

Medically Important Yeasts

The Medically Important Yeasts

1. *Candida albicans* >> Candidiasis
2. *Candida sp.* >> Candidiasis
3. *Trichosporon beigelii* >>
Trichosporonosis, Candidiasis
4. *Geotrichum condidium* >> Geotrichosis
5. *Saccharomyces servacies* >> Candidiasis
6. *Rhodotorula sp.* >> Candidiasis
7. *Cryptococcus neoformance* >>
Cryptococcosis

Candida albicans

- **10% KOH:** budding
yeast cells &
pseudohyphae.
- **Colony morphology:**
rapid growth, creamy
moist colonies.



Candida albicans

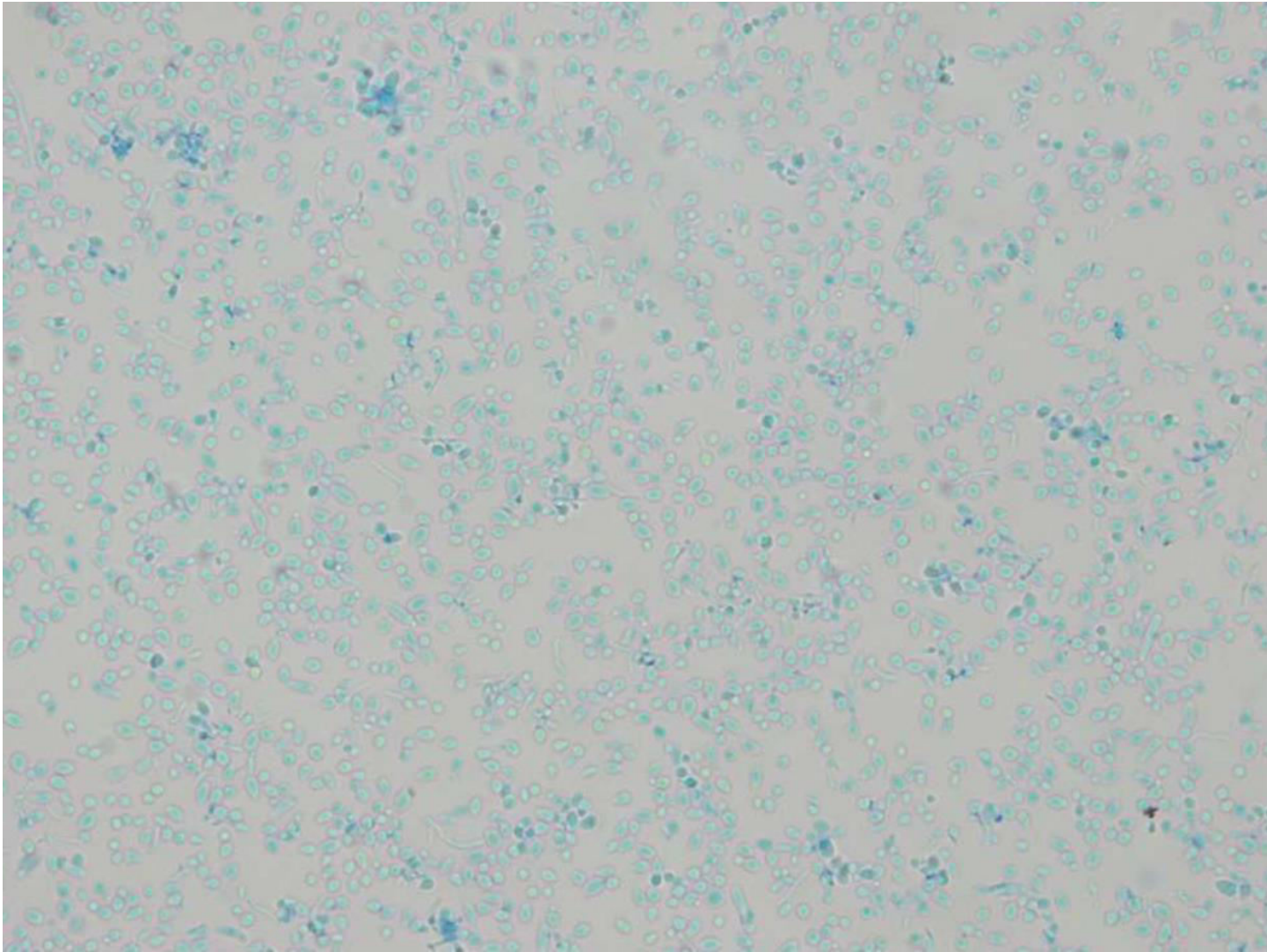
- **Microscope morphology:**

LPCB from SDA>> yeast cells

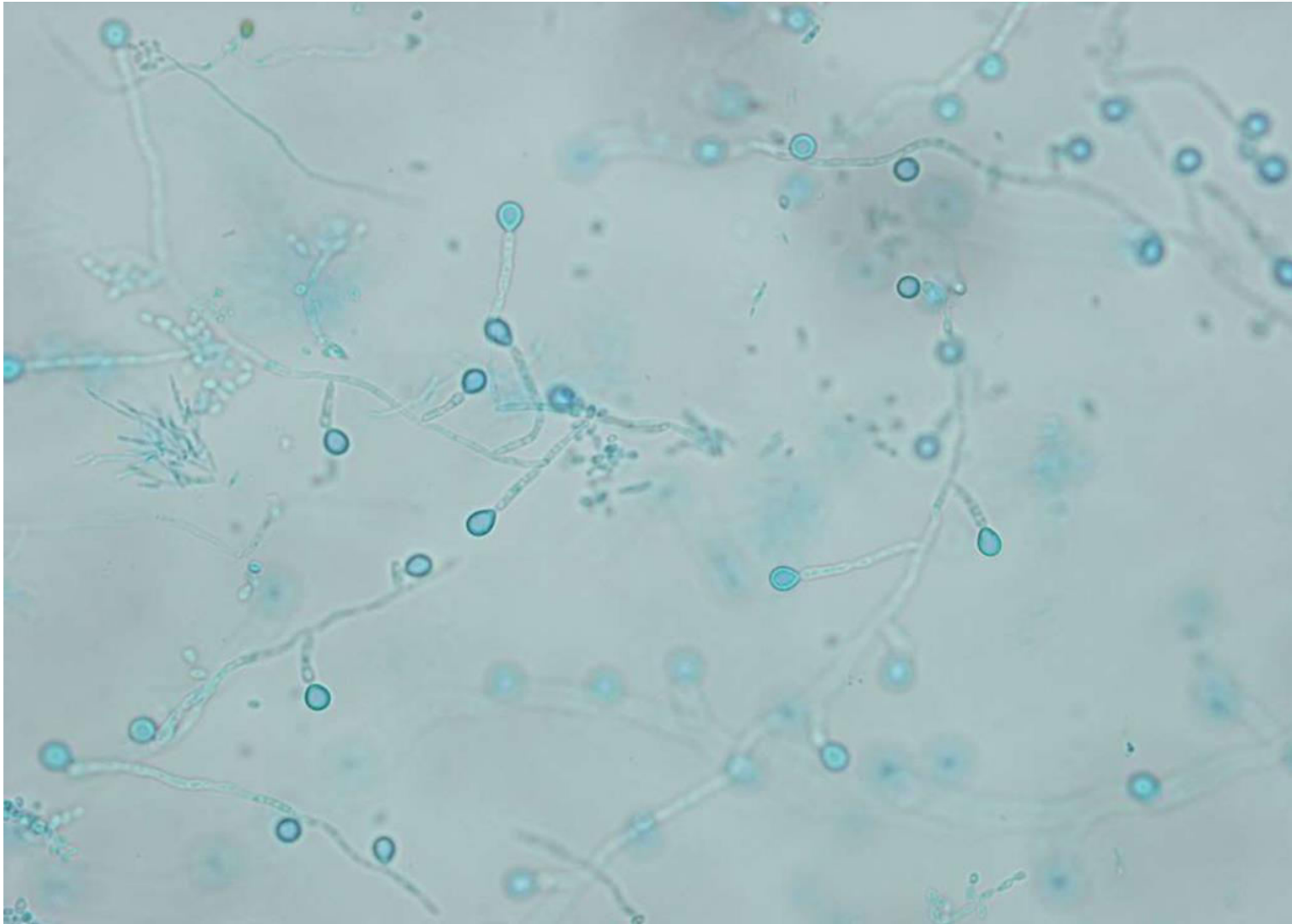
LPCB from CMA>> yeast cells, Pseudohyphae,
Blastospores, Chlamydospore

NOTE: On CMA, all yeast will give pseudohyphae and yeast cells, but *C.albicans* is the only yeast that give Chlamydospore

