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GENOME-WIDE ANALYSIS OF A RECENTLY ACTIVE RETROTRANSPOSON, AU SINE, IN WHEAT: CONTENT, DISTRIBUTION WITHIN SUBGENOMES AND CHROMOSOMES AND GENE ASSOCIATIONS

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The impact of Transposable Elements (TEs) on genome structure and function is intensively studied in eukaryotes, especially in plants where TEs can reach up to 90% of the genome in some cases, such as in wheat. We have performed a genome-wide in silico analysis using the updated publicly available genome draft of bread wheat (*T. aestivum*), in addition to the updated genome drafts of the diploid donor species, *T. urartu* and *Ae. tauschii,* to retrieve and analyze a non-LTR retrotransposon family, termed *Au* SINE (Short Interspersed Nuclear Elements), which was found to be widespread in plant species. Then, we have performed site-specific PCR and realtime RT-PCR analyses to assess the possible impact of *Au* SINE on gene structure and function. To this end, we retrieved 133, 180 and 1886 intact *Au* SINE insertions from *T. urartu, Ae. tauschii* and *T. aestivum* genome drafts, respectively. The 1886 *Au* SINE insertions were distributed in the seven homoeologous chromosomes of *T. aestivum*, while ~67% of the insertions were associated with genes. Detailed analysis of 40 genes harboring *Au* SINE revealed allelic variation of those genes in the *Triticum-Aegilops* genus. In addition, expression analysis revealed that both regular transcripts and alternative *Au* SINE-containing transcripts were simultaneously amplified in the same tissue, indicating retention of *Au* SINE-containing introns. Analysis of the wheat transcriptome revealed that hundreds of protein-coding genes that harbor *Au* SINE in at least one of their mature splice variants. *Au* SINE might play a prominent role in speciation by creating transcriptome variation.

Biography

Danielle Keidar Friedman is a PhD Candidate at Ben Gurion University, Israel. Her study focuses on transposable elements dynamics in allopolyploid wheat species. She is studying SINE (Short Interspersed Nuclear Elements) and MITE (Miniature Inverted-repeat Transposable Elements) proliferation following polyploidization events, their possible impact on gene expression and regulation and their mode of transposition.

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