



Changes in the architecture of *Candida tropicalis* biofilms: effect of a new compound with antifungal activity

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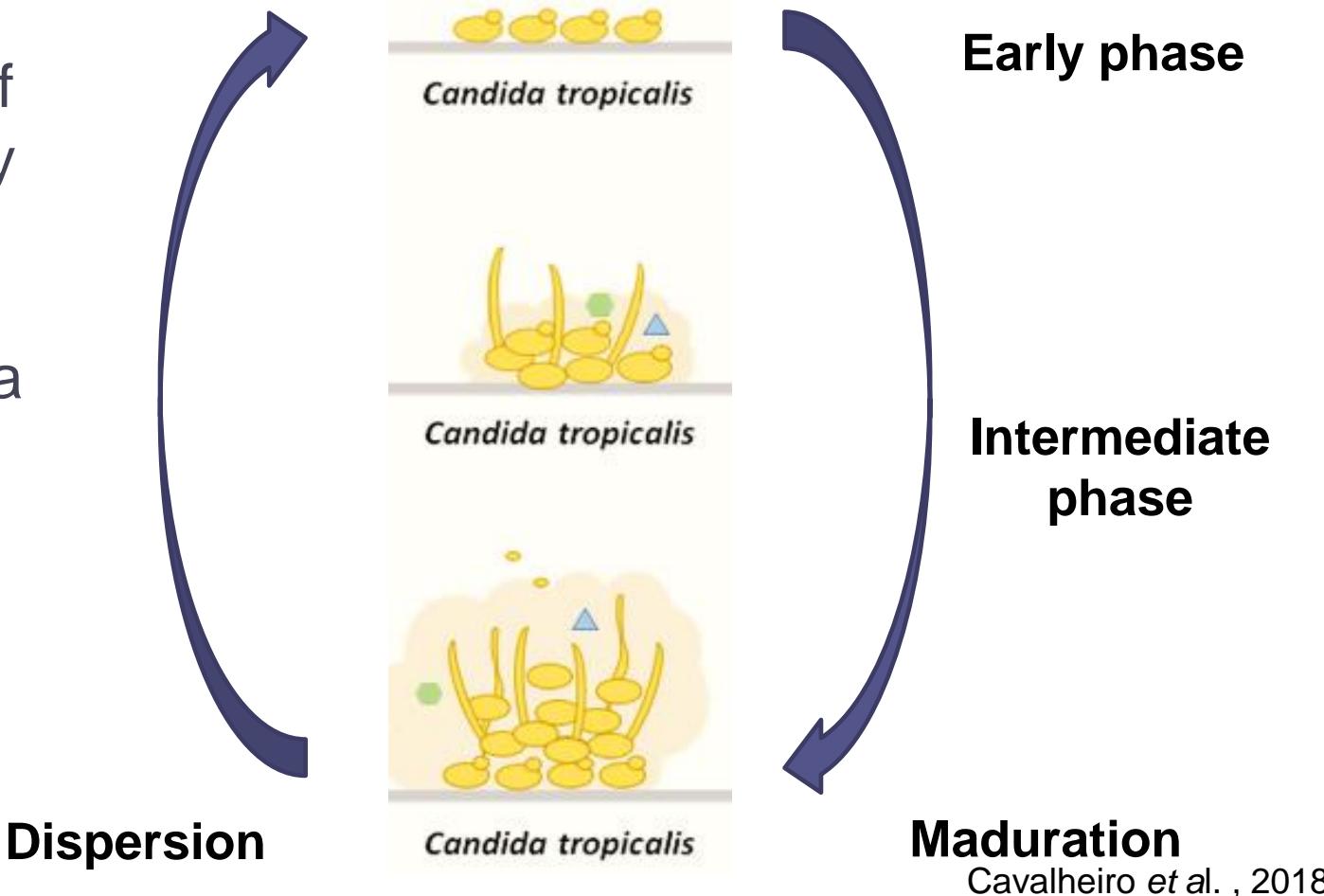
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INTRODUCTION

A biofilm consists in a community of microorganisms that are irreversibly attached to a given surface, inert material, or living tissue, producing extracellular polymers that provide a structural matrix

