Immune responses against auto intracellular pathogenic genomes or cancered cells.

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Abstract

Cancer, also termed malignancy is a disease characterized by an uncontrolled growth of cells, i.e., an abnormal growth of immortal cells with no apoptosis. More than 100 types of cancer are known, including breast cancer, skin cancer, colon cancer, prostate cancer, and lymphoma. What makes a cell a cancer one is the auto intracellular pathogenic genome, or "cancerous genome" located inside that cancer cell. The code of design of constructing or building the body of every species of all living-things is found in its genome; the same is true with the pathogenic genome in building the body of cancered cells (host cells). Three major types of tumor suppressor genes are known to code for proteins that suppress growth of cells: (i) one or first type tells cells to slow down and stop dividing, (ii) the second type is responsible for fixing changes (repairing) in damaged cells, and (iii) the third type is in charge of apoptosis (the programmed death of cell). If mutations that can inactivate any of these tumor suppressor genes occur, cancer will be onset and allow cancered cells to grow unchecked. The cytotoxic T cells and NK cells are 100% correct in identifying the cancer cell foreign to the body of the patient just as they identify virus-infected cells, because the genome inside the cancer cell is foreign to the body of the patient as it is transformed into a completely different genome from those found in the body cells of the patient. The genome is transformed by a multitude of mutations referred to as driver mutations. The transformed genome is said pathogenic because it causes the dangerous disease called cancer. As the genome is changed or transformed all biological molecules/biomass of its cells produced by the coded information or directives of this changed genome are foreign (non-self) to the body of the patient and that is why the killer immune cells recognize the cancer cell as foreign to the body of the patient and kill it. Unlike the genomes of the normal cells in the body of the patient, the changed genome makes the cancered cells immortal, promotes uncontrolled rapid cell divisions, metastatic growth of cancered cells and bans apoptosis. Thus, the genome transformed by driver mutations is an auto intracellular pathogenic genome. The scientific truth and the terrifying danger we suffer from cancer imparted by the term cancered cells or cancer cell is erroneous, un-pulverized, unfit or turbid, being target less so that it cannot be used in academic lessons for learners/readers and as the result of this incompatibility it has been misleading students and confusing scientists of biological sciences of the world for centuries until the emergence of this paper. Therefore, using cancered cells or cancer cell as a term in modern textbooks, articles of journals and in any scientific work must be banned completely. Whenever there is a patient of cancer, the host cell infected and the pathogen that invaded are the cancer cell (host cell infected) and auto intracellular pathogenic genome (cancerous genome) respectively. The outcome of this study is strongly believed to empower researchers of cancer and health professionals to devise effective and optional methods of choice or strategies in fighting against cancer because their consciousness about cancer will be free from beating around the bush as the host and its intracellular pathogen that are essential for the occurrence of cancer are spectacularly distinguished to get the target accurately.

Keywords: Apoptosis, Auto intracellular pathogenic genome, Cancer, Cancer cell, Driver mutations, Foreign antigens, Immortal cells, Immune responses, Metastatic growth.

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Introduction

Immune system can recognize the cancered cells as well as tumor specific antigens (TSA) and can mount an immune response using different types of cells such as $CD4^+$ TH cells which secrete several cytokines like IL-2, and IFN-ɤ which lead to activation of cytotoxic Tc cells. $CD8^+$ Tc cells are the actual mercenaries of the cancered cells that initiate lysis/destruction of cancered cells through perforin activation. NK cells kill those cells with pathogenic genome inside them through ADCC and lyse them post contact. Since NK cells are not MHC restricted and their destructive activity is increased by IFN-ɤ, IL-2, and IL-12. NK cells are the most potent weapons against the cancered cells [1,2].

The central role of macrophages to almost all immune processes is strongly visible here. Macrophages help in eradication of tumors through their multifaceted armory which includes respiratory burst, N release, proteinases, TNF- α and ADCC amongst others. Cancer does occur in plants, but they are less

vulnerable to its effects because vegetable tumor does not metastasize as plant cells are typically locked in place by a matrix of rigid cell walls, so they cannot migrate [3,4].

