



Association of a Novel Long Non-Coding RNA-MRNAs Network with Default Mode Network Hyper-Connectivity in Hallucinative Schizophrenia

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Editorial

The neural and molecular underpinnings of Auditory Verbal Hallucinations (AVHs), a prominent core symptom of schizophrenia, are largely unknown [1-3]. The aim of the present study was to identify AVH-specific long non-coding RNA (lncRNA)-mRNA networks in schizophrenia [4-6]. High-throughput RNA sequencing and functional Magnetic Resonance Imaging (fMRI) was performed in two groups of schizophrenia patients each comprised of five female patients. One group experienced classical AVHs (AVH group) and the other did not (non-AVH group). Brain-connectomic methods were used to identify AVH-specific lncRNA-mRNA networks and to determine their associations with Functional Connectivity (FC) of the Default Mode Network (DMN). lncRNA and mRNA expression profiles differed markedly between the AVH and non-AVH groups. Fragments per Kb of exon per million mapped fragments (FPKMs) were significantly greater in the AVH group than in non-AVH group. The lncRNA MSTRG.96171.1 was linked with 13 mRNA nodes in an lncRNA-mRNA network. Elevated Posterior Cingulate Cortex (PCC) -ventromedial Prefrontal Cortex (vmPFC) FC within the DMN correlated with total AVH scores ($r=0.104$, $p<0.001$) and MSTRG.96171.1 expression ($r=0.095$, $p<0.001$). lncRNA-mRNA network data together with fMRI findings showed an association between a lncRNA-mRNA network and DMN hyper-connectivity in AVH-experiencing schizophrenics, which correlated with AVH symptom severity. lncRNAs could drive biological responses via lncRNA-mRNA networks. Our findings may help to elucidate RNA network involvement in the pathogenesis of schizophrenia.

Abbreviations

AVH: Auditory Verbal Hallucination; DMN: Default Mode Network; FC: Functional Connectivity; FPKMs: Fragments per Kb of Exon per Million Mapped; DSM-V: Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders; lncRNA: long noncoding RNA; PCC: Posterior Cingulate Cortex; vmPFC: ventromedial Prefrontal Cortex

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