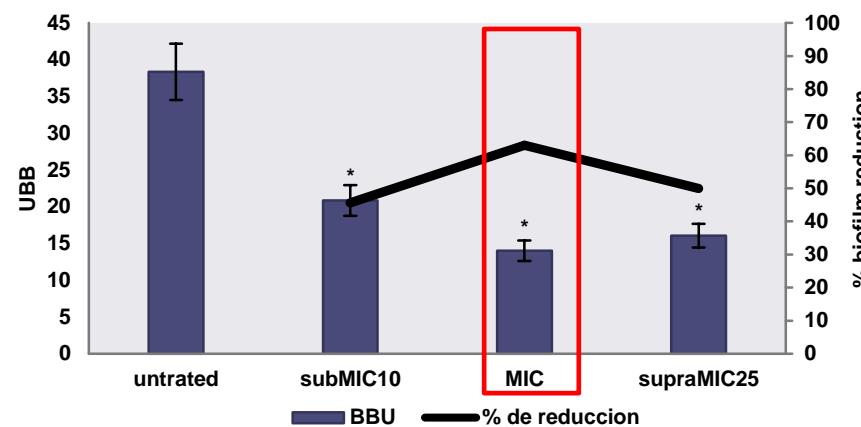
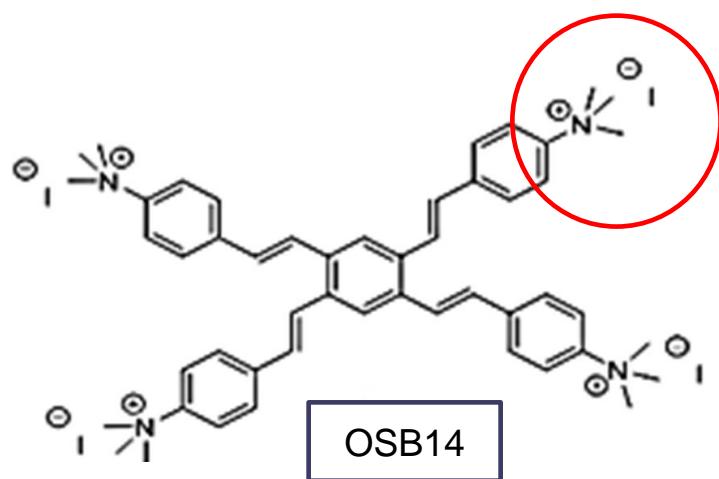
Candida tropicalis is particularly relevant in urinary tract infection

Schematics the three stages of biofilm formation by *Candida tropicalis*



INTRODUCTION

Olygostyrylbenzenes (OSBs) can be envisaged as the first generation of poly(phenylene)vinylene dendrimers with a rigid conjugated scaffold and a promising antibacterial activity.



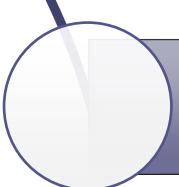
COMBINATION	BBU	BIOFILM REDUCTION (%)	FICI	
AmB/OSB	-	-	-	-
SupraMIC/MIC	18	52	1	ADDITIVE
SupraMIC/SubMIC	4	90	1	ADDITIVE
SubMIC/MIC	6	92	0.04	SYNERGISM

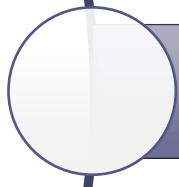
OBJECTIVE

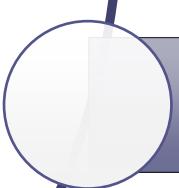
Evaluate the changes in the topography and architecture of mature biofilms of *C. tropicalis* produced by OSB14 action and the synergistic association with AmB.

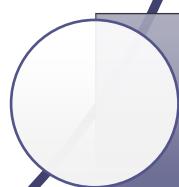
MATERIALS and METHODS

 Yeast Strain: *C. tropicalis* NCPF 3111 (National Collection of Pathogenic Fungi, Bristol, UK)

 Conditions: OSB14 compound (MIC), AmB (SMIC90), synergistic association with AmB (subMIC/MIC) and untreated biofilms.

