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The lncRNA ANRIL-induced gene modulation depends on its Exon21 enriched in Transposable Elements

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Abstract: Long non-coding RNAs (longer than 200nts, lncRNAs) are critical regulators of gene expression. lncRNAs regulatory activities rely on functional domains within their sequences often including Transposable Elements (TE) derived sequences. Due to their important regulatory function, lncRNAs are consequently linked to various pathologies (cancers, cardiovascular diseases...). ANRIL (Antisense non-coding RNA in the INK4 locus), one of the disease-associated lncRNA is well described for its association with pathologies. However, the underlying molecular aspects of its function as well as the diseases association are not fully understood. We identified several exonic sequences noticeably enriched in TE within ANRIL, among which Exon 21 contains 67% of TE-derived sequences. The generation of the Exon 21 depleted HEK293 cell line allowed to investigate its function revealing its importance for the deposition of H3K27me3 at promoter level of a subset of genes. In parallel, the purification of associated proteins allowed to identify a promising protein partners named hnRNPK and SUZ12 presumably important for ANRIL functions.

