



Universiteit
Leiden
The Netherlands

Inverse electron demand Diels-Alder pyridazine elimination: synthetic tools for chemical immunology

Geus, M.A.R. de

Citation

Geus, M. A. R. de. (2021, October 7). *Inverse electron demand Diels-Alder pyridazine elimination: synthetic tools for chemical immunology*. Retrieved from <https://hdl.handle.net/1887/3215037>

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/1887/3215037>

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

**Inverse electron demand Diels-Alder pyridazine elimination:
synthetic tools for chemical immunology**

Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op donderdag 7 oktober 2021
klokke 13:45 uur

door

Mark Alexander Ruben de Geus

Geboren te Nootdorp in 1990

Promotiecommissie

Promotores: Dr. S.I. van Kasteren
Prof. dr. H.S. Overkleeft

Overige leden: Prof. dr. A. Kros (voorzitter)
Prof. dr. M. van der Stelt (secretaris)
Dr. D.V. Filippov
Dr. K.M. Bongers (Radboud Universiteit Nijmegen)
Prof. dr. J.M. Fox (University of Delaware, Verenigde Staten)

Cover design by Dieuwertje van Dijk

Printed by Ridderprint B.V.

ISBN: 978-94-6416-782-5

dieuwbieus.nl

ridderprint.nl

"All we have to do is decide what to do with the time that is given to us"

J.R.R. Tolkien

Table of contents

Chapter 1	1
Bio-orthogonal bond-forming and breaking reactions in biology	
Chapter 2	17
An optimized synthesis of bifunctional cyclooctenes for click to release chemistry	
Chapter 3	35
Towards incorporation of <i>trans</i> -cyclooctene-modified amino acids in Fmoc solid phase peptide synthesis	
Chapter 4	59
Chemical control over T-cell activation <i>in vivo</i> : design and synthesis of <i>trans</i> -cyclooctene-modified MHC-I epitopes	
Chapter 5	91
Chemical activation of iNKT-cells: design and synthesis of caged α -galactosylceramide derivatives	
Chapter 6	117
Synthetic methodology towards allylic <i>trans</i> -cyclooctene-ethers enables modification of carbohydrates: bioorthogonal manipulation of the <i>lac</i> repressor	
Chapter 7	157
Summary and future prospects	
Nederlandse samenvatting	177
List of publications	181
Cirriculum vitae	183