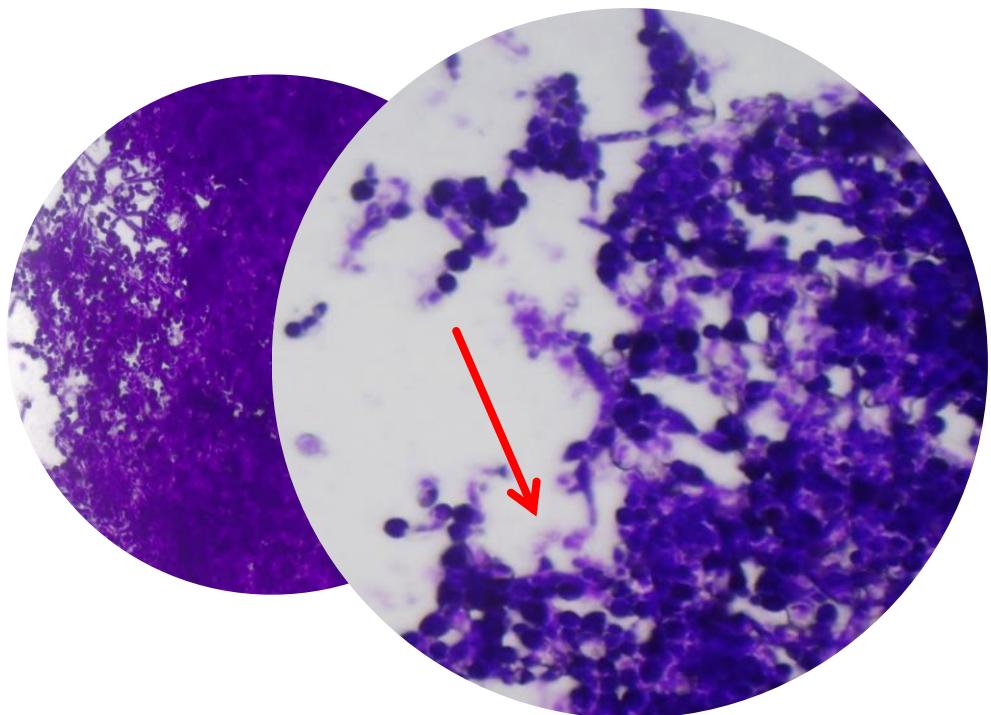
 Light microscope (LM): Each condition was stained with 1% (w/v) cristal violet.

 Confocal laser scanning microscopy (CLSM): The biofilms were stained with Calcofluor-White dye.

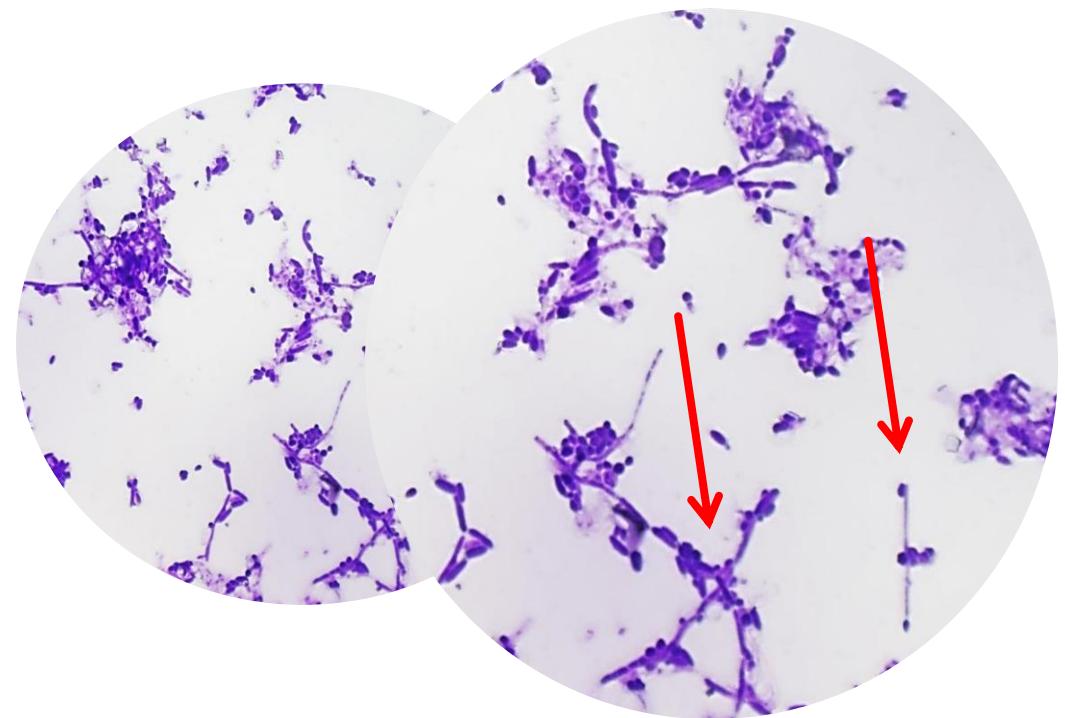
 The analysis of different variables describing the biofilm structure: biomass or bio-volume ($\mu\text{m}^3/\mu\text{m}^2$), thickness (μm), maximum diffusion distance (μm) and roughness coefficient was performed with the program COMSTAT.

