



## Introduction

*Candida* species are characterized as a naturally occurring, opportunistic pathogenic yeast.<sup>1</sup> For healthy adults, *Candida* species can be found in the mouth, within the gastrointestinal tract, and in other parts of the body.<sup>2</sup> Individuals with a weakened immune system or an uncontrolled medical condition may experience a *Candida* overgrowth due to microbiome dysbiosis. This condition, called candidiasis, can lead to discomfort, pain, or irritation in the affected mucosal areas.



Figure 1. Example of Oral Candidiasis

Fluconazole is typically the first option for treating candidiasis; however, some individuals may develop resistance to this azole antifungal, making it less effective. The development of new antifungal drugs is imperative due to the limited availability of effective treatments. Natural small molecules are an important source of new antimicrobial pharmacophores. Our research group has isolated new polyprenylated benzophenones from the fruits and seeds of *Garcinia brasiliensis*, which have shown potential to express both antibacterial and antifungal properties.<sup>3</sup>

## Objective

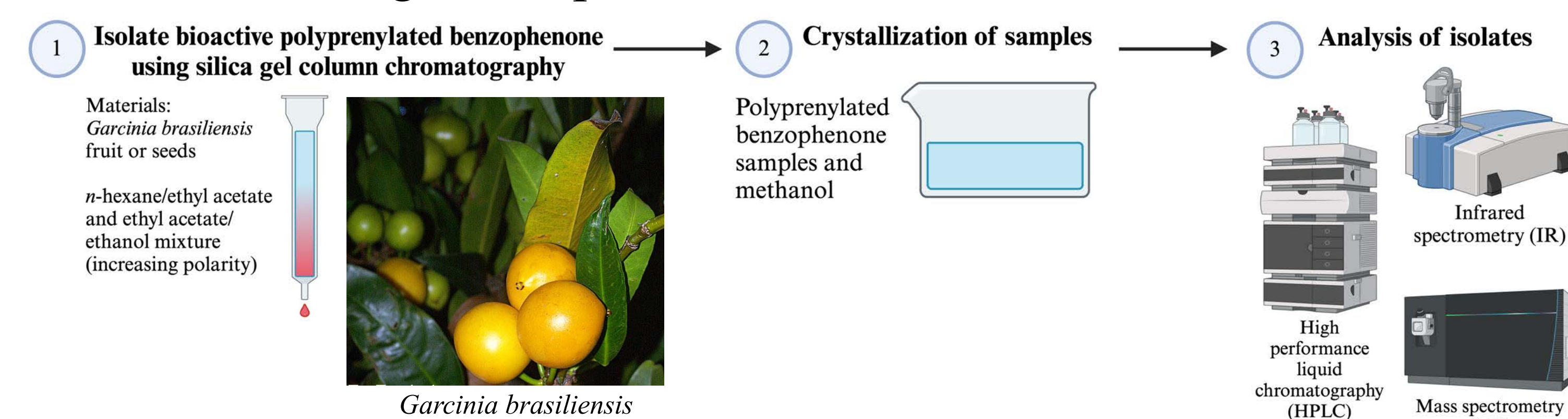
To evaluate the *in vitro* antifungal activity of various Benzophenones against *Candida* spp and determine the cytotoxicity of select drugs against oral cell line cultures.

