

# THREEFOLD MATERIAL-INFORMATIONAL-ENERGETIC

REALITY:  $E \stackrel{i}{\rightleftharpoons} mc^2$

Rudolf KLIMEK<sup>1</sup>

**ABSTRACT.** *Man, as an individual unit of society, through his life, work, and free will defines his relationship to truth and good through the informational state of his “I”, not only through action, but also through inaction in relation to his environment.*

*The formula  $E \stackrel{i}{\rightleftharpoons} mc^2$  helps in understanding the causal purposefulness of observed structures and processes in liaison with their environment on account of the causative role of information, which also is inseparably linked with their mass and energy. The reality formula is the basis for all irreversible processes of life, including carcinogenesis, where “i” encompasses also the sources of generative entropy production over time. This pertains mostly to the self-awareness of a person. Due to defining life itself as a spontaneous mutual interchange of the matter, information and energy of elementary particles coupled with information about their state. Once death occurs, the atoms of which the body is made fall apart into independent entities, but the person's past deeds leave behind accessible information about his unique life, which already began in the program of his zygote, and still exists in his informational legacy or in the social memory of it.*

**KEYWORDS:** *dissipative structures, entropy, human life, information, informatonosis, sources of generative entropy*

## Contents

### Introduction

1. Informational view of the threefold existence of reality
2. Human life with personal identity
3. The efficacy of information
4. Generative entropy

### Conclusion

<sup>1</sup> Fertility Centre Cracow, Cracow, POLAND

## Introduction

A word is a particle of information which links the unbreakable material-energetic constituents of all living beings, including man, as the most highly organized species of multicellular organisms due to his use of lingual information. According to Khroutski [4] the active information is the action of giving the form to the subject by communicating to it/her/him the knowledge or intelligence and, thus, functionally realizing the immanent intelligent Functionalist self-organizing of the subject's organic whole and its/her/his natural dynamic (cyclic) ontogenesis (natural change and development). People create expressions in different languages, but their meaning depends on their common social surroundings. For example, the motto of the Papal University John Paul II in Cracow: „*Nihil est in homine bona mente melius*” (There is, in a man, nothing better than thoughts) is often related only to thinking, while the Latin word “mens” in the polish language can have up to seven meanings to describe the spiritual good of a person: 1. mind, reason; 2. thought; 3. talent, intelligence; 4. prudence, sense; 5. memory; 6. soul; 7. personality, ego, the “I”. This view, more broadly than both mottos: „*plus ratio quam vis*” and „*ne cedat academia*” of the Jagellonian University represents the understanding of human reality, which I have described in the form of the formula  $E \rightleftharpoons mc^2$  containing, apart from energy (E) and mass (m), information (I), denoted by the letter “i”, being the Latin abbreviation for the word *imaginatum* (from *imaginor* = I imagine).

### 1. Informational view of the threefold existence of reality

In scientific contemplation we call a part separated from reality a system, and the rest of the world the environment. One cannot, however, separate the name of the system or the environment from their threefold nature, which always links mass (m), energy (E) and information (I). The essence of mass and energy is summarized in A. Einstein's most famous equation  $E=mc^2$ , which, in a holistic view, I have supplemented with information as their equivalent element. In the quest for universal rules of the universe's functioning his material-informational-energetic formula  $E \rightleftharpoons mc^2$  takes a special place, because it helps in understanding the causal purposefulness of observed events (structures, processes) in liaison with their environment on account of the causative role of information. The information itself not only states a fact or provides an analysis of data, which is well known, but predominantly protects the common material-energetic relationship of particles in both the system and the environment. The reason of including information into consideration can be demonstrated by the mutable behavior of the mass and energy of the water's particles in the unstable flow of a river, especially one flowing in mountainous areas. The width and inclination of the riverbed provides essential information for the mass and energy of the flow of water per time unit. Also a person perceives information as motivation for his acts and lack thereof in accordance with his own perceived values of good and evil or faith and knowledge, which can be related to the informational role of the riverbed in a flowing river.

