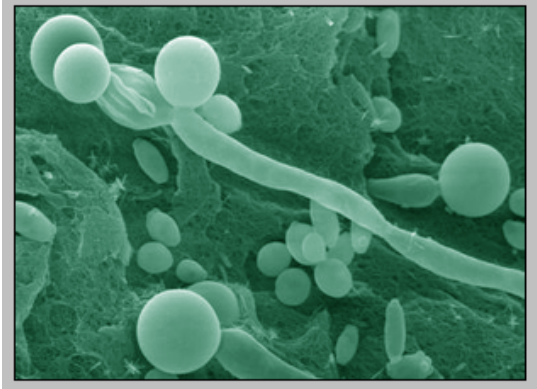


Candida dubliniensis...

A Troublesome Yeast



Jay Hardy, CLS, SM (ASCP)

Jay Hardy is the founder and CEO of Hardy Diagnostics. He began his career in microbiology as a Medical Technologist in Santa Barbara, California.

In 1980, he began manufacturing culture media for the local hospitals. Today, Hardy Diagnostics is the third largest media manufacturer in the U.S.

To ensure rapid and reliable turn around time, Hardy Diagnostics maintains six distribution centers, and produces over 2,700 products used in clinical and industrial microbiology laboratories throughout the world.

First described in 1995 and discovered amongst AIDS patients in Dublin, Ireland; *Candida dubliniensis* has been a troublesome organism for microbiologists for several reasons.

First of all, the phenotypic tests for *C. dubliniensis* can be, at times, unreliable leading to its erroneous identification as *C. albicans*.

Secondly, this organism has been known to develop resistance upon exposure to the common anti-fungal, Fluconazole, leading to treatment failures.

Although *Candida albicans* remains the most common opportunistic yeast pathogen in patients with AIDS and other immunocompromised persons, species less susceptible to fluconazole, such as *C. dubliniensis*, are becoming more common.

C. dubliniensis is most often found in oropharyngeal lesions of AIDS patients. However the organism can be considered indigenous oral

flora in a small percentage of healthy persons.

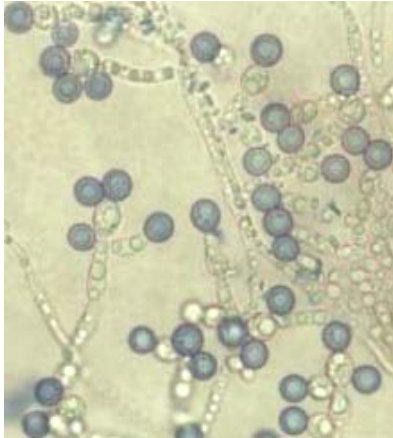
The role of *C. dubliniensis* as a pathogen was once thought to be limited to oral candidiasis; however more serious cases of septicemia have been reported.

Macroscopic Morphology

Colonies on Sabouraud's dextrose agar at 25°C are white to cream, soft, and smooth to wrinkled; and are indistinguishable from *C. albicans*. Colonies grown on [chromogenic Candida agar](#) are dark green as opposed to the light blue-green exhibited by *C. albicans*.

Microscopic Morphology

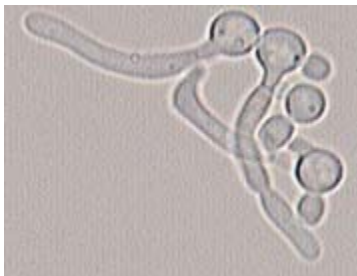
On cornmeal following 72 hours incubation at 25°C, abundant branched pseudohyphae and true hyphae with blastoconidia are present. Many strains produce an abundance of chlamydospores resulting in excess of 25-30 being observed in each microscopic field.



Chlamydospore arrangement is usually seen in pairs, chains, and clusters (as opposed to *C. albicans* chlamydospores, which usually occur singly).

Germ Tubes

C. dubliniensis is [germ tube](#) positive which accounts for its historic miss-identification as *C. albicans*.



Growth at 42 degrees C

This organism grows very poorly or not at all at 42 degrees C. Unfortunately, a small percentage of *C. albicans* isolates will also have difficulty growing at this higher temperature.

Prevalence and Epidemiology

Candida dubliniensis is found all around the world. It is thought to have been previously identified as *Candida albicans* and has been recognized as a distinct species since 1995.



The organism has been found in the stool, urine, vagina, and oral cavity of healthy individuals; although it is most commonly seen in immunocompromised patients. Various studies report a prevalence of *C. dubliniensis* of 15 to 30% in

the oral cavity of AIDS patients.

Antifungal Susceptibility

The most important problem with *C. dubliniensis* is its apparent ability to become resistant to Fluconazole upon repeated exposure to this drug, as seen in patients on long term therapy.

Although most strains are sensitive, Fluconazole appears to be less active against *C. dubliniensis* than against *C. albicans*, since *C. dubliniensis* is usually associated with recurrent episodes of candidiasis and protracted exposure to azole antifungal drugs in patients with AIDS.

For this reason, the control of *C. dubliniensis* may require higher doses of Fluconazole or the use of other anti-fungal agents.

Laboratory Identification

Test	<i>C. albicans</i>	<i>C. dubliniensis</i>
Germ tube	Positive	Positive
Chlamyospores	Positive (usually single)	Positive (usually in pairs and clusters)
Growth at 42 deg. C (note: one study reports better results at 45 deg. C)	Mostly Positive	Negative or slight growth
d-Xylose assimilation	Mostly Positive	Mostly Negative
Trehalose assimilation (not rapid)	Positive	Mostly Negative
Methyl-D-Glucosidase (MDG)	Mostly Positive	Negative
Chromogenic media	Blue green colonies	Dark green colonies (however this characteristic is usually lost upon subculture)
Bird Seed Agar (Staib Agar, Niger seed agar, Caffeic Acid Agar)	Smooth colonies	Rough colonies, with fringe or “feet”
Casein Agar (24 deg. C, at 48 hours)	No Chlamyospore production	Abundant Chlamyospore production

As you can see, this troublesome organism does not always play by the rules and requires some special consideration by microbiologists who are attempting to identify the agent of disease and predict the best treatment option.

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