- Natural Killer Cells or NK Cells are a type of cytotoxic lymphocyte critical to the immune system.
- The role of NK cells played is analogous to that of cytotoxic T cells in the vertebrate adaptive immune response.
- NK cells provide rapid responses viral-infected cells, acting at around 3 days after infection, and respond to tumor formation.
- Typically, immune cells detect major histocompatibility complex (MHC) presented on infected cell surfaces, triggering cytokine release so as to cause lysis or apoptosis.
- NK cells are unique, as they have the ability to recognize stressed cells in the absence of antibodies and MHC, allowing for a much faster immune reaction.
- They were named "natural killers" because of the initial notion that they do not require activation to kill cells that are missing "self" markers of MHC class I. This role is especially important because harmful cells that are missing MHC I markers cannot be detected and destroyed by other immune cells, such as T lymphocyte cells.
- NK cells (belonging to the group of innate lymphoid cells) are defined as large granular lymphocytes and constitute the third kind of cells differentiated from the common lymphoid progenitor-generating B and T lymphocytes.
- NK cells are known to differentiate and mature in the bone-marrow, lymph nodes, spleen, tonsils, and thymus, where they then enter into the circulation.
- NK cells differ from natural killer T cells NKTs) phenotypically, by origin and by respective effector functions; often, NKT cell activity promotes NK cell activity by secreting interferon gamma. In contrast to NKT cells, NK cells do not express T-cell receptors (TCR) or pan T marker CD3 or surface Immunoglobulins (Ig) B cells receptors, but they usually express the surface markers CD16 (FcyRIII) and CD56 in humans, NK1.1 or NK1.2 in C57BL/6 mice. The NKp46 cell surface marker constitutes, at the moment, another NK cell marker of preference being expressed in both humans, several strains of mice including BALB/c mice) and three monkey species [5-9].

In addition to the knowledge that natural killer cells are effectors of innate immunity, recent research has uncovered information on both activating and inhibitory NK cell receptors which play important functional roles, including self-tolerance and the sustaining of NK cell activity. NK cells also play a role in the adaptive immune response: numerous experiments have demonstrated their ability to readily adjust to the immediate environment and formulate antigen-specific immunological memory, fundamental for responding to secondary infections with the antigen. The role of NK cells in both the innate and adaptive immune responses is becoming increasingly important in research using NK cell activity as a potential cancer therapy [10-14].

Key Objectives

●To substantiate/verify that the genome of a cancer cell is a pathogenic genome.

●To display that the actual and spectacular types/mechanisms of horrible pathogenesis/cancer is caused by the pathogenic genome that is found inside the cancer cell. Transformation of a normal genome (inside a normal cell) into a pathogenic or cancerous genome is caused by a multitude of mutations that are referred to as driver mutations.

Literature Review

What makes a cell a cancer one is the auto intracellular pathogenic genome, or "cancerous genome" located inside that cancer cell. A cell is a living-thing and a living-thing is the product of reaction of its genome and its nutritive substances in its compatible environment. The pathogenic genome is the transformer of nutritive substances of a cancer cell into countable infinite number of cancered cells of its kind just like any other normal genome of all living-things. It is a normal genome that is transformed into a pathogenic genome by a multitude of mutations known as driver mutations which form the driving force of the metastatic growth of cancered cells. The genome is a self-replicating, i.e., a self-producing structure and it is the only structure that produces/constructs all other structural molecules or "biomass" in all species of living-things [15,16]. The code of design of constructing or building the body of a living-thing of every species of all living-things is found in its genome. The same is true with the pathogenic genome in cancered cells [17].

The term cancer cell or cancered cells is a confusing or a misleading term in which a host cell and the pathogen are undistinguished for student children of both pure and applied biological sciences. It is also full of ambiguity to scientists of biological sciences by the fact that its scientific truth is incompatible with the language it has to be imparted through. In short, the term cancer cell/cancered cells is an erroneous, inappropriate, and turbid term that cannot be presented to learner kids who are the seedlings to be better scientists of tomorrow. The reason for why the term cancer cell came into being or existed in the system of living-things is due to the lack of deep understanding about the role of genome in all living-things. The term cancer cell or cancered cells dares to mean that the host cell (i.e., cancer cell or cancered cells) is the pathogenic cell that causes cancer. This concept of terminology is wrong and we must get it removed from courses of learner kids of the world. In fact, the cancer cell is the host cell which is infected (cancer) by auto intracellular pathogenic genome or cancerous genome found inside the host cell itself.

