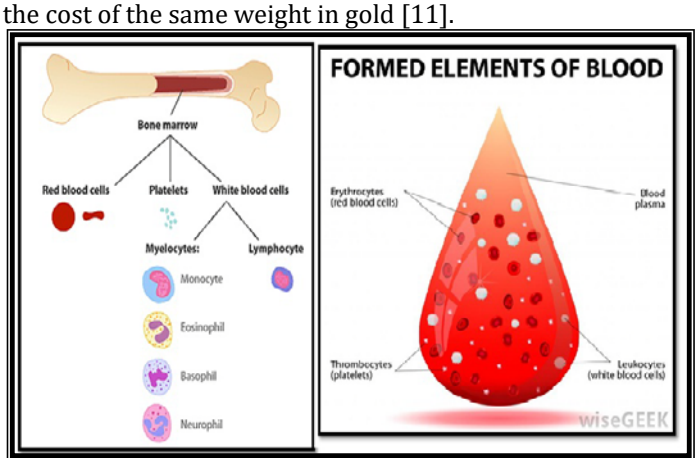
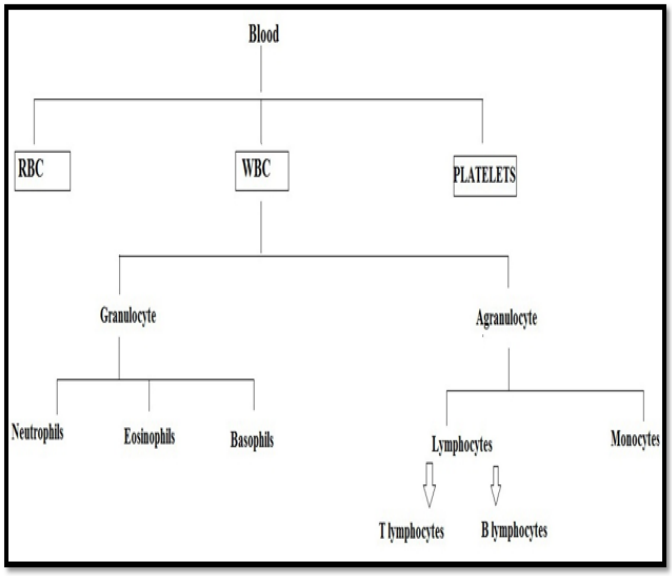


Fig 2:- Formation of Blood from bone marrow and Components in blood (Picture adopted from http://www.abc.net.au/health/library/stories/2004/10/18/1830091.htm, http://www.wisegeekhealth.com/what-is-a-polymorphonuclear-leukocyte.htm)

Different Types of Blood Cells and Their Roles in the Human Body Blood is a mixture of two things: cells and plasma. The heart pumps blood through the arteries, capillaries and veins to provide oxygen and nutrients to every cell of the body. The blood also carries away waste products. The adult human body contains approximately 5 liters of blood. It makes up 7 to 8 percent of a person's body weight. Approximately 2.75 to 3 liters of blood is plasma and the rest is the cellular portion. Blood is a connective tissue whose matrix is fluid. It is composed of: red corpuscles, white cells, platelets, and blood plasma. It is transported throughout the body within blood vessels.



Amazing Nature of RBC

- **Biconcave** shape (i.e round and flat) that favors the rapid absorption and release of O_2 and CO_2 by providing large surface/volume ratio.
- **No nucleus**. This will provide space for the carrier protein
- **Can change shape** to an extent without breaking .They are flexible, can bend and fold depending upon the situations arises at

The cellular portion of blood contains red blood cells (RBCs), white blood cells (WBCs) and platelets. The RBCs carry oxygen from the lungs. The WBCs help to fight infection, and platelets are parts of cells that the body uses for clotting. All blood cells are produced in the bone marrow. As children, most of our bones produce blood. As we age this gradually diminishes to just the bones of the spine, sternum, ribs, pelvis and small parts of the upper arm and leg. Bone marrow that actively produces blood cells is called red marrow, and bone marrow that no longer produces blood cells is called yellow marrow. The process by which the body produces blood is called hematopoiesis. All blood cells (RBCs, WBCs and platelets) come from the same type of cell, called the pluripotent hematopoietic stem cell. This group of cells has the potential to form any of the different types of blood cells and also to reproduce itself. This cell then forms committed stem cells that will form specific types of blood cells.

Red Blood Cells

Red blood cells (RBCs), also known as erythrocytes, are by far the most abundant cells in the blood. RBCs give blood its characteristic red color. RBCs account for approximately 40 to 45 percent of the blood. This percentage of blood made up of RBCs is a frequently measured number and is called the hematocrit. The ratio of cells in normal blood is 600 RBCs for each white blood cell and 40 platelets.

Most importantly, the primary function of red blood cells is to transport oxygen from the lungs to the cells of the body. An RBC contains hemoglobin, a molecule specially designed to hold oxygen and carry it to cells that need it. Hemoglobin combines loosely with oxygen in the lungs, where the oxygen level is high, and then easily releases it in the capillaries, where the oxygen level is low. Each molecule of hemoglobin contains four iron atoms, and each iron atom can bind with one molecule of oxygen for a total of four oxygen molecules (Fig 3). The iron in hemoglobin gives blood its red color. In humans, mature red blood corpuscles do not contain a nucleus and are therefore incomplete cells. They are incapable of cell division or reproduction and self-maintenance and have very little metabolic activity.

Circulating red blood corpuscles average about 8.0 μm., whereas in dried blood smears, they are approximately 7.5 μm. In fixed and sectioned tissues, they may shrink further, but they can still be used as a rough 6 μm for internal size estimation of cells and other structures because of their widespread histological availability. In human males, there are about 5.5 million red blood corpuscles per mm^3 of blood. In females, the number is about 5.0 million per mm^3. It has been estimated that a 150-pound (68.2 kg) human has about 5 liters of blood.

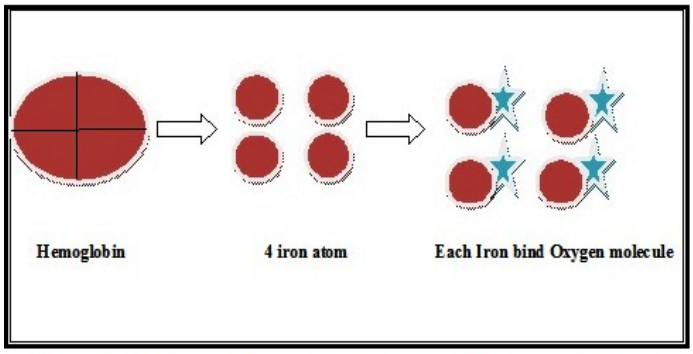


Fig 3 :- Diagrammatic representation shows how hemoglobin combine with Oxygen

Massed red blood corpuscles are red in color owing to the presence of the respiratory pigment hemoglobin. Mature red blood corpuscles are membrane bound and normally devoid of a nucleus, nucleolus, cell organelles, and inclusions. A small number (about 0.5 to 1.5 percent) of immature but circulating red blood corpuscles (reticulocytes) contain some ribonucleoprotein (RNA) in the form of ribosomes. Because of their RNA content, they can be stained with nuclear dyes such as brilliant cresyl blue; the RNA will appear as a reticular network, hence the name reticulocyte. When their circulating number exceeds 1 per cent, an increase in oxygen-carrying capacity is indicated owing, perhaps, to hemorrhage, a change in altitude above sea level, or pathologic changes in the vital capacity of the lungs. It is well established that the life span of red blood corpuscles Is approximately 120 days. This means that about 25 X 10^{10} corpuscles are replaced daily, a turnover rate of 2.5 million per second. Both damaged and normal but "worn-out" erythrocytes are removed from the vascular system by macrophages, which are found primarily in the liver, spleen, and bone marrow. Breakdown products of hemoglobin are used in the formation of bile (bilirubin), and iron is conserved and used in new red cell production.

Red corpuscles, filled with a self-synthesized protein/iron complex, hemoglobin, carry carbon dioxide to the lungs from cells and tissues where it is exchanged for oxygen. The oxygen-carrying corpuscles are passively carried in blood plasma within blood vessels. Both exchanges, in tissues and lung, take place at the capillary level; this will be considered later. The cycle of gaseous exchange is repeated about 200,000 times during the life of the corpuscle. Red blood corpuscles, normally devoid of nucleic acids (DNA, RNA), stain with acid dyes because of their content of strongly basic hemoglobin. They stain red with the widely used hematoxylin and eosin (H. & E.) and other stains. The red corpuscle may therefore also be called *eosinophilic* or an *erythrocyte* ("red cell").

