

***PsANT*, the adenine nucleotide translocase of *Puccinia striiformis*, promotes cell death and fungal growth**

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Adenine nucleotide translocase (ANT) is a constitutive mitochondria component that is involved in ADP/ATP exchange and mitochondria-mediated apoptosis in yeast and mammals. However, little is known about the function of ANT in pathogenic fungi. In this study, we identified an ANT of *Puccinia striiformis* f. sp. *tritici* (*Pst*), designated *PsANT*. *PsANT* contains three typical conserved mitochondria-carrier-protein (mito-carr) domains and shares more than 70% identity with its orthologs from other fungi, suggesting that ANT is conserved in fungi. Immuno-cytochemical localization confirmed the mitochondrial localization of *PsANT* in normal *Pst* invading hypha cells or collapsed cells. Over-expression of *PsANT* verified that *PsANT* promotes cell death in tobacco, wheat and fission yeast cells. Further study showed that the three conserved mito-carr domains worked together to induce cell death. qRT-PCR analyses revealed an in-planta induced expression of *PsANT* during infection. Knockdown of *PsANT* using a host-induced gene silencing system (HIGS) attenuated the growth and development of virulent *Pst* at the early infection stage but not enough to alter the virulence of the pathogen. These results provide new insight into the function of *PsANT* in fungal cell death and growth and might be useful in the search for and design of novel therapies in future.

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