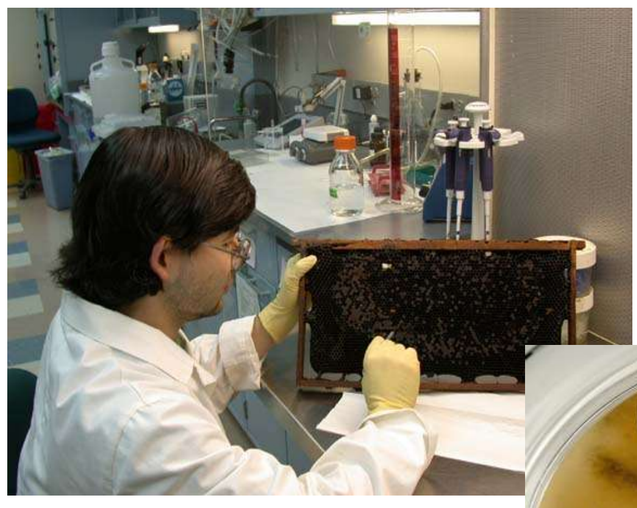
# Honey Bee Fungal Pathogen, *Ascosphaera apis*

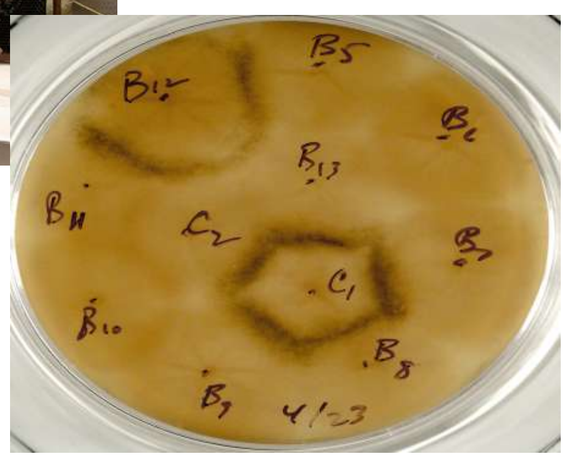
**Dr. Katherine Aronstein**

## Background

- *Ascosphaera apis* is an important fungal pathogen of honey bees.
- Two different Mating Types (Mat-1 and Mat-2) exist in *A. apis* that mate to produce spores.
- Sexual spores (ascospores) that are the primary infective agent of chalkbrood disease. Honey bee larvae can be infected with *A. apis* by ingesting larval food contaminated with ascospores.
- *A. apis* Genome (~24 Mb) is sequenced and submitted to GenBank database
- *A. apis* genome and transcriptome analyses are published

## *A. apis* Fungal Isolates

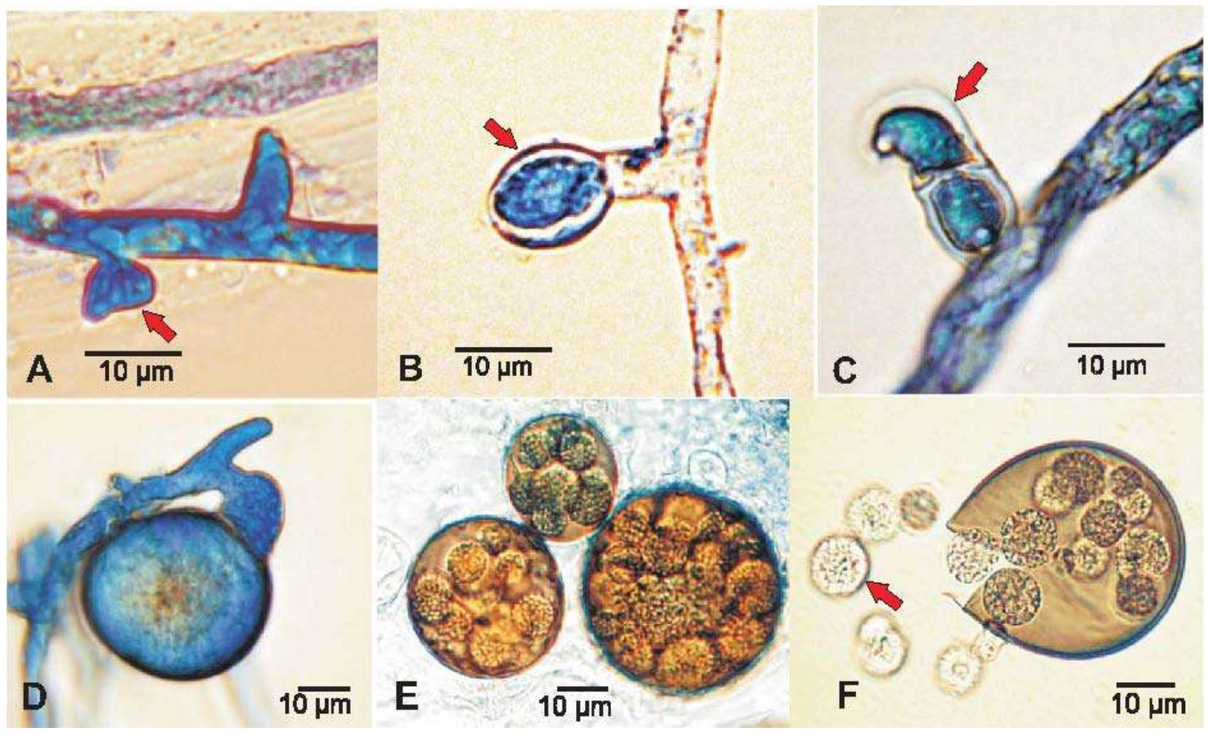




- Chalkbrood mummies were collected in different states in the US
- Purified fungal colonies were tested to determine the mating type
- One purified strain of each mating type was used for isolation of DNA
- *A. apis* isolates were used in the *A. apis* Genome Sequencing Project

Chalkbrood mummies

## *A. apis* Sexual Reproductive Structures

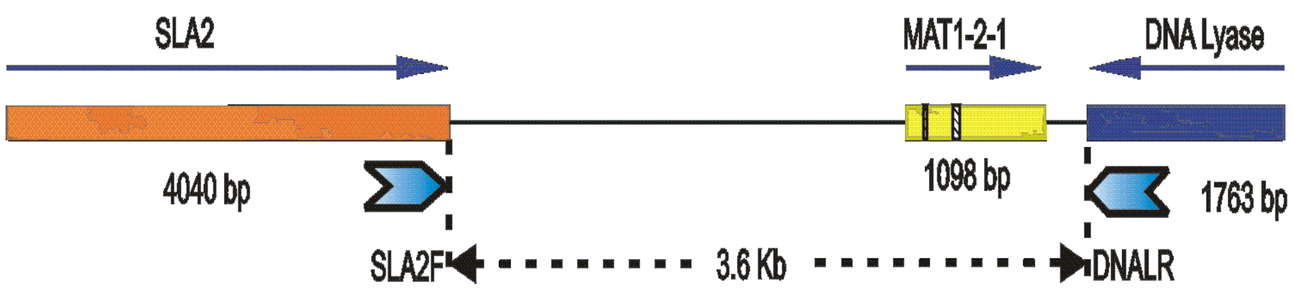



A) Ascogonia, D) Developing ascomata

B) Fertilized ascogonia , E) Mature fruiting bodies

C) Development of a crozier, F) Asci containing spores

## Genome Analysis: *A. apis* Mating Type Mat-2 Locus




- Sexual reproduction in heterothalic ascomycetes is controlled by a single mating type (MAT) locus.