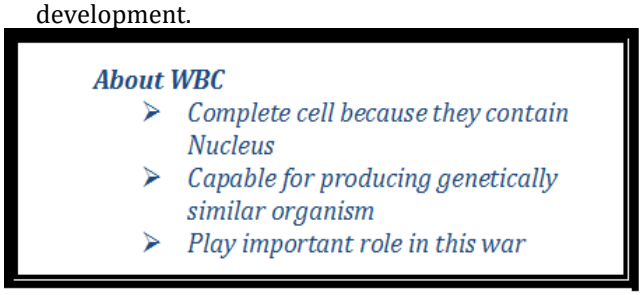
Since red cells are normally only found within blood vessels, any extravascular red cells may be an artifact of tissue preparation or the result of disease or a vascular accident (stroke).

White Blood Cells

White blood cells (WBCs), or leukocytes, are a part of the immune system and help our bodies fight infection. They circulate in the blood so that they can be transported to an area where an infection has developed. When the number of WBCs in the blood increases, this is a sign of an infection somewhere in body.

White blood cells or leucocytes ("white cells") are complete cells because they contain a nucleus and other vital organelles. Each type of white blood cells is given a specific defense task to fight against foreign objects. Two distinct types recognized are:

- The so-called agranular leucocytes include lymphocytes and monocytes. These "agranular" leucocytes do not have cell type-specific granules. They are, however, not devoid of granules (as their name implies) but may contain varying numbers of azurophilic granules.
- The granular leucocytes include neutrophiles, eosinophils, and basophils, each of which have their own type-specific granules from which they derive their names. They have granules in their cells that contain digestive enzymes.Thus, the agranular leucocytes may or may not have nonspecific granules, whereas the granular leucocytes always contain type-specific granules, except in the earliest stages of their development.



The average number of leucocytes in a normal adult varies between 5000 and 9000 per mm^3. The number of white blood cells is increased (above 12,000) or decreased (below 5000) in disease states. An increase over the normal values is termed *leucocytosis*; a decrease is termed *leucopenia*. As examples, neutrophils are known to increase in number in bacterial (pus-forming) infections, eosinophils increase in allergic conditions and parasitic infections, and basophils may increase in certain inflammatory conditions of skin. Other diseases may result in changes in the number of more than one type of leucocyte.

The life span of white blood cells is considered to be shorter than that of red blood cells. The exact life span is, however, not known, because these cells normally leave the vascular system to enter tissue spaces to perform their special functions. Aging leucocytes are removed from the circulation by macrophages located in the liver and spleen. They may die and disintegrate in the connective tissue with remnants being phagocytized by histiocytes, or they may migrate through the epithelium of the gastrointestinal and respiratory tracts and be eliminated.

Some leucocytes can be recognized in tissue sections, but others are not seen to advantage by this method. A peripheral blood smear is the preferred method for identification of blood cell types. In this method, a drop of blood is spread thinly and evenly over a microscope slide. The thin layer of blood air- dries rapidly, is fixed with methanol, and stained with a Romanovsky stain. Romanovsky (1891) discovered that certain dye mixtures stained blood cell components in a way that permitted accurate determination or differential counts of the variety of cells in the circulating blood and bone marrow. Some white cell cytoplasmic components (primarily inactive DNA and RNA) stain blue with methylene blue (hence, they are called *basophilic*), some (primarily lysosomes and a variety of other hydrolytic enzymes) may bind the azures (dye products of methylene blue oxidation) and appear light purple; some (primarily hydrolases, which digest phagocytized materials such as antigen-anti body complexes) may bind eosin (hence, they are called *eosinophilic* or *acidophilic*), and some (primarily hydrolytic enzymes related to phagocytic function) may bind another dye complex, which produces a dusty-pink or violet color (and are called *neutrophilic*, in spite of the fact that the particles are not chemically neutral). In this atlas, we have elected to use Wright's stain, which is classified as a Romanovsky-type stain. Giemsa's stain is also widely used and will be similar in its staining characteristics. Leucocytes are relatively inactive while being passively carried in the blood stream, but, because they are capable of ameboid movement, they concentrate in sites of infection and are always found in sites of "potential infection" in tissues and organs; the particular vulnerability of the diges tive system has already been mentioned. Neutrophils and monocytes are the most phagocytic of the white blood cells; they ingest foreign particles, bacteria, and degenerating cells and cell fragments whether or not they can digest them. Monocytes are considered to be the most active phagocyte. Neutrophils provide the first line of defense against invading foreign bodies and organisms, and lymphocytes are believed to form antibodies, a function shared with plasma cells.

Agranulocytes

The agranulocytes include the Lymphocytes and Monocytes.

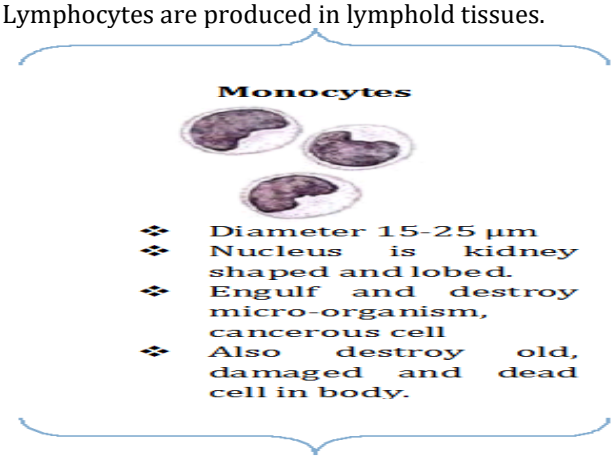
Lymphocytes

Lymphocytes are complex cells that direct the body's immune system. Lymphocytes are different from the other WBCs because they can recognize and have a memory of invading bacteria and viruses.

Lymphocytes vary widely in size. Small lymphocytes are 7 to 10 µm in diameter, and large lymphocytes are approximately 14 to 20 µm in diameter, although intermediate sizes may be encountered. Depending upon the functions, these are of major two types:

- ✓ Larger lymphocytes are thought to be involved in humoral immunity, because they are activated by specific antigens; they differentiate into B lymphocytes and are formed in specific areas of the spleen and lymph node. B lymphocytes are responsible for humoral immunity or antibody production.
- ✓ Most (80 per cent) of the lymphocytes, however, are T lymphocytes, which are long- lived and are formed in different areas of the spleen and lymph node than are the B lymphocytes. T lymphocytes (T cells) are responsible for cell-mediated immunity.

The nuclei of lymphocytes are usually round but may be slightly indented. Nuclear chromatin is clumped, inactive heterochromatin, which stains intensely with Wright's stain. The cytoplasm immediately adjacent to the nucleus is agranular and poorly stained and appears as a perinuclear halo. The thin rim of remaining cytoplasm is usually intensely basophilic but may stain variable shades of blue. Some lymphocytes possess a few azurophilic granules, but they are not evenly distributed.. Lymphocytes are produced in lymphold tissues.



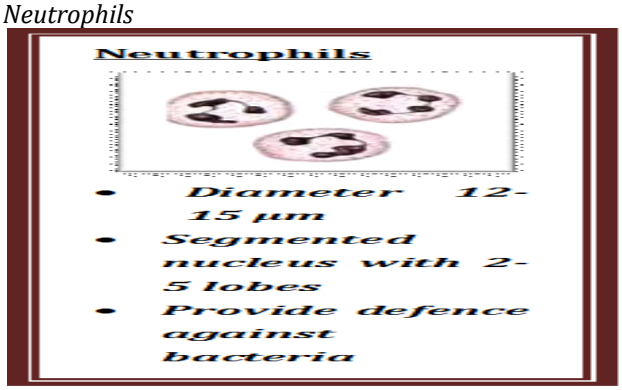
Monocytes

Monocytes are approximately 15 to 25 µm in diameter. The nuclei of monocytes are usually kidney shaped, indented, or lobed. The cytoplasm of monocytes is gray-blue and contains azurophilic granules, which are generally evenly distributed. Vacuoles are often demonstrable in the cytoplasm. Monocytes frequently show evidence of ameboid movement and are voracious phagocytes. Monocytes are also produced in lymphoid organs. Monocytes enter the tissue, where they become larger and turn into macrophages. Macrophages are found in the liver, spleen, lungs, lymph nodes, skin and intestine. There they can phagocytize bacteria throughout the body. These cells also destroy old, damaged and dead cells in the body.