RESULTS: LM

UNTREATED

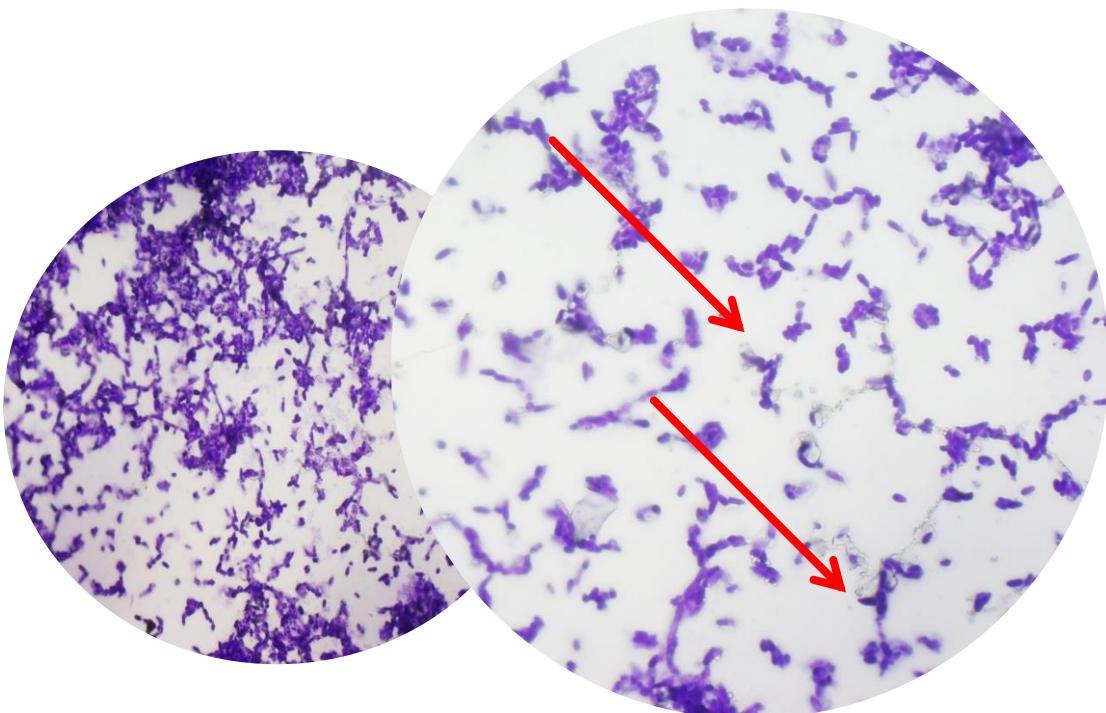


AmB

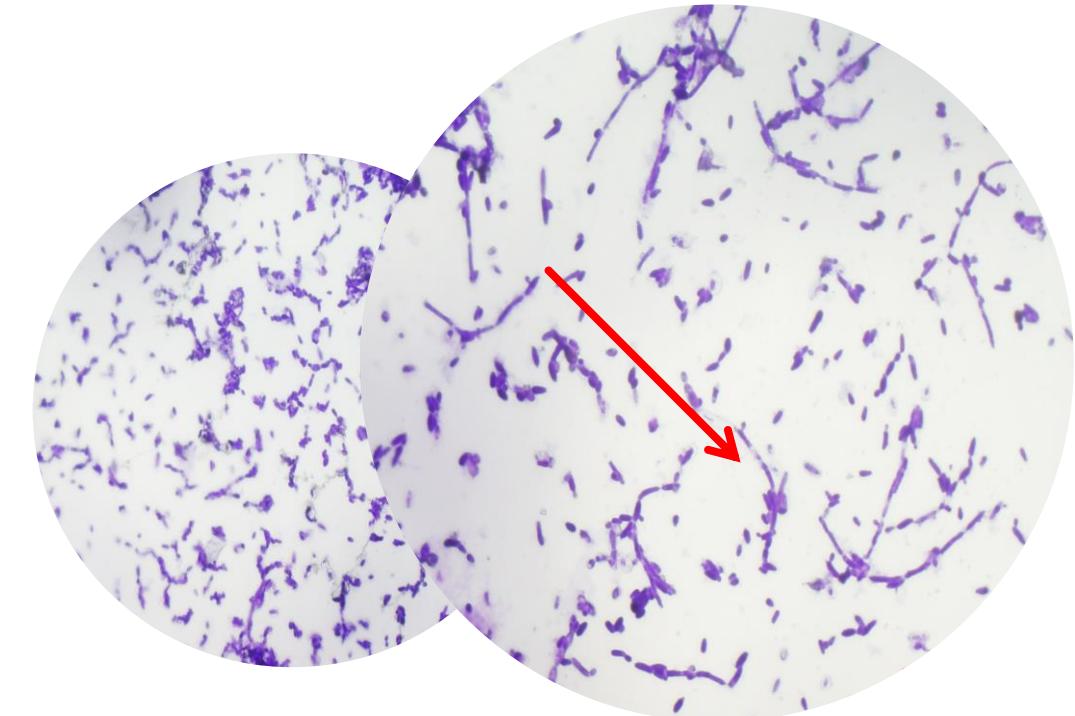


