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Identification of alterations in host genome methylation driven by the Human Immunodeficiency Virus type 1

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Nowadays, the knowledge in DNA methylation-mediated gene regulation has brought a step closer to understand the virus-host interplay in the context of genome alteration. HIV has shown the ability to change the DNA methylation pattern by DNA methyltransferases and therefore to affect host genes transcription. In addition, the methylation status may be correlated with the progression of acquired immunodeficiency syndrome (AIDS). However, the detailed DNA methylation pattern caused by HIV is still not clear. To better understand the precise mechanism, it will be necessary to evaluate the pattern alterations of DNA methylation across the genome. To clarify the alteration of the profiles of host genome methylation caused by HIV infection, we conducted a study on HIV-1 associated genome-wide DNA methylation pattern by using the MeDIP - microarray method. In addition, the identified pattern was validated in T cell lines. A pair of monozygotic twins was recruited in mainland China. One of the twins was infected with HIV while the other was not. Based on the data from NimbleGen DNA Methylation 2.1M Promoter Array, 4679 differentially methylated regions in the HIV positive subject with the peak value more than 3.0 were identified and analyzed. Furthermore, the validation result from T cell line confirmed the efficacy of the DNA methylation patterns well. The hyper-methylation pattern identified by this research project could be a very helpful guidance to reveal the interaction between the host and the virus through DNA methylation while further study would contribute to better understanding of the development of HIV/AIDS.

Biography

Yinfeng Zhang has completed his Master degree from the Chinese Academy of Sciences and pursuing the PhD. degree at the School of Biomedical Sciences, The Chinese University of Hong Kong, Hong Kong. He has focused on the study of HIV for more than 6 years, including the HIV vaccine development, the molecular mechanisms of the interaction between HIV and the host and the alteration of microbiome and virome in AIDS patients. He has published five articles in reputed journals as the first author and co-author.

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