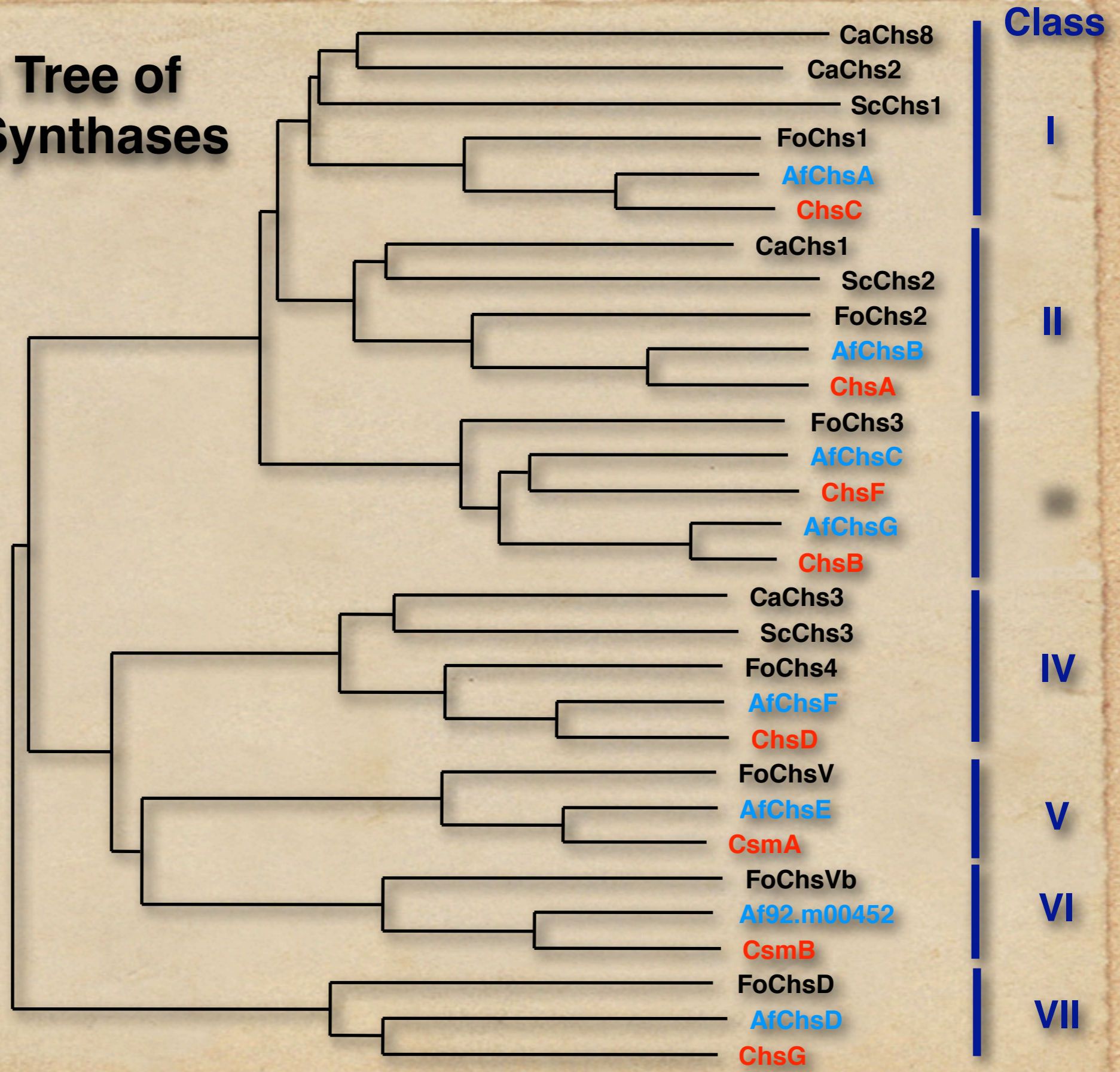


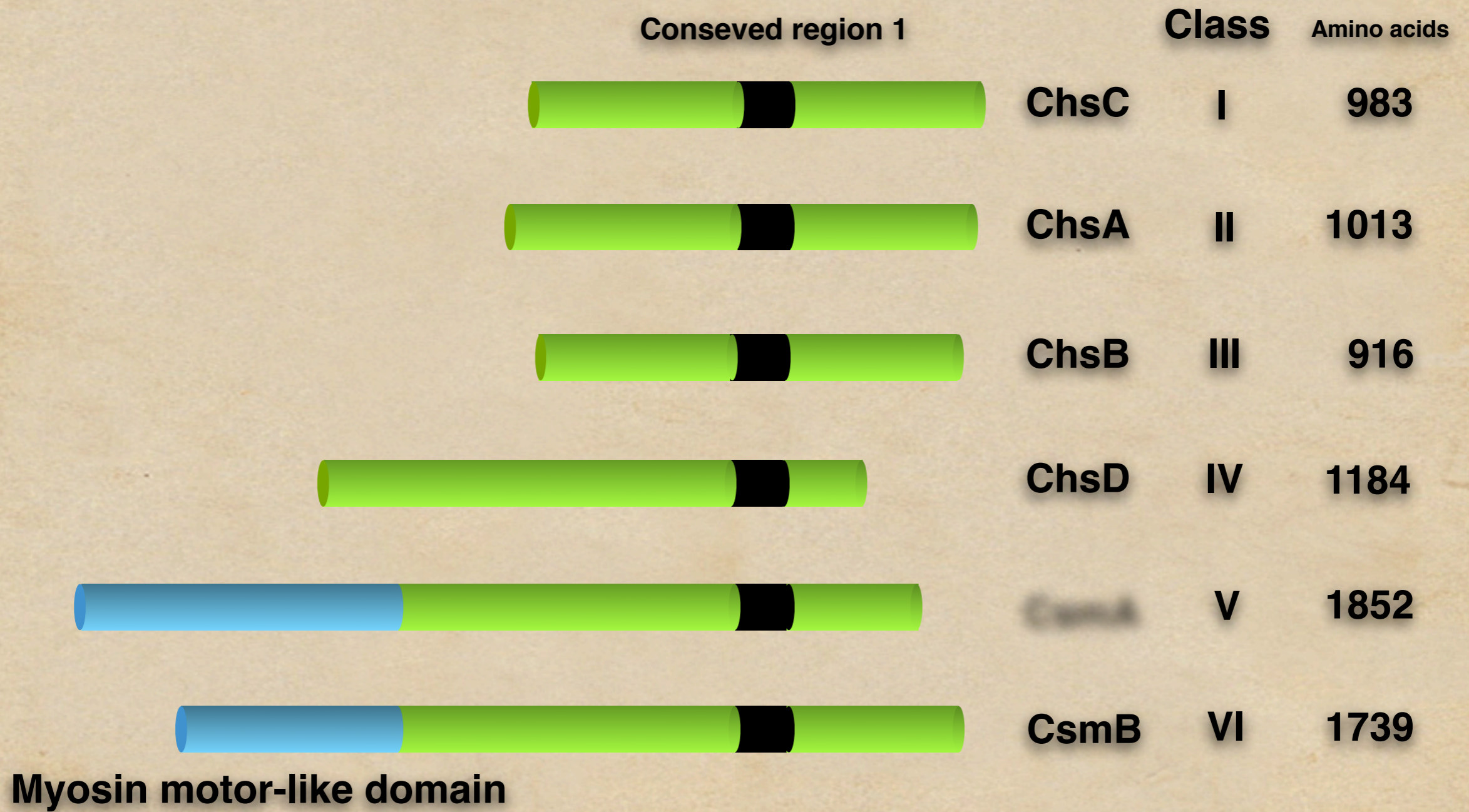
# Phylogenetic Tree of Fungal Chitin Synthases



