

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/138650> holds various files of this Leiden University dissertation.

**Author:** Junaid, A.O.

**Title:** Microengineered human blood vessels for next generation drug discovery

**Issue date:** 2020-12-16

***Microengineered Human  
Blood Vessels For Next  
Generation Drug Discovery***

ISBN: 978-90-831117-1-1

© Abidemi Olakunle Junaid

Printed by: Print Service Ede

**Microengineered Human Blood Vessels For Next Generation Drug Discovery**

**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 16 december 2020  
klokke 12.30 uur

door

**Abidemi Olakunle Junaid**

geboren te Ibadan, Nigeria  
in 1990

**PROMOTOR**

Prof. dr. Thomas Hankemeier

Prof. dr. Anton Jan van Zonneveld

**CO-PROMOTOR**

Dr. Janine van Gils

Dr. Alireza Mashaghi

**PROMOTIECOMMISSIE**

Prof. dr. Hubertus Irth (voorzitter)

*Leiden University, the Netherlands*

Prof. dr. Joke Bouwstra (secretaries)

*Leiden University, the Netherlands*

Prof. dr. Gerald Urban

*University of Freiburg, Germany*

Prof. dr. Dirk Jan Duncker

*Erasmus University Medical Center, the Netherlands*

Prof. dr. Marie-José Goumans

*Leiden University Medical Center, the Netherlands*

Prof. dr. Bob van de Water

*Leiden University, the Netherlands*

Financial support by the Dutch Heart Foundation for the publication of this thesis is gratefully acknowledged.

The research described in this thesis was supported by a grant of the Dutch Heart Foundation (DHF CVON 2014-11 RECONNECT).

## Contents

<b>Chapter I</b>	
General Introduction	7
<b>Chapter II</b>	
An End-User Perspective on Organ-on-a-Chip: Assays and Usability Aspects	19
<b>Chapter III</b>	
Microengineered human blood vessel to study microvascular destabilization <i>in vivo</i>	47
<b>Chapter IV</b>	
Ebola hemorrhagic shock syndrome-on-a-chip	69
<b>Chapter V</b>	
Metabolic response of blood vessels to TNF $\alpha$	95
<b>Chapter VI</b>	
An integrated microvessels-on-a-chip platform for automated multi-channel perfusion and continual <i>in situ</i> oxygen monitoring	125
<b>Chapter VII</b>	
Discussion and Conclusion	143
<b>Chapter VIII</b>	
Summary	156
Nederlandse samenvatting	159
Acknowledgements	162
Curriculum Vitae	163
List of Publications	164