Growth regulation in normal cells: The growth of normal cells is controlled by growth or tumor suppressors. Three major types of tumor suppressor genes are known to code for proteins that suppress growth of cells.

- One type tells cells to slow down and stop dividing,
- The second type is responsible for fixing changes (repairing) in damaged cells, and
- The third type is in charge of apoptosis (the programmed death of cell).

If mutations that can inactivate any of these tumor suppressor genes occur, cancer will be onset and allow cancered cells to grow unchecked.

Concrete evidence for the presence of an "auto intracellular pathogenic genome" in a cell

In cell-mediated immunity cells like cytotoxic T cells and Natural Killer cells recognize host cells infected with intracellular pathogens such as viruses and kill them. The same killer cells of the cell-mediated immunity do recognize a cancer cell as a cell infected with a foreign intracellular pathogen and kill it exactly as they kill the virus-infected host cells. The cytotoxic T cells and NK cells are 100% correct in identifying the cancer cell as an infected cell with intracellular pathogen, because the genome inside the cancer cell is foreign to the body of the patient as it is transformed into a completely different genome by a multitude of mutations referred to as driver mutations. As the genome is changed or transformed all the biological molecules/biomass of its cells produced by the coded information or directives of this changed genome are foreign (non-self) to the body of the patient and that is why the killer immune cells recognize the cancer cell as foreign to the body of the patient and kill it. Unlike the genomes of the normal cells in the body of the patient, the changed genome makes the cancered cells (host cells) immortal, promotes uncontrolled rapid cell divisions, metastatic growth of cancered cells and bans apoptosis. Thus, the genome transformed by driver mutations is an auto intracellular pathogenic genome. The correct term to replace the erroneous cancer cell is "cancer cell (host cell) or infected cell". This is true, because the term cancer or "malignancy" is a type of disease characterized by an uncontrolled growth of cells, i.e., an abnormal growth of immortal cells with no apoptosis. More than 100 types of cancer are known, including breast cancer, skin cancer, colon cancer, prostate cancer, and lymphoma. When it is said a cancer cell, the fact that the cell is a host whereas the cancerous genome inside it is an auto intracellular pathogen is missed. In other words, the scientific truth of the disease called cancer is not compatible with the language it has to be imparted. The only cause that changes a normal cell into a cancer cell is the state of being changed or transformed of the genome by a multitude of mutations inside the normal cell. The multitude of mutations is referred to as driving mutations for they are the driving force of metastatic growth of cancered cells (Figures 1-8).

In the Figure 9 above, the cross section of a human liver is showing multiple large pale malignant tumor deposits. The malignant tumor deposits are adenocarcinoma derived from a primary lesion in the body of the pancreas (Figure 10).

In Figures 11a and 11b, the term "cancered cellss" means that cancered cellss (i.e., cancered cells) are the causative agents of the disease called cancer. It means that cancered cellss or cancered cells are pathogenic cells that cause cancer. This meaning and concept is completely wrong and ignorant of the

