

TECHNOLOGY OFFER

# ANTIMALARIAL AGENT, METHODS AND USES THEREOF

This invention relates to halogenated alkyl-aromatic secondary metabolites, in particular hierridin C and its application as an antimalarial and anticancer agent. Furthermore, this technology relates to methods to obtain this novel compound from the cyanobacterium *Cyanobium sp.* LEGE 06113 and to methods to chemically synthesize it under laboratory conditions.

## KEYWORDS

Hierridin C

Halogenated alkyl-aromatic

Antimalarial

Anticancer

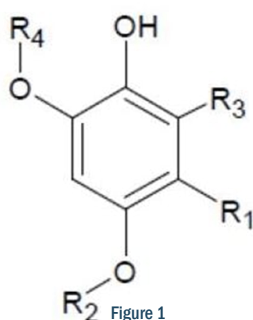
Cyanobacteria

## DESCRIPTION

In 2020, nearly half of the world's population was at risk of malaria and according to the latest World Health Organization Malaria Report, there were 241 million cases of malaria infection, resulting in 627.000 deaths.

Over the last decade, there is a growing need for antimalarial agents, either for monotherapy or as multi-drug therapies as drug-resistant strains are emerging worldwide, in particular mefloquine and chloroquine resistant strains. Therefore, new agents able to kill the resistant malaria parasites are warranted.

This technology relates to new halogenated alkyl-aromatic secondary metabolites obtained from *Cyanobium sp.* LEGE 06113, hierridin C (Figure 1) and its derivatives and their use as an antimalarial and anticancer agents. This technology comprises the methods to obtain the compound from cyanobacterial cultures, and to methods to chemically synthesize hierridin C and its derivatives under laboratory conditions.



The solution herein relates to compounds sharing the same halogenated skeleton as hierridin C (Figure 1), and to its use in formulations for treating, preventing or inhibiting malaria in humans.

## ADVANTAGES & INNOVATIONS

The advantage of this invention is that there is no strain of *P. falciparum* known to be resistant to halogenated alkyl-aromatic secondary metabolite, in particular hierridin C and its derivatives. This is relevant as death by malaria is almost exclusively caused by *P. falciparum*.

The hierridin C is a natural product and can be obtained from a renewable, photoautotrophic source by mass culturing in the laboratory or open ponds or alternatively it may be chemically synthesized.

The hierridin C is a new antimalarial agent, which can be used to treat malaria, one of the most prevalent and life threatening infectious diseases in the developing world.

## ANTIMALARIAL AGENT, METHODS AND USES THEREOF



### INTELLECTUAL PROPERTY RIGHTS

#### Patents granted

International Patent Application via PCT W02016207869, 27.06.2016:  
<https://patentscope.wipo.int/search/en/detail.jsf?docId=W02016207869>

Entry in India National phase in 21.12.2017; Entry in Brazil National phase in 03.04.2018.

Patent Granted in USA on 14.05.2019; Patent Granted in Europe on 13.11.2019.



### DEVELOPMENT STAGE

#### Technology Development / Laboratory Testing (TRL 4 - 5)

TRL 4 - The technology was validated in the laboratory.

Further development for validation in large scale setups required.



### COOPERATION OPPORTUNITY

#### Research Cooperation Agreement, License Agreement, Commercial Agreement

Intellectual Property Licensing agreement, product development agreement.

Collaboration for further implementation of the antimalarial drug discovery pipeline, namely regarding lead optimization and in vivo experiments.



### RELEVANT PUBLICATIONS

Costa M., Sampaio-Dias I.E., Castelo-Branco R., Scharfenstein H., de Castro R.R., Silva A., Schneider M.P.C., Araújo M.J., Martins R., Domingues V.F., Nogueira F., Camões V., Vasconcelos V.M., Leão P.N. 2019. Structure of Hierridin C, Synthesis of Hierridins B and C, and Evidence for Prevalent Alkylresorcinol Biosynthesis in Picocyanobacteria. *Journal of Natural Products* 82(2): 393-402. <http://dx.doi.org/10.1021/acs.jnatprod.8b01038>

### DEVELOPED BY



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