It is easiest to perceive matter and energy in an object, for example in a man's

hand holding a coin, whose label designates its value, but does not include the whole of information embedded in it. In reality information describes the state of organization of each system, i.e. its material and energetic constituents, as a third and equal bonding element. The other empty hand contains only information in the form of a concept commonly known as “nothing”. It is enough to hold something in one hand, a material object with its own embedded energy (kinetic, gravitational), and not hold anything in the other hand, to understand that both hands are linked by the difficult to understand information described by the word “nothing” in the empty hand and hidden only in the material-energetically perceived something in the other hand, which we rate by the number of quanta. This requires only the understanding of the essence of information in a similar way to understanding the mass and energy of objects. The part of a system which, multiplied, fits completely into the whole system is called a technical quanta, for example a gram is a quanta of a ton, a centimeter – of a meter, a second – of an hour. The smallest unit of information is a qubit and such a quant also is used to determine the maturity of the fetus to the independent life of the child, and in women to monitor the progression of the pregnancy due to its technically tangible value – the technical quanta [3,14,20]. Instead of immersing oneself into the history of the dispute around the meaning and understanding of quantum information and its qubits, which can be transferred from one particle to another via quantum teleportation, it is enough to realize that the empty hand (the one without a coin) contains information in its pure form, being an inseparable part of every system and its environment.

Every material-energetic-informational system (a structure, process) in the universe contains in its cause information, as a programmed objective of its action (a plan, intention, purpose etc.), a desired and immediately afterward created effect in the cause-effect relationship of events. The material and energetic substrate changes, which happen during this – are always accompanied by the production of useless entropy, the magnitude of which is also defined by qubits as a mathematical inversion of information, which, in medicine, enabled the understanding of an organism's ageing and the emergence of cancer [10,21]. Ageing is characterized by a decreased ability for self-defense and self-regulation of the system due to the gradual loss of internal equilibrium as a reaction to environmental effects. A measure of the dwindling organization of the human organism is the measure in which one tires – a sign of growing entropy, the production of which is always greater than zero. This pertains mostly to the self-awareness of a person, irrespective of how we call it: ego, “I”, a person or name. For the longest time thinking was attributed to the brain, as if this part of the body could function without the circulation of blood or breathing. The same atoms make up the heart, the lungs, and the brain, but in the field of nuclear magnetic resonance imaging they all resonate depending on their surroundings and the internal state of the whole person, taking the person's psycho-emotional life, and even gender into account. This became possible due to defining life itself as a spontaneous mutual interchange of the matter, information and energy of elementary particles coupled with information about their state. The word “spontaneity” without explaining its source fulfils in this definition a role of variable in mathematical and

physics equations, or ones awaiting further explanation [2,12,18,19].

## 2. Human life with personal identity

The example of the empty hand and the riverbed as an objective existence of information, which has no precise boundary separating it from the environment – enables in consequence the understanding of the informational nature of human identity and the possibility of showing the moment of its emergence. Every person is a unique form, indivisible, characterized by his separateness, and this unique identity is determined biologically, emotionally and psychically from the moment of formation as a zygote from the union of two reproductive gametes, each with its own unique identity. In humans the mature, but unable to divide, female reproductive gametes (ova) and male ones (spermatozoa) create a cell capable of splitting only after their union. This cell's identity differs from that of the father and mother, and its division marks the beginning of three clones of further cells. The first is the creation of a human mature enough for procreation, the second are reproductive cells, and the third, together with the mother, provides a correct intrauterine development of the child. The biological importance of the zygote is demonstrated by the millions of spermatozoa and the hundreds of thousands of egg cells, in which only two reproductive gametes are used at conception.

