

From Cancer Phenomena to the Science of Consciousness

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Abstract: - Current Biology aims to reveal the molecular mechanisms of diseases and devise ways to combat diseases. Such an approach is based upon the belief that deregulated molecular events in Cell are the foundation for diseases, and that such dis-regulation can be corrected by physical means. However, the most current knowledge derived from research at the frontier of biology and physics are challenging such a mechanical view of body and disease. Use Cancer as an example, we can see that Cancer is not simply an isolated malfunction of some proteins, but the manifestation of the failing of an entire system. The phenomena of Cancer also can be used as a metaphor for understanding the current problems of human society. In this Macro-Cosmo of human society, we know that the problems we are facing are not caused by the malfunction of one person, or one country, but are the manifestation of problems of the collective consciousness of the humanity. Therefore, in order to meet the expectation of humanity in finding cure for diseases and revealing the fundamental truth of the Universe, future biologists inevitably need to go beyond the studies of molecules. What is beyond the molecular world? We are now face to face with the nature of human consciousness, which seems to be the Master-Behind of all physical phenomena in this visible world.

Key-Words: -biology; cancer; consciousness; phenomena; molecular mechanisms

1 Introduction

This is an article I wrote several years ago, for the first Future Science Conference in Cambridge, England. Most of the audiences for the conference were not biologists. I also read the book, the "Holographic Universe" by Michael Talbot. Meanwhile, the observations from my own laboratory, regarding the molecular mechanisms of carcinogenesis, also pointing out to me the necessity to understand the cancer phenomena with a system view. Thus, this article is an attempt, by a hardcore molecular biologist and basic cancer researcher, to share the understandings on the phenomena of cancer. I tried the method of using analogue to explain some of the concepts that otherwise is hard to illustrate. Here I propose that the most fundamental question we are facing in understanding all life phenomena is the question of what is the fundamental nature of human consciousness. The concept of cancer phenomena as a metaphor to understand current social and environment issues was also proposed in this article.

2 Problem Formulation

The key problem of this article is to address what is the right way to reach true scientific understanding of the cancer phenomena. Since current paradigm of cancer research does not view molecules as a living entity and does not include the consideration of the impact of human consciousness on molecular behaviors, it is critical for us to understand whether such an approach can lead to true understanding of cancer.

3 Problem Solution

The method I used here is to use laymen's language to paint pictures of molecular and sub-molecular phenomena and the phenomena of cancer from a system view. From these phenomena, questions are further defined and hypotheses are proposed. Below is the article.

A human being has a physical body. But a human being is more than only a physical body. It is the non-physical part that makes us distinct. Biologists have now patched up a detailed picture of the building blocks of our physical body: the micro-Cosmo of the Cell. In the world of Cell, a vast numbers of molecules work together in great

harmony to assure the functions and maintenance of this Cosmo. The main workers in this world are proteins, which were "born" following the coding messages of the Gene. Between you, him, her, and me as we are all human beings, we all sharing the same human genome and we all have the same sets of proteins. But we, from our life experience, know that each individual of human being thinks differently, feels differently and acts differently. These differences have to come from something else beyond the genes and proteins.

Now if we take a step back and use the existing paradigm of scientific thinking to examine what human being is made of, we can in fact reach the same conclusion. So imagine you are looking at me. I have a physical body, which we know that in this physical world can be further dissected into smaller and smaller compositions: from organ, to tissues, to cells, to molecules. So the building blocks of our physical body are different molecules, which then again, according to physics, are made of smaller particles. But here is the turning point. Upon examining into an atom, physicists tell us that atom is not a solid ball. Inside of an atom is vast space in which electrons spin around a center made of proton and neutron, like the earth spin around the sun. Then what is made of proton and neutron? The same concept of motion and space applies to proton and neutron. At the end of such dissection, physicists are challenged by the observation that it is no longer possible to separate the observer and the observed. A simple conclusion from these observations can be made: we are made of space and motion. So genes, of course, are also mere manifestations of space and motion. In this physical dimension, our eyes fix such space and motion to the motionless and solid phenomena, but Science tells us that these are in a way delusions.

