The histone acetyltransferase GcnE regulates development and adherence in the human fungal pathogen *Aspergillus fumigatus*

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Histone modifications including acetylation, methylation and phosphorylation play a crucial role in gene regulations in eukaryotes. The acetylation module of SAGA type histone acetylation complex comprises of an acetyltransferase GcnE and two adaptor proteins AdaB and AdaC. In *Aspergillus*, GcnE has been shown to regulate asexual development and secondary metabolism in *A. nidulans* and *A. flavus*; however, knowledge of GcnE in the human pathogenic fungus *A. fumigatus* is limited. In this study, we showed that GcnE plays a role in conidiation and biofilm formation in *A. fumigatus*. We observed that the $\Delta gcnE$ mutant was unable to response to different nitrogen sources compared with the wild type. In addition, loss of *gcnE* resulted aberrant conidiation that conidiophores showed abnormal phialide formation. The $\Delta gcnE$ mutant exhibited increased susceptibility to cell wall perturbing agents and increased tolerance to LiCl. Furthermore, we showed that GcnE is involved in biofilm formation and overexpression of adherence related genes (*somA* and *uge3*) partially rescued the defects of biofilm formation in the $\Delta gcnE$ mutant. Finally, GcnE is not involved in virulence in neutropenic murine model of invasive aspergillosis. Collectively, GcnE plays a crucial role in conidiation and biofilm formation but not in virulence in *A. fumigatus*.

1. GcnE is involved in nitrogen assimilation

2. GcnE controls conidiation

3. GcnE is involved in stress responses

4. GcnE governs biofilm formation

5. GcnE regulates gene for conidiation, adherence and ammonium transportation

6. Virulence is independent of GcnE