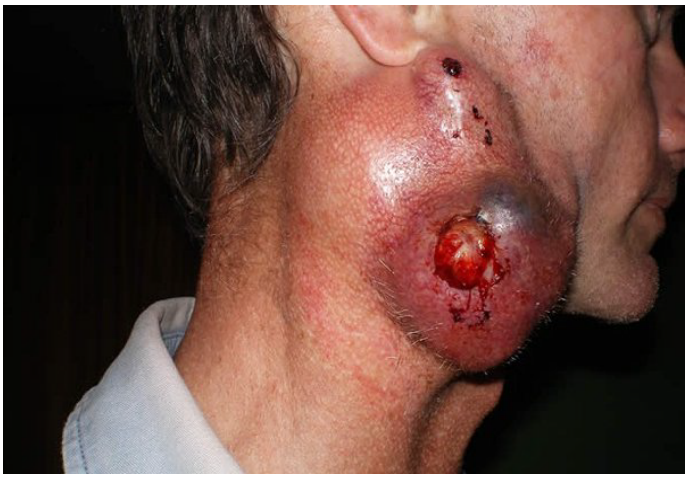

Figure 1. *Neck cancer.*

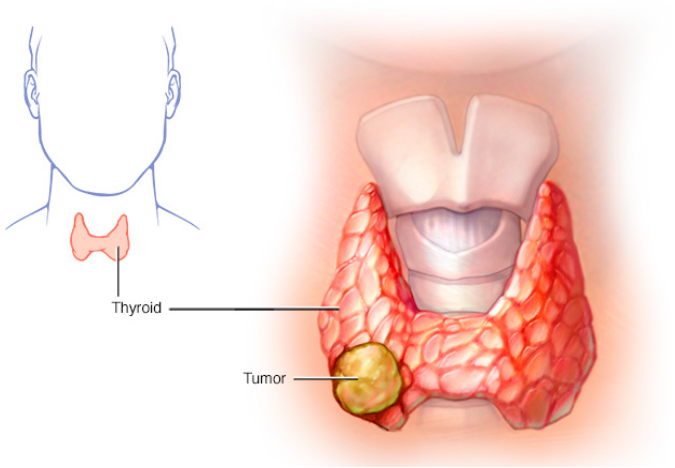

Figure 2. *Thyroid cancer.*

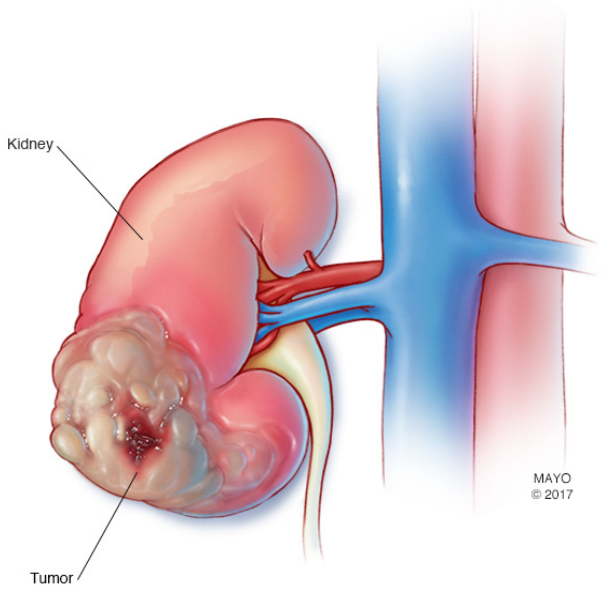

Figure 3. *Kidney cancer.*

role of genome in all living-things. In the events and context of cancer, cancered cellss or cancered cells are host cells or cancered cells and not pathogens that cause cancer. The actual pathogen in causing cancer is the auto intracellular pathogenic