: *A. nidulans*  
 Af: *A. fumigatus*  
 Fo: *F. oxysporum*  
 Ca: *C. albicans*  
 Sc: *S. cerevisiae*



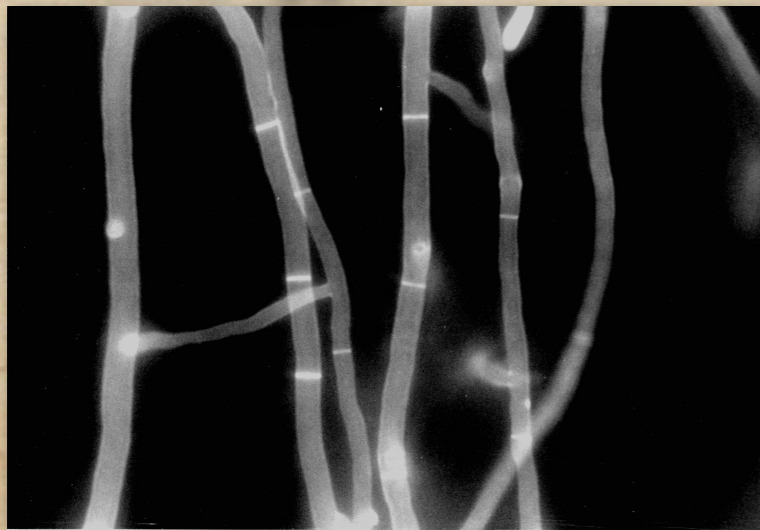
# Structures of Chitin Synthases of *A. nidulans*



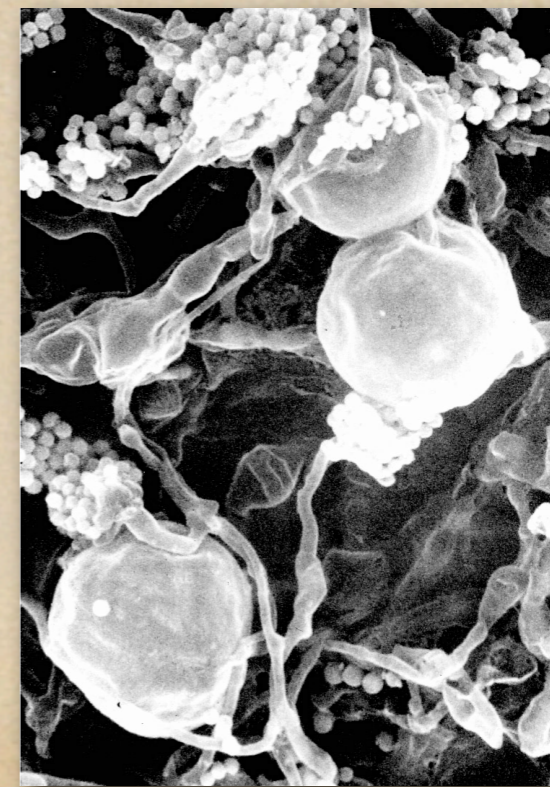
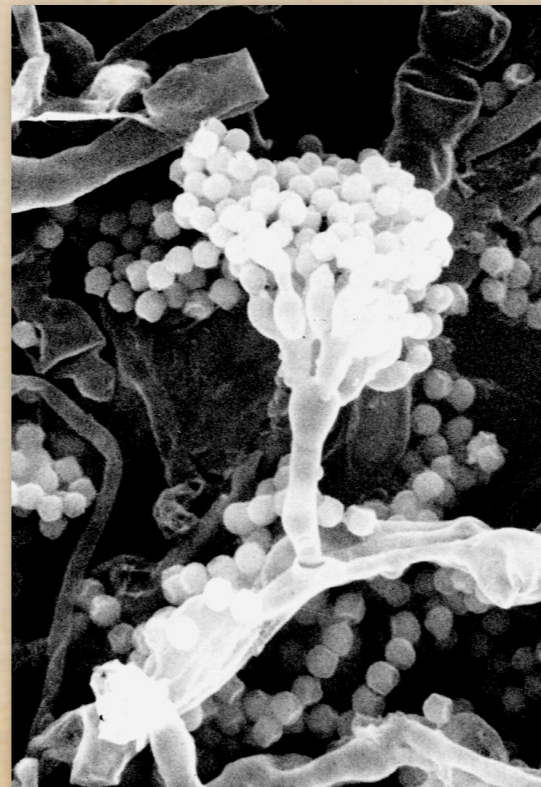
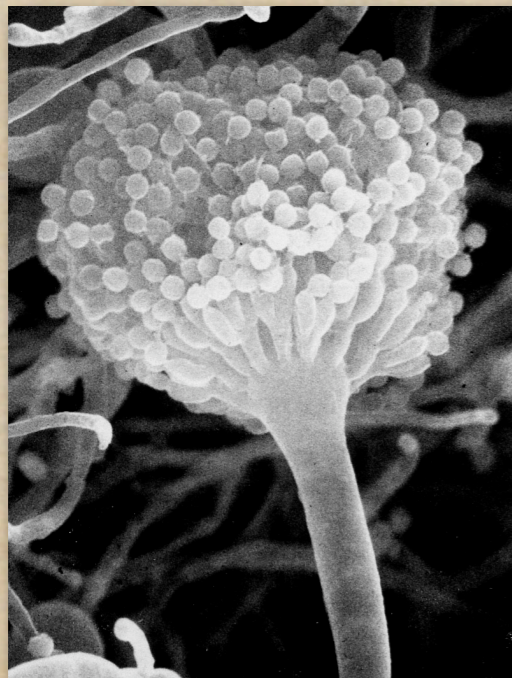
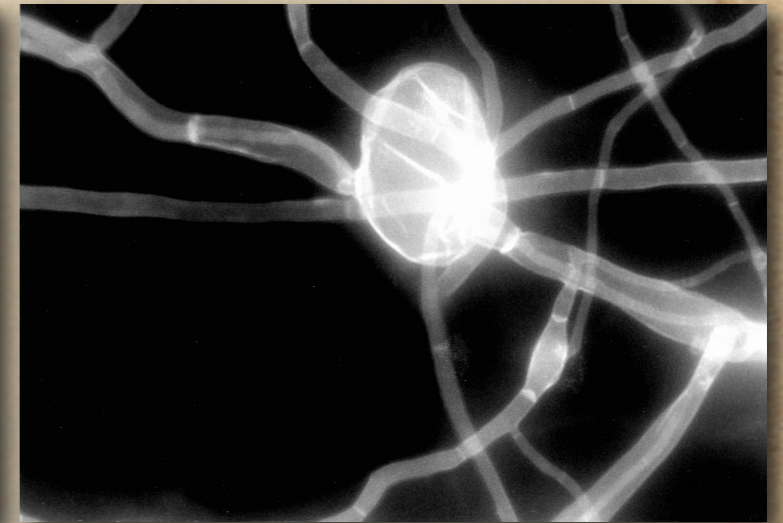
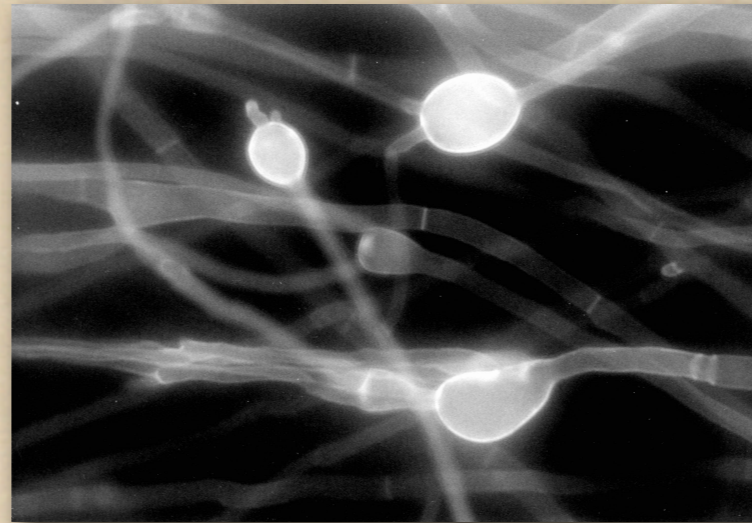