Granulocytes

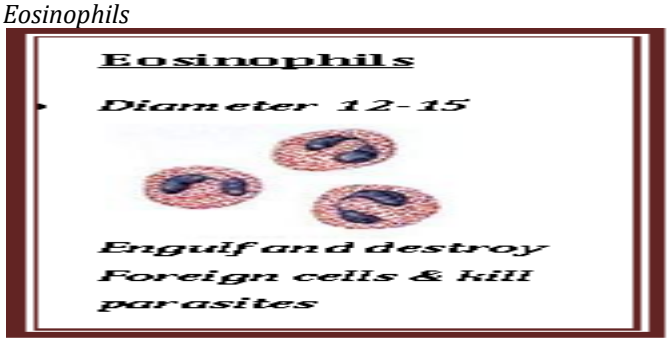
The granulocytes include the neutrophils, eosinophils, and basophils. These cells are also known as polymorphonuclear cells because of their characteristic segmented nucleus. The three polymorphonuclear cell types are produced in the bone marrow.

Neutrophils



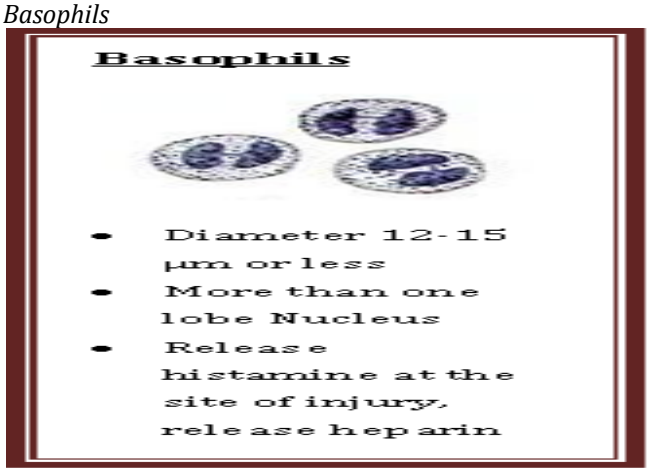
Neutrophils constitute 60 to 70 per cent of circulating white blood cells. They are 12 to 15 µm in diameter and possess a characteristic segmented nucleus with two to five lobes joined by fine strands of chromatin, hence the name *polymorphonuclear neutrophils* (PMN). The stainable heterochromatin is inactive DNA; there are no nucleoli. Immature "polymorphs" have a non-segmented oblong or rectangular nucleus; hence they are called bands. They are often bent and look like horseshoes, but they never bear this name. In females, the X chromosome may appear as a "drumstick-like" appendage on one of the lobes of the nucleus. Neutrophils have abundant cytoplasm with two types of granules of different size and staining characteristics. When stained with Romanovsky-type stains, the cytoplasm appears a dusty-rose color because of cell type-specific granules that are near and below the resolving power of the light microscope (about 0.2 µm). The granules contain several enzymes: alkaline phosphatase, collagenase, and lysozyme. The second population of granules is not cell-specific. They are azurophilic, about 0.5 µm in diameter, and stain metachromatically (light purple or violet). These are primary lysosomes rich in enzymes. Although not seen with the light microscope, these cells have few mitochondria and utilize anaerobic pathways to degrade glycogen for their energy requirements. Neutrophils survive 1 to 4 days in tissues once they leave the blood stream. They traverse the connective tissues by ameboid movement and are the most active phagocytes of the three granulocytes. The azurophilic granules or lysosomes are capable of hydrolyzing bacteria, cellular debris, fungi, and viruses. Ameboid movement and, to a lesser degree, phagocytosis is seen in eosinophils and basophils. Neutrophils are the one of the bodys main defenses against bacteria. They kill bacteria through the process of phagocytosis.

Eosinophils



Eosinophils constitute 2 to 4 per cent of circulating white blood cells. The cell is 12 to 15 µm in diameter and usually has a bilobed nucleus. The cell is easily identified by the presence of many (about 250) large and refractile cell-specific granules. These stain red with Romanovsky-type stains. The granules stain with the dye eosin; hence, the name *eosinophil*, which means "eosin-loving." In the eosinophil, unlike the neutrophil, specific granules are primary lysosomes. Eosinophils kill parasites and have a role in allergic reactions.

Basophils



Basophils constitute less than 1 per cent of the circulating white blood cells and usually require patient examination of a blood smear to locate, but they are worth the search when found. They are 12 to 15 μm in diameter but may be smaller. They possess an irregularly lobed nucleus most often obscured by the large, metachromatically basophilic granules; hence, the name *basophil*. The specific granules are irregular in size and shape and stain metachromatically owing to the presence of heparin. They also contain histamine. Basophils function in allergic reactions.

Platelets

Platelets (thrombocytes) help blood to clot by forming something called a platelet plug. The other way that blood clots is through coagulation factors. Platelets also help to promote other blood clotting mechanisms. Platelets are formed in the bone marrow from very large cells called megakaryocytes, which break up into fragments. These cellular fragments are platelets. They do not have a nucleus and do not reproduce

Platelets are small discs about 2 to 4 μm in diameter and number between 200,000 to 350,000 per mm^3 of blood. In general, two to six blood platelets or thrombocytes are seen in an oil immersion field, but their distribution is variable and they may appear in large clumps. Their specific function is related to the clotting of blood both inside and outside blood vessels.

Blood Plasma

The fluid in which the blood cells reside (when within blood vessels) is called *blood plasma*. It is the liquid portion of the blood. Blood cells like red blood cells float in the plasma. Also dissolved in plasma are electrolytes, nutrients and vitamins (absorbed from the intestines or produced by the body), hormones, clotting factors, and proteins such as albumin and immunoglobulins (antibodies to fight infection). Plasma distributes the substances it contains as it circulates throughout the body. Plasma constitutes 55 per cent of whole blood, whereas the cellular components total 45 per cent in a normal hematocrit determination. Blood plasma contains gases, proteins, carbohydrates, amino acids, lipids, inorganic salts, enzymes, hormones, and antibodies (immunoglobulins). It is slightly alkaline. Blood plasma serves an important role in coagulation, temperature regulation, respiration, regulation of blood pH (as a buffer), and fluid balance. Hormones, absorbed nutrients, and metabolic wastes are carried in the plasma to sites of action, utilization, or elimination. When blood plasma clots, the remaining fluid is called *blood serum*.

Origin of Blood Cells

Since blood cells have a short life span, they must be constantly replaced in vast numbers. The term applied to this process is *hematopoiesis* and takes place in the bone marrow and lymphoid tissues of adults. In the embryo and fetus, various organs are active in hematopoiesis, including the yolk sac, liver, spleen, thymus, and lymph nodes, as well as bone marrow.

Erythropoiesis

Red blood corpuscles undergo their maturation within bone marrow, and several "stages" can be recognized .The earliest cells of this series have a large round nucleus, reticulated chromatin, and one or more small nucleoli. The cytoplasm is seen as a thin rim, which stains a royal blue color with Wright's stain. These cells, unfortunately, are called by several names of which you should be aware but not memorize. Determine the nomenclature preferred by your instructor and then underline the name to simplify the learning process; for example, rubriblast, proerythroblast, pronormoblast, or megaloblast. As the rubriblast matures, the nucleus becomes smaller, chromatin coarsens, and nucleoli become ill defined or disappear. The cytoplasm remains basophilic and stains blue. These cells are termed prorubricytes, basophilic erythroblasts, basophilic normoblasts, or early erythroblasts. The next recognizable stage involves further coarsening and reduction of nuclear size. Nucleoli are absent. Relatively, the cytoplasm appears to occupy more of the cell and is seen to contain a mixture of eosinophilic (red) and basophilic (blue) purplish cytoplasm. These cells are named rubricytes, polychromatophilic erythroblasts, normoblasts, intermediate erythroblasts, or intermediate normoblasts. The nucleus of the next stage is still smaller than the preceding stage and is a solid blue-black color. The nucleus is now non-functional and ready to be discarded. The cytoplasm is predominantly acidophilic with some residual basophilia. The hemoglobin, which is eosinophilic, dominates with only minimal amounts of residual ribonucleoprotein staining the cytoplasm a purplish tint. The nucleus is ejected from the cell in the next "stages" and the cytoplasm still retains a very slight purple tint, signifying the increased synthesis of hemoglobin. These cells are termed diffusely basophilic erythrocytes or polychromatophilic erythrocytes. In the final "stage,ff the cytoplasmic ribonucleoprotein disappears and the corpuscles appear as flexible biconcave discs, 6 to 8 μm in diameter, and reddish in color when stained with Romanovsky-type stains; in this atlas, with Wright's stain.