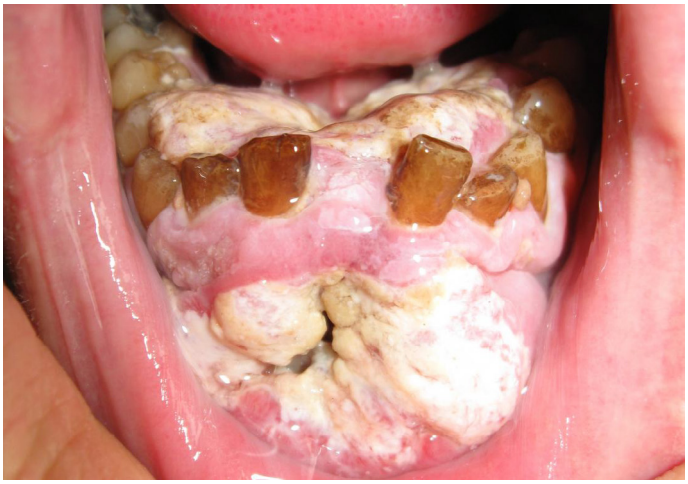

Figure 4 (a). *Mouth cancer.*

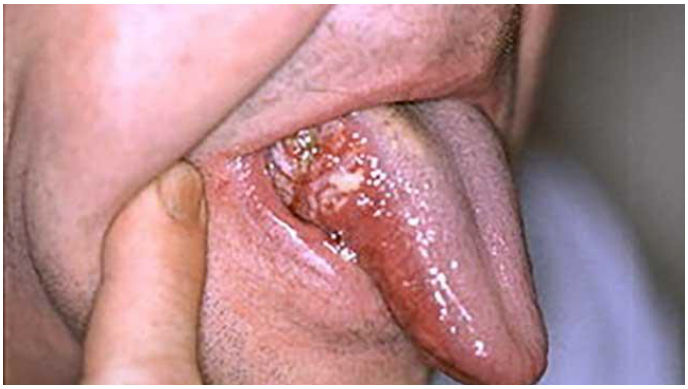

Figure 4 (b). *Mouth cancer.*

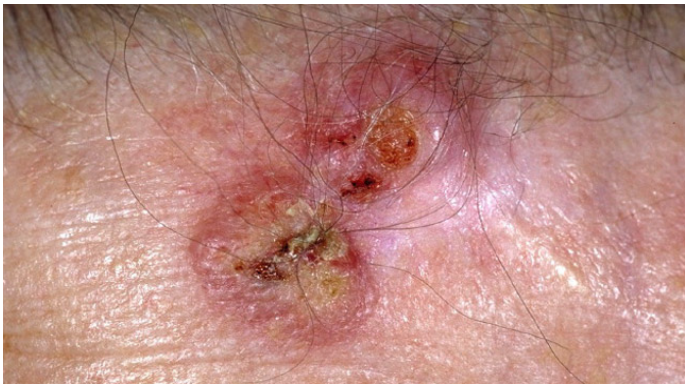

Figure 5 (a). *Skin cancer.*

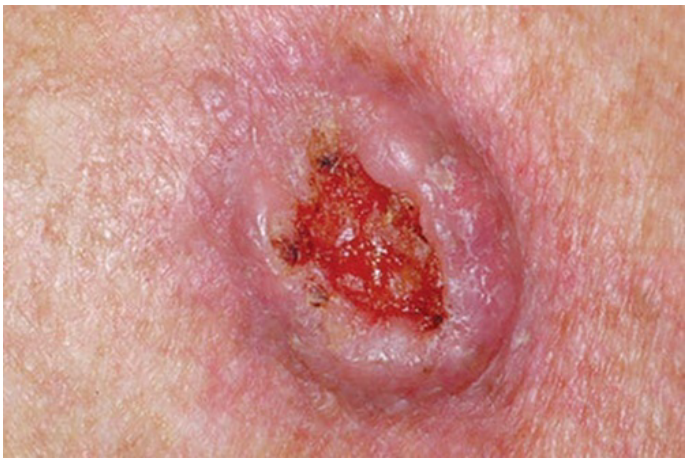

Figure 5 (b). *Squamous cell carcinoma, a common skin cancer (Abnormal or uncontrolled growth of cells).*

