Germ Tube

2017

Germ tube

- Presumptive identification of *Candida albicans* is based on its ability to produce short, tube-like structures called germ tubes when incubated at 35-37˚C for 2-4 hours in pooled human sera.
- Formation of germ tubes is associated with increased synthesis of protein and ribonucleic acids. The essential requirements for this synthesis are contained in tryptic soy broth and fetal bovine sera.

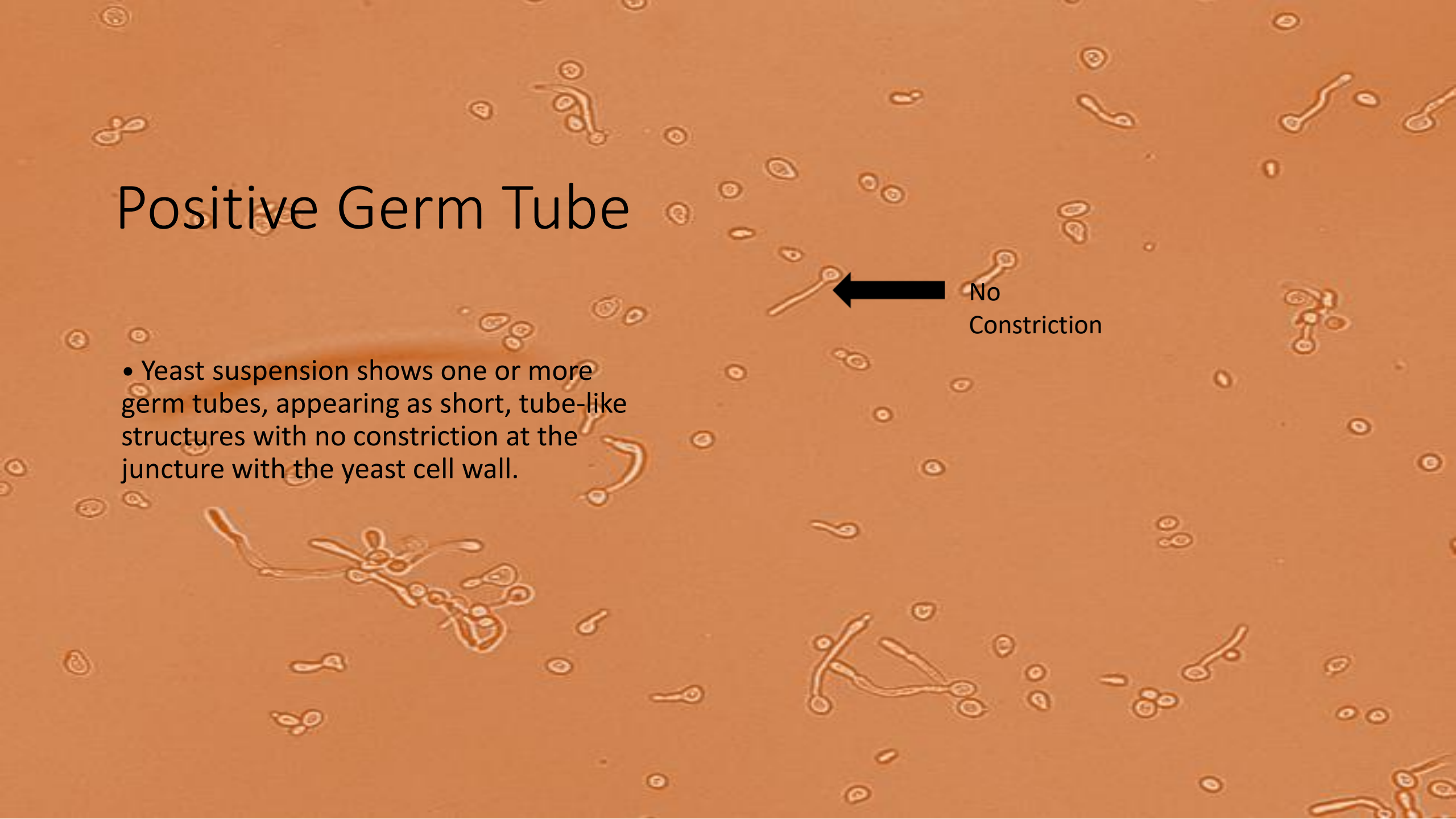
Procedure

- Remove the required number of Germ Tube aliquots from the freezer and allow to come to room temperature.
- Make a suspension of a single yeast colony by touching the tip of a sterile applicator stick to the colony and emulsifying the cells in the solution.

Note: DO NOT inoculate the solution heavily as increased inoculums cause a significant decrease in the percentage of cells forming germ tubes.

- Incubate at 35-37°C for 2-4 hours.
- Place a drop of suspension on a microscope slide, using a sterile pipette, place coverslip over suspension, and observe microscopically with high dry objective for the presence of germ tubes.