Granulocytic Series

Granular leucocytes develop in the bone marrow from undifferentiated cells called myeloblasts. Myeloblasts are approximately 20 μm in diameter. The nucleus is round, stains a purple color, and contains two or more nucleoli. The cytoplasm is basophilic, and, when stained with Wright's stain, it appears agranular and pale blue. In the next recognizable "stage," the nucleus is reduced in size and the chromatin becomes more coarse and unevenly stained. This cell now contains the granules that stain variably from red to purple-blue and is designated a progranulocyte or a promyelocyte. A progranulocyte becomes a myelocyte when the granules become sufficiently differentiated in size, color, and shape to be positively identified as the specific granules of neutrophils, eosinophils, or basophils. The subsequent developmental "stages" are identical for the three types of granulocytes or polymorpho nuclear cells.

The primary changes include a reduction in cell size and alterations in nuclear shape. The nucleus of the myelocyte tends to be slightly flattened. The chromatin becomes increasingly coarse, and nucleoli are usually indistinct or absent. The next stage, the metamyelocyte, contains an indented kidney-shaped nucleus. Additional folding results in a horseshoe-shaped nucleus, which stains deeply with basic dyes. The overall cell size continues to decrease. These cells are called "bands." The final developmental 11stageff results in a cell with a segmented or lobed nucleus, the lobes being united by narrow filaments or strands of chromatin. The cytoplasm contains the specific granules characteristic of the three types. These cells are called *segmented granulocytes* or

polymorphonuclear granulocytes. The mature polymorphonuclear granulocyte is approximately 15 μm in diameter.

All lymphocyte progenitor cells are believed to originate in the bone marrow. They leave the marrow to develop in the thymus to form T lymphocytes, which will leave the thymus to populate other lymphoid organs. Other bone marrow lymphocyte progenitor cells become B lymphocytes, which leave the marrow to populate other specific areas of lymphoid tissue. T and B lymphocytes cannot be distinguished by ordinary histologic methods.

According to findings of Priyank and Garima above data only shows leukocytes have nucleus whereas no nucleus is found in RBC and platelets. Some of the data suggest that mitochondria [12] are also found in leukocytes it clearly means that leukocytes contain all the genetic information which are necessary for the development of a new individual**.**

Animal Genetics

In mammals, the male-specific Y chromosome plays a pivotal role in sex determination, and also bears genes that are required for spermatogenesis. However, not all the genes that are needed to make a testis or to make germ cells need to be on the Y chromosome, and many are known to be located on the X chromosome or on the autosomes (chromosomes other than the X and Y).

Like other mammals, human females have two X chromosomes (XX) and males have a single X and a single Y chromosome (XY). The X is large (5% of the total length of a single set of chromosomes) and bears a proportional number of genes (3000 or 4000), which have a variety of functions much like those of genes located on other chromosomes. To ensure fair play between the sexes, only one X chromosome is genetically active in female cells[13]

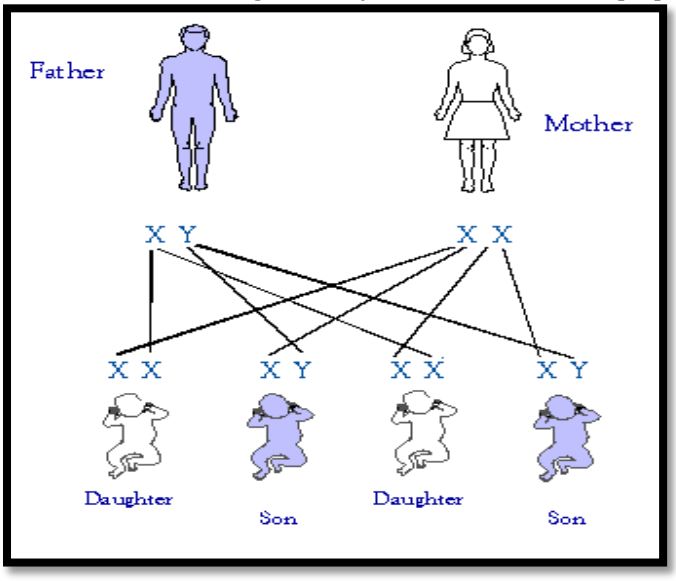


Fig 4:- Shows that how X and Y chromosome transmit from mother and Father. This fig also shows that male have X and Y chromosome whereas female have XX chromosomes. (Figure adopted from askmichellebiology.blogspot.com)

As mentioned in scientific literature, male carry both the chromosomes X and Y in them, which signifies that males are carrier of both the character of males and females; but female character gets suppressed and male character starts getting more expressed at the time of puberty.

May be there are possibilities after searching the literature there is no chances of fertilization without ova. Now the question arises that from where the ova required for fertilization come from?

The role of media was done by soil and sterilization was done by the fire that was burning during the war.

It has also been mentioned in the Literature that Raktbija also had a blessing that whenever even a single droplet from his body will fall on ground, new individual of exactly same genetic makeup would be developed from the blood cells. This process was somewhat time consuming and the war was continued over a couple of days. The major part is, the ova production in this case was from the same individual Raktbija, all because of the blessing he got. Raktbija had well developed both male and female characters in him. In this case, the nucleus of his blood fertilized the ova by the technique known as Somatic Cell Nuclear Transfer. In this technique, the role of media was done by soil and sterilization was done by the fire that was burning during the war.

DNA and Panchabutas

Panchbhutas- The 5 component of life

According to Hindu mythology, life and the various species originated by the combination of planetary globes without these *panchabhutas* life is not possible and the five manifestations of nature namely Earth or *Prithvi;* Water or *Jal ;* Fire or *Agni*; Air or *Vayu* and then Ether or *Akasha*.. *Bhoota* (Sanskrit:भूत) in Sanskrit means compound and *maha bhoota* indicates a big compound. According to Ayurveda, an ancient Indian medical system, the equilibrium of the body with the *pancha bhoota* is governed by the principles of *tridoshas -kaph*(phlegm), *pitta*(bile), *vayu*(gas), *dhātu* and *malas*(waste products).

Each of these Five elements has its own character and celestial elements which we will gauge in the following lines. [14]

***Earth (Prithvi*)**: One can touch earth and smell it too ! However, there are two types of earth one is Eternal or (*nitya*) which are in the form of atom (*Paramanu*).The other type is perishable (*anitya*) which exists in the form of *Karya* or Work at animate and inanimate levels. Symbolically speaking our body, sense organs are the Earth which as a whole get the shape of *Jiva* or life but those are perishable. But elements or atoms are eternal as after death may we bury, or burn the body, all the atoms get disintegrated to come back to its original eternal form. So our body and its *Karya* or Work are perishable as the mountain or rock forms but the atom remains which are eternal.

Water* or *Jal is the second element which again has two characters as in the Earth i.e. eternal in the shape of atom and *Karya* (Work) be it as river, pond or sea are perishable. As from sea or river water evaporates to be in the sky as cloud then again in the shape of rain it comes down on earth. So the eternal atom is only changing its *karya* or shape of work and what we see is the perishable form.From the sense organ perspective we can touch it to feel and taste it as well.

***Air* or *Vayu*.**Again it has two levels as earth and water i.e.eternal atom and perishable *Karya*. One can feel air, as we breath in or out.We feel the storm or strong breeze which are temporary but air at atomic level remains around us eternally. In the *Purana* there is a mention of 49 types of *Maruts* or winds.Seven are important namely 1.

Pravaha 2 *Avaha*; 3,*Udvaha* 4. *Samvaha;* 5 *Vivaha*; 6 *Parvaha* and 7.*Paravaha*. The wind which takes the water from the ocean is called *Udvaha.*

Fire* or *Agni is the fourth element of Indian *Panchabhuta*. Again it has eternal and perishable elements as we have seen above. The essential character of Fire is to generate heat.According to Hindu Mythology, *Agni* is one of the Eight guardians who guards our universe and is known as *Asta- dik-palakas* (*Asta*-eight, *dik*--Zone,*Palaka*-Guardian). The Fire is posited in the South East of the Universe.

