

The two-component sensor kinase TcsC and its role in stress resistance of the human-pathogenic mold *Aspergillus fumigatus*.

McCormick A, Jacobsen ID, Broniszewska M, Beck J, Heesemann J, Ebel F (2012) The two-component sensor kinase TcsC and its role in stress resistance of the human-pathogenic mold *Aspergillus fumigatus*. *PLOS One* 7(6), e38262-e38262.

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Abstract

Two-component signaling systems are widespread in bacteria, but also found in fungi. In this study, we have characterized TcsC, the only Group III two-component sensor kinase of *Aspergillus fumigatus*. TcsC is required for growth under hyperosmotic stress, but dispensable for normal growth, sporulation and conidial viability. A characteristic feature of the Δ tcsC mutant is its resistance to certain fungicides, like fludioxonil. Both hyperosmotic stress and treatment with fludioxonil result in a TcsC-dependent phosphorylation of SakA, the final MAP kinase in the high osmolarity glycerol (HOG) pathway, confirming a role for TcsC in this signaling pathway. In wild type cells fludioxonil induces a TcsC-dependent swelling and a complete, but reversible block of growth and cytokinesis. Several types of stress, such as hypoxia, exposure to farnesol or elevated concentrations of certain divalent cations, trigger a differentiation in *A. fumigatus* toward a

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Leibniz-HKI-Autor*innen



Ilse Denise Jacobsen

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