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The role of SEPT7 in magnaporthe oryzae: structural insights and functional implications

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Magnaporthe oryzae is a phytopatogen that causes one of the most destructive diseases of cultivated rice in the world. Infections caused by this recalcitrant pathogen leads to the annual destruction of approximately 10– 30% of the rice harvested. Septins are involved in maintaining the appressoria and transpressorria, important cell structures to the process of plant invasion. Understanding septin structure could be of great value in shedding light into this mechanism. Particularly because Magnaporthe has two non-canonical septins (Sep7 and Sep8) which may be important for the formation of the massive septin ring which is not seen in other species. Regardless of the extensive physiological information, there is almost no knowledge related to these non-canonical septins. In this study, using a biophysical and structural approach, we characterized an engineering version of the G domain of MoSEPT7 (MoSEPT7Δ49). MoSEPT7Δ49 was purified as a dimer in solution identified by SEC-MALS, in addition to showing slow activity in GTP hydrolysis. Crystallographic structure revealed that Septin7 has open G-interface showing unique features, such as an unusual helix insertion and some differences in the beta meander region. Some structural resemblances have also been observed between Sep7 of Magnaporthe and Sep1 from Chlamydomonas (a unique septin in this organism). The implications of this study point towards a deeper comprehension of septin structure and function in Magnaporthe oryzae to better understand their cellular roles.(1-3)

Palavras-chave: Magnaporthe oryzae; Non-conical; Septins.

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Referências:

- 1 DAGDAS, Y. F. *et al.* Septin-mediated plant cell invasion by the rice blast fungus, magnaporthe oryzae. *Science*, v. 336, n. 6088, p. 1590–1595, 2012. DOI: 10.1126/science.1222934.
- 2 CRUZ-MIRELES, N. *et al.* From appressorium to transpressorium—defining the morphogenetic basis of host cell invasion by the rice blast fungus. *PLoS Pathogens*, v. 17, n. 7, p. e1009779, 2021.
- 3 MIRDITA, M. *et al.* ColabFold: making protein folding accessible to all. *Nature Methods*, v. 19, n. 6, p. 679– 682, 2022. DOI: 10.1038/s41592-022-01488-1.