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Pervasive non-coding transcription by Pol V suggesting a genome surveillance mechanism

Non-coding transcription is a resource of functional RNAs acting on gene regulation in various molecular mechanisms. Plants have RNA-based transcriptional silencing system called RNA-directed DNA methylation (RdDM) carried out by two non-coding RNA polymerases, Pol IV and Pol V. These two polymerases are responsible for RdDM specificity on transposable element (TE) regions, however, its mechanism is not conclusive. Here, we combined a newly developed sequencing method and genomics approach to identify Pol V transcribing region. This approach revealed that Pol V transcribes more broadly than speculated, which suggests pervasive non-coding transcription. Our analysis provided a new insight about the mechanism how the specificity of RdDM is determined and a model of genome surveillance.