Comparative study on alternative splicing in human fungal pathogens suggests its involvement during host invasion.

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Abstract

Alternative splicing (AS) is an important regulatory mechanism in eukaryotes but only little is known about its impact in fungi. Human fungal pathogens are of high clinical interest causing recurrent or life-threatening infections. AS can be well-investigated genome-wide and quantitatively with the powerful technology of RNA-Seq. Here, we systematically studied AS in human fungal pathogens based on RNA-Seq data. To do so, we investigated its effect in seven fungi during conditions simulating ex vivo infection processes and during in vitro stress. Genes undergoing AS are species-specific and act independently from differentially expressed genes pointing to an independent mechanism to change abundance and functionality. Candida species stand out with a low number of introns with higher and more varying lengths and more alternative splice sites. Moreover, we identified a functional difference between response to host and other

stress conditions: During stress, AS affects more genes and is involved in diverse regulatory functions. In contrast, during response-to-host conditions, genes undergoing AS have membrane functionalities and might be involved in the interaction with the host. We assume that AS plays a crucial regulatory role in pathogenic fungi and is important in both response to host and stress conditions.

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