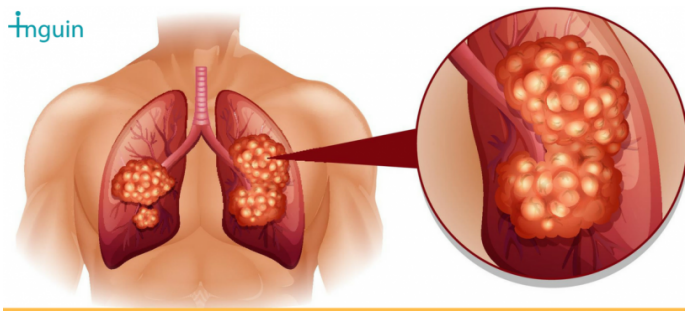

Figure 6. *Lung cancer.*

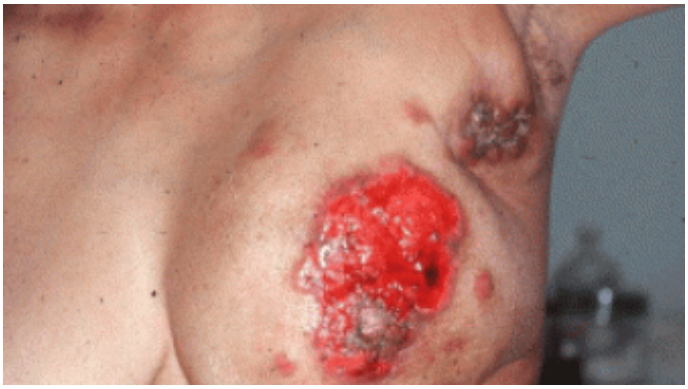

Figure 7 (a). *Advanced breast cancer symptom.*

genome or cancerous genome found inside the cancer cell (host cell). The term cancer cell means the infected host cell with the auto intracellular pathogenic genome. The genome transformed by a multitude of driver mutations is said pathogenic, because it causes the horrible disease called cancer. A cancered cells or a cancer cell is erroneous, un-pulverized, and a turbid term with incompatibility that has been misleading students and confusing scientists of biological sciences of the world for centuries until the emergence of of this paper. As internal components of cancer, the host cell and pathogen are undistinguished; because of this, the consciousness of man about cancer is beating around the bush and the target point has not been realized in order to devise effective scientific treatment.

Discussion

Cancerous genomes are auto intracellular pathogens inside the cancered cells. The biomass of normal cells is produced by the coded information of their normal genomes whereas the biomass of cancered cells is built or produced by the coded directives or information of their cancerous genomes. The role of uncontrolled rapid division and the subsequent metastatic growth by spreading to different regions of the patient's body and settling there as new malignant tumors is played by the pathogenic genome of the cancer cell, forming blood vessels by way of angiogenesis for nutrient supply. Therefore, the most appropriate or addressive and self-explanatory term for cancer is "cancerous genome" and not "cancer cell or cancered cells". The only structure that builds a cell or a virus of any species of

Figure 7 (b). *Advanced breast cancer symptom.*

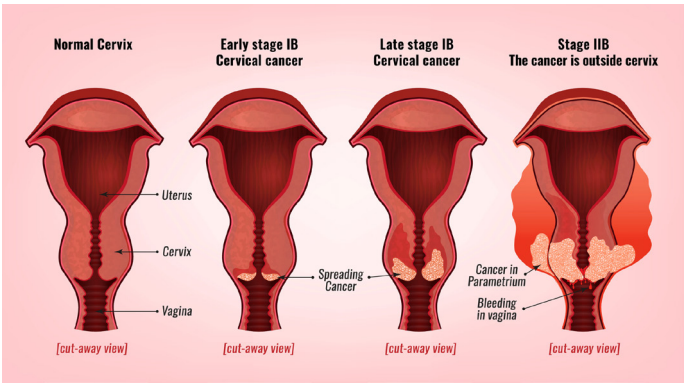

Figure 7 (c). *The stages of cervical cancer.*

all living-things is the genome found inside that cell or virus. It is only the cancerous genome that is responsible for making a cell a cancer one. A normal genome builds or generates normal cells whereas cancerous genome builds or generates cancered cells, using its nutritive substances as raw materials [1]. In other words, a cancer cell means a cell that is infected with an auto intracellular pathogenic genome or cancerous genome. When a host cell is infected with an intracellular pathogenic virus, it is termed as an infected cell, then the most appropriate and equivalent term for the infected state of a cell with an auto intracellular pathogenic genome (auto intracellular cancerous