# Structures of the Hyphae and the Conidiophores of the *csmA* Deletion Mutant

Wild type

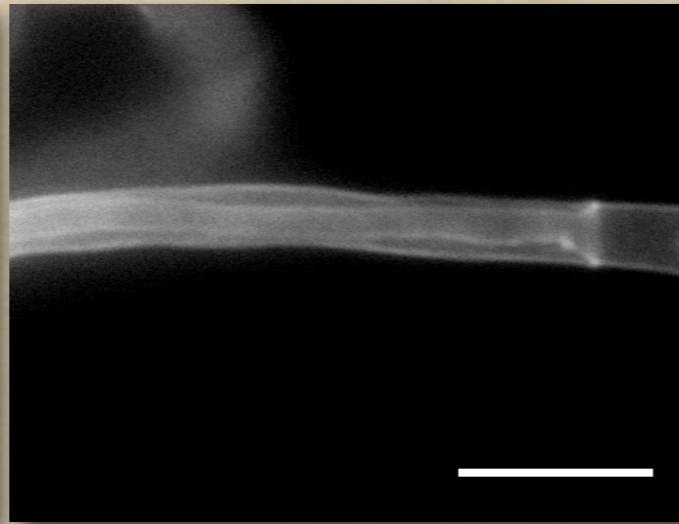
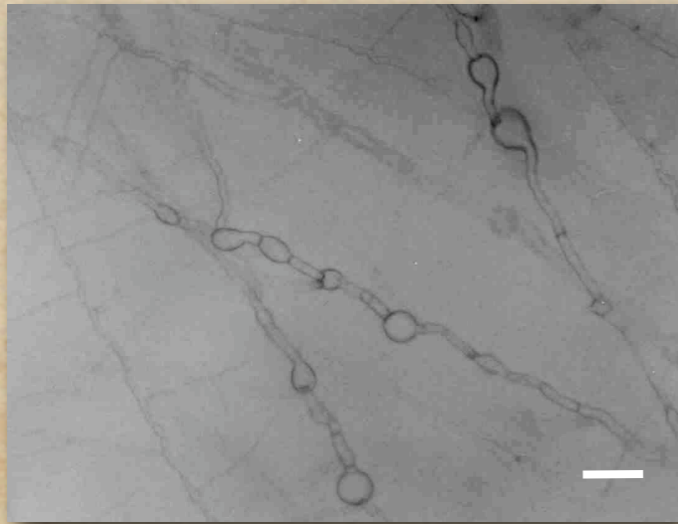