Positive Germ Tube

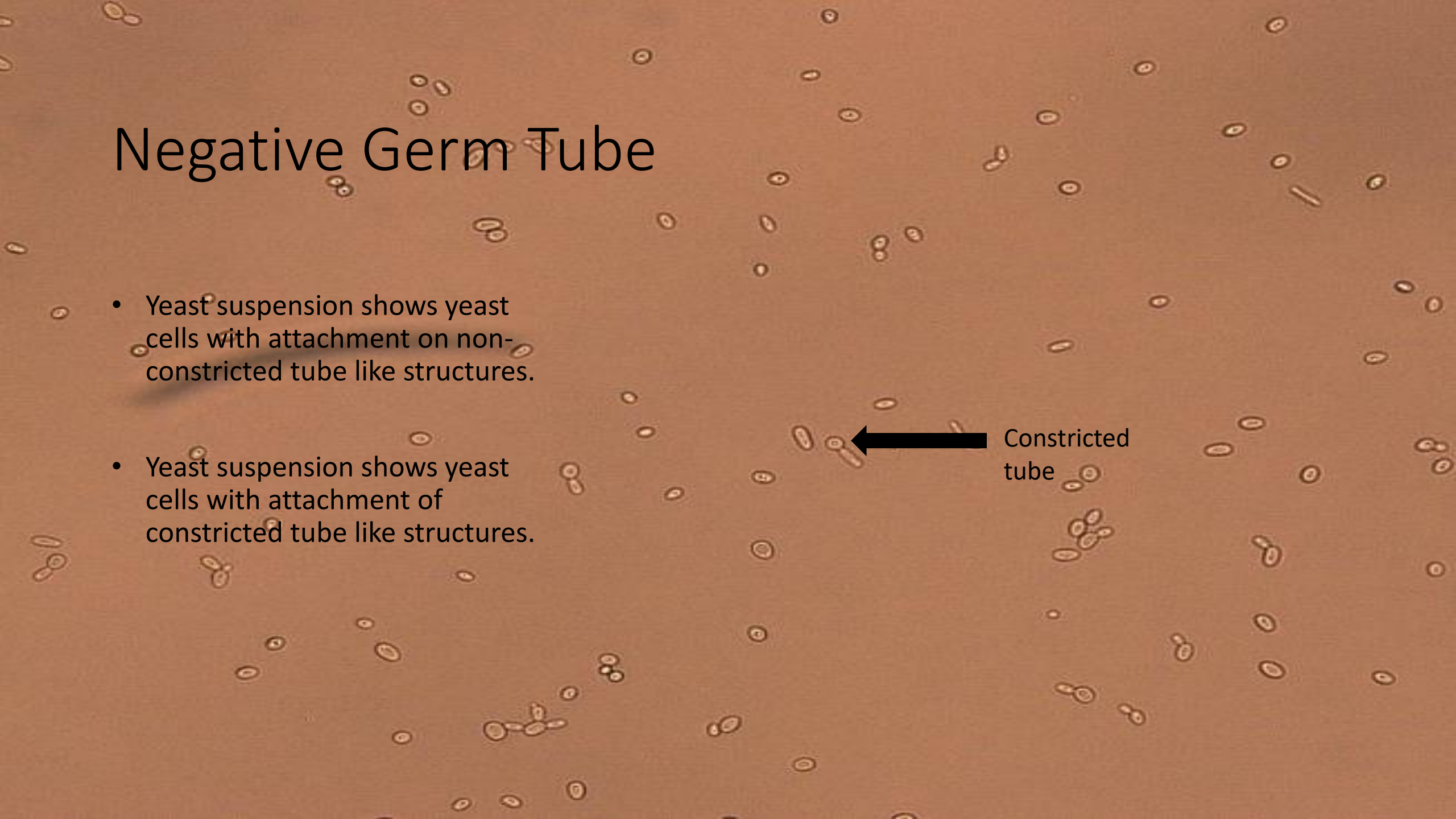


- Yeast suspension shows one or more germ tubes, appearing as short, tube-like structures with no constriction at the juncture with the yeast cell wall.

Negative Germ Tube

- Yeast suspension shows yeast cells with attachment on non-constricted tube like structures.

- Yeast suspension shows yeast cells with attachment of constricted tube like structures.



Limitations

- Some oral strains of *Candida tropicalis* have been shown to produce early pseudohyphae that can be confused with germ tubes; however, such hyphal extensions are constricted at the point of origin with the yeast cell in contrast to germ tubes.
- The yeast formerly named *Candida stellatoidea* also produces germ tubes; however, it has been combined with *Candida albicans* and no longer exists as a separate species.
- *Candida dubliniensis,* first described in 1995, also produces germ tubes and chlamydospores. Growth at elevated temperatures and colony morphology on differential media have been shown to facilitate differentiation of *Candida albicans* and *Candida dubliniensis.*
- This test is only part of the overall scheme for identification.