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Genomics from Prokaryotes to Eukaryotes

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Chaotic genetic drift from paramecium to Homo sapiens can explain the continuum of chronological appearance of diseases. Diseases will become more and more complicated as we climb the leader of species. What are the possible in hands diseases in prokaryotes, mitochondropathies, Golgipathies, or membranopathies? In pluricellular organisms, the diseases will develop as long as the tissues will differentiate to different destinies, different complexities and different concept of disease.

Primates certainly perform more complex tasks, but this complexity adds to the bill in terms of diseases. If an immune system is needed to protect against different categories of pathogens, the possible chaos induced is either autoimmune disease or immunodeficiency. Adding to the complexity of the organism by itself, the behavior related and the evolving lifestyles will add psychosocial predisposition to new diseases interrelated to newly emerging set of dependencies (stress, tobacco, alcohol, etc).

Thus, the combination of old inherited diseases from prokaryotes to the classical ancient diseases of eukaryotes and the newly emerged new classes of over challenging morbidities would make the combination a complete chaos. A man with sarcoidosis, immunocompromised, infected by Mycoplasma tuberculosis, addicted to smoking and over consuming alcohol, exposed to professional pollutants and asbestos, is certainly a case that we encounter often.

Cancer another example of genetically predisposed, adding to it acquired mutations, and complex lifestyle. The world is heading toward the infinitesimal explanations of disease by the genomics, proteomics, but again the complexity of the chaos makes the predictable, unpredictable and vice versa. Leibniz, or a new contemporary cybernetician, like Norbert Weiner is needed to analyze the new outcome of the human genome project. The health implications as a system and not as a compartment by compartment analysis is becoming a must. We are in a new difficult period, contrary to the past where the amount of daily discoveries, makes it impossible even for Dr Faustus to output such a tremendous amount of knowledge.

We had to understand our ancestral unicellular organisms in order to elucidate some of the characteristics and secrets of multicellular organisms. We discovered that the analogy became futile as far as the gap between the species was wider. At the end, when we tried to pass from normal multicellular organisms to pathological, again we discovered that many secrets were still hidden inside, and that our knowledge of the "normal' is not enough to explain the "pathological".

Would we be able to find out all the genes implicated in the carcinogenesis of all the clones at the same time? As cancer cells evolutes with time, no one can predict the past mutation that took place and disappeared, and the potential new mutations coming in the future. Changing the natural history of cancer artificially with drugs, can reactivate old mutations, or select new mutations.

Looking closely to all living creature on earth, we discover that the same library of molecules, the same concept is used in creating all living organisms.

One way of proving the concept of evolution came by studying the kinome (38-39). Gerard Manning, in Science magazine in 2002, created a catalogue of protein kinases complement of the Human Genome (kinome) as a first step of analyzing protein phosphorylation in normal and disease states. In his next step, he led a comparative analysis of those protein kinases in different species concluding: "Whole-genome analysis of protein kinase evolution shows that new kinase classes developed to mediate the complexity of higher organisms, and demonstrates the birth, loss, and expansion of kinase families in each fully-sequenced eukaryote".

We are at the top of the alimentary chain. According to the evolutionary concept, human beings came from a single cell that could have evolutes from the plant kingdom to the animal kingdom.

Thus, all living forms and existing molecules are nothing but ancestral patterns and proteins of human beings. Nature hates redundancy. Cell memory is capable of coping with any natural existing product, and the cancer cell is without any exception capable of getting rid of any exposed molecules that are natural or semi-natural. Our cells are not stranger to any of those patterns of "life molecules. The inhibition of one single receptor in the pathway would tickle and destabilize the cell, only for a moment. It will then figure out a parallel pathway to shunt the assault.

The secret of the supremacy of human eukaryotic cells lies in their capacities in understanding and dealing with all existing molecules and patterns.

Historically and back to the "Dark Ages" before the renaissance, we have considered cancer as an infectious disease, and consequently we have tried to apply what we knew from microbiology to manage this oncology problem. Still in our days, some patients and laypeople insist that cancer is a viral or bacterial disease, and call it the "germ" or the "microbe". Some people are still in the era of germ theory of disease cited by Marcus Terentius Varro (published in 36 BC): ". . . and because there are bred certain minute creatures which cannot be seen by the eyes, which float in the air and enter the body through the mouth and nose and there cause serious diseases".

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