LPCB from SDA>> yeast cells



Chlamydospores of *C. albicans*



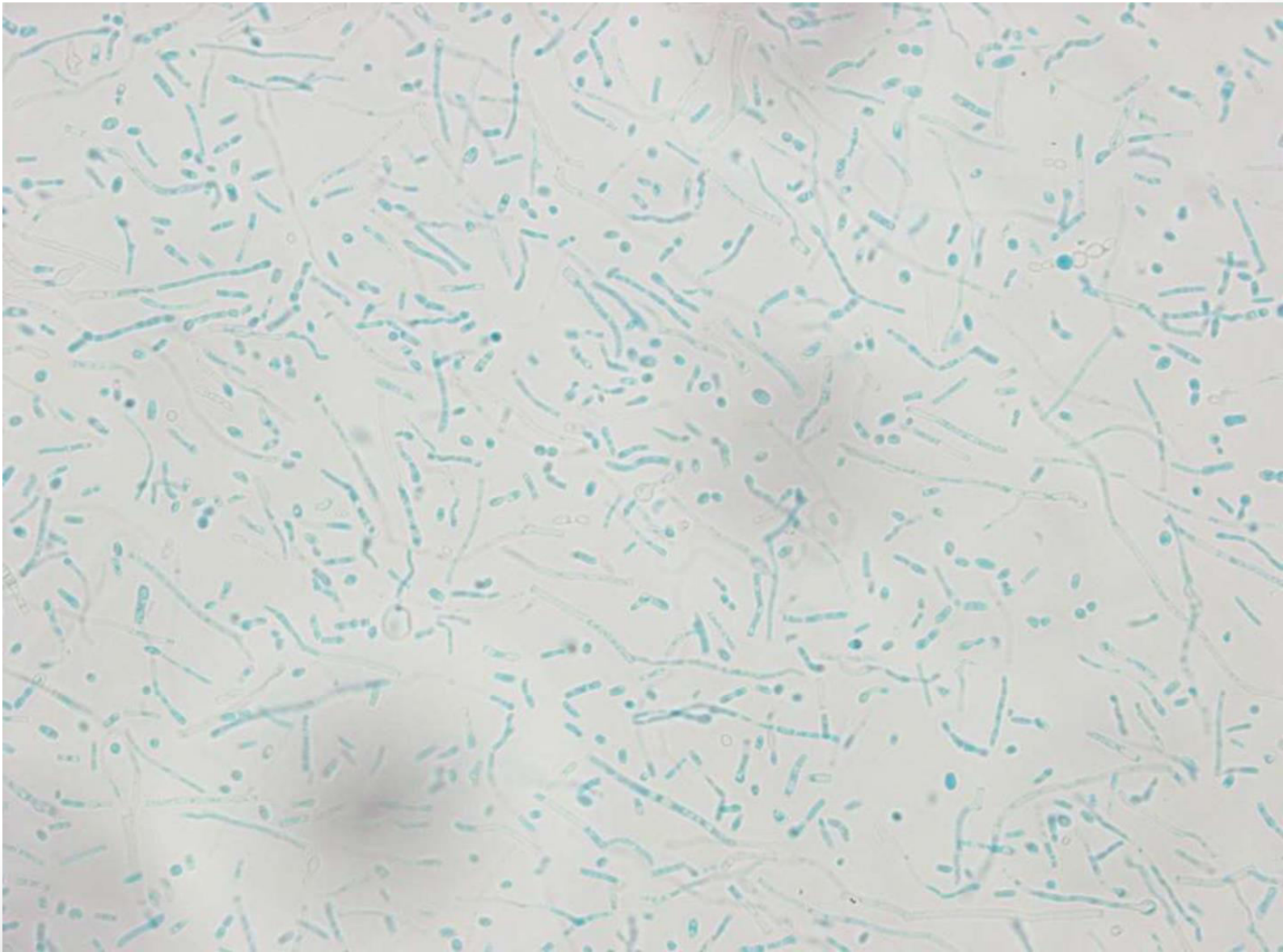
Trichosporon beigeli &

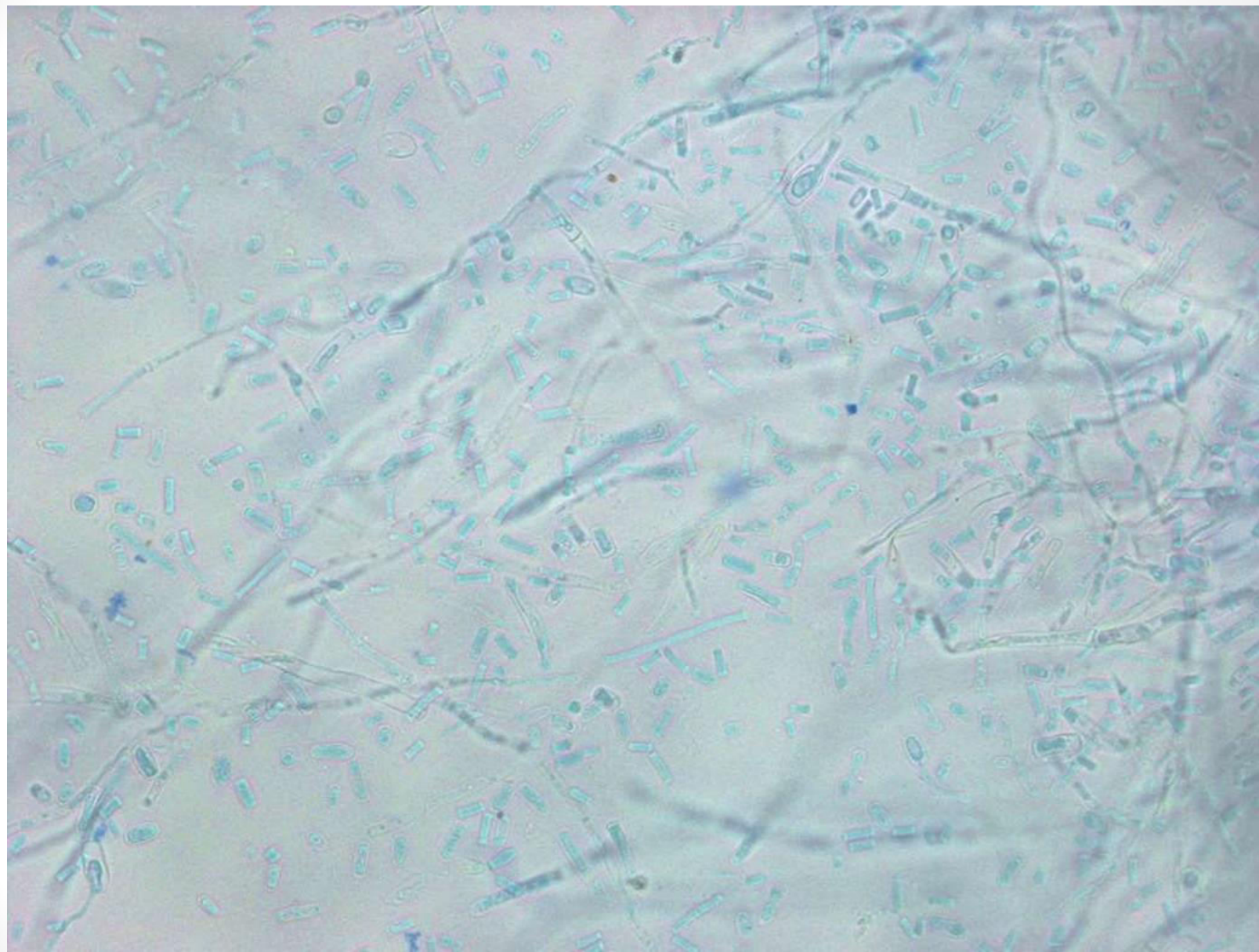
Geotricum candidum

- **10% KOH:** budding yeast cells & pseudohyphae.
- **Colony morphology:** rapid growth, creamy moist colonies
- **Microscope morphology:**

**LPCB from culture>> yeast cells, Pseudohyphae,
Arthrospores**

Microscopic morphology show arthrospores with yeast cells





Yeast Identification

Laboratory diagnosis of yeast:

- **Specimen>>** depend on site of infection (swabs, urine, blood, CSF, respiratory specimen).
- **DM with 10% KOH>>** budding yeast cells & pseudohyphae.
- **Culture on SDA, CMA>>** rapid growth, creamy moist colonies.

Yeast Identification

- **Microscope ex. With LPCB>>** most yeasts will give yeast cells, psuedohyphae or true hyphae

Note:

C. Albicans, *Trichosporon beigelii* & *Geotricum condidium* >> show special characteristic.

Yeast Identification

- **Germ Tube Test (GTT):**
- **Procedure>>**

Add yeast colony to 0.5 or 1 ml serum and incubate it at 37°C for 1:30 - 3 hrs.

