STANTON TERRITORIAL HEALTH AUTHORITY

Yellowknife, Northwest Territories

TITLE: Germ Tube	**Revision Date:** 11-March-2016	**Issue Date:** 11-March-2014
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Distribution: Microbiology Test Manual	**Page:** 1 of 5	
Approved by: Cheryl Case, Manager of Diagnostic Services	**Signed by:** Cheryl Case	

INTRODUCTION:

This test is the most valuable rapid test for presumptive identification of *Candida albicans*. Yeast infections are among the most common fungal infections affecting humans and they are often seen as secondary invaders in immuno-compromised patients and those on chemotherapy.

PURPOSE:

The germ tube production test is used to differentiate *Candida albicans* from other *Candida species*.

PRINCIPLE:

Formation of germ tubes is associated with increased synthesis of protein and ribonucleic acid. The essential requirements for this synthesis are contained in tryptic soy broth and fetal bovine sera. The solution is lyophilized for stability.

SAMPLE INFORMATION:

Type	Well isolated presumptive yeast colonies

REAGENTS and/or MEDIA:

Type	Remel CAT#21068
Storage Requirements	Store lyophilized product in its original container at 2-8°C until used. Allow product to equilibrate to room temperature before use. Do not incubate prior to use.
Stability	Store hydrated aliquots at -20°C for up to 4 months.

SUPPLIES:

- Test tube
- Glass slides and cover slips
- Pasteur pipettes
- 35°C incubator

SPECIAL SAFETY PRECAUTIONS:

Since viable micro-organisms are used, all cultures must be handled with appropriate precautions. All equipment in contact with cultures should be decontaminated by appropriate methods.

QUALITY CONTROL:

Quality Control is set up each day the test is performed using the following control organisms.

Positive:	*Candida albicans*	ATCC 10231
Negative:	*Candida glabrata*	ATCC 15126

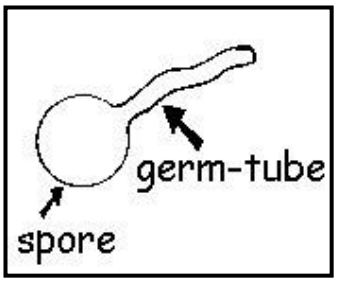
- A TQC order is automatically generated to record the QC results

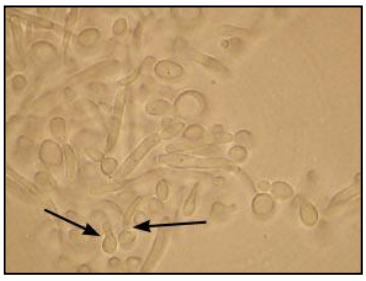
PROCEDURE INSTRUCTIONS:

Step	Action
Performing a Germ Tube Test	
1	In the plate log – Order **^GT**
2	Rehydrate Germ Tube solution with sterile water according to the volume size indicated on the vial.
3	Aliquot 0.5 ml of solution into clean test tubes. Unused aliquots may be capped tightly and frozen at -20^{o}C for up to 4 months.
4	Make a dilute suspension of a single yeast colony by touching the tip of a Pasteur pipette to the colony and emulsifying the cells in the solution. DO NOT inoculate the solution heavily; excessive inoculum causes a significant decrease in the percentage of cells forming germ tubes. Positive and negative controls should be tested simultaneously.
5	Incubate aerobically at 35-37^{o}C for 2-4 hours.
6	Examine microscopically under high (40X) magnification for the presence of germ tubes.

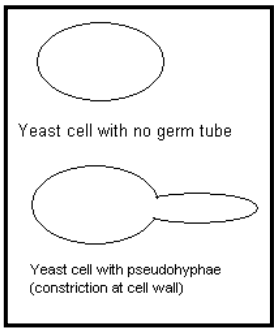
INTERPRETATION OF RESULTS:

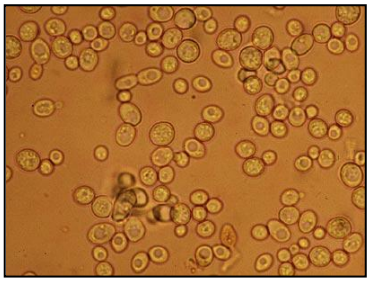
Positive test: Germ tubes appearing as short, tube-like structures with no constriction at juncture with yeast cell wall.





Negative test: Yeast cells only or with attachment of pseudohyphae.





NOTES AND PRECAUTIONS:

1. Very heavy concentration of inoculum causes a significant decrease in the percentage of cells forming germ tubes.
2. *Candida stellatoidea*, which also produces germ tubes, is no longer a species and has been combined with *C.albicans*.
3. Some oral strains of *Candida tropicalis* have been shown to produce germ tubes.
4. *Candida dubliensis* is germ tube positive; however, careful microscopic observation will reveal that, unlike *C.albicans*, the short hyphal initials are constricted at the junction of the blastoconidium and the germ tube.
5. This test is only part of the overall scheme for identification. Further biochemical testing may be necessary for identification.

REFERENCES:

- Germ Tube Solution package insert, 2008

- Murray Patrick, Baron Ellen Jo, Jorgensen James, Landry Marie Louise, Pfaller Michael, Manual of Clinical Microbiology, 9th edition, 2007, p.335

REVISION HISTORY:

REVISION	DATE	Description of Change	REQUESTED BY
1.0	14/11/12	Initial Release	A.Darrach