A person's genetic identity appears in the moment the gametes with different parental identities merge into a unique, new one. The impossibility of defining the exact borders of information turns out not to be accidental, since every reproductory cell is programmed with a material-informational-energetic human life. This is a statistically defined phenomenon in the shape of a realization of o human life as an inter-generational transfer of life between individuals. If the reproductory cell is responsible for the genetic identity of an individual then the beginning of his life depends on the gametes of his grandparents, or, to be more exact, on the cellular clones of the zygotes of not only their children, but of also potentially their grandchildren. From the moment of fertilization the cells which developed from the zygotes ensure the maturation of a fetus which is able to pass on life through reproductory cells of its own and due to the simultaneously developing of pregnancy cells they condition the procreational health of the mother. This is what makes it difficult for people to understand the beginning of a personal human existence, which consists of, apart from matter and energy, information, which links an individual's personal life with the social form of life of other people. The problem lies in the fact that one tries to separate the purely informational aspect (the perception of a personal "I") from the informational program of the whole material-energetic development of a person which is embedded in the zygote.

The zygote forms with the goal of producing the above-mentioned types of cellular clones, each of which has its own reason for existence. Seen from this point of view, death is a transition into an informational eternal life, which is localized in a virtual, or, in the case of religious believers, a real heaven, purgatory, or hell. It is to be noted that the identity of every person, felt and understood as his own ego "I", consists of pure information, denoted and individualized by his name, which, in my



opinion, is easiest for him to accept, but difficult to maintain even despite acquired titles and positions. A person's name is a derivative of reality, informationally created in the moment of the egg's fertilization. This union of two reproductory cells as two independent material-energetic-informational entities creates a new genetic identity, i.e. a unique information set of the beginning of a human life, which, in contrast to matter and energy of its constituting atoms, is a completely new particle of information.

### 3. The efficacy of information

The psycho-neuro-cybernetic perception of the information (really close to Aristotle's notion *entelecheia*) "why is there something instead of nothing" in the empty hand, as an informational "nothing" ceases to be something unimaginable when, through an analogy, we relate it to the lack of nucleic structure of the HPV virus inside its protein shell. Such a vaccine was produced (Gardasil, Silgard, Cervirax) to counter infection by the human papillomavirus (HPV), which was rightfully awarded with the Nobel Prize. Unfortunately some doctors called it the "first and single vaccination against cervical cancer" instead of one against only a dozen types of this virus. Harald zur Hausen and his team had identified the parts of the HPV DNA in genome of cervical cancer cells [29,31]. According to them cervical cancer tissues harbored the viral DNA integrated into the host-cell genome and the prevalence of integrated forms of HPV increased as the disease progressed. The integration itself was followed by a decrease in viral load. Fifty to 80% of a sexually active population becomes HPV infected during a lifetime. Cervical cancer had long thought to be causatively induced by sexually transmitted factors, e.g. the inoculation of extracts from condylomata acuminata could cause skin warts and occasionally their conversion into squamous cell carcinoma. Less than 10% of infected individuals develop dysplasia and most of these show a mild form that either regresses or that fails to progress. The actual lifelong risk for cervical cancer in those infected is not known and depends on type of HPV infection plus the genetic and immunological background [31-33].

However, through the ages people have worked out effective methods of eliminating and preventing this viral epithelial infection. This is why the virus constantly changes the composition of its protein shell, which the infected organism recognizes, and thus can fight the virus. An injection of the aforementioned vaccine under the epithelium is simultaneously a transfer of information that the viral infection has already passed the epithelial protective barrier, and, more importantly, that the vaccination contains a virus which actually is not there. To paraphrase: the protein sheath can be compared to an open person's hand, which, instead of the virus, holds only the information about it. Therefore an excessive reaction, especially of a not fully healthy organism, can become the cause of illness or even of the death of a vaccinated person [3,18,19]. Considerable attention in the last decade has focused on well-characterized or novel genes. However, the future of cancer target discovery resides not only in the uncharacterized or novel genes, but also in the dark matter of the human proteome due to the lack of adequate information about the genes [1].

What more, the presence of circulating cell-free DNA in plasma was demonstrated not only in cancer patients as specific tumor-biomarkers, but also are originated from host cells. The investigation of cell-free DNA may provide useful diagnostic and prognostic information [26]. Human immune system can detect the presence of cancer before the clinical manifestation of disease and therefore the detection of cancer-associated autoantibodies in body fluids may reveal the presence of an early stage cancer. They may have a prognostic value for survival or predict the clinical benefit of immunotherapy [27].