- **Result>>**

If there is germination >> GTT positive

If there is no germination>> GTT negative

****C. albicans* always give GTT positive**

GTT positive



Yeast Identification

- **Not:**

- **If >>**

1- GTT is positive, and

2- Chlamydospore production is positive from CMA

>> **The yeast is *C. albicans***

- **If not** >> other yeasts (so we have to continue our identification)

Yeast Identification

There are different tests to identify yeasts:

- API 20 C.
- Vitek yeast identification system.
- CHROM agar.
- Ureas test

API 20C

- **API 20C stand for:** Analytical profile index 20 different carbohydrate
- **API 20C:** is strip consist of small tubes (tubules) that contain different types of carbohydrate
- **Uses:** for yeast identification

API 20C

- **Principle:** carbohydrate assimilation
- **Procedure:**
 1. Prepare fungal suspension (place fungal colonies in tube contain sterile saline)
 2. Then by using sterile pipette inoculate 2-3 drops of suspension in the API 20C tubules
 3. Then place the API 20C strip in an incubation tray contain water to provide humid atmosphere and the lid are placed
 4. Incubate the strip

API 20C

- **Result:**

- hazy or turbid tube>>> there is growth (+)

- Clear tube >> no growth (-)

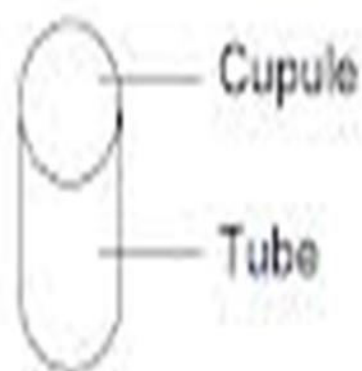
ONPG	ADH	LDC	ODC	LCIT	H ₂ S	URE	TDA	IND	LVP	IGEL	GLU	MAN	INO	SOR	RHA	SAC	MEL	AMY	ARA
	Red	Orange	Pink	Blue	Black	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Blue	Yellow	Blue	Yellow
api 20 E Origin / Source / Herkunft / Origen / Origem / Προέλευση / Ursprung / Opislovanje / Pochozdenie :										BIOMÉRIEUX									
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ONPG	ADH	LDC	ODC	LCIT	H ₂ S	URE	TDA	IND	LVP	IGEL	GLU	MAN	INO	SOR	RHA	SAC	MEL	AMY	ARA
6	7	0	4	7	5	2													
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Ident. / Ταυτοποίηση :

Sal. spp

Inoculation de la galerie

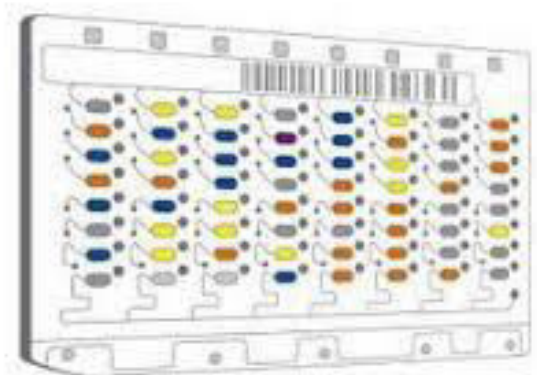


Détail d'un tube © Georges Doizi

																				Référence
ONPG	ADH	LOC	DOC	CIT	H2S	URE	TOA	IND	VP	GEL	GLU	MAN	INO	SOR	RHA	SAC	MEI	AMY	ARA	Date
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VITEK System