## References

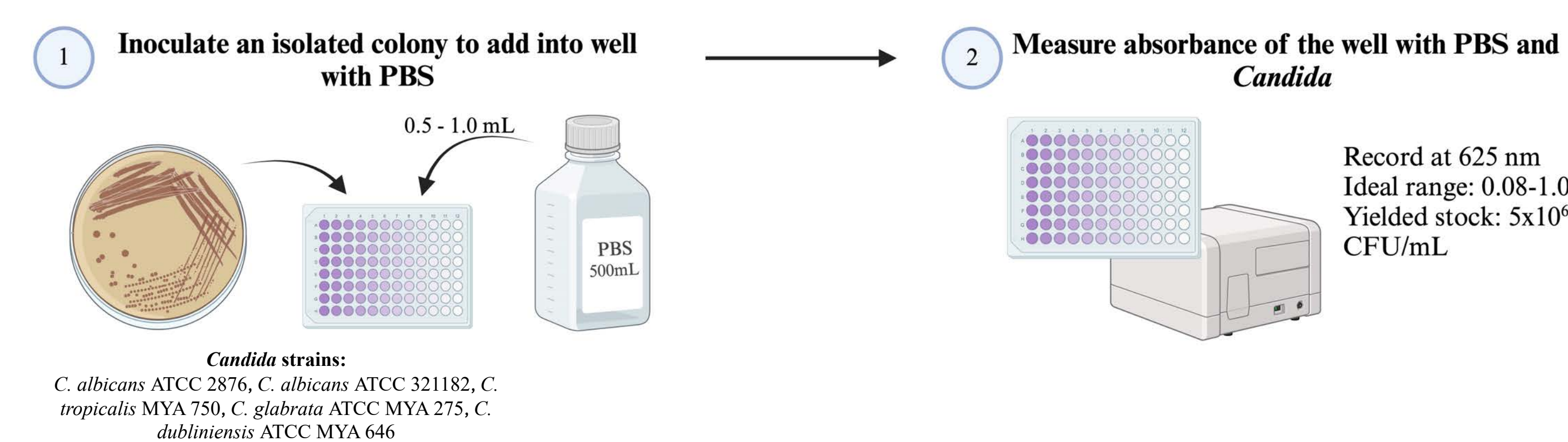
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## Methods

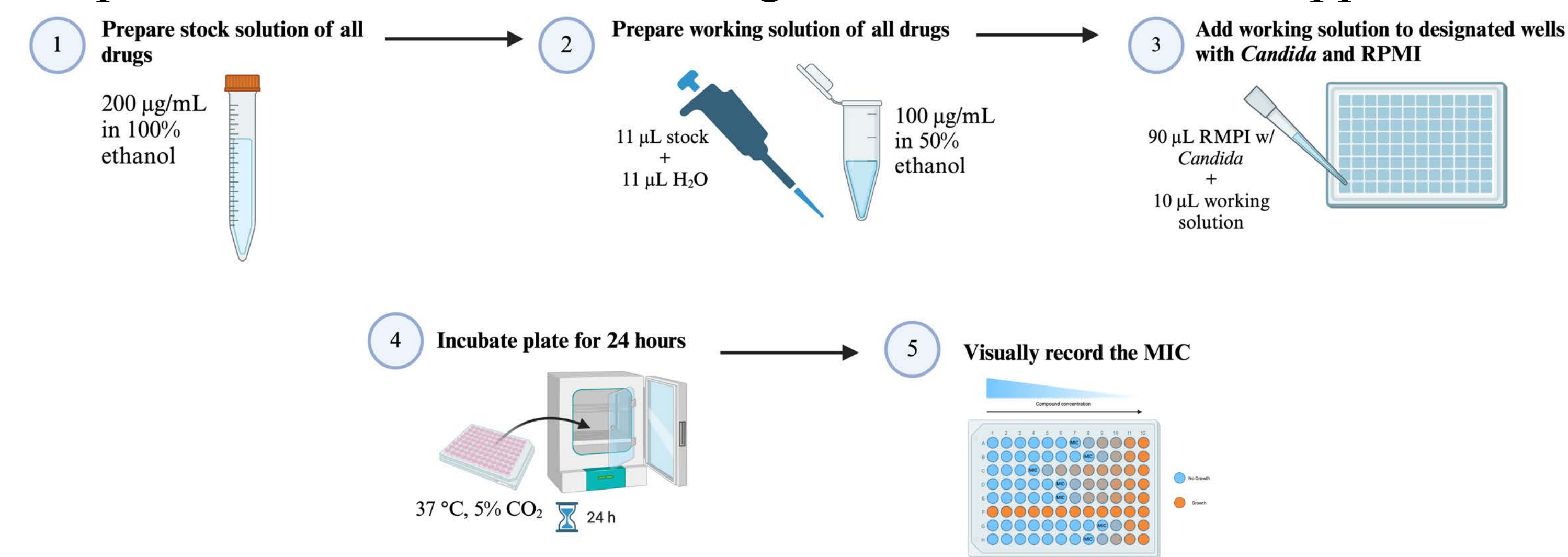
### Obtaining Benzophenones from *Garcinia brasiliensis*