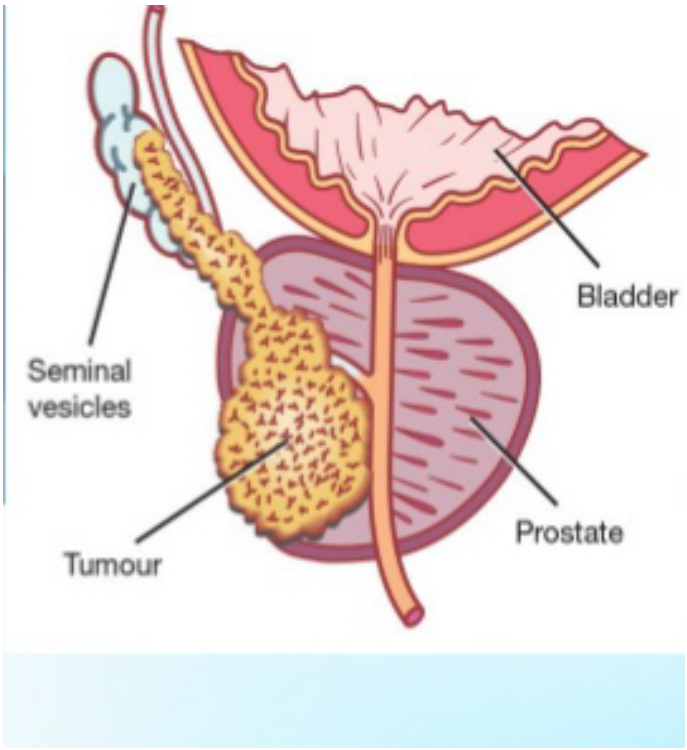

Figure 8 (a). *Locally advanced prostate cancer.*

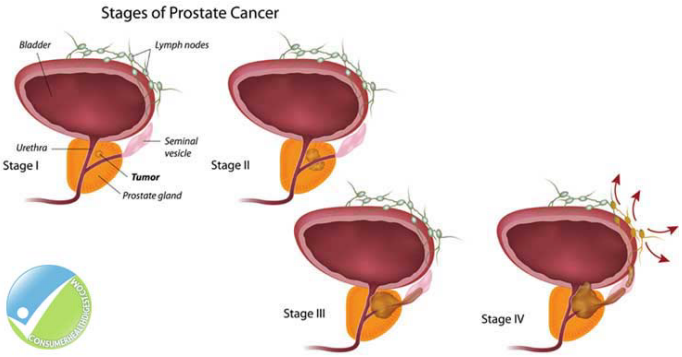

Figure 8 (b). *The stages of prostate cancer started with a malignant tumour.*

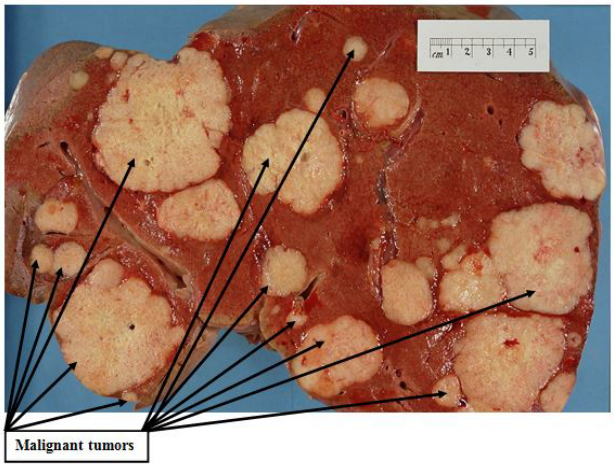

Figure 9. *A cross section of a human liver affected by liver cancer.*

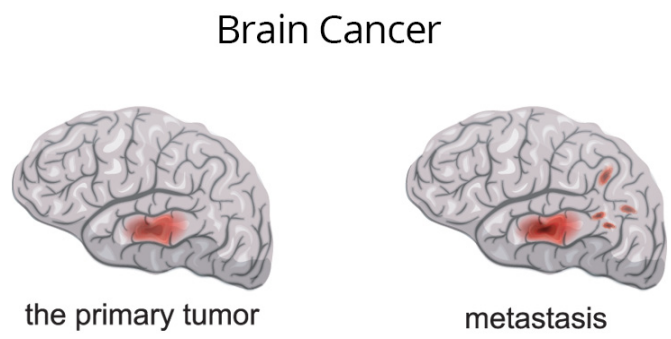

Figure 10. *The stages of brain cancer from the malignant primary tumor to the metastasis of spreading cancer.*