In my opinion the HPV-DNA parts of the cellular DNA play primary role in maintenance of the transformed cells. Cervical cancer is a clonal disease and for that reason original HPV viral part of cancer-cell genome may be a source of HPV viruses appearing during degradation of exfoliated cervical cells. The beginning of the neoplastic illness is the appearance of a single cell, which, in order to sustain its diminishing metabolism, becomes a new entity (neoplasm) through the self-organization of the cellular genome [2,19]. Also it is well known that development of cervical carcinoma has been associated with many, not only infectious factors as e.g. early age of sexual debut, multiple sexual partners, poor sexual hygiene, poverty, immunosuppressed state of the host, chemical and physical carcinogenic agents as well as personal genetic background and epidemic role connected with diabetes, hypertension, obesity, premature deliveries and growing numbers of cesarean sections without clinical indications [17]. Neogenesis, in the light of the formula of reality  $E \rightleftharpoons mc^2$ , results from the possibility of exchanging the mass of the cell's useless organelles for the energy needed for the self-organization of the cellular genome of the cells which are in a dissipathogenic state, also called a pre-cancerous state. The uniqueness of their information is based upon its ability to exist independently as opposed to matter and energy, the changes in which are determined by one of the most important natural laws, i.e. the local thermodynamic production of entropy as a measure of information in a system. Maybe, studying information through the thermodynamic laws is a more long and complex way of research, while applications of the neo-Aristotelian scientific Organicism, including Biocosmological Functionalist-systemic studies (wherein Aristotle's aetiological teleodriven causes – *c.formalis*, *c.efficientis* and *c.finalis* – play the decisive role) can bring about easier and shorter approaches [5].

Information in science has also an own potential, when the borders of human knowledge are crossed. For example, it was known from the beginning of the twentieth century that the blood of pregnant women contains a hormonal substance which causes uterine contractions, called oxytocin. Before this hormone, made of only a few amino acids, was industrially synthesized in 1953, the whole world used natural hormonal substances derived from the cerebral hypophysis of animals. In the case of an overdose the death of the fetus or mother was possible due to the rupture of uterine walls, and the cause of such tragedies was seen in an inability to determine the exact hormonal effectiveness of the natural tissue extracts. This argument was eliminated with the introduction of precisely defined oxytocin doses on the picogram level. The synthesis of the hormone allowed a broadening of the indications for its

use, but despite the use of exact dosage the aforementioned tragic cases still occurred, until 50 years ago, in Cracow, the concept of relative duration of the human pregnancy was introduced [6,7,22]. Furthermore, the natural compounds of oxytocin and vasopressin turned out to be much more active than deduced from the hormonal amounts in them. In this way, based on blind clinical trials, I introduced a treatment based on natural cerebral hormones, together with precancerous states of the cervix, already in fifties of the last century. With this I have refuted the prevalent (at that time) notion that the cervical cancer is not hormonally conditioned. In 1968 I published the results of these studies, due to which A.V. Schally was able to determine the chemical formula and synthesize the neuropeptide hormones in 1971, for which in 1976 he received a honorable causa doctorate of the Cracow University, and a year later, the Nobel Prize [2,8,9,23-25].

#### 4. Generative entropy

The concept of entropy is important due to its production with every material-energetic change – the larger the entropy, the less ordered a system is [10,19,21]. Entropy appears each time anew and its size must be larger than zero in order for the system to function. Furthermore, if the production of entropy in a system decreases (physicists call this a negative source of entropy), the system can still exist via an increase of production of entropy in its environment by increasing the dispersing of mass, energy and information in it. Life is a source of entropy production, which in living organisms is produced by linked molecular processes increasing (positive source) or decreasing (negative source) its magnitude.

