

## Accepted Manuscript

Inhibitory properties of aromatic thiosemicarbazones on mushroom tyrosinase: Synthesis, kinetic studies, molecular docking and effectiveness in melanogenesis inhibition

K. Hałdys, W. Goldeman, M. Jewgiński, E. Wolińska, N. Anger, J. Rossowska, R. Latajka

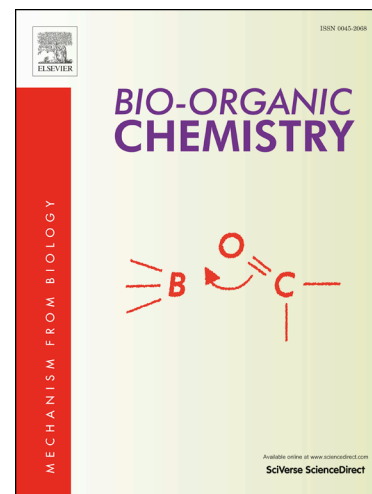
PII: S0045-2068(18)30591-1  
DOI: <https://doi.org/10.1016/j.bioorg.2018.09.003>  
Reference: YBIOO 2500

To appear in: *Bioorganic Chemistry*

Received Date: 15 June 2018  
Revised Date: 5 September 2018  
Accepted Date: 6 September 2018

Please cite this article as: K. Hałdys, W. Goldeman, M. Jewgiński, E. Wolińska, N. Anger, J. Rossowska, R. Latajka, Inhibitory properties of aromatic thiosemicarbazones on mushroom tyrosinase: Synthesis, kinetic studies, molecular docking and effectiveness in melanogenesis inhibition, *Bioorganic Chemistry* (2018), doi: <https://doi.org/10.1016/j.bioorg.2018.09.003>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Inhibitory properties of aromatic thiosemicarbazones on mushroom tyrosinase: Synthesis, kinetic studies, molecular docking and effectiveness in melanogenesis inhibition

K. Haldys<sup>1\*</sup>, W. Goldeman<sup>2</sup>, M. Jewgiński<sup>1</sup>, E. Wolińska<sup>1</sup>, N. Anger<sup>3</sup>, J. Rossowska<sup>3</sup>, R. Latajka<sup>1</sup>

<sup>1</sup>Department of Organic and Pharmaceutical Technology, Wrocław University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland

<sup>2</sup>Department of Organic Chemistry, Wrocław University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland

<sup>3</sup>Ludwik Hirszfeld Institute of Immunology and Experimental Therapy, Polish Academy of Science, Rudolfa Weigla 12, 53-114 Wrocław, Poland

## Abstract

The group of 19 thiosemicarbazones (TSCs) were synthesized and its inhibitory activity toward mushroom tyrosinase and ability to inhibition of melanogenesis in B16 cells were investigated. Moreover, molecular docking of these compounds to the active site of the enzyme was performed. The obtained results allowed to make the structure-activity relationship (SAR) analysis. Kinetic studies revealed that TSCs 1, 2, 11 and 18 have better inhibitory properties than kojic acid, a reference compound, with the best inhibitory constant ( $K_i$ ) value of 0,38  $\mu\text{M}$  for TSC 2. According to SAR analysis, the smaller and less branched molecules exhibit higher affinity to the enzyme. Melanin production in B16 cells was inhibited by all investigated compounds at micromolar level. Most of compounds studied in this work can be considered as potent inhibitors of tyrosinase and melanogenesis. They may have broad application in food preservatives and cosmetics. Combined results of molecular docking and SAR analysis can be helpful in designing novel tyrosinase inhibitors of desired properties.

katarzyna.haldys@pwr.edu.pl; waldemar.goldeman@pwr.edu.pl;  
michal.jewginski@pwr.edu.pl; ewa.mrozinska@pwr.edu.pl; natalia.anger@iitd.pan.wroc.pl;  
joanna@iitd.pan.wroc.pl; rafal.latajka@pwr.edu.pl

Keywords: tyrosinase, thiosemicarbazones, kinetic studies, SAR, molecular docking, B16F10 cell line.

Download English Version:

<https://daneshyari.com/en/article/11006195>

Download Persian Version:

<https://daneshyari.com/article/11006195>

[Daneshyari.com](https://daneshyari.com)