Then comes the last of the *Panchabhuta* or five elements which is sound or **ether**. Ether is unique as it has only one character i.e. eternal. Ether is the carrier of sound be it man made or otherwise. One can hear it. As ether is the only eternal element of the five elements it attracted the attention of various sages. The concept of *Akashvani* or Devine sound which is heard by sages of higher order is related to this Ether or *Akasha*.

DNA- The Master Molecule of life with its 5 codes.

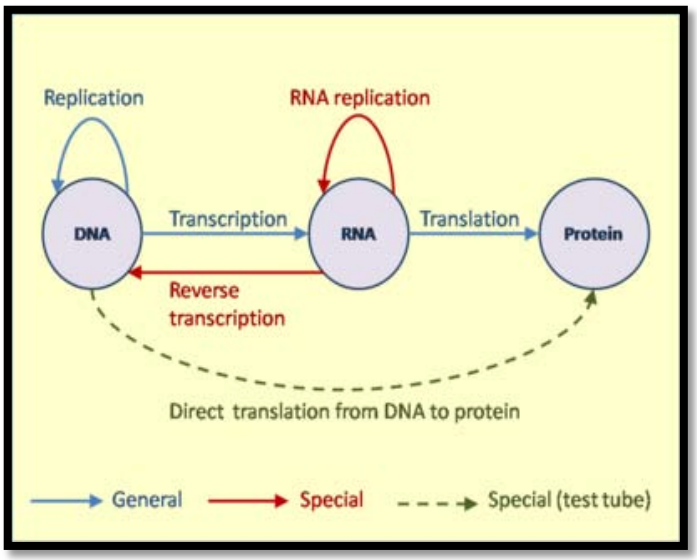
The biochemical investigation of DNA began with Friedrich Miescher, who carried out the first systematic chemical studies of cell nuclei. In 1868 Miescher isolated a phosphorus-containing substance, which he called "nuclein," from the nuclei of pus cells (leukocytes) obtained from discarded surgical bandages. He found nuclein to consist of an acidic portion, which we know today as DNA, and a basic portion, protein. Miescher later found a similar acidic substance in the heads of sperm cells from salmon.

Central dogma (Fig 5)of molecular biology states the flow of genetic information within a biological system. It was first stated by Francis Crick in 1956 and re-stated in a *Nature* paper published in 1970.It has also been described as **"DNA makes RNA and RNA makes protein",** a positive statement which was originally termed the sequence hypothesis by Crick. And these proteins are building blocks that ultimately form the complete body of an organism. Without protein the structure and function of any individual is not properly feasible.

Fig 5:- This diagram shows that DNA makes RNA and RNA further makes proteins by the process called Central Dogma. (Diagram adopted from http://creationwiki.org/Molecular_biology)

DNA is the molecule of heredity that passes from parents to offspring. It contains the instructions for building RNA and proteins, which make up the structure of the body and carry out most of its functions. Inside the cells of all living things, tiny molecular machines i.e., RNA (messenger RNA (mRNA), transfer RNA (tRNA), and ribosomal RNA (rRNA)) read the information in DNA and use it to build proteins. The proteins formed as a result of this process are responsible for entire health as well any disease that develops in an organism. This states that the master molecule for entire information is DNA only, and if there is any modification or abnormality at DNA level, it can disturb the entire organ system and even life of an organism. RNA is the intermediate which has important role in coding and transfer of information as well as synthesis of proteins.

DNA-The Deoxyribonucleic Acid is primarily made up of 4 components- Adenine (A), Guanine (G), Cytosine (C) and Thymine (T). These 4 codes are the carrier of the genetic information in both sexual and asexual mode of reproduction. But these 4 codes are not the whole sole controller of the entire genetic makeup in almost all multicellular organisms. For the complete coding and synthesis of various proteins and survival of life, the organisms require 5th component that comes from RNA (the assistant molecule that helps is carrying genetic information to protein level). This component is known as Uracil (U) that comes in place of Thymine of DNA in an RNA strand when the genetic information is copied from DNA by mRNA. Only rarely does thymine occur in RNA or Uracil in DNA.



A, T, G, C and U of DNA and RNA are called Nucleotides that have a variety of roles in cellular metabolism. They are the energy currency in metabolic transactions, the essential chemical links in the response of cells to hormones and other extracellular stimuli, and the structural components of an array of enzyme cofactors and metabolic intermediates. And most importantly, they are the constituents of nucleic acids: deoxyribonucleic acid (DNA) and ribonucleic acid (RNA), the molecular repositories of genetic information. The structure of every protein, and ultimately of every biomolecule and cellular component, is a product of information programmed into the nucleotide sequence of a cell's nucleic acids. The ability to store and transmit genetic information from one generation to the next is a fundamental condition for life.

Nucleotides have three characteristic components: (1) a nitrogenous (nitrogen-containing) base, (2) a pentose sugar, and (3) a phosphate. The molecule without the phosphate group is called a **nucleoside.** The nitrogenous bases are derivatives of two parent compounds, **pyrimidine** and **purine.** The bases and pentose's of the common nucleotides are heterocyclic compounds.

The 5 basic life supporting molecules of the nucleic acids are – *Carbon, Hydrogen, Nitrogen, Oxygen, Phosphorous* which compose the structure of DNA by forming its basic components i.e., nucleotides (A, T, G, C and U). This is as similar as the 5 components of life mentioned in the religious texts (i.e., *Panchbhutas* because these are also formed by combination of *Carbon, Nitrogen, Oxygen, Phosphorous and Hydrogen*) because if any one component lacks, the possibility of life of a multicellular organism is impossible.

In order to study detailed explanation of the 5 basic life components and their significance in the structural formation of DNA, we need to structurally observe Adenine, Guanine, Cytosine, Thymine and Uracil, which are as follows:

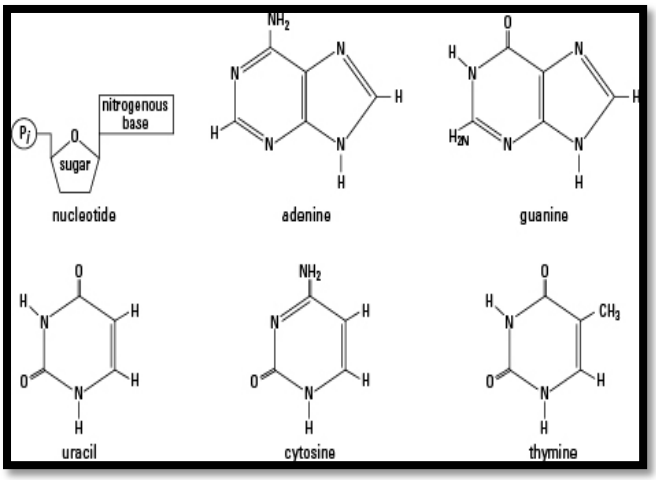


Figure 6: 5 nucleotides forming DNA and RNA
[Figure adopted from https://www.google.co.in/search?q=structure+of+5+nucleotides&safe=active&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjj6JCj8cbJAhUMU44KHRnJD1IQsAQIGw#imgrc=I7uJYE-zLOLIiM%3A]

Role of Carbon, Nitrogen, Oxygen and Hydrogen

The most important functional groups of pyrimidines and purines are ring nitrogen's (-N), carbonyl groups (-C=O), and exocyclic amino groups (-NH_2). Hydrogen bonds (-H) involving the amino and carbonyl groups are the second important mode of interaction between bases in nucleic acid molecules. Hydrogen bonds between bases permit a complementary association of two (and occasionally three or four) strands of nucleic acid. The most important hydrogen-bonding patterns are those defined by James D. Watson and Francis Crick in 1953, in which A bonds specifically to T (or U) and G bonds to C (Refer fig 7). This bonding states that there are 2 hydrogen bonds between A and T and 3 hydrogen bonds between G and C. These two types of base pairs predominate in double-stranded DNA and RNA. It is this specific pairing of bases that permits the duplication of genetic information. The carbon and nitrogen atoms in the parent structures are conventionally numbered to facilitate the naming and identification of the nucleotides as well as many of their derivative compounds [15].