The basis for all irreversible life processes, including of course carcinogenesis, are the changes (d) in the production of entropy (diS) through time (dt) carrying the

name of the generated entropy:  $\frac{d_i S}{dt} \equiv S_{gen}$ , for the existence of which its value must be greater than zero. In the end it is the sum of entropy increase of the system and environment, what holistically is taken into account by the formula of reality  $E \rightleftharpoons mc^2$ , in which “i” stands also for the generative entropy of the system.

This is why oncological prophylactics and treatment, apart from the ageing of the organism, must take into account other non-cancerous diseases which accompany the neoplastic one. In such a cellular change of life forms the only stable ones are the primary cellular states and the neoplasms formed from them, and the middle state of dysplasia is characterized by an increase in fluctuation of opposing metabolic processes. Large fluctuations may destroy cells which are easily affected by the interaction with their surroundings, while small fluctuations may offer the chance of steering every system onto new metabolic paths. The basic property of neoplastic cells is not an acquired one, but their own trait in the form of their own unique, self-organizing under the influence of negative sources of entropy to keep the cellular metabolism by dissipating mass, information, and energy in the proximity of the neoplasm.

The increased dissipation becomes a local sign of the beginning of an illness threatening the existence of the whole multicellular organism, which answers via neo

angiogenesis, the widening of blood and lymphatic vessels in the area of the neoplasm, being a morphological effect of previous biophysical, biochemical and immunological changes. The deciding event for a neoplastic illness is the effectiveness of the immune system upon the individual cancer cells, the destruction of which by phagocytes can presently be imaged in real-time. Due to modern technology one may define the most endangered parts of the organism via magnetic resonance and spectroscopy. After the removal or even a reduction of neoplastic tissue the use of hyperthermia adds to the classical surgical methods, which results in a lower possibility of acquiring the marginal tissue around the neoplastic one to guarantee oncological sterility, it is the removal of all cancer cells in the way of eliminating germs. Finally, the modern thermodynamic method, (e.g. the unexpected analysis) found a direct use to determine the characteristic changes of energetic nucleotidal genes in cells undergoing carcinogenesis [11,13,15,17,20].

F. Collins called the nucleic genetic code the language of God due to its universal extent. Similarly one can see God's provision of free will and the Decalogue in the form of the local formulation of the second law of thermodynamics, or, more closely, the statement that the negative sources of entropy generate new positive entropy sources. This means that in this universe good ultimately defeats evil, because it is the informational anchor of faith and hope. This happens because the laws of nature act of themselves and independently from human interference, which, incorrectly interpreting the universe, can disturb it only locally, but not on a greater scale.

## Conclusion

Man, as the individual unit of society, through his life, work, and free will defines his relationship to truth and good through the informational state of his "I", not only through action, but also through inaction in relation to his environment. He is in turn shaped by this environment, an example of which is the similar character of people living under the same conditions. It should be understood that the word *cancer* refers to a chronic disease, although the term is frequently used in medicine to intimidate people and thus urge them to undergo preventive cancer screenings. Contrary to the prevailing customs, anticancer therapy should always be accompanied by the treatment of concomitant pathological conditions as well as by the normalization of the patient's environment. Although tumors are also only rarely genetically predetermined, all of them derive from genome self-organization. The universal mechanism of changes in the cellular genetic code is an effect and not the cause of carcinogenesis. The genetic identity of a human is created in the moment of conception, therefore pathologic course of pregnancy is associated with higher risk of cancer, and not only the cancer of the reproductive organs [3,10,14,16,20,22,30]. The existence of societies dependent on legislative, executive and judiciary power is naturally regulated by information, but the norms established by people cannot ignore the real natural rights, according to which the public interest is a priority. From a psychocybernetic point of view, biochemical and biophysical subcellular structures composed of multimolecular amino acids and nucleic acids, which, together or



separately, are able to duplicate or reconstruct their fragments only together with the whole cell. I generalize these considerations with the following conclusions:

