

# High-throughput screening for detection of monoamine oxidases and transaminases in fungi isolated from human skin.

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## Abstract

High-throughput screening (HTS) assays were applied to screen enzymatic activity of monoamine oxidases and transaminases in fungi.

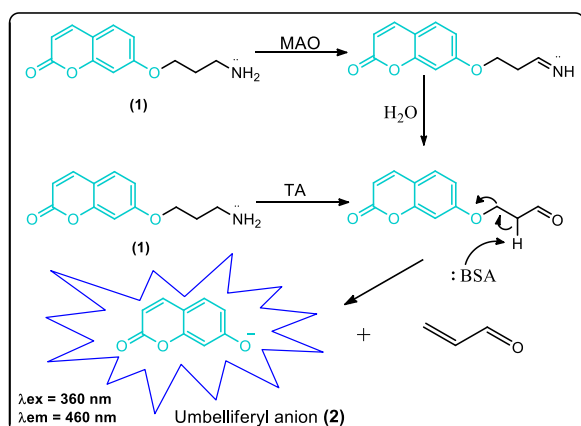
## Introduction

Enzymes have been widely used in the chemical industry, because they are versatile catalysts that operate under mild conditions and follow the Principles of Green Chemistry. Consequently, there is a huge demand for new sources of enzymes, which may be accomplished by the enzymatic screening of microorganisms.<sup>1</sup>

Such a screening when associated with fluorogenic substrates is a simple, low cost and sensitive technique, that allows a rapid evaluation of a large number of samples.<sup>2,3</sup> Thus, HTS technique was applied to search monoamine oxidases (MAO) and transaminases (TA) in 39 fungi isolated from human skin<sup>4</sup>.

## Results and Discussion

Fungi were screened using the methodology described by Badalassi *et al.* (2000)<sup>5</sup> adapted for whole microbial cells<sup>6</sup>. Figure 1 shows the HTS assay scheme using the fluorogenic probe 1.



**Figure 1.** Fluorogenic assay to detect MAO and TA activities.

Assays were performed in 96-well microplates (200  $\mu$ L) and monitored by fluorescence ( $\lambda_{\text{ex}}$  460 nm) for 96h at plate reader (PerkinElmer EnSpire).

The concentration of the microbial suspension used was 50 mg/mL and for the probe 1 was 100  $\mu$ mol L<sup>-1</sup>.

Of the 39 fungi screened, 12 of them showed more than 15% of conversion of the probe 1 within 96h of reaction, as shown in Table 1.

**Table 1.** Enzymatic Conversion (%) of the fluorogenic probe 1.

Code	Fungus	Enzymatic Conversion (%)			
		24h	48h	72h	96h
7M1	<i>Epicoccum sp.</i>	6	14	19	21
9M1	<i>Epicoccum sp.</i>	18	23	27	31
23M1-IS4	<i>Scolecobasidium sp.</i>	43	60	60	60
28M1	<i>Epicoccum sp.</i>	15	21	23	25
28M2	<i>Epicoccum sp.</i>	10	15	17	20
28M3-IS2	<i>Epicoccum sp.</i>	13	16	16	20
28M4	<i>Phoma sp.</i>	9	12	14	19
28M5	<i>Massarina sp.</i>	9	13	16	30
30M1-IS1	<i>Phoma sp.</i>	12	16	22	25
30M1-IS2	<i>Aureobasidium sp.</i>	16	18	19	22
37M-IS2	<i>Marasmius sp.</i>	22	29	35	40
43M1	NI	17	20	24	32

NI = Not Identified

## Conclusions

Monoamine oxidases/transaminases activities were detected in 12 fungi. After, these fungi will be evaluated by conventional biocatalysis assays with amines of synthetic interest.

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