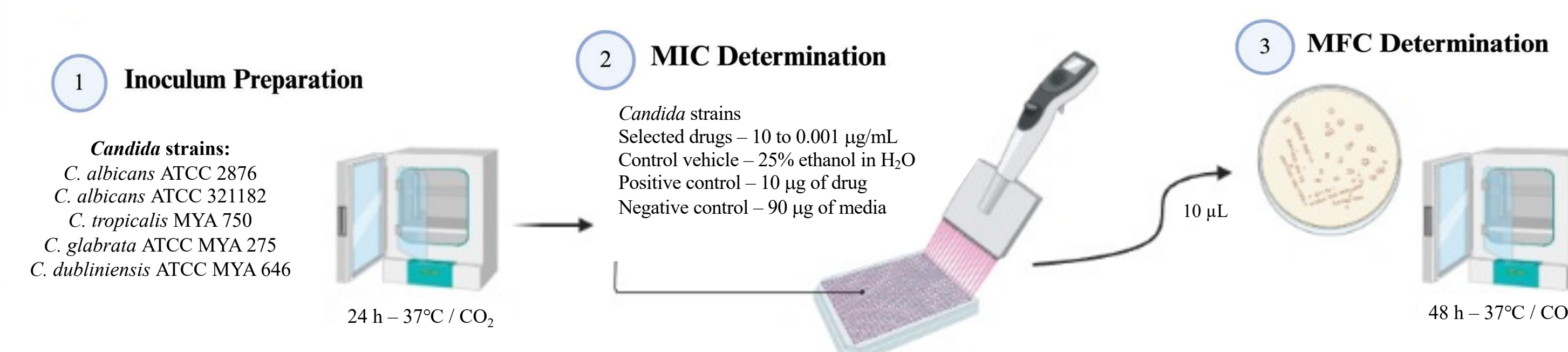
### Preparation of *Candida* Species<sup>4</sup>



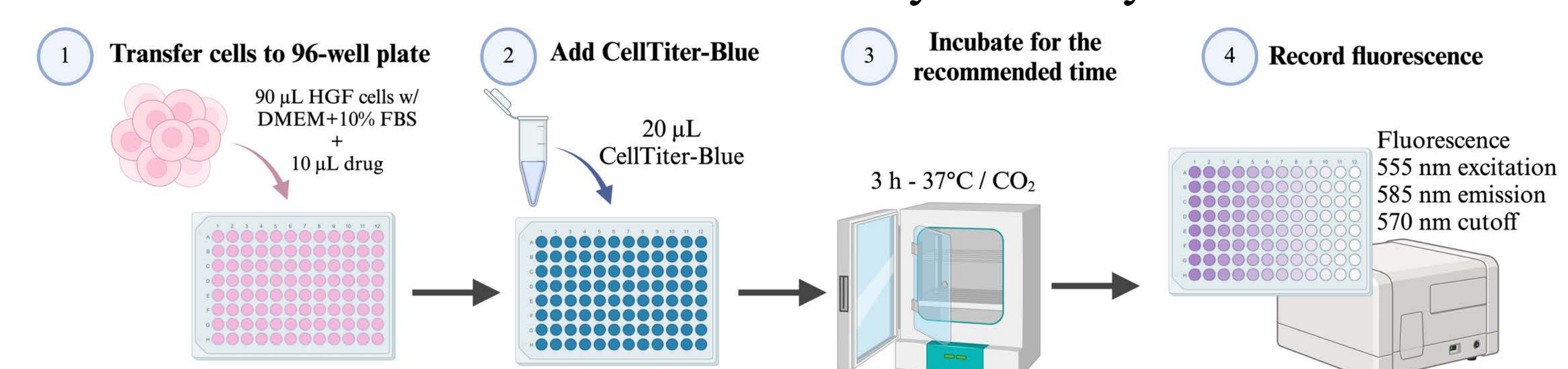
### Preparation and Selection of Drugs with Initial 96-Well Application