1. In Albert Einstein's most famous equation  $E=mc^2$  the coefficient of time (speed of light squared) does not change the identity of mass and energy, and each subsequent need for defining both these concepts concerning reality results from the lack of taking the information, which is inseparably linked with them, into consideration.
2. The formula of reality  $E \stackrel{i}{\rightleftharpoons} mc^2$ , where “i” encompasses also a generative entropy – takes into consideration the system's and the environment's information as the same type of coexisting fact as mass or energy.
3. The beginning of a person's life on the level of an informational coexistence of spontaneous changes in the mass and energy of elementary particles requires the laws of nature to override those of human social life. In order to preserve the human species the free will of man is limited by the laws of thermodynamics, because the negative sources of entropy generate its new positive sources.
4. Faith is the oldest source of knowledge about reality comprised of mass, information and energy, the interdependence of which is described by the formula  $E \stackrel{i}{\rightleftharpoons} mc^2$  of the common spontaneous transformation of mass and energy of elementary particles, together with the information about their states.

#### *Conflict of interest*

I confirm that this article content has no conflict of interest.

#### *Disclosure*

This review article is an update of previously published articles entitled: “Causal prevention of cancer as a natural biological phenomenon” [13], “The use in obstetrics of quantum theory as well as modern technology to decrease the morbidity and mortality of newborns and mothers during iatrogenic induced delivery”[15] and “Cesarean biography of cancers” [17].

#### **References**

1. Delgado AP, Brandao P, Hamid S, Narayanan R (2013). Mining the dark matter of the cancer proteome for novel biomarkers. *Current Cancer Therapy Reviews*, 9:265–277.
2. Jasiczek D, Kaim I, Czajkowski K (2012). Historic discovery of natural thermodynamic cause of cancer. *Neurocrinol Lett* 33(4): 101–111.
3. Jasiczek D, Klimek R, Štencl J, Tadeusiewicz R, Tholt M (2012). Obstetrical prevention of human cancers. *Neuroendocrinology Letters*. 33(2): 118–123.

4. Khroutski, Konstantin S (2013). Forming an evolutionary vector to the Aristotelian Pole of scientific Organicism. *Biocosmology-neoAristotelism*. Vol 3(1) pp. 28–52. [URL://en.biocosmology.ru/electronic-journal-biocosmology---neo-aristotelism](http://en.biocosmology.ru/electronic-journal-biocosmology---neo-aristotelism).
5. Khroutski, Konstantin S (2014). Rehabilitating Pitrim Sorokin's grant triadologic approach. *Biocosmology-neoAristotelism*. Vol 4(1-2) pp. 1–42. [URL://en.biocosmology.ru/electronic-journal-biocosmology---neo-aristotelism](http://en.biocosmology.ru/electronic-journal-biocosmology---neo-aristotelism).
6. Klimek M, Klimek R, Mazanek-Mościcka M (2002). Preterm birth as an indicator of cancer risk for the mother. *It J Gynecol Obstet*. 3: 73–77.
7. Klimek M, Klimek R, Skotniczny K (2001). Auxiological relations between prenatal ultrasound and oxitocinase measurements high-risk pregnancies. *J Prenat Neonat Med*. 6: 350–355.
8. Klimek R (1967). Le syndrome hypothalamique post-gravidique. *Revue Franc. Endocrinologie Clinique*, 8:43-48.
9. Klimek R (1968). Les resultats therapeutiques des cas du syndrome hypothalamique post-gravidique. *Actualites Endocrinologiques*. 9:195–201.
10. Klimek R (1987). NMR imaginig in terms of human atomic pathology. *Europ J Obstet Gyn & Reproductive Biology*. 24(2): 135–143.
11. Klimek R (1989). Causal prevention of cervical cancer. *Medicine Biologie Environment*. 18(2): 8–10.
12. Klimek R (1990). Conquering cancer ourselves. *New trends in gynecology and obstetrics*. J.Libbey CIC s.r.l., 6(2): 53–117.
13. Klimek R (1990). Cervical cancer as a natural phenomenon. *Eur J Obstet Gynec Reproductive Biology*. 36(3): 229–238.
14. Klimek R (1994). *Monitoring of pregnancy and prediction of birth date*. The Parthenon Publishing Group, New York, London.
15. Klimek R (2001). The use in obstetrics of quantum theory as well as modern technology to decrease the morbidity and mortality of newborns and mothers during iatrogenic induced delivery. *Neuroendocrinology Letters*. 22: 5–8.
16. Klimek R (2012). Ten Commandments-Holy Trinity teleological program of universe creation. In: *Wszolek B, Kuzmirz A, Jamrozy M, editors. The Man and the Universe*. Częstochowa-Kraków: AID p. 57–64.
17. Klimek R (2014). Cesarean biography of cancers. In: *Humenic I, Szaniszló IA, Zolacova Z, editors. Reproducne zdravie zeny w centre zajmu*. Bratislava: Wolters Kluger; p.207–221.
18. Klimek R, Jasiczek D, Gralek P, Fedor-Freybergh P (2011). Cancer – final cellular form of life. *Int J Prenat Psychol Medicine*. 23: 1–2: 7–17.
19. Klimek R, Jasiczek D, Stencl J (2013). *Explained cause of cancer*. Polish Academy of Science, Cracow.
20. Klimek R, Klimek M, Rzepecka-Weglarz B (2000). A new score for postnatal clinical assessment of fetal maturity in newborn infants. *Int J Obstet Gynecol* 71:101–105.
21. Klimek R, Kolenda Z (2013). Carcinogenic entropy. *Curr Gynecol Oncol*. 11(1): 10-20.