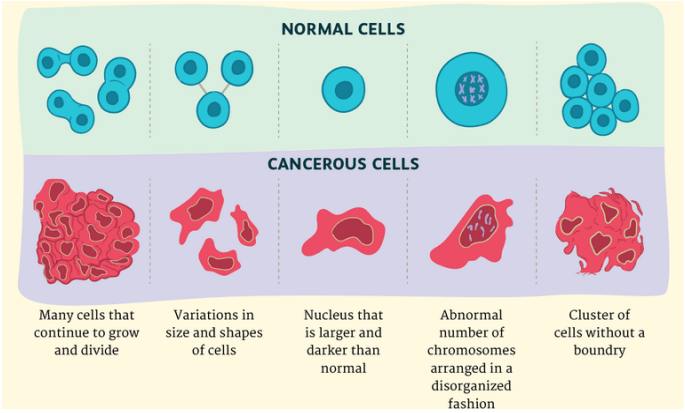

Figure 11 (a). *Morphology of normal cells and that of cancer cells (Eldridge L, Hughes G, 2017, 16).*

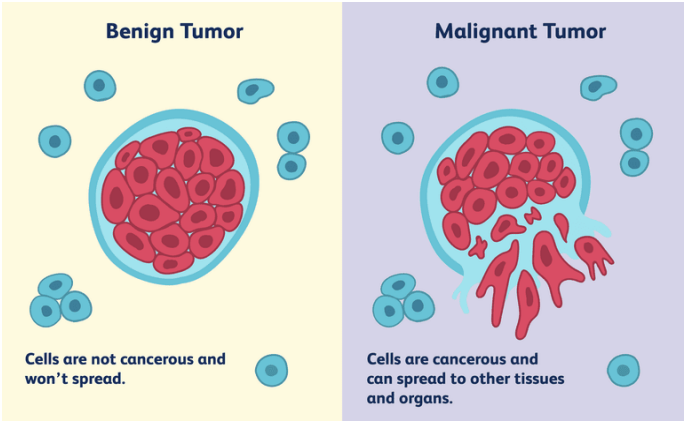

Figure 11 (b). *Morphology of normal cells and that of cancer cells (Eldridge L, Hughes G, 2017, 16).*

genome) is a cancer cell. This is why that the terms infected cell and cancer cell were recognized similarly by immunologically competent cells such as NK cells and cytotoxic Tc cells and both the virus-infected cells and the cancered cells are killed/lysed by similar mechanism of attack from NK cells and cytotoxic Tc cells. This is so because the scientific truth must be logically compatible with the language it has to be imparted through. In this pathological context, the term cancer means "infected with auto intracellular pathogenic genome" that result in cancer.

Conclusion

The scientific truth and the terrifying danger we suffer from cancer and imparted by the term cancered cells or cancer cell is erroneous, un-pulverized, unfit or turbid, being target less so that it cannot be used in academic lessons for learners/readers and as the result of this incompatibility it has been misleading students and confusing scientists of biological sciences of the world for centuries until the emergence of this paper. Therefore, using cancered cells or cancer cell as a term in modern textbooks, articles of journals and in any scientific work must be banned completely. The readers or learners are misled to take that the term cancered cells or "cancer cell" means a pathogen or pathogenic cell that causes cancer whereas actually it is a host cell, being a victim of infection by auto intracellular pathogenic genome! The outcome of this study is strongly believed to empower researchers of cancer and health professionals to devise effective and optional methods of choice or strategies in fighting against cancer because their consciousness about cancer will be free from beating around the bush as the host and its auto intracellular pathogen that are essential for the occurrence of cancer are spectacularly distinguished to get the target accurately. The major investigative role played by this paper is: the Host and Pathogen responsible to harbor and cause cancer in a person are distinguished for the first time in the history of the entire global challenge/burden of morbidity to mortality imposed on humans by cancer.

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