

Commentary

Between Evolution, Science and Humanity

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The relations of living beings with each other and with nature are dynamic and volatile so that adaptations are an indispensable constant for the maintenance of life. Biological and biochemical beings and structures succumb while others are perfected in an ecological engineering model of highly competitive or collaborative performance according to the survival interests of each one. In this environment, it is more common that the pathogens persist and accumulate itself than be extinguished, demanding from us an increasing capacity to cope or live with these agents.

Since millennial Hansen bacillus to the new Coronavirus, through bubonic plague, Spanish flu and HIV, pathogens are constantly changing and adapting to new ways of life, environmental changes and new prophylactic and therapeutic resources. Thus, the more living beings and nature interact for survival, the more complex these interactions become and the more surprising their effects.

Therefore, even whit the scientific and social progress, we will always need to invest in applied research in microbiology, immunology and pathology. This investment will increasingly require the incorporation of technological progress. The path traveled from the descriptive epidemiology used by John Snow to control the cholera in the city of London in 1854 to the molecular epidemiology for the control of Coronavirus in 2020 proves this statement.

This path was inspired on the relationship model between living beings each other and with nature. It developed from the interaction between traditional epidemiology and molecular biology [1]. It resulted, therefore, in the molecular epidemiology of today, capable of deciphering, in short-term, pathogens involved in diseases outbreaks or in individual diseases, as well as the relationships between these pathogens and the immune system of their victims, and with the therapeutic resources applied against them. Thus, it allows the rapid development of strategies to face the changes and adaptations of the infectious agents that are harmful to humans and other animals.

By deciphering the origin, the phylogeny, the phylogeographic circulation and the potential of interaction of the infectious diseases causative agents among themselves and with the organisms that they infect, molecular epidemiology puts us again in a position to confront the novelties that the new microbiological world presents us. However, for making the technological and scientific advances to have maximum effectiveness and efficiency, it is important that ethnic, social, cultural, political and geographical boundaries are not applied to science and its products. More and more joint international efforts

are needed to face the diverse microbiological problems that affect us with a novelty every day. These boundaries are human constructions that are not recognized by nature or by other living beings and can put us at a disadvantage.

This means that it is important to guarantee the access of all people and animals to the applied resource of scientific production through equity principles. Otherwise, we will waste technological advance, subtract efficiency from scientific investment and place ourselves again at a disadvantage in the environment of complex ecological engineering for survival.

References

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