$\Delta csmA$

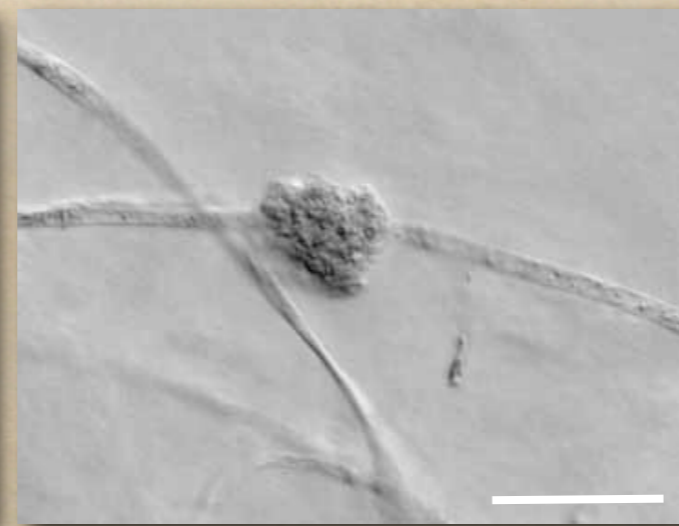
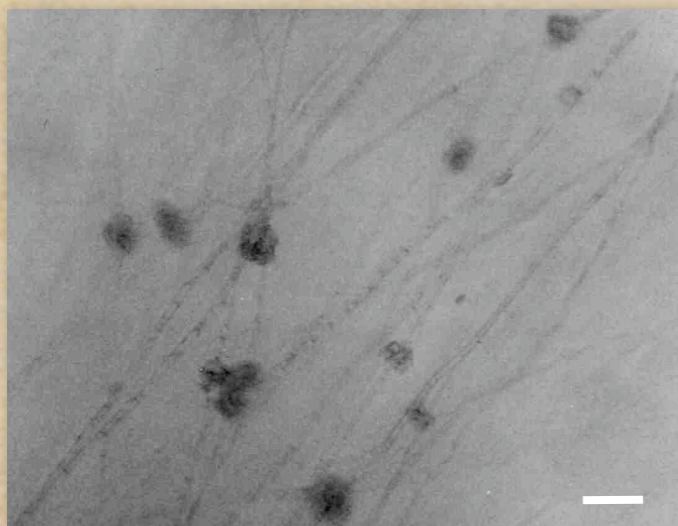




# Structures of the Hyphae and the Conidiophores of the *csmB* Deletion Mutant



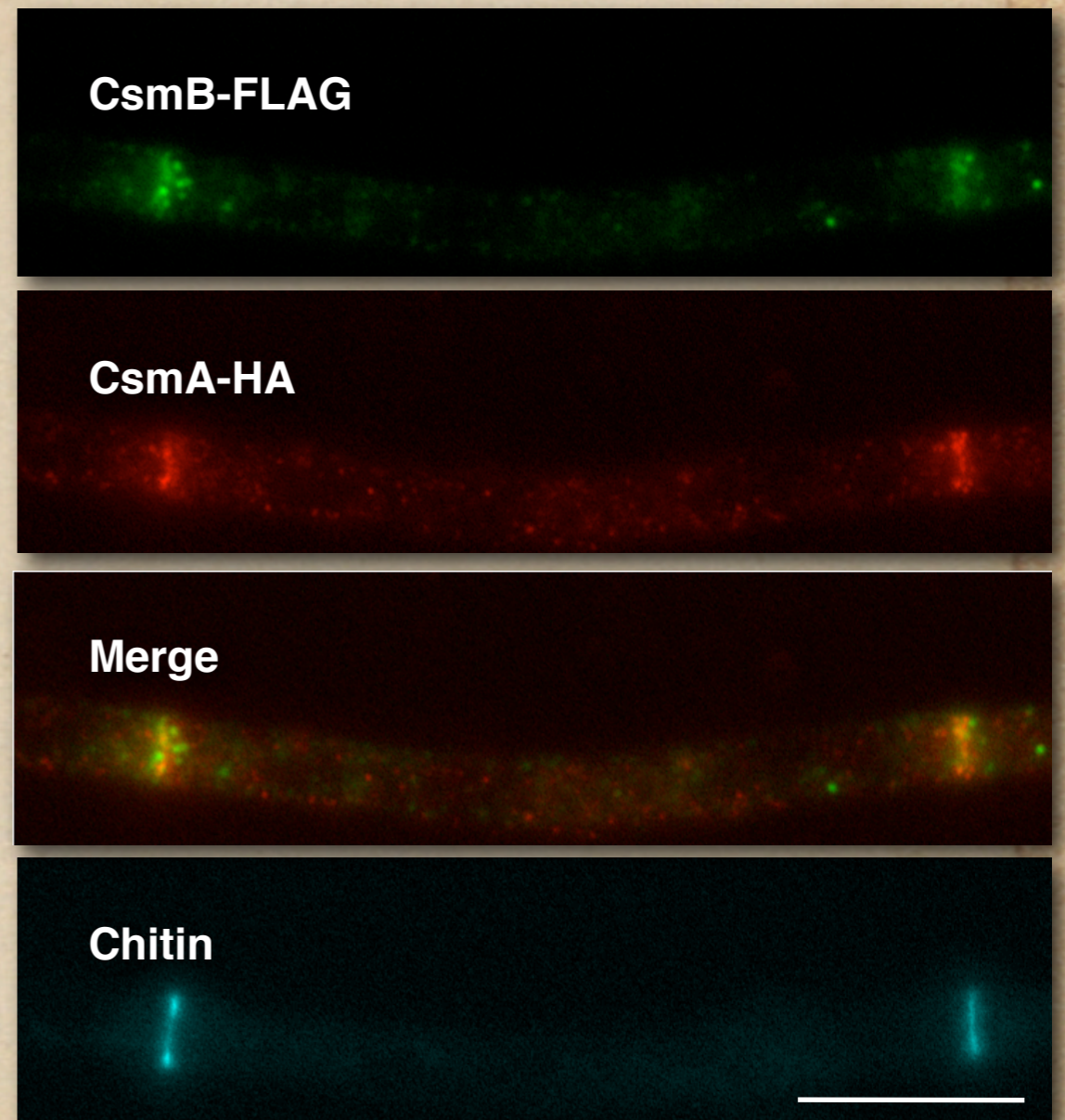
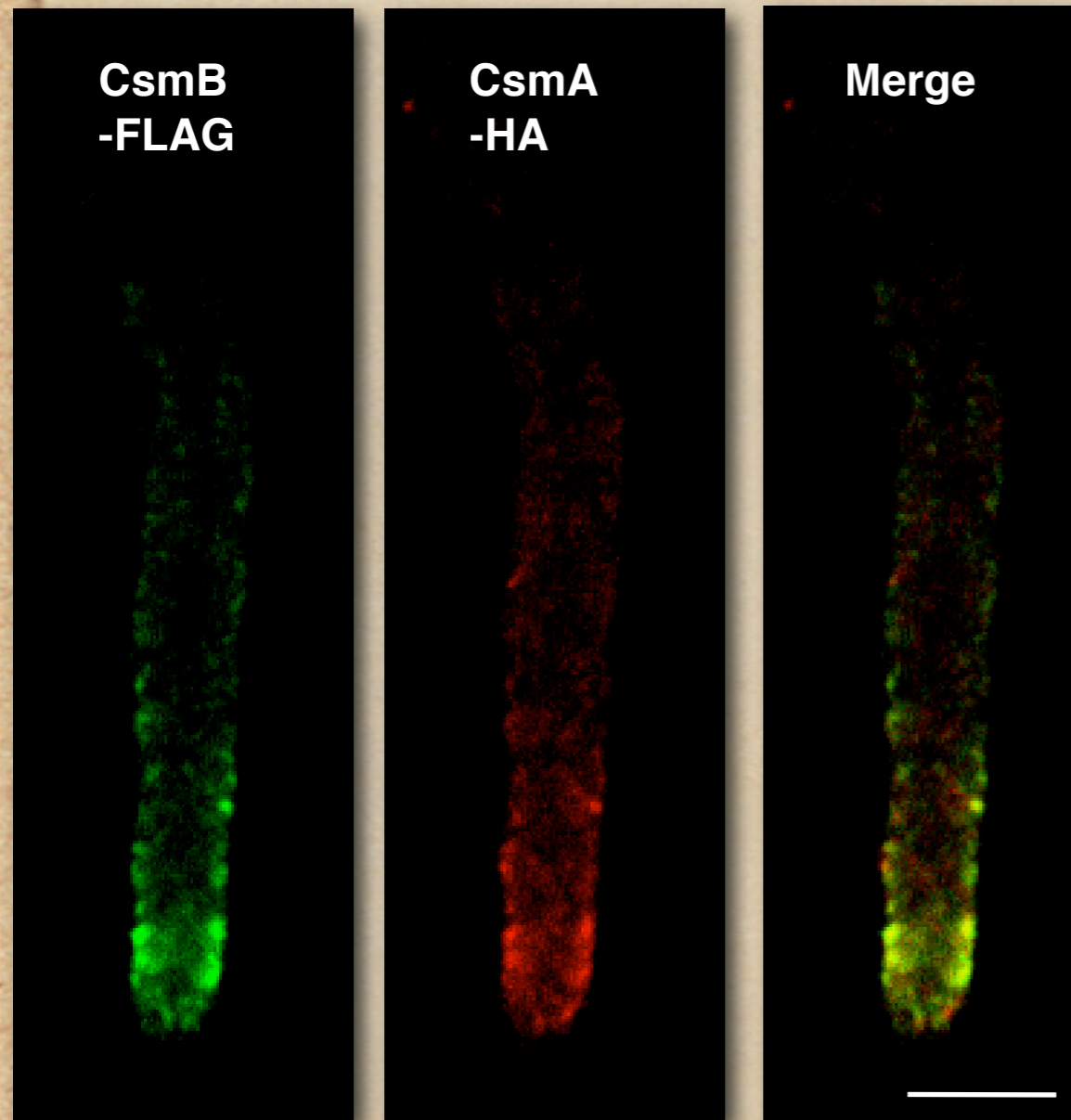
Bars; 10  $\mu\text{m}$