RESULTS: LM

OSB14

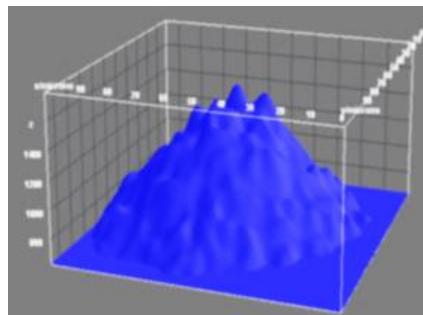
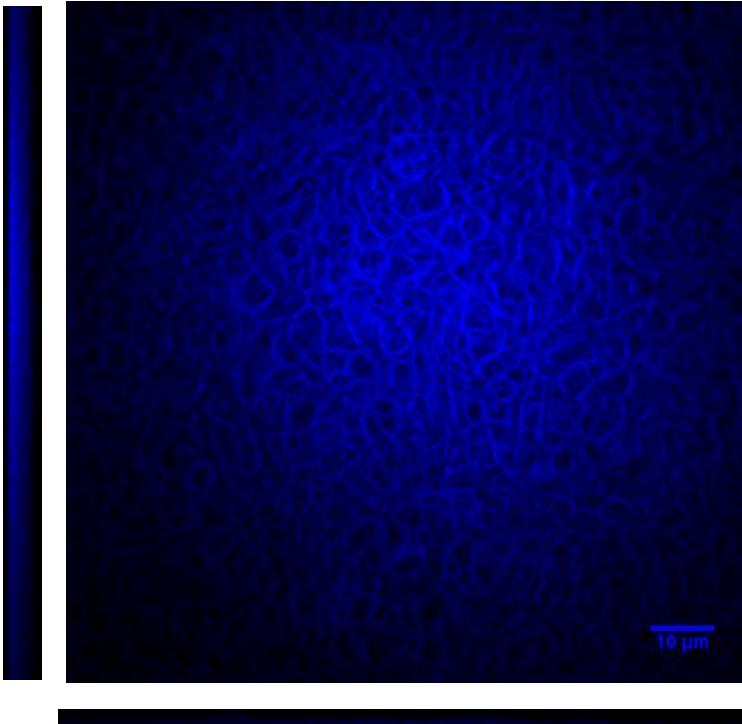


