

Targeting chikungunya virus replication: insights into chikungunya virus replication and the antiviral activity of suramin in vitro Albulescu, I.C.

Citation

Albulescu, I. C. (2019, November 27). *Targeting chikungunya virus replication : insights into chikungunya virus replication and the antiviral activity of suramin in vitro*. Retrieved from https://hdl.handle.net/1887/80955

Version: Publisher's Version

License: License agreement concerning inclusion of doctoral thesis in the

Institutional Repository of the University of Leiden

Downloaded from: https://hdl.handle.net/1887/80955

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle http://hdl.handle.net/1887/80955 holds various files of this Leiden University dissertation.

Author: Albulescu, I.C.

Title: Targeting chikungunya virus replication: insights into chikungunya virus

replication and the antiviral activity of suramin in vitro

Issue Date: 2019-11-27

Targeting chikungunya virus replication

Insights into chikungunya virus replication and the antiviral activity of suramin *in vitro*

Irina Cristina Albulescu

PhD thesis, Leiden University, 2019.

The research described in this thesis was performed at Leiden University Medical Center,

Department of Medical Microbiology, Leiden, The Netherlands.

This work was financially supported by the European Union 7th Framework Programme EUVIRNA (a Marie Curie Initial Training Network), grant agreement no. 264286, and the by the European Union's Horizon 2020 Research and Innovation Programme under

ZIKAlliance grant agreement no. 734548.

Cover design by Roxana Drăgușel.

Printed by: Proefschrift-AIO.nl

ISBN: 978-94-93184-16-9

Copyright © 2019, Irina C. Albulescu, all rights reserved

Targeting chikungunya virus replication

Insights into chikungunya virus replication and the antiviral activity of suramin *in vitro*

Proefschrift

ter verkrijging van de graad van Doctor aan de Universiteit Leiden, op gezag van Rector Magnificus prof.mr. C.J.J.M. Stolker, volgens besluit van het College voor Promoties te verdedigen op woensdag 27 november 2019 klokke 16:15 uur

door

Irina Cristina Albulescu geboren te Petroșani, Romania in 1985 Promotor: Prof. Dr. E.J. Snijder

Co-promotor: Dr. M.J. van Hemert

Leden Promotiecommissie: Prof. Dr. A.E. Gorbalenya

Prof. Dr. H. Ovaa

Prof. Dr. J.M. Smit, UMC Groningen

Dr. L. Delang, KU Leuven

"I know, I know the sun is hot Mosquitos come suck your blood Leave you there all alone Just skin and bone

. . .

Swallow and chew
Eat you alive
All of us food
That hasn't died"

(lyrics from the "Mosquito Song", by Queens of the Stone Age)

Contents

Chapter 1 - General introduction, aim, and outline of the thesis	9
Chapter 2 - An <i>in vitro</i> assay to study chikungunya virus RNA synthesis and the mode of action of inhibitors	41
Chapter 3 - Suramin inhibits chikungunya virus replication through multiple mechanisms	59
Chapter 4 - Suramin inhibits Zika virus replication through multiple mechanisms	79
Chapter 5 - Suramin inhibits chikungunya virus replication by interacting with virions and blocking the early events in infection (in preparation for submission)	95
Chapter 6 - General discussion and conclusion	117
Appendix	
List of Commonly Used Abbreviations	140
Summary	141
Samenvatting	143
Rezumat	145
Curriculum Vitae	147
List of Publications	148