Bars; 2  $\mu\text{m}$

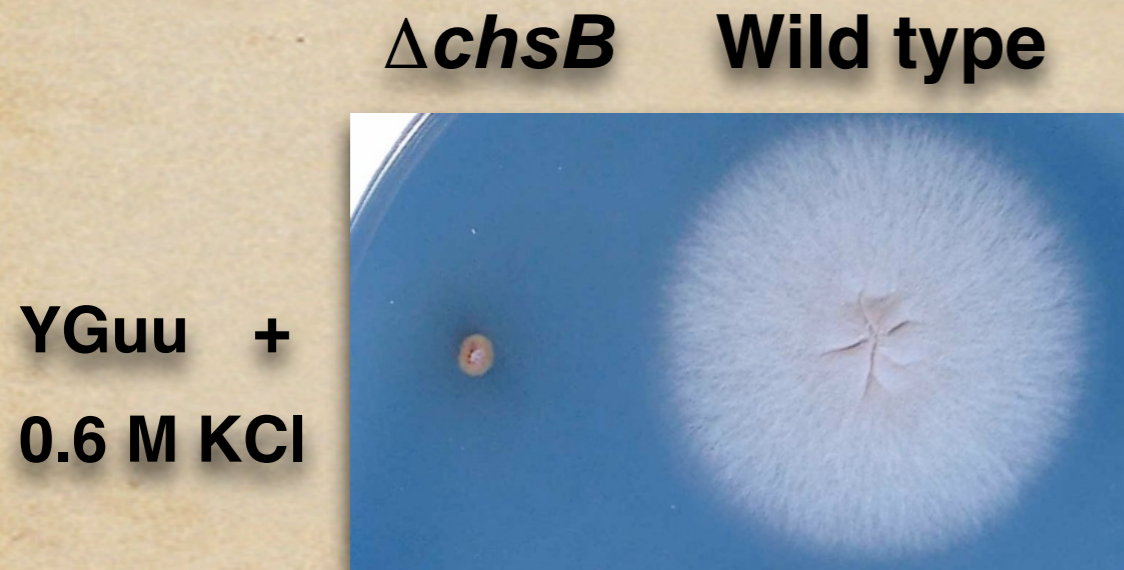
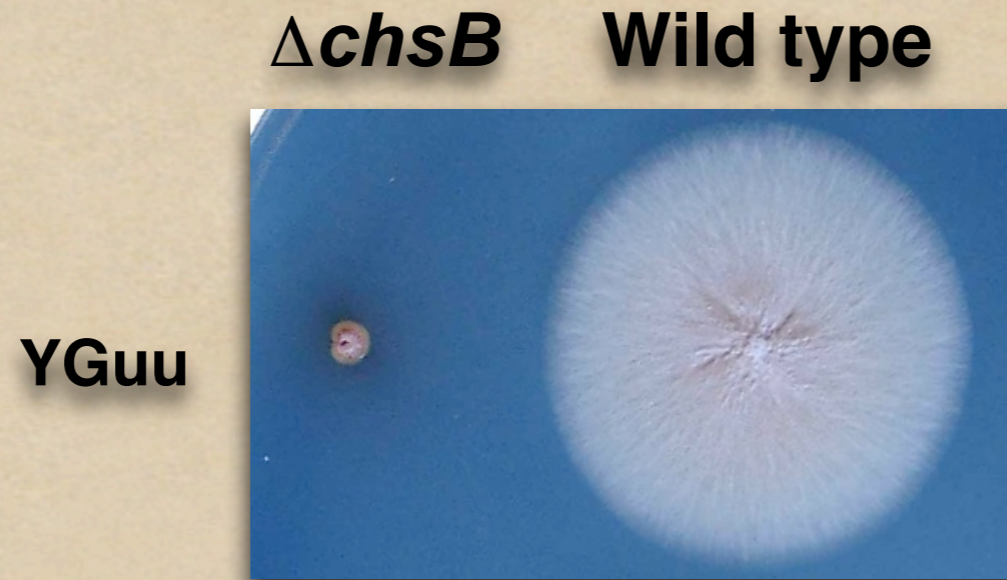