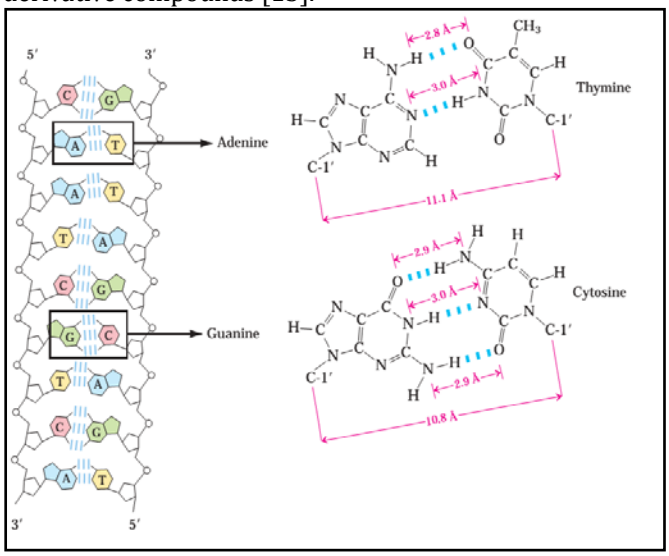


Fig 7:- Hydrogen bonding patterns in the base pairs defined by Watson and Crick. Hydrogen bonds are represented by 3 blue lines [15]

Role of Phosphorous

The successive nucleotides of both DNA and RNA are covalently linked through phosphate-group "bridges," in which the 5'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide, creating a phosphodiester linkage. Thus the covalent backbones of nucleic acids consist of alternating phosphate and pentose residues, and the nitrogenous bases may be regarded as side groups joined to the backbone at regular intervals. The backbones of both DNA and RNA are hydrophilic. The hydroxyl groups (-OH) of the sugar residues form hydrogen bonds (-H) with water (-H_2O)[15].

In this way, we can say that all the 5 molecules i.e., Carbon(C) , Hydrogen (H), Oxygen (O), Nitrogen (N) and Phosphorus(P) are important for the formation of the nucleotides that form the entire structure of DNA and also the RNA. This section can conclude that *panchbhutas* and DNA are one and same thing (Fig 8 and Fig 9).

According to the findings of Priyank and Garima "DNA and Panchbhutas are not different. These are only 2 different names suggesting similar things. Vedas and Purans says Panchbhutas whereas in Science that is called DNA"

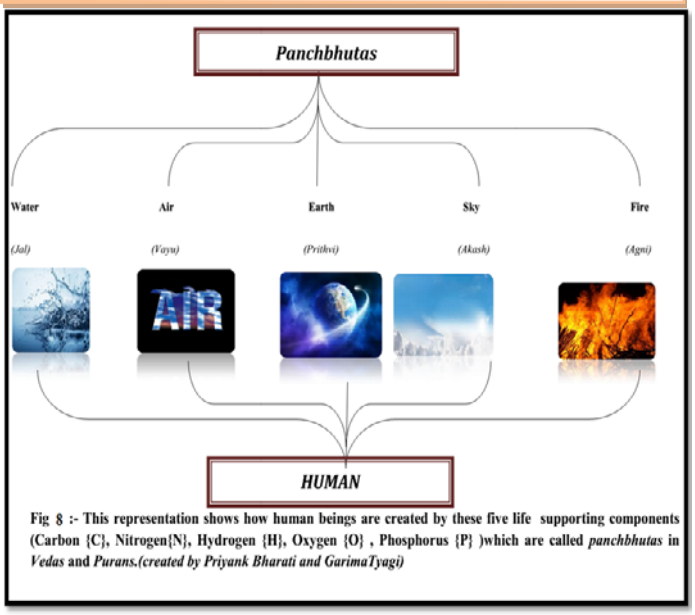


Fig 8 :- This representation shows how human beings are created by these five life supporting components (Carbon {C}, Nitrogen{N}, Hydrogen {H}, Oxygen {O} , Phosphorus {P})which are called *panchbhutas* in *Vedas* and *Purans.(created by Priyank Bharati and GarimaTyagi)*

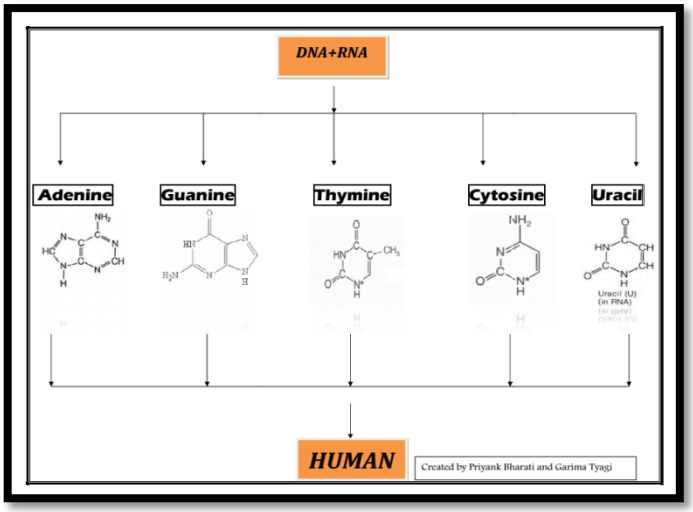


Fig 9:- This figure shows the 5 most important components necessary for life and body organization of human beings. This figure also depicts that without Carbon, Nitrogen, Oxygen, Hydrogen and Phosphorous the structure of these 5 components is impossible.

Role of Soil as a media during war

The term soil refers to the outer loose material of the Earth crust. The soil is composed of 5 major components, these includes- Mineral matter, Water, Organic matter, Air and living organism. These 12 elements are 'mineral nutrients'- Nitrogen, Phosphorus, Potassium, Sulfur, Magnesium, Calcium, Iron, Boron, Manganese, Zinc, Molybdenum, Copper which are present in soil. Oxygen, Hydrogen and carbon are gases which are obtained from atmosphere. Nitrogen is an essential element of all amino acids. Amino acids are the building blocks of proteins. Nitrogen is also a component of nucleic acids, which form the DNA of all living things and holds the genetic code [16].

In the war between Maa kali and Raktabija soil play a important role. All these 15 elements are used in animal cell culture also. Animal cells grown in culture also must be supplied with Nitrogen compounds, Carbon source, Salts like Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, PO_4^{3-}, HCO_3^-, Trace elements like manganese (Mn), molybdenum (Mo), nickel (Ni), tin (Sn), vanadium (V) etc are used [17].

Soil is good source of media.

- ❖ Soil shows antiseptic activity antibiotic property, antiviral factors
- ❖ Soil has all the capability which are necessary for the growth and differentiation of animal cell

Living portion of soil body includes small animals and microorganisms that plays the most important role in the release of nutrients and carbon dioxide. The bacteria are the most abundant group usually more numerous than the 4 combined. Soil bacteria can be rod,(bacilli) cocci (spherical) spirilla (spirals), of these, bacillus are more numerous than the others. Muslia Abulkadir and Salawudeen Waliyu in 2012 shows that the soil bacteria isolated shows antibiotic activity under normal growth condition and was found inhibiting some gram positive and some gram negative organism both *Bacillus lentus and Bacillus alvei* shows antibacterial activity against *Staphylococcus aureus* whereas *Micrococcus roseus* shows antibacterial activity against *Shigella spp.*. They also show that *Bacillus lentus, Micrococcus roseus, Enterobacter, Aerogene, Bacillus alvei* from soil sample have potential of producing antibiotics [18]. Another study shows that soil microorganism provide an excellent resource for the isolation and identification of therapeutically important products. Among them actinomycetales is an important group [19]. Actinomycetes are gram-positive bacteria with high guanine + cytosine content of over 55% [20] in their DNA, which have been recognized as a source of several secondary metabolites, antibiotics and bioactive compounds that affect microbial growth [21]**.** Actinomycetes are potential source of many bioactive compounds [22] [23] [24] [25] which have diverse clinical effects and important applications in human medicine [26]. It has been estimated that approximately one-third of the thousands of naturally occurring antibiotics have been obtained from actinomycetes [27]. Studies show that actinomycetes isolates have the potential to act as sources of new antibacterial compounds against pathogenic microorganisms to humans [28].

