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International Journal of Chronic Diseases & Therapy (IJCDT)
ISSN 2572-7613

Systematic Strategy Opinion for Research and Clinical Practice of Chronic Diseases

Editorial

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Received: September 28, 2015
Published: September 30, 2015

Citation: Zhan X (2015) Systematic Strategy Opinion for Research and Clinical Practice of Chronic Diseases. *Int J Chronic Dis Ther.* 1(3e) 1-2.
doi: http://dx.doi.org/10.19070/2572-7613-150003e

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Chronic diseases such as cancer, chronic obstructive pulmonary disease (COPD), diabetes mellitus, hypertension, epilepsy, chronic hepatitis, neurodegenerative disease, and obesity are a kind of whole-body diseases that are involved in multi-factors, multi-processes, and multi-consequences, that are involved in multiple molecules including genes, mRNAs, proteins, peptides, and metabolites, and that those molecules function in a mutually interacted pathway network system but not exert their roles individually [1-3]. Also, heterogeneity in between-individual and intra-disease is involved in each chronic disease [4, 5], and let each chronic disease more complicated, which is heavily challenging the efficacy of traditional therapeutic model – the same therapeutic strategy for the same type of disease [1]. It is very difficult or even impossible for one to use single-one factor such as one gene, protein, or metabolite to clarify occurrence, development, and consequence of a chronic disease. In fact, the traditional single-factor strategy is based on an unrealistic assumption that the increase in the amount of a single-molecule can unambiguously characterize a chronic disease [2]. The paradigm is being shifted from traditional single-factor strategy to multi-factor systematic strategy for research and clinical practice of a chronic disease.

From a systematic strategy viewpoint, multiple organs including tissues and body-fluids should be targeted for a chronic disease research [2]. The tissue research benefits clarification of molecular mechanisms and discovery of therapeutic targets. The body-fluid research benefits discovery of biomarkers for prediction, diagnosis, and prognosis. For example, one should consider multiple targeted organs such as pituitary tissues, cerebral spinal fluid (CSF), and blood for pituitary adenoma [2]; lung tissues and blood for lung cancer; lung tissues, blood, and airway secretions for COPD; brain, CSF, and blood for epilepsy, etc. With the rapid development of omics (genomics, transcriptomics, proteomics, peptidomics, and metabolomics), bioinformatics, computation biology, and systems biology [6, 7], it is possible for one to integrate multi-molecules at the different levels of gene (genome), mRNA (transcriptome), protein (protrome), peptide (peptidome), and metabolite (metabolome) together with clinical characteristics [8-10] for research and clinical practice of a chronic disease from an angle of multi-factor systematic strategy and molecular network to discover molecule-panel for accurate and effective molecular biomarker for prediction, diagnosis, prognosis, or therapeutic targets of a chronic disease towards personalized medicine [11] and precision medicine [12].

Acknowledgements

This work was supported by the grants from China "863" Plan Project (Grant No. 2014AA020610-1 to X. Z.), Xiangya Hospital Funds for Talent Introduction (to X.Z.), the National Natural Science Foundation of China (Grant No. 81272798 and 81572278 to X.Z.), and Hunan Provincial Natural Science Foundation of China (Grant No. 14JJ7008 to X. Z.).

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