Extended Abstract

MicroRNAs and epigenetics in Alzheimer's disease: Study from the whole human genome

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Abstract

Alzheimer's disease (AD) is the most prevalent neurodegenerative disease throughout the world. Most of the clinical symptoms of AD appear at a very later stage, therefore, the identification of disease markers is essential which can help proper detection of AD at an earlier stage and slow down its progression. Small non-coding RNAs, microRNAs (miRNAs), are modulators of gene expressions and play important roles in cellular processes. Recent studies implicate certain miRNAs in the pathogenesis of AD. Epigenetic markers such as DNA methylation and histone modification around promoter regions modify chromatin structure and regulate expression of downstream genes. Epigenetic studies have also revealed that miRNAs are directly regulated by DNA methylation and histone modification at their promoters as well. In this work, we have performed a genome wide study to reveal the distribution of AD related proteins (AD_R) and proteins previously not known to be associated with AD (AD_UR) from the human genome. We have constructed regulatory networks involving genes, transcription factors and miRNAs. Several network motifs namely feed forward loop (FFL), feed-back loop (FBL) and single input module (SIM) were studied from the regulatory networks. We have identified the epigenetic modification patterns of regulators of these network motifs. Our study also revealed the long non-coding RNA and other non-coding RNA mediated regulations in AD. AD biomarkers and epigenetic modifications identified in our study will provide insight into new AD therapeutic targets.

Biography

Debjani Roy has completed her PhD in Computational Biology from New York University, USA. She is currently an Assistant Professor at Biophysics Department, Bose Institute, Kolkata. Her research interests include computational systems biology, drug repositioning and structural bioinformatics. She has so far published more than 30 papers in reputed journals and has presented her work in many national and international conferences.