22. Klimek R, Król W (eds) (1964). *Oxytocin and its analogues*. PTE Cracow.
23. Klimek R, Krupiński L, Madej J, Paradysz A (1967). Cytohormonalne i kolposkopowe obserwacje w przypadkach zespołu podwzgórzycy pociążowej. [Cytohormonal and colposcopic observations in post gestational hypothalamosis]. *Folia Medica Cracoviensia*. 9: 441–447.
24. Klimek R, Paradysz A (1969). Współistnienie zespołu podwzgórzycy pociążowej z rakiem szyjki macicy. [The co-existence of the post gestational hypothalamosis with the cancer of uterine cervix]. *Gin Pol*. 40:1252–1256.
25. Klimek R, Walas-Skolicka E (1977). Le syndrome hypothalamique post-gravidique comme agent de risque de development de cancer du col uterin. *Arch Anat Cytol Pth*. 25(3): 305–309.
26. Latz S, Muller SC, Ellinger J (2013). Diagnostic und therapeutic value of cell-free circulating DNA as a non-invasive biomarker in patients with prostate cancer. *Current Cancer Therapy Reviews*, 9:258–264.
27. Meistere I, Kalnina Z, Silina K, Line A (2013) Cancer-associated autoantibodies as biomarkers for early detection and prognosis in cancer: an update. *Current Cancer Therapy Reviews*, 9:227–235.
28. Schenker JG (2010). *Ethical dileman in perinatal medicine*. Jaypee Brothers Medical Pub. New Delhi.
29. Schwarz E, Fresse UK, Gissmann L, Mayer W, Roggenbuck B, Stremlau A, zur Hausen H (1985). Structure und transcription of human pappillomavirus sequences in cervival carcinoma cells. *Nature*. 314(6006): 111–4.
30. Wicherek L, Klimek M, Dutsch-Wicherek M (2005). The level of maternal immune tolerance and fetal maturity. *Neuroendocrinology Letters*. 26(5): 561–566.
31. zur Hausen H (1986). Intracellular surveillance of persisting viral infections. Human genital cancer results from deficient cellular control of pappillomavirus gene expression. *Lancet*. 2(8505): 489–91.
32. zur Hausen H (202). Papillomaviruses and cancer: from basic studies to clinical application. *Nat Rev Cancer*. 2(5): 342–50.
33. zur Hausen H (1989). Pappillomaviruses in anogenital cancer as a model to understand the role of viruses in human cancers. *Cancer Res*. 49(17): 4677–81.