### Determination of Minimal Inhibitory Concentration (MIC) and Minimal Fungicidal Concentration (MFC)<sup>5</sup>



### Determination of Cytotoxicity



## Results

Table 1. Determination of MIC/MFC for all drugs using various *Candida* species

Sample Names	<i>C. albicans</i> (ATCC MYA 2876)		<i>C. albicans</i> (ATCC 321182)		<i>C. dubliniensis</i> (ATCC MYA 646)		<i>C. glabrata</i> (ATCC MYA 275)		<i>C. tropicalis</i> (ATCC 750)	
	MIC	MFC	MIC	MFC	MIC	MFC	MIC	MFC	MIC	MFC
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (CT (chá))	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (CT (chá))	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (CT (chá))	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cafes (Cold Plasma)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (CT)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 1)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 2)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 3)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 4)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 5)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 6)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Benzophenone Synthetic (Cold Plasma - 7)	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity
Benzophenone Synthetic (Cold Plasma - 8)	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity
EXTRACT OF BACUPARI SKIN (CT)	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity
ETHANOL EXTRACT OF BACUPARI SEEDS (CT)	No activity	No activity	No activity	No activity	10-1	10-1	No activity	No activity	10-1	10-1
7-EPICLUSIANONA (CT)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7-EPICLUSIANONA (Cold Plasma - 1)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7-EPICLUSIANONA (Cold Plasma - 2)	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GUTTIFERONA-A (CT)	No activity	No activity	10-1	10-1	10-1	10-1	10-1	10-1	10-1	10-1
FUKUGETINA (CT)	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity
Synthetic Molecules (CAF-PC (CT))	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity	No activity
Synthetic Molecules (CAF-BZ (CT))	No activity	No activity	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

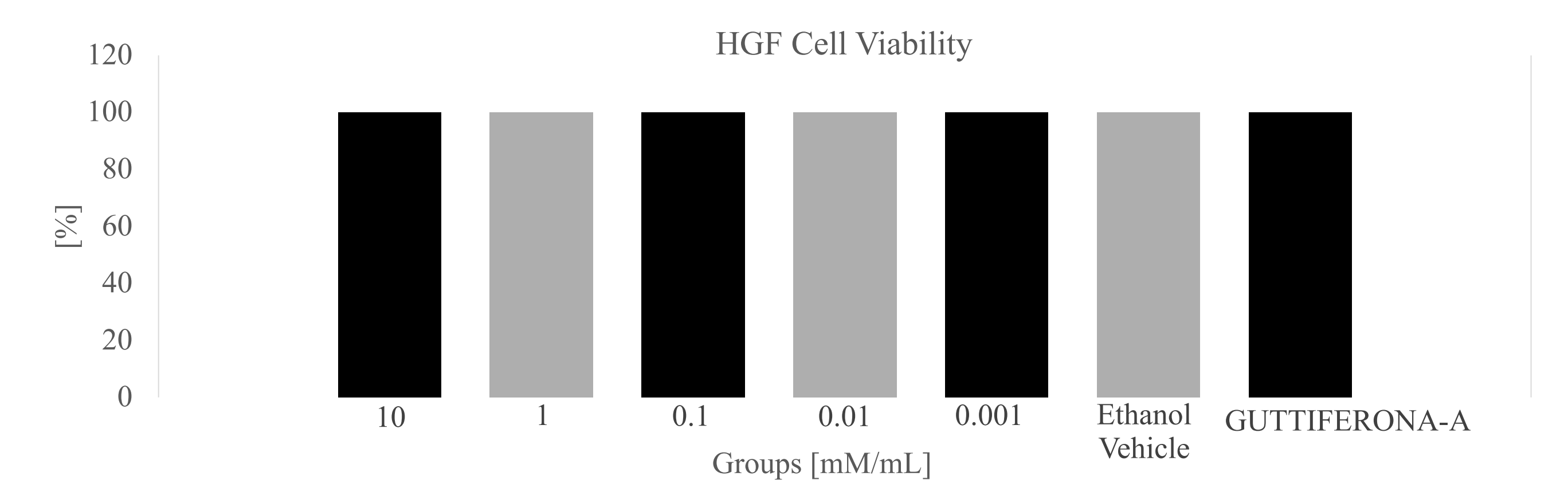


Figure 2. Cytotoxicity of Guttiferona-a at various concentrations and 2.5% ethanol vehicle compared to control group of only HGF cells

## Conclusions

Polyprenylated benzophenones do express antifungal properties at certain concentrations. Guttiferona-a produced the most MIC/MFC results at 1-10 mM/mL. In addition, it also posed no cytotoxic effects between 0.001-10 mM/mL against oral cell line cultures (HGF).

## Acknowledgements

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