# Localization of CsmA-HA and CsmB-FLAG in the Hyphal Tip and Forming Septa





# Growth of *chsB* Deletion ( $\Delta chsB$ ) Mutant





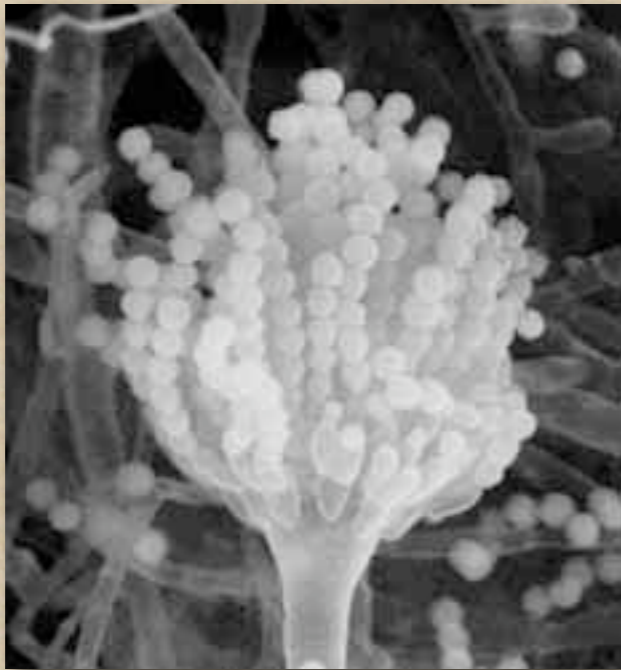
# Phenotypes of the *chsA chsC* Deletion ( $\Delta AC$ ) Mutant

Strain	Phenotype
$\Delta chsC$ ( $\Delta C$ )	-
$\Delta chsA$ ( $\Delta A$ )	Slight reduction of conidiation efficiency
$\Delta chsA \Delta chsC$ ( $\Delta AC$ )	Decrease of hyphal density, growth sensitivity to various reagents and high osmolarity, defects of conidiophore development, reduction of conidiation efficiency

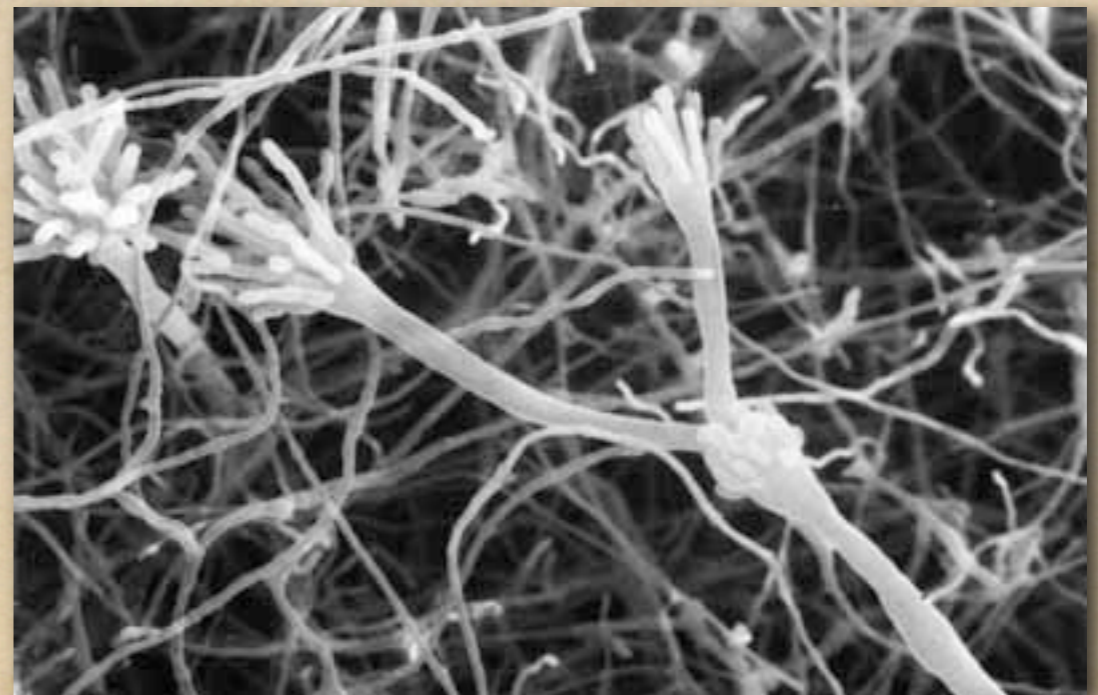
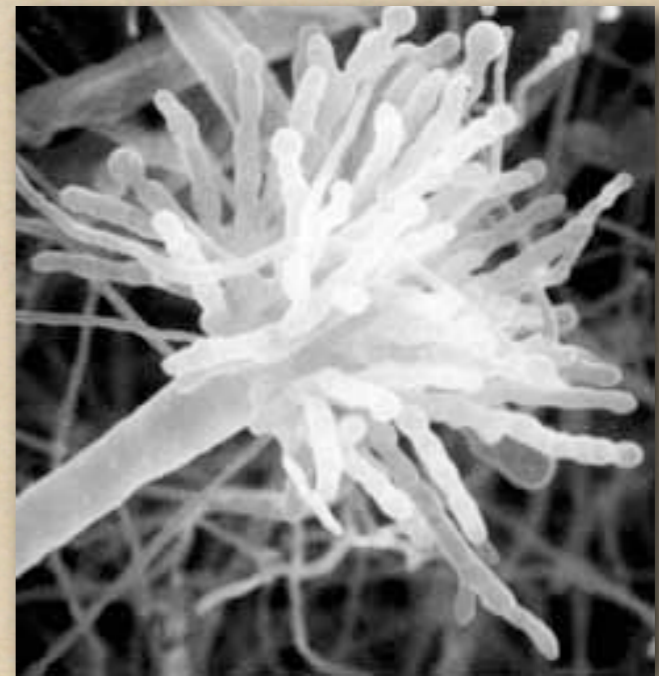