So we have a physical body, which in fact is made of space and motion, but not solid life-less particles. In fact, in reality, there are no solid life-less particles at all. Everything is moving and everything is in fact ALIVE. The physical phenomena we are surrounded with are the products of our senses from processing the ever-moving life forces. Our senses have the ability to "freeze" motions and create shadows, in this physical dimension, of the "dancers" of other dimensions. So Science has already brought us to the edge of this physical dimension and revealed the shadow nature of the reality and the limitations of our physical senses. In an ironic way, although many scientists still consider themselves atheists, the findings of the

most advanced science in fact are shedding lights onto the core of all religion: the mystery force beyond. Such a force is the true nature of everything, since everything with so different forms and shapes and sizes and weights and speeds and colors and sounds can all be traced back to their connection with "particles" with space and motion. Then the big question is: what is the nature of the force, using the scientist way to ask it; or what is the nature of the divine power, using the religious way to ask it. From this perspective, Science and Religion should be holding hands and help each other to find the answer. But the answer is not easy to find, since both scientists and theologians are living in the physical world and therefore are limited by their physical instrument: the physical body.

For this reason, more than 2300 years ago, the grandfather of all Western philosophy, Socrates, was given a message from the oracle. The message led him to search for the true nature of wisdom. His answer was the following: "Wisdom only belongs to God; for a human being, the highest wisdom is to realize that his human wisdom, in comparison to that of God, is of no value". His realization of this made him the wisest man, and also the most condemned, by politicians, religious leaders and even artists, since it is simply the hardest fact to face for any human being.

But the conclusion of the existence of an all encompassing force behind all physical manifestations and the recognition of the limitations of our own physical instrument of body in seeing the truth of such a force do not mean that we are simply helpless and are doomed to be ignorant forever. Since we should not forget: we have more than a physical body. "I think, therefore I exist". No body can argue that we are conscious beings. If a physical body is connected with a consciousness, then what about the different parts of the body, namely the organs, the tissues, the cells, and the molecules? Since consciousness is an invisible force that directs the activities of a human body, then, what is its relationship with the force behind the motions of particles and the behaviors of molecules? If there is an all encompassing force behind the activities of the basic particles of all physical manifestations, then the same force is behind the activities of a human body, which can be viewed as a form of a particle in the Universe. In this sense, human experience is an awakening of the force itself at the level of the "particle in a form of the human body". Therefore, the nature of our consciousness is

the nature of the force behind all the activities of our cells, molecules and even smaller particles.

So when there is disease of a human body, is it in fact a manifestation of something of a similar nature at the level of the consciousness that is associated with this body? Then the search for a cure for all diseases should start by asking the question: what kind of characteristics of a consciousness will sustain the health of a body and what kind of characteristics of a consciousness will ill a body? Then we should ask: what are the fundamental laws that are operating to sustain a healthy human body?

Current biology has focused upon the detailed dissection of the molecular mechanisms underlying various functional manifestations of Cell, in a hope to gain final control of the physical body, use physical means. I have been working in the field of Signal Transduction, which aims to understand how cells receive signals from outside of the cell and how such signals are transmitted from cell surface all the way into the nucleus to alter the gene expression, thereby altering the behaviors of the cell. While ten years ago there was quite a lot of optimism on making major breakthroughs of developing molecular medicines from understanding the molecular mechanisms underlying the normal or abnormal behaviors of cells, such optimism is gradually fading now. The reason is that more and more biologists recognize the immense complexity of the regulation of cell functions. Most importantly, we began to recognize the hard fact that we are not dealing with a mechanical entity, but a living entity, at the cellular level. A living entity of a cell also cannot be fully understood by separating a cell from its surroundings, since the behavior of any single cell, at any single moment, is dependent upon those that this cell is directly communicating with, within a defined sub-system, which again, as a part of a body, is actively communicating with all other sub-systems in the body. Thus, the human body is an indivisible living system, whose disease state is not simply a mechanical problem, but a manifestation of a system failure. To address the foundation of cancer, we need to address what cause the system failure. To cure cancer, we therefore need to find a way that can fix the entire system.

Use Cancer as an example.

Currently, it is concluded, from combined genetic, biochemical, cell biological and animal model studies that cancer is caused by the genetic alteration of critical regulatory genes of a single cell. Such a cell somehow gained the ability to

undergo uncontrollable proliferation to reach a large mass, which itself could cause sufficient damage to vital organs such as lung, brain, liver, kidney, pancreas and therefore lead to malfunctions and finally the death of the entire body. In addition, cancer cells appear to have also gained new properties that allow them to be mobile (metastasis), to re-program their living environments, such as inducing the growth of blood vessels. Most interestingly, the cancer cells also exhibit the amazing ability to escape the immune surveillance of the powerful immune system. Furthermore, the growth factors made from the cancer cells also re-program the entire physiology of the body such that the body metabolic rate appears to be greatly enhanced and lead to an overall state of energy drainage.

