



Opinion Article

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Comments on the Klimek's Informational Law: $E = mc^2$

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Opinion

A review on informational spacetime world and cancer by Rudolf Klimek is based on over 50 years of clinical experience of the Author as biochemist, gynecologist, obstetrician and endocrinologist, but not limited to practical clinical medicine. His broad interest in cancer and general problems related to medicine and philosophy of science resulted in numerous books and articles, some of them with me as co-author [Klimek R (2023) Law of informational cosmic spacetime: $E = mc^2$ Adv Theo Comp Phy. 6(3),233-23; Klimek R (2024) Prevention of Iatrogenic Cervical Cancer: A Critical Review-E-ISBN: 978-81-970671-3-6; Klimek R. (2024) $E = mc^2$ - New Law of Informational Space - Time World. Am J. Biomed Sci & Res. 21(1)55-56]. Concepts of Klimek are considered by some scientists to be controversial. They are, however, very inspiring for scientists carrying on research related to cancer and human physiology. As cell biologist I am interested in cell biology including cancer cell biology. I would like to add here a few remarks to problems discussed in this review. Much of the basic information about neoplastic diseases is due to research conducted on normal and cancerous animal and human cells. Cancer is not only found in human organisms. Almost all vertebrates suffer from it: fishes, amphibians, reptiles, birds and mammals. Not only medicine doctors, but also biologists carry on research on its nature, both on whole animal organisms and on cells in cultures in vitro The neoplastic diseases occur in all organs and all types of cells. They can be induced by great number of various factors, such as viruses, free radicals, variety of organic and inorganic substances, X rays, or can appear spontaneously without any defined cause. For such a great diversity of cancer diseases and their inducers it is difficult to identify common features and to find effective treatment. Klimek already in 1977 suggested that the common feature of all cancers is the energy dissipation. He has been one of the first scientists who put forward the idea postulating that the information is besides mass and energy a third

basal entity in universe. This concept is in last years propagated by increasing number of scientists; kosmologists philosophers and physicists. Klimek in his articles discusses the significance of preventing the development of cancer as a disease. Also Djamgoz and Plant [2014] in the book "Beat Cancer" concentrate attention on factors which prevent and slow down development of cancer.

The results of studies performed on cancers transplantable in experimental animals and tissue cultures of the cancer cells in the second half of XX century have greatly improved effectiveness diagnosis and treatment of cancer patients. Scientists got the possibility to follow and influence the development of cancer in animals. It was proved that single cell (as in leukemia L 12) or a few cells Walker or Ehrlich ascites cancers, can cause development of cancers lethal for animals. Observations on cells in vitro permitted to identify many differences between cancer and normal cells. The time-lapse technique to follow cell behavior during neoplastic transformation helped to find features differing between cancer and normal cells. It become possible to identify numerous different factors which are able to cause the transformation of individual cells which introduced to animals develop lethal cancers. This activity was observed with viruses [polyoma], mutations of genes of tyrosine kinase, free radicals, irradiation with X rays, and many organic and inorganic substances, which appeared to be cancerogenic. Such results of experiments performed under controlled conditions help to avoid in human surrounding the cancer inducing factors which induce inheritable changes this is neoplastic cell transformation. (i). Also factors which cause promotion in already transformed cells [their proliferation (ii) and cause the increased malignancy [progression] in cancer cell heterogenous populations in tumors (iii)]. These three stages in development of cancer is eases in animals were found to be dependent on different factors and require separate ways of recognition and prevention.



The research on cancer origin, treatment and prevention carried on in experimental laboratories are complementary to observations and studies under clinical conditions. Some of results of experimental studies became effectively introduced to clinical oncology but many results still wait for decades after their description. Another insufficiently studies are the effects of enhancement of cancer development by factors which acting together are much more effective than when acting separately. Such enhancement are recognized by asbestos and cigarette smoking. The phenomenon is similar as more effective curation of cancer by the sets of cytostatic than when applied each separately. The effective prevention of cancer diseases strongly stressed by *Klimek* should be more generally examined in both induction and treatment of cancer diseases. Very early it was recognized that croton oil, which itself is not cancerogenic - is the factor which strongly induces cancer promotion and progression and hence development cancer diseases. *Klimek* in his review documents effects of obesity and papilloma viruses infections on cancer diseases in woman. Prevention of cancer disease occurrence by elimination of factors which themselves do not induce cancer but influence its promotion and progression should be more intensively investigated.