# Conidiophor Structures of the *chsA chsC* Double Deletion ( $\Delta AC$ ) Mutant

Wild type



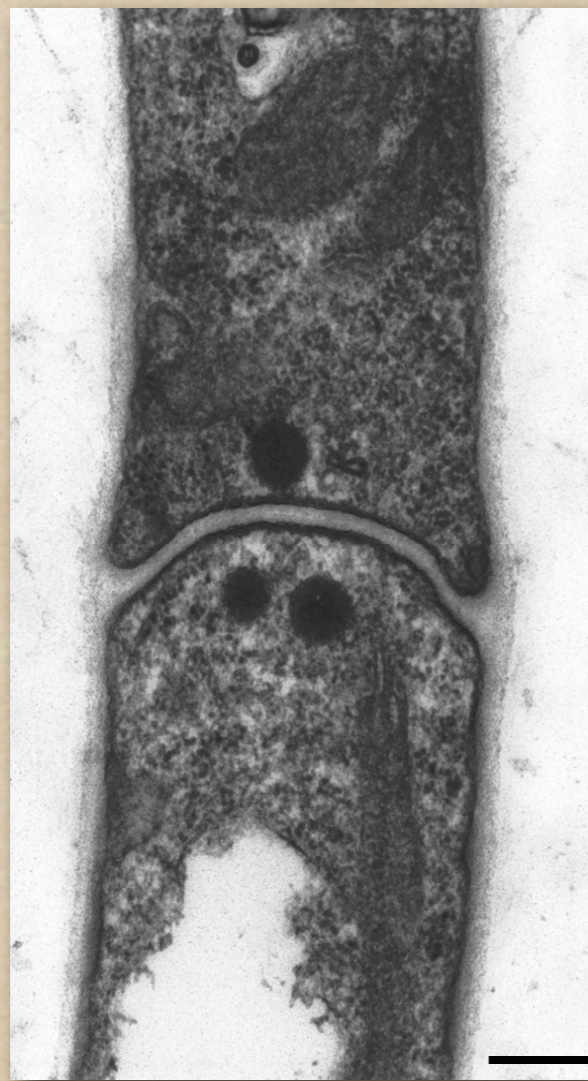
$\Delta AC$





# Structures of the Cell Walls and Septa of the *chsA chsC* Deletion ( $\Delta AC$ ) Mutant

Wild type



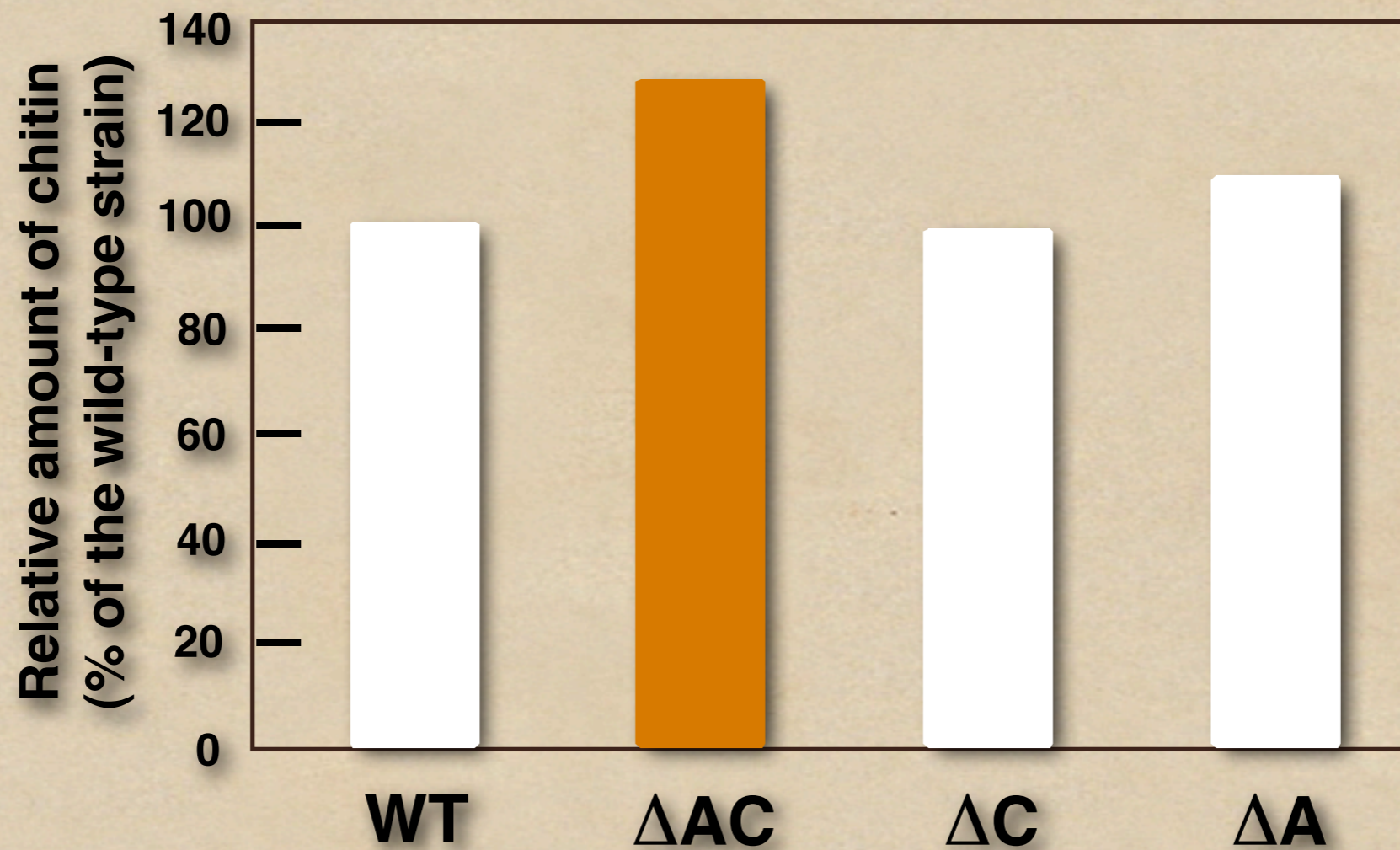
$\Delta AC$



Bars; 0.25  $\mu\text{m}$



# Chitin Contents of *chs* Deletion Mutants





# Growth of the *chsA chsC chsD* Triple Deletion ( $\Delta$ ACD) Mutant

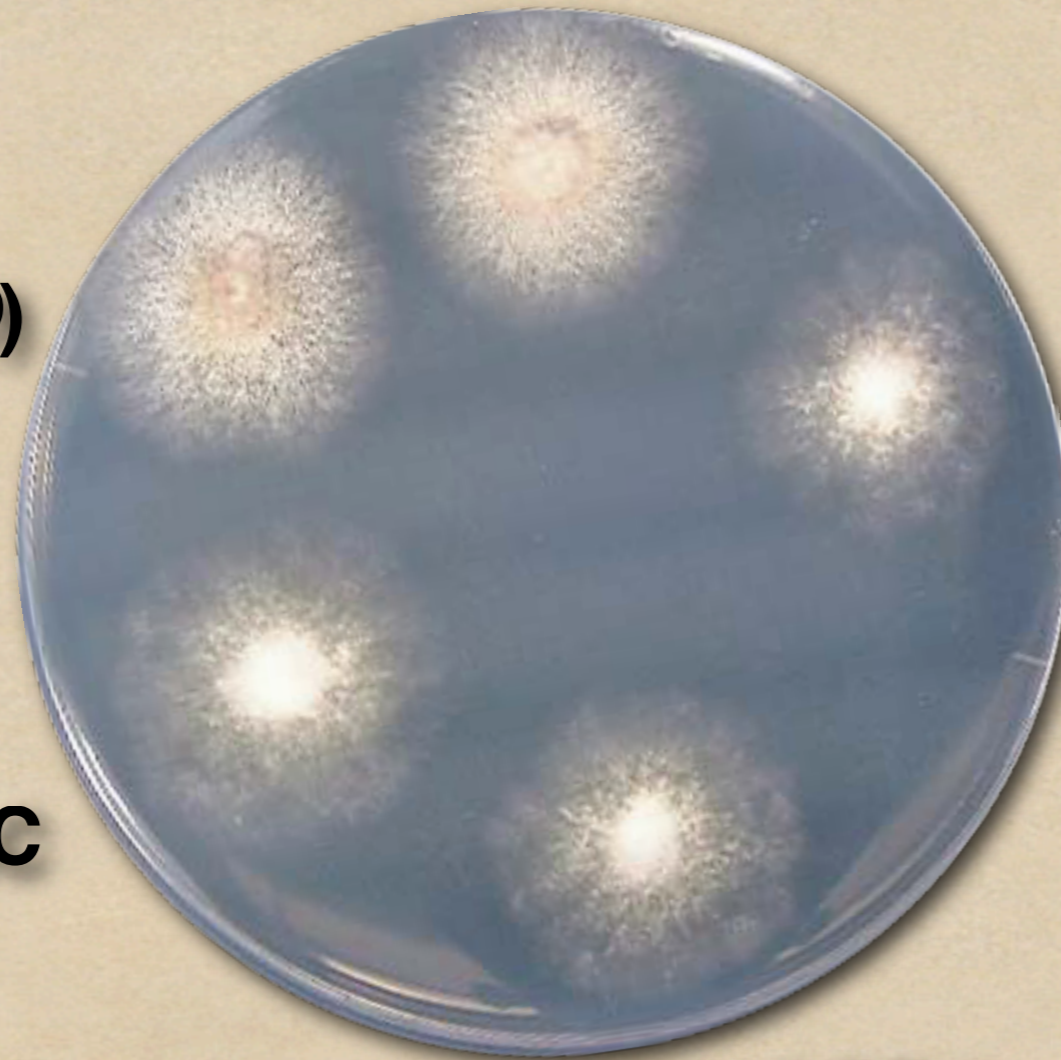
Wild type

$\Delta$ D  
( $\Delta$ *chsD*)

$\Delta$ ACD-2

$\Delta$ AC

$\Delta$ ACD-1





# Growth of the *chsA chsC csmA* Triple Deletion ( $\Delta$ ACM) Mutant

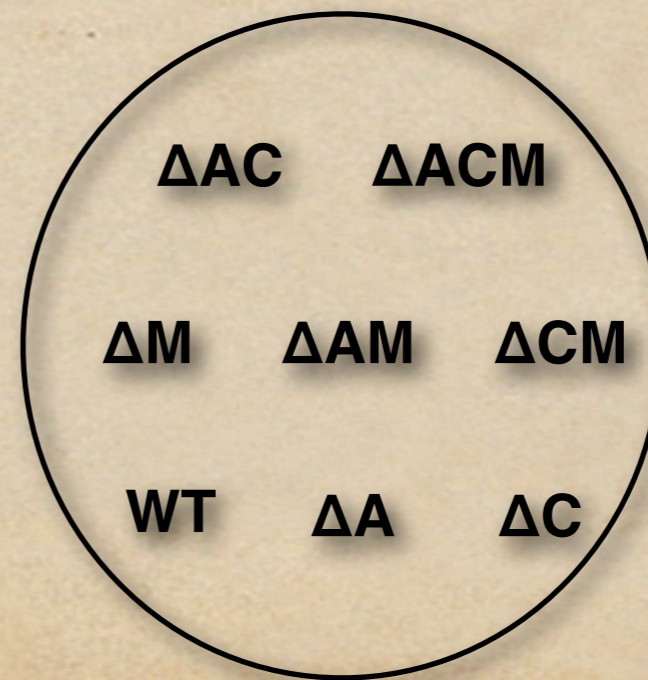
1/2 YGuu



YGuu



YGuu  
+ 1.0 M sorbitol





# Functions of Chitin Synthases in the Hyphal Growth of *A. nidulans*

Low osmotic condition



High osmotic condition