To summarize the known changes at the system level, it appears that cancer cells not only break the pre-programmed speed and timing of growth (cell cycle defects lead to un-restrained proliferation), but also bypassed the pre-programmed cell death (delay or escape apoptosis). Then the cells start to invade into foreign lands, near then far (breaking the pre-programmed compartmentalization: metastasis). When they reach a new site, they started exploitation by fully taking advantage of the local environment and device new ways to consume (angiogenesis in the tumor). The uncontrolled growth at the foreign sites damages the normal operations of these vital organs by taking over the space, resource and disrupting the microenvironment required by these vital organs. Excess metabolic products of the increased cell mass are secreted and pollute the living environment of the foreign sites. The cancer cells have ways to escape the body policemen. There are many known strategies, such as hiding the defects, making factors to directly inhibit the immune system, and also ways to trick the immune system to lose combat power (immune tolerance).

There are several interesting aspects of cancer that I see.

First, if the simple mutations of several genes in a cell can achieve such an amazing systemic effect that eventually leads to the failure of the entire body, then the current program of human body at this stage appears to have some major loopholes. But if our body is the perfect product of natural selections, then how can we still have so many loopholes left in the system to allow so many different types of cancers to exist?

Second, the "intelligence" exhibited by the cancer cells to break multiple laws of normal cell biology (laws that operate at the cellular level) is hard to be explained by single cell-based mechanical means. At the surface, the foundation of carcinogenesis appears to be the altered behavior of one single cell. But a careful analysis of all the properties of cancer, as described above, clearly indicate that carcinogenesis is the result of the failure of the many different systems in a coordinated fashion. If only one of the any of the above mentioned system was capable of resisting the effect of cancer cells, cancer cannot cause death of the body. Thus, carcinogenesis should be viewed at the level of a system beyond a single type of cancer cell. Thus, cancer appears to be a system disease instead of a cell disease.

Third, the similarity of the behavior patterns between the cancer cells and modern industrialized human society is simply stunning. Can we learn something from such a similarity? In the Macro-Cosmo of the earth, human being is an integral part of the earth environment, just like a normal cell is an integral part of a human body. When a cell outsmart the laws that govern the normal operation of the cell as an integral part of the system, the body, the cell turns into a harmful tumor for the body and can kill the body. Use the similar analogue, when human race relies upon only the intellects to decipher the laws of the nature and then try to outsmart the laws of nature, by developing fancy technologies to exploit the resource of the nature, leading to the mass material construction, massive waste production, invasion into natural habitats for other species and create environmental pollution to the extent that the earth is becoming a toxic waste bin, if continued, will soon not going to be able to sustain lives of most species. The problems we can experience in this Macro-Cosmo, as we know, are not simply caused by the problem of one person. The solution for such a society problem, is also certainly not going to come from the change of one person, or even one country. Here again, we are dealing with a system. For the system of human society, the problem stems from a lack of wisdom and the over emphasis on intellect and technology. Now we have made a full circle and can see that it is again the nature of our collective consciousness that determines the health and the ill of our human society. To live, or to die, at the individual level, or at the level of the human society as a whole, are all determined by the nature of our consciousness.

4 Conclusion

With these reasoning as the foundation, we can conclude that the secret of all life phenomena maybe indeed lies beyond the molecules. The cure for cancer will not be obtained by examining the laws at the molecular level. Biologists in the 21st century will need to face a fundamental question: what is the true nature of our consciousness?

As a Cancer researcher (1-19) and a Falun Gong practitioner (20), I have observed the recovery of practitioners from complex diseases and read articles on how practitioners recovered from cancer. It was from these personal experience and observations that I decided to write down my preliminary observations and understandings of the interconnectedness of diseases at the individual level and at the societal level and the apparent link of these physical phenomena to the nature of human consciousness. I hope this serves as a reference for cancer researchers to think beyond the molecular mechanisms, since after all, we are multi-dimensional beings.

References:

- [1] Bassing CH, Yingling M, Howe DJ, Wang T, He WW, Gustafson ML, Shah P, Donahoe PK, Wang X-F. A transforming growth factor beta type I receptor that signals to activate gene expression. *Science*, Vol. 263, 1994, pp.87-99.
- [2] Wang T, Donahoe PK, Zervos AS. Specific interaction of type I receptors of the TGF-beta family with the immunophilin FKBP12. *Science* Vol.265, 1994, pp.674-6.
- [3] Wang T, Luo Y, Small GM. The POX1 gene encoding peroxisomal acyl-CoA oxidase in *Saccharomyces cerevisiae* is under the control of multiple regulatory elements. *J Biol Chem* Vol. 269, 1994, pp.24480-24485.
- [4] Wang T, Danielson PD, Li B-Y, Shah PC, Kim SD and Donahoe PK. P21ras farnesyltransferase alpha subunit in TGF-beta and activin signaling. *Science*, Vol 271, 1996, pp.1120-1122.
- [5] Wang T, Li B-Y, Danielson PD, Shah PC, Rockwell S, Lechleider RJ, Martin J, Manganaro T, and Donahoe PK. The immunophilin FKBP12 functions as a common inhibitor of the TGF-beta