It was observed already more than half hundred years ago that cell and animal nutrition have very significant influence upon the induction, promotion and progression of cancer diseases but now it is confirmed by clinical medicine. The significance of nutrition upon cancer occurrence by its prevention and acceleration in human populations remains to be more broadly studied and recognized. Already this problem consideration would require a separate extensive review of literature concerning experimental and clinical observations. Years ago it was shown that the changes in electric features of cell surfaces which accompany cell neoplastic transformation and malignancy. More recently the close correlation between electrophoretic mobility, electrokinetic potential and capacity to form metastases has been demonstrated. These results have not been applied to clinical diagnosis of cancer malignancy because the measurements with microscopic single cell electrophoresis are time-consuming and required specialized equipment. Now such measurements can be accomplished in a few hours instead of months, but this demands co-operation of cell biology specialists with clinical oncology doctors. Rather seldom in lucky circumstances the discoveries from basic research of cells are relatively fast, in a few years, applied to clinics. Such fast usage of studies of intermediate filaments [11nm in diameter] which permitted to demonstrate cell and tissue type specific chemical nature of intermediate filaments [research of *W. Franke in Heidelberg* and *Mary Osborn* and *K. Weber* in Goettingen] became confirmed by pathologists *J. Stachura in Kraków* and *W. Domagała in Szczecin*. This permitted to discriminate secondary cancers from primary tumors in clinical patients and to identify the primary tumor localization.

Very inspiring for new studies in oncology are *Klimek's* concepts, presented earlier in his books and articles in which he discusses this concept of information as third cosmic being besides the matter and energy. This idea is now often discussed by cosmologists and physicists, and *Klimek* was one of the first who formulated this hypothesis. The examination of this theory in biology and oncology can be very important everywhere where the genetic information is investigated. This problems got basic significance for attempts to explain the phenomenon of life of organisms but also for analysis of molecular and cellular backgrounds of initiation, promotion and progression of cancer diseases. The new discoveries in cell and molecular biology cause the necessity of correction of many basic concepts, considered for decades as proved; First of all the results of epigenetic demonstrated the heritage of new form on the cellular level. Only partly true are the postulates that only mutations, this is changes in genome can lead to permanent new features in cells. The cell differentiation was found to be associated with selective gene regulation and not changes in genes. The permanent and heritable changes associated with the genes are not necessary [though often well documented] for initiation of neoplastic transformation in single cells. Also promotion and progression of malignancy in developing cancer can be associated with epigenetic and not necessary with genetic changes. Genetic information in living organisms is carried in nucleic acids {DNA and RNA} in genes and their structure but also in their arrangement and selective activation and inhibition. All cells in an multicellular organisms in spite of their structural and functional versatility are carriers of the same genetic information as zygote, the one cell from which they all origin. It requires investigation how epigenetic changes in cell features can be responsible for initiation, promotion, and progression of neoplastic diseases, similarly as permanent changes in structure and function of differentiating cells. The identification and elimination of factors which do not induce but effectively intensify promotion and progression of already transformed cells and cancer genesis should be more extensively studied to prevent spreading of cancer diseases.

In summary. The review by *Klimek* concerning literature on women's cancers prevention and treatment discusses problems common to almost all cancer diseases. He concentrates on effective prevention of cervical cancer not only by elimination of HPV viruses and obesity, but his comments postulate more broad research of promotion and progression factors besides metagenes and direct cancerogens. The research based on epigenetics and recognition of genetic information and its realization requires analysis of epigenetic heritable changes involved in progression of cancer malignancy and development of diseases. Taking into account these new aspects of oncology should inspire numerous new directions of examination and analysis of cancers origin and development. The review and these short comments show the need for more extensive and broad discussions of biological aspects of cancers, based on results of information biology development in 21 century.