Let us not move much far, if we turn back to even 50-100 years or now a day's also, the farmers tie the mud (soil) from the field on their wound which used to cure it and protect it from swelling, pus formation, fungal effect as well as bacterial effect that could take place at the site of wound. This fact must have been heard as well as observed by a number of people of this era too. This shows the antiseptic property of soil.

Soil shows antiseptic activity, antibiotic property, antiviral factors [29] and antifungal activity [30].

Soil has all the capability which is necessary for the growth and differentiation of animal cell. Soil also plays a crucial role in providing nourishment to animal cell.

Recent researches show that soil has antibacterial, antifungal and antiseptic qualities in it. If we consider the time that we are discussing in this research paper, the environmental conditions were much more pure than now as the rate of pollution was almost negligible at that time. We can simply compare and conclude that when these properties are shown by soil currently, in presence of this much pollution, the quality of the soil must have been multiple times higher at that time because that era was completely pollution less.

Scientific Technology used in the war of Maa Kali and Raktbija : Somatic Cell Nuclear Technology or Cloning

Somatic cell cloning (cloning or nuclear transfer) is a technique in which the nucleus (DNA) of a somatic cell is transferred into an enucleated metaphase-II oocyte for the generation of a new individual, genetically identical to the somatic cell donor . The success of cloning an entire animal, Dolly, from a differentiated adult mammary epithelial cell has created a revolution in science and technology. Somatic cloning may be used to generate multiple copies of genetically elite farm animals, to produce transgenic animals for pharmaceutical protein production or xeno-transplantation [31][32][33][34], or to preserve endangered species.

Somatic cell nuclear transfer (SCNT) is a laboratory technique for creating an ovum with a donor nucleus. It can be used in embryonic stem cell research, or in regenerative medicine where it is sometimes referred to as "therapeutic cloning." It can also be used as the first step in the process of reproductive cloning. This technique has some major steps which are as follows [35]:

- ✓ In SCNT the nucleus, which contains the organism's DNA, of a somatic cell (a body cell other than a sperm or egg cell) is removed and the rest of the cell discarded. At the same time, the nucleus of an egg cell is removed.
- ✓ The nucleus of the somatic cell is then inserted into the enucleated egg cell.
- ✓ After being inserted into the egg, the somatic cell nucleus is reprogrammed by the host cell.
- ✓ The egg, now containing the nucleus of a somatic cell, is stimulated with a shock and will begin to divide.
- ✓ After many mitotic divisions in culture, this single cell forms a blastocyst (an early stage embryo with about 100 cells) with almost identical DNA to the original organism.

Dolly, the sheep was successfully cloned in 1996 by fusing the nucleus from a mammary-gland cell of a Finn Dorset ewe into an enucleated egg cell taken from a Scottish Blackface ewe. Carried to term in the womb of another Scottish Blackface ewe, Dolly was a genetic copy of the

Finn Dorset ewe.

Dolly, the first mammal to develop from the nucleus of an adult somatic cell [36]. Wilmut and colleagues took foetal fibroblast cells and cells derived from the mammary gland of an adult sheep and applied the same approach of synchronizing cells in G_0 prior to nuclear transfer. They reported successful production of live offspring from both cell types. Twenty-nine out of 247 (12 percent) of successful fusions between adult mammary gland nuclei and enucleated oocytes developed to the blastocyst stage, and 1 out of 29 (3 percent) blastocysts transferred developed into a live lamb— Dolly. This experiment was, in fact, the first time any adult animal had been derived from nuclear transfer of an adult nucleus, since the frog experiments generated only swimming tadpoles. However, the amount of new information about the stability of the differentiated state derived from this experiment was small, since no attempt was made to use only fully differentiated cells expressing specialized mammary gland proteins for the transfer, as was done for the skin cell experiments in frogs. The successful nuclear transfer animal could have derived from a less-differentiated, stem-cell-like cell in the population. The excitement generated by Dolly was more related to the realization that there may be no theoretical barrier to nuclear transfer into the oocyte from any cell of the body in any mammalian species. Hence, the science fiction scenario of copying or "cloning" an adult mammal, including humans, became science fact [37].

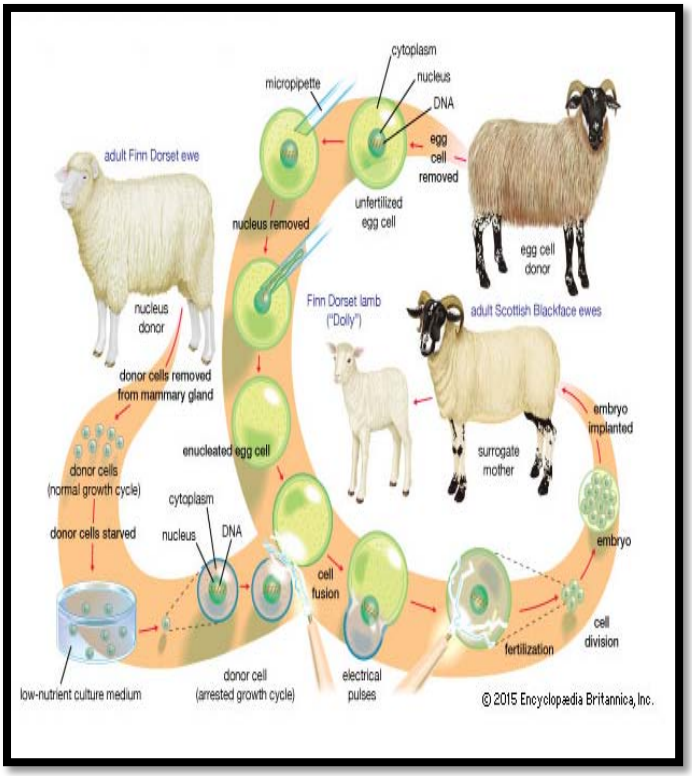


Fig 10:- Procedure followed to produce Dolly. This is only a example to show the procedure of SCNT (picture adopted from http://www.britannica.com/science/somatic-cell-nuclear-transfer)

CONCLUSION AND DISCUSSION

There was nothing impossible in this world before and not even now. In order to explain how developed science was a number of years before, authors have taken an example which can just be an incident of imagination for this world. Nobody ever thinks that it was actually not a fragment of religion but a true example of pure science and that too without any scientific instrumentation. The casual attitude of most of people is that they just leave religious matter without even going into deep details of facts and science that is behind them. We want to clarify one thing very clearly that "Religion itself is science". The only difference comes when we take religion on the track of superstition rather than fact. According to Hindu Mythology, science is the knowledge that was versed by Lord Shri Hari Vishnu*"Narayan"*(i.e, Vigyaan = Shri Hari Vishnu's Gyaan).

The very basic unit of life i.e., cell is primarily made up of carbon which is the most essential component for its composition. The brain of a cell is known as nucleus that has chromosome having chromatin network or in more simplified language we can say, DNA. If there won't be nucleus in a cell, then genetically similar organisms would not be formed. In this war that authors have explained above, the entire technology is revolving around blood and its unique characteristics. If we look at the components of blood it is primarily composed of RBC's, WBC's and platelets. Out of these cells, RBC's and platelets lack nucleus but WBC's has nucleus along with mitochondria, making them capable of showing certain characters exactly like that of reproducing cells. According to PG (Priyank and Garima) hypothesis, blood cells are similar to sperm cells (Table 1). Just due to their spherical shape, they are unable to penetrate ova. Other than this, there is no difference between a sperm cell and a WBC. Till date, only 2 haploid cells have been discussed in science, sperm and ovum. But WBC's part of blood is also a haploid cell with some how similar composition and properties like that of sperm cells. But this fact is not mentioned anywhere in biological sciences.

Blood Cells	Sperm Cells
✓Contains nucleus.	✓Contains nucleus.
✓Mitochondria are present.	✓Mitochondria are present.
✓Proteinaceous nature.	✓Proteinaceous nature.
✓Histone proteins are present.	✓Histone proteins are present.
✓Transfers genetic information.	✓Transfers genetic information.
✓Have motility.	✓Have motility.

Table 1: Similarities between blood cells and sperm cells (by Priyank and Garima)

This concept supports the truth that in the war being discussed here, WBC's were responsible for generating clones of Rakatbija. When war started, Raktabija was tried to be killed by Maa Kali and whenever his blood droplets felled on ground, they differentiated and matured on soil in a similar way like Hematopoietic stem cells developing into multipotent cells and finally into progenitor cells. In this case, soil acted as a culture media. The major part is, the ova production in this case was from the same individual Raktabija, all because of the blessing he got. Raktabija had well developed both male and female characters in him. In this case, the nucleus of his blood fertilized the ova by the technique known as Somatic Cell Nuclear Transfer. In this technique, The role of media was done by soil and sterilization was done by the fire that was burning during the war.