- family type I receptors. *Cell* Vol.86, 1996, pp.435-44.
- [6] Donahoe PK and Wang T. Molecular Mechanisms of Mullerian Inhibiting Substance-mediated Apoptosis. Book Chapter in "Cell Death in Reproductive Physiology" edited by Tilly J., Strauss JF, and Tenniswood M. 1997 Springer-Verlag New York, Inc.
- [7] Kim RH, Wang D, Marti J, Huff C., Caestecker MP, Parks T., Meng X., Lechleider RJ, Wang T. and Roberts A. A novel Smad nuclear interacting protein 1 (SNIP1) suppresses p300-dependent TGF-beta signal transduction. *Genes & Development* Vol. 14, 2000, pp.1605-1616.
- [8] Liu XH, Elia A, Golemis E, Farley J. and Wang T. A novel cytoplasmic signaling mechanism of Smad3 involving proteasomal degradation of HEF1. *EMBO J.* Vol. 19, 2000, pp. 6759-6769.
- [9] Parks, W.T., Martin,J., Frank D.B., Huff,C., Haft, C.R., de Caestecker, M.P., McNally, J.G., Reddi, A., Taylor, S.I., Roberts, A.B., Wang, T., and Lechleider, R.J. Sorting Nexin 6, a Novel SNX, Interacts with the TGF-beta Family of Serine-Threonine Kinase Receptors. *J Biol Chem.* Vol 276, No. 22, 2001, pp.19332-19339.
- [10] Guo X., Lin Y., Horbinski, C., Drahushuk, K. M., Kim I.-J., Kaplan, P. L., Lein, P., Wang T., and Higgins, D. Dendritic Growth Induced by BMP-7 requires Smad1 and proteasome activity. *J Neurobiol.* Vol. 48, No. 2, 2001, pp120-30.
- [11] Gruendler C., Lin Y. and Wang T. Proteasomal degradation of Smad1 induced by Bone Morphogenetic Proteins. *J. Biol. Chem.* Vol. 276, 2001, pp.46533-46543.
- [12] Lin Y., Martin, J. Gruendler, C., Farley, J., Meng, X., Li, B.-Y., Lechleider, R., Huff, C., Grasser, W., Kim, R., Paralkar, V., Wang, T. A novel link between the proteasome pathway and the signal transduction pathway of the Bone Morphogenetic Proteins (BMPs). *BMC Cell Biology* Vol. 3, 2002, pp.15.
- [13] Wang T. The 26S proteasome system in the signaling pathways of TGF-beta superfamily. *Front. In Bioscience*, Vol. 8, 2003, pp.1109-1127 (invited review)
- [14] Nelson B. H., Martyak, T., Thompson, L., Moon J. J. and Wang T. Uncoupling of Promitogenic and Antiapoptotic Functions of IL-2 by Smad-Dependent TGF-beta Signaling. *J. Immunol.* Vol. 170,2003, pp.5563-5570.
- [15] Wang T., Zervos T. and P. K. Donahoe. The novel role of the immunophilin FKBP12 as a regulator of the TGF-beta family type I receptors. *Front. In Bioscience*, Vol.9, 2004, pp. 619-631 (invited review)
- [16] Francki A., McClure T. D., Brekken, R. A., Motamed K., Murri C., Wang T. and Sage E. H. SPARC regulates TGF-beta 1-dependent signaling in primary glomerular mesangial cells. In press.
- [17] Nourry C., Maksumova L., Liu X., Mach M., Liu X., Stroschein S. L., Luo K. and Wang T. Direct interaction between APC subunits and Smad3/HEF1 complex in proteasomal degradation of HEF1. In Press (BMC Cell Biology).
- [18] Feng L., Guedes S. and Wang T. The E3 Ub ligase hItch/AIP4 in Smad3-regulated proteasomal degradation of HEF1. In Press (JBC)
- [19] Quan-Zhen Li, Gabriela E. Garcia, Ping Li, Richard J. Johnson, Tongwen Wang and Lili Feng. An ancient cultivation practice Falun Gong improves neutrophil functions and causes system-level gene regulation. Accepted for Publication in "The WSEAS Transactions on Systems".
- [20] www.falundafa.org; www.thewholeelephant.org