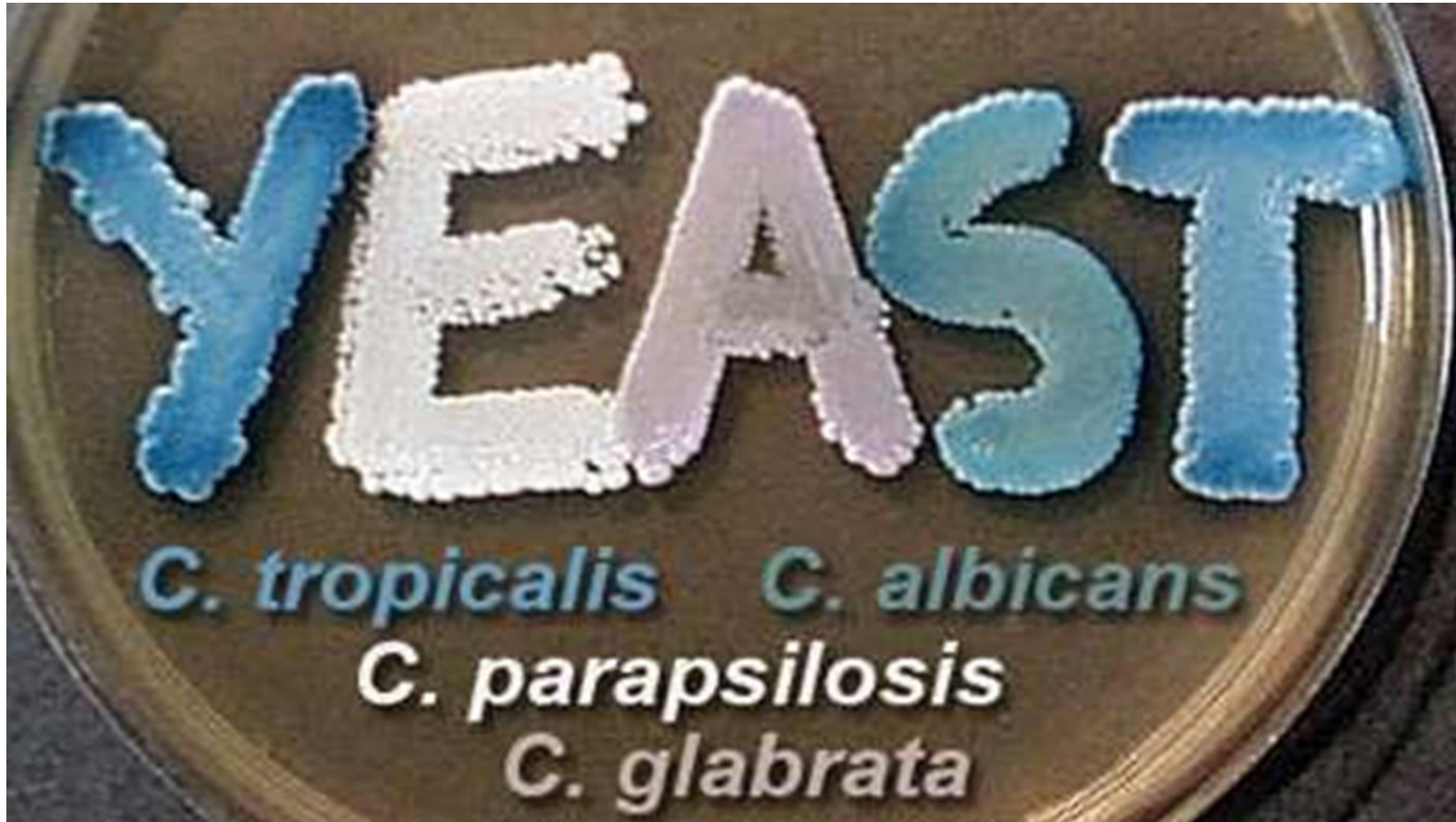
- Fully automated system dedicated to the **identification and susceptibility testing of microorganisms.**
- This system can identify yeast in 15 h due to a sensitive fluorescence-based technology.
- The ID-YST card consists of 47 biochemical reactions.
- VITEK system is **rapid and accurate** method for the identification of medically important yeasts



CHROM Agar

- This media used to identify Candida species according to the colonies color on the media.
- **CHROM agar consist of :** agar , pepton , chromogenic mix and chlormphenicol
- **Procedure:** direct streaking of organism then incubate for 48 h at 30 °C in aerobic conditions.
- **Advantages:**
Easy to read, sensitive and specific, save time
- **Disadvantages:** Expensive

CHROM Agar



Urease Test

- This test is used to detect the enzyme urease, which breaks down urea into ammonia



- If the yeasts that grow in this media have urease enzyme, they will destroy the urea in the media, so the media color will change from acidic (yellow) to alkaline (pink).
- Indicator: phenol red

Urease test

-ve

+ve



Cryptococcus neoformance

- **Specimen>>** CSF, body fluid and tissue
- **DM with India ink (Nigrosin negative stain)>>** encapsulated budding yeast cells (capsular material appeare as clear halo)
- **Culture on SDA, BHI agar>>** grow fast 1-2 days
- **Serology lab>>** Latex agglutination test, Immuno-diffusion test, Counter immuno-electrophoresis test

