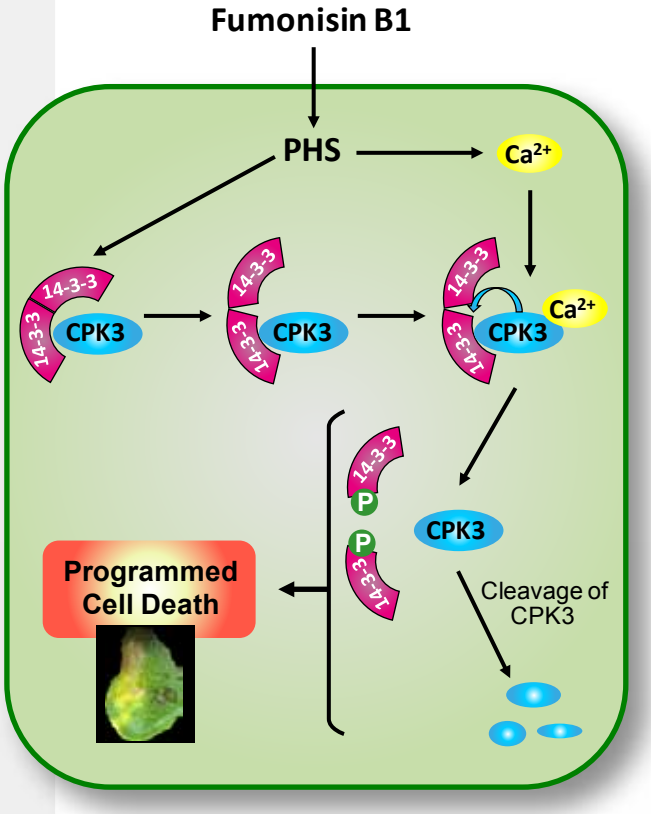
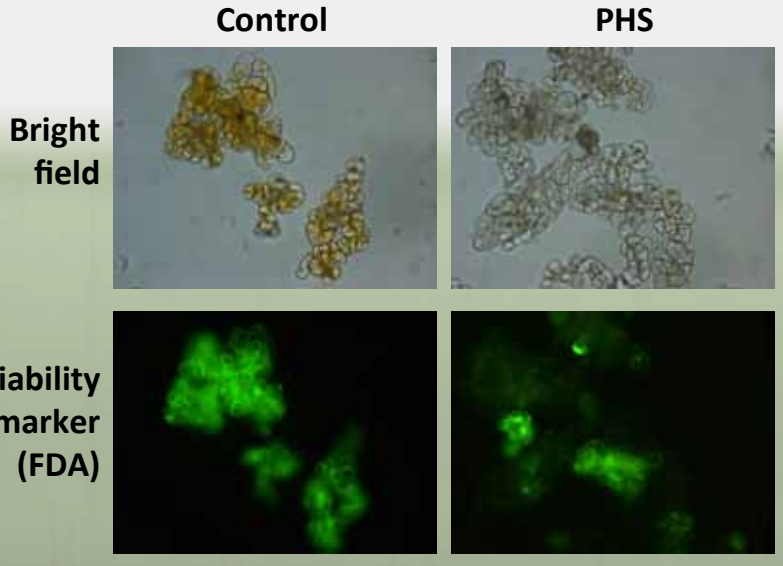
14-3-3-Regulated Ca^{2+}-dependent protein kinase CPK3 is required for sphingolipid-induced cell death in *Arabidopsis*

In eukaryotic cells, sphingoid long chain bases (LCBs) such as sphingosine or phytosphingosine (PHS) behave as second messengers involved in various processes including programmed cell death (PCD). In plants, induction of PCD by LCBs has now been described, but the signalling pathway is still enigmatic.

Using *Arabidopsis*, we identify new key steps in this pathway. We demonstrate that PHS induces activation of the calcium-dependent kinase CPK3, which phosphorylates its binding partners, the 14-3-3 proteins. This phosphorylation leads to the disruption of the complex and to CPK3 degradation. Using *cpk3* knockout lines, we demonstrate that CPK3 is a positive regulator of LCB-mediated PCD in response to the mycotoxin fumonisin B1. These findings establish 14-3-3-regulated CPK3 as a key component of the LCB pathway leading to PCD in plants.



Model for LCB-mediated PCD induced by fumonisin B1 in Arabidopsis



PHS induces PCD in Arabidopsis cells

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