The enucleated ova formed in Raktabija was fused with the nucleus of WBC exactly as ova fuses with sperm

cells in case of fertilization; on the culture medium soil containing all essential micronutrients for growth and differentiation of animal cells. On the nutrient medium, genetically similar copies of Raktabija were formed. This was totally impossible without DNA present in the nucleus. In the entire process, the sterilization was provided by the fire arising from the explosion that took place during the war because of which the inhibiting microorganisms for the culture growth were killed. This entire process was time consuming, as the war continued for many years, hence clones got time to grow and divide into complete organism.

The war took place thousands and thousands of year back but exact time is still unknown. But similar research is done in the year 2013 following the same principal. Satoshi Kamimura and colleagues [38] have developed 600 genetically similar mice from a single drop of peripheral blood. According to their research, a nucleated cell (WBC's) suspension was prepared by cell lysis following SCNT using randomly selected leukocyte nuclei, cloned offspring's were born at a 2.8% birth rate. In this study, they used mouse as an animal model. They concluded that this study has been demonstrated for the very first time that mice could be cloned using the nuclei of peripheral blood. These cells could be used for cloning immediately after collection and no donor animal need to be euthanized**.** This technique would be applicable for generating genetic copies of invaluable strains of mice, which can't be preserved by other assisted reproduction technique such as conventional in-vitro fertilization or Intra Cytoplasmic Sperm Injection (ICSI).

According to this research, the cell could be cloned immediately after collecting peripheral blood. Again if we talk of that war, clones also started growing as the droplets felled on soil. This concept is again supported by recent era's biological research. The scientific researches that are been carried out in this era regarding cloning research are able to make clones of animal model but it is still not that efficient to clone a human being. On the contrary, thousands years back because of this fight, human clones were developed successfully from blood droplet. Hence, the advancement of science and technology can clearly be understood even in our religions by this unique example.

RECOMMENDATIONS

According to our research these recommendations should be made and the results could be observed.

✓ If soil is used as culture media in scientific research, then results would be more positive and environment friendly as compared to artificial media. Because soil supports fast replication as the process takes place in the presence of natural conditions. Whenever a seed falls on earth (soil), it attains all the nourishment that can support life and forms a complete tree; in the same way the nourishment was taken by blood cells and finally they grew to mature and finally as an organism.

✓ Blood can be considered as the best and easily available source of fertilization process if male is infertile.

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REFERENCES

1. Shri Durgasaptashati, Geeta Press, Gorakshpur (U.P.), 100th Reprint Edition
2. www.ancient.eu/Kali/
3. http://datab.us/kAaP4qmeykI#Mahakali%20and%20Rakhtbeej%20battle
4. Bruce Albert, Alexander Johnson, Molecular Biology of The Cell, (J.Edu) Garland Science Taylor Francis Group
5. http://www.mechanobio.info/topics/cellular-organization/go-0005634/01_go-0005634
6. http://biology.kenyon.edu/courses/biol63/watson_06.pdf
7. Desmond S.T. Nicholl, An Introduction to Genetic Engineering, 2nd Edition, Cambridge University Press, 2002
8. http://ghr.nlm.nih.gov/handbook/basics.pdf
9. http://www.anatomyatlases.org/MicroscopicAnatomy/Section04/ Section04.shtml
10. http://web.mit.edu/scicom/www/blood.html
11. Dean L. Blood Groups and Red Cell Antigens [Internet]. Bethesda (MD): National Center for Biotechnology Information (US); 2005. Chapter 1, Blood and the cells it contains. Available from: http://www.ncbi.nlm.nih.gov/books/NBK2263.
12. http://www2.lf3.cuni.cz/opencms/export/sites/www.lf3.cuni.cz/en/departments/chemie/vyuka/studijni-materialy/CSFBXX41C/prednasky/blood_cells_vk.pdf
13. http://www.biolreprod.org/content/63/3/667.2.full
14. http://www.ibiblio.org/gautam/hind0003.htm
15. David L. Nelson and Michael M. Cox, Lehninger Principles of Biochemistry, Fourth Edition, website www.whfreeman.com/lehninger4e
16. http://www.ctahr.hawaii.edu/mauisoil/c_nutrients01.aspx
17. http://www.ncbi.nlm.nih.gov/books/NBK21682/#_ncbi_dlg_citbx_NBK21682
18. Muslia Abulkadir and Salawudeen Waliyu, 2012, Screening and Isolation of the soil bacteria for ability to produce Antibiotics, *European Journal of Applied Sciences,* 4(5), 211-215
19. Berdy J. Bioactive microbial metaboltes: A personal view. *J Antibiot* (Tokyo) 2005;58:1-26
20. Ventura M, Canchaya C, Tauch A, Chandra G, Fitzgerald GF, Chater KF, et al. Genomics of acticobacteria : Tracing the evolutionary history of an ancient phylum. *Microbiol Mol Biol Rev*. 2007; 71: 495-498.
21. Ishida N, Miyazaki K, Kumagai K, Rikimaru M. Neocarzinostatin, an antitumor antibiotic of high molecular weight, isolation, physiochemical properties and biological activities. *J Antibiot* (Tokyo) 1965; 18: 68–76.
22. Vining LC. Secondary metabolism, inventive evolution and biochemical diversity: A review. *Gene*.1992;115:135–40.
23. Edwards C. Isolation, properties and potential applications of thermophilic actinomycetes. *Appl Biochem Biotechnol*. 1992;42:161–79.
24. Demain A. Cambridge: Cambridge University Press; 1995. Why do microorganisms produce antimicrobial? Proceeding of symposium on society of General Microbiology; pp. 205–28.
25. Xu LH, Jiang Y, Li WJ, Wen ML, Li MG, Jiang CL. Streptomyces roseoalbussp. nov., an Actinomycete isolated from soil in Yunnan, China. *Antonie Van Leeuwenhoek*. 2005;87:189–94.

26. Watve MG, Tickoo R, Jog MM, Bhole BD. How many antibiotics are produced by genus Streptomyces? *Arch Microbiol*. 2001;176:386–90 .
27. Takizawa M, Colwell RR, Hill RT. Isolation and diversity of actinomycetes in the chasapeake bay. *Appl Environ Microbiol*. 1993;59:997–1002.
28. Hotam S. Chaudhary, Jayprakash Yadav, Anju R. Shrivastava, Smriti Singh, Anil K. Singh, and Natrajan Gopalan*, J Adv Pharm Technol Res.* 2013 Apr-Jun; 4(2): 118–123. doi: 10.4103/2231-4040.111528.
29. Cheo, P.C, Antiviral factors in soil, Soil sciences society of America Journal, 44 (1),62-67
30. www.journals.pu.edu.pk
31. Anderson GB and Seidel GE: Cloning for profit. *Science* 1998, 280:1400-1401.
32. Polejaeva IA and Campbell KHS: New advances in somatic cell nuclear transfer: Application in transgenesis. *Theriogenology* 2000, 53:117-126.
33. Robl J: Development and application of technology for large scale cloning of cattle. *Theriogenology* 1999, 51:499-508.
34. Stice SL, Robl JM, Ponce de Leon FA, Jerry J, Golueke PG, Cibelli JB and Kane JJ: Cloning: new breakthroughs leading to commercial opportunities. *Theriogenology* 1998, 49:129-138.
35. http://www.sciencedaily.com/terms/somatic_cell_nuclear_transfer.htm
36. Wilmut I, Schnieke AE, Mc Whir J, Kind AJ and Campbell KHS: Viable offspring derived from fetal and adult mammalian cells. *Nature* 1997, 385:810-813.
37. https://bioethicsarchive.georgetown.edu/nbac/pubs/cloning2/cc2.pdf.
38. Satoshi Kamimura, Kimiko Inoue , Narumi Ogonuki , Michiko Hirose, Mami Oikawa , Masahiro Yo, Osamu Ohara, Hiroyuki Miyoshi and Atsuo Ogura, Mouse cloning using a drop of peripheral blood, *Biol Reprod.* 2013 Aug 1;89 (2):24, pg 1-6, doi: 10.1095/biolreprod.113.110098.

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