SINERGY ASSOCIATION
AmB/OSB14

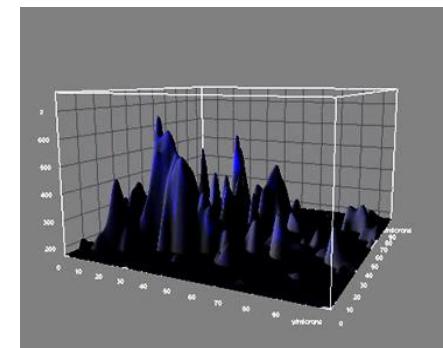
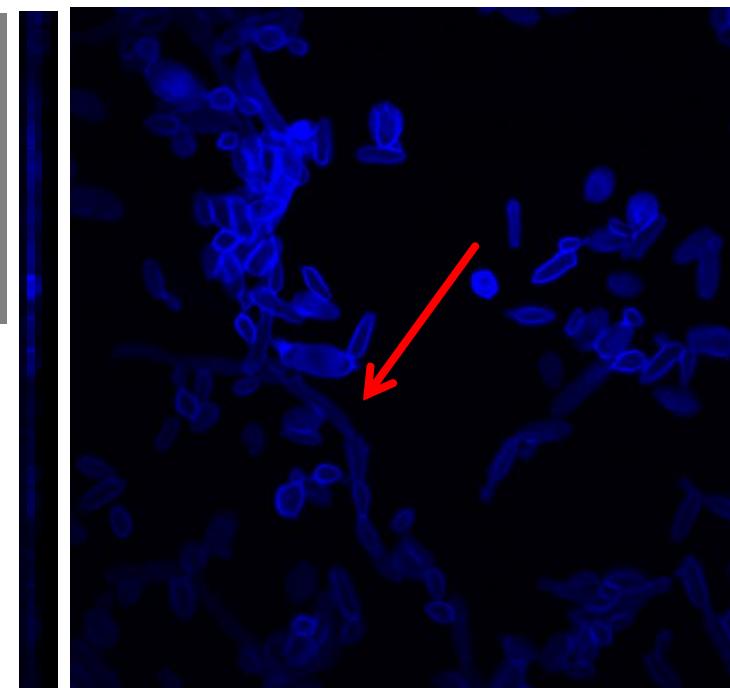


RESULTS: CLSM

UNTREATED

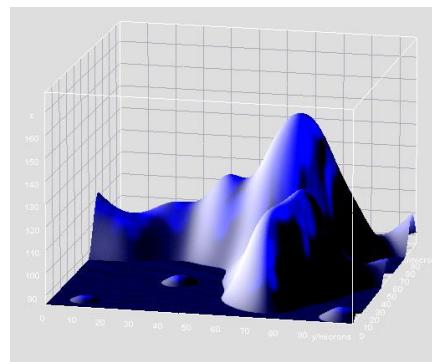
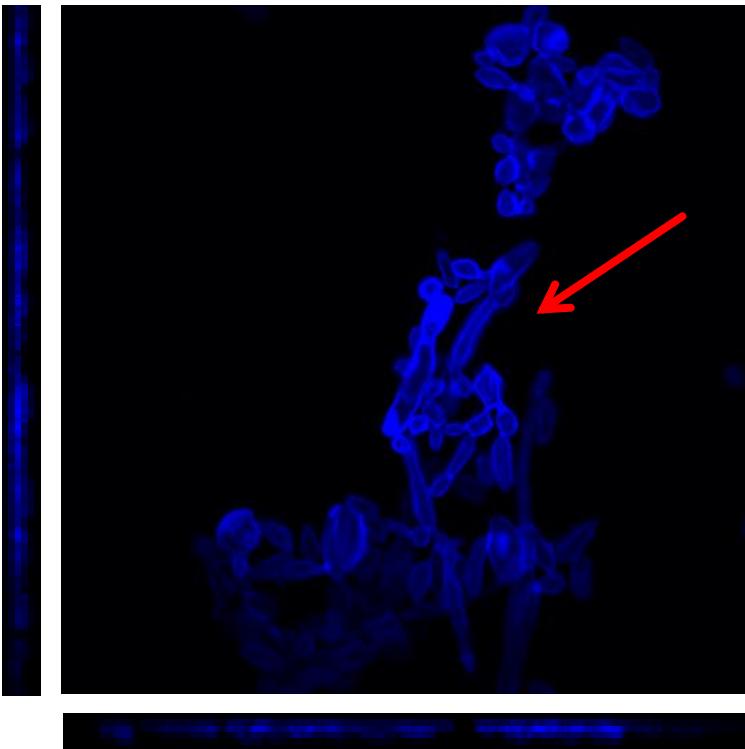


