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Editorial

Paradigm Shift in Life Sciences

Kisoon Kim*

Division of Viral Disease Research, Center for Infectious Diseases Research, Korea National Institute of Health, Cheongju, Korea

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The concept of paradigm shift involves a crucial process of change. Conversion of scientific ideas and practices in life sciences and public health research can cause the shift to better human health. Scientists that persistently challenge the accepted models to develop new hypotheses can seismically advance our knowledge and understanding and cause a paradigm shift.

From a public health point of view, the main threats to human health are infectious and non-infectious diseases. Traditionally, disease control and response to infectious agents are based on strategies to prevent or ameliorate symptoms through treatment. The ability to identify causative pathogens of disease is an essential prerequisite, and further characterization of the pathogens including epidemiology, emergence, antigenicity and alteration of biological features is critical in developing therapeutic medicines and/or prophylactic vaccines. Besides cancer, noninfectious diseases such as chronic diseases like hypertension, diabetes and obesity, are extremes where public health is threatened. In the past, chronic diseases have been identified as symptomatic of a patient's lifestyle and genetic predisposition. However, research into the relationship between infectious agents and non-infectious chronic diseases, has been recently reported. Even though these cases are not common, viral infections including enteroviruses, coxsackieviruses and adenovirus have been implicated in myocarditis, Type 1 diabetes and obesity respectively [1, 2, 3]. In addition, the distribution of normal flora of intestinal microorganisms, could affect disease progression of atopic dermatitis in infants [4]. More recently, the spread of fine dust has become a social problem that can cause disease, most notable is cardiovascular disease [5]. Thus, environmental factors such as fine dusts, once considered only to cause respiratory system diseases, have now been found to be 1 of the main causes of cardiovascular disease.

Consideration of causative agents of disease needs perspective. This "collaborative linkage" was comprehensively addressed at the 4th Industrial Revolution Commission, 2017. In fact, combined health science is not just an up-to-date concept. There has been a field of fusion science that has long encompassed physics-biology, physics-chemistry and biology and is perceived as the initial concept of the 4th Industrial Revolution along with information technology.

The advantage of information science represented by informational technology, is how rapid it is and it can be applied to the field of life sciences. The next generation sequence (NGS) analysis method has been commercialized and focuses on real time, large capability, genetic signature acquisition allowing rapid unveiling of genetic information. In the present issue, authors Lee et al., presented the possibility of analyzing expression of transcriptome RNA in the blood through NGS. They suggested that data from RNA-sequencing can be utilized for both disease progression and diagnosis. Although invasive action is necessary to obtain a blood sample (using a needled syringe), a wealth of information regarding disease status could be ascertained. When the NGS technology is applied to analyze transcriptomes in blood samples, it is feasible that patient information is more detailed and is in addition to information obtained from a classic serology test. Furthermore, it is considered a new research approach when mRNA signatures obtained from the NGS, function as a biomarker, and the relationship between the symptoms of the host. and the molecular, biological changes of the host can be

*Corresponding author: Kisoon Kim
Division of Viral Disease Research, Center for Infectious Diseases Research, Korea National Institute of Health, Cheongju, Korea
E-mail : tigerkis@korea.kr

speculated.

Recently, in Phase I clinical trials, it has been reported that practical techniques have been developed to standardize and quantify the associations of classic, clinical manifestations, with alterations of host genetic biomarkers [6]. Continuous development of de novo strategies that allow a paradigm shift in the field of life sciences may clarify ambiguous clinical phenomena so that more standardized and informative clues can be accessed from identical specimens and with measurable quantity.

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