



Universiteit
Leiden

The Netherlands

Dynamic polymer hydrogels as synthetic extracellular matrices for 3D cell culture

Liu, T.

Citation

Liu, T. (2021, October 26). *Dynamic polymer hydrogels as synthetic extracellular matrices for 3D cell culture*. Retrieved from <https://hdl.handle.net/1887/3223084>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3223084>

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

Dynamic polymer hydrogels as synthetic extracellular matrices for 3D cell culture

Proefschrift

ter verkrijging van

de graad van doctor aan de Universiteit Leiden,

op gezag van rector magnificus prof.dr.ir. H. Bijl,

volgens het besluit van het college voor promoties

te verdedigen op maandag 26 Oktober 2021

Klokke 11:15 uur

door

Tingxian Liu

Geboren op 15 November 1990, Xinyang, Henan, China

Promotiecommissie

Promotor: Prof. dr. A. Kros

Copromotor: Dr. R. E. Kieltyka

Overige Leden:

Prof. dr. H.S. Overkleeft (voorzitter), Faculty of Science, LIC

Prof. dr. R.T. Dame (secretaris), Faculty of Science, LIC

Prof. dr. S.E. Le Dévédec, Leiden Academic Centre for Drug Research (LACDR)

Prof. dr. P.C.J.J. Passier, Leiden University Medical Center (LUMC)

Prof. dr. S. Ghosh, Indian Association for the Cultivation of Science (IACS)

Doctoral Thesis, Leiden University, 2021

Cover Design: Tingxian Liu

To my family and friends

致 我的家人和朋友

Table of Content

Chapter 1

Introduction	7
--------------	---

Chapter 2

Squaramide-based supramolecular materials drive HepG2 spheroid differentiation	37
--	----

Chapter 3

Co-assembly of integrin-targeting peptides on squaramide supramolecular materials facilitate 3D expansion of hiPSCs	89
---	----

Chapter 4

Dynamic, cyclic thiosulfinate-crosslinked hydrogels enable cardiomyocyte natural behaviour in 3D	128
--	-----

Chapter 5

Engineering macroporous hydrogels using the tetrazine-norbornene click reaction	175
---	-----

Chapter 6

Summary and perspectives	213
--------------------------	-----

Samenvatting	218
---------------------	-----

Curriculum Vitae	223
-------------------------	-----

List of Publications	225
-----------------------------	-----

Acknowledgement	227
------------------------	-----