AmB

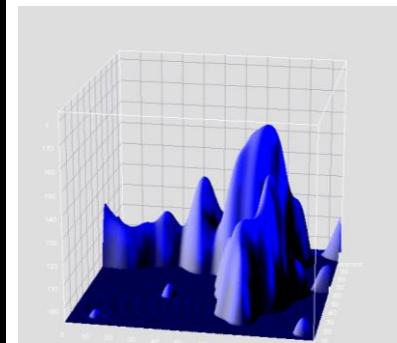
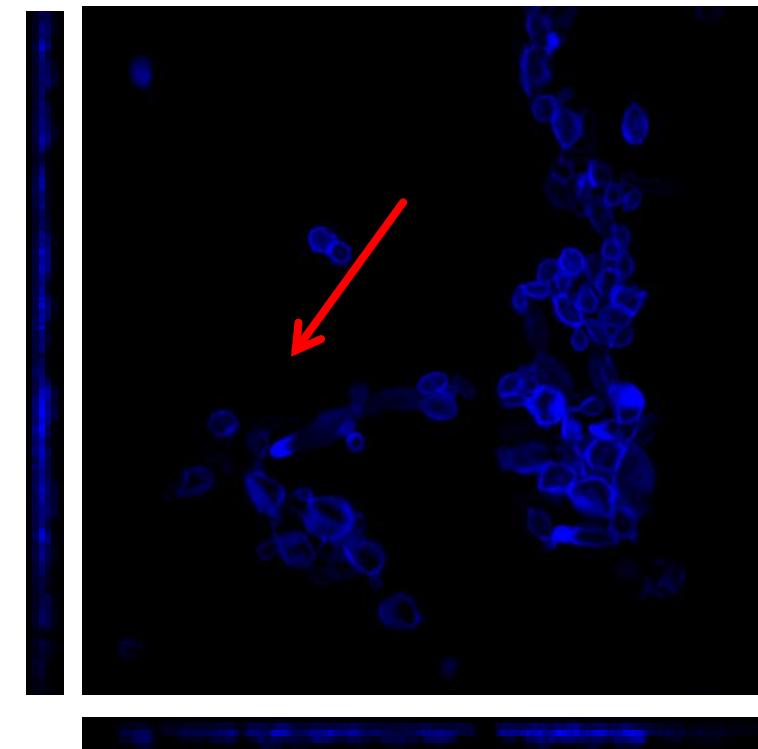


RESULTS: CLSM

OSB14



SINERGY ASSOCIATION
AmB/OSB14



COMSTAT

RESULTS

14

COMB.

AmB

Untreated

	(MIC)	(subMIC/MIC)	(SMIC90)	biofilms
Bio-volume ($\mu\text{m}^3/\mu\text{m}^2$)	$3,13 \pm 0,24$	$0,49 \pm 0,04$	$0,57 \pm 0,05$	$7,03 \pm 0,78$
Thickness (μm):	$1,34 \pm 0,32$	$0,44 \pm 0,03$	$0,42 \pm 0,05$	$6,97 \pm 0,74$
Maximum diffusion distance (μm)	$1,22 \pm 0,02$	$0,79 \pm 0,03$	$0,59 \pm 0,01$	$1,66 \pm 0,88$
Roughness coefficient	$1,31 \pm 0,19$	$1,38 \pm 0,24$	$1,62 \pm 0,01$	$0,31 \pm 0,01$

CONCLUSION

Biofilms infections are particularly difficult to eradicate, and the most used available antifungals have a limited activity in them.

The information obtained is relevant to understand the changes in the architecture and the microenvironment of *Candida* biofilms with this new antifungal agent, developing different aspects of its mechanism of action.



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