The non-coding RNA contribution to Alzheimer Disease

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Many detailed studies of Alzheimer Disease (AD) performed until now resulted in the identification of a panel of proteins whose function and/or malfunction is associated to AD phenotype. Notwithstanding the triggering event of the disease remains unknown. Based on some recent experimental evidence of ours, we suggest an unconventional origin for AD disease testing the hypothesis that the over-expression of four newly identified specific non-coding RNA molecules transcribed by the RNA Polymerase III (here referred to as AP-cluster) might trigger AD. These transcripts drive the splicing process of four polypeptides to the synthesis of alternatively spliced variants resulting in protein isoforms specifically associated to the pathological phenotype. Thus we here show: 1) The investigation of AP-cluster role in AD generation. 2) The effect of its expression with respect to the amyloid plaque formation and to the alternative splicing of four target proteins. 3) The identification of AD cluster-specific regulatory regions that might constitute novel therapeutic targets. 4) The phenomenon measured in AD patients and non-AD control individuals.