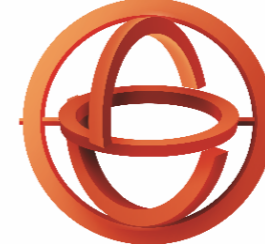


Description of Funded Research Projects

1<sup>st</sup> Call for H.F.R.I. Research Projects  
to support Post-Doctoral Researchers



**H.F.R.I.**  
Hellenic Foundation for  
Research & Innovation

Research Project Title:

**Synthetic and biological studies of the  
antibacterial antitumour natural product  
oleamycin A and structural analogues**

**Principal Investigator:**  
Michail Tsakos

**Popular Title:**

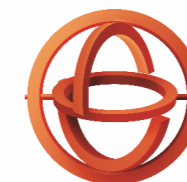
Synthetic study of the natural product oleamycin A  
which exhibits antibiotic and anticancer activity

**Scientific Field:**

Organic Chemistry, Chemical Biology

**Host Institution:**

National and Kapodistrian University of  
Athens



**H.F.R.I.**  
Hellenic Foundation for  
Research & Innovation

Oleamycin A is a macrocyclic lipodepsipeptide isolated in 2014 from *Streptomyces* sp. (strain Lv20-58) and was found to exhibit pronounced antimicrobial activity in vitro against a panel of Gram-positive bacteria, and potent cytotoxicity against the HCT-116 human colon carcinoma cell line with an IC<sub>50</sub> in the low nanomolar range (6.5 ng/ml). Structurally, oleamycin A is characterized by a complex architecture comprising a hexadepsipeptidic macrocyclic core and a polyketide side chain, while its absolute configuration has yet to be determined.

Primarily, this proposal describes experiments focused on the total synthesis and structural elucidation of oleamycin A to fuel biochemical experiments aimed at deciphering the origin of its remarkable biological activity. Moreover, our objective is to prepare structural analogues of oleamycin A, such as other members of this family of secondary metabolites or rationally designed non-natural analogues, in order to investigate the structure-activity relationship, and to shed light on the molecular mode-of-action of this class of antitumour antibiotics.

Recent studies have shown that colorectal cancer constitutes the second cause of death in Greece. In particular, cancer incidence rates are unexpectedly increasing among young people (age 20 – 29) who, until now, were “flying under the radar of prevention”. Oleamycin A is an organic compound produced naturally by bacteria that live around the route zone of the Mediterranean olive tree, and it has been shown to exhibit pronounced anticancer activity against the HCT-116 human colon carcinoma cell line.

Apart from its conspicuous application as a potential chemotherapy regimen, our objective is to use the natural product or a designed synthetic analogue as a biochemical tool in order to discover novel oncologically relevant proteins. This study appertains to the field of Chemical Biology, the goal of which is to provide a deeper understanding of the origin and progression of cancer.

“



The HFRI grant for postdoctoral researchers offered me the opportunity, after four years of postdoctoral appointments in three different countries abroad, to return to my home country whilst taking the next step in my research career. Given that I am the Principal Investigator now, this grant allows me to work on my own ideas, evolve as a researcher by taking initiatives, but also responsibilities that will help me mature as a scientist and will secure a smooth transition towards a successful academic career.

*The Principal Investigator,  
Michail Tsakos*

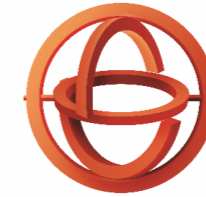
## Funding

Amount: **200,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**





**H.F.R.I.**  
Hellenic Foundation for  
Research & Innovation

## CONTACT

185, Syggrou Ave. & Sardeon St. 2

17 121 Nea Smyrni, Greece

[info@elidek.gr](mailto:info@elidek.gr)

[www.elidek.gr](http://www.elidek.gr)



HELLENIC REPUBLIC  
MINISTRY OF  
DEVELOPMENT AND INVESTMENTS

**GSRT**

GENERAL SECRETARIAT FOR  
RESEARCH AND TECHNOLOGY