

University of Groningen

## Modular Chemical Probes

van der Zouwen, Antonie Jacobus

DOI:  
[10.33612/diss.195936165](https://doi.org/10.33612/diss.195936165)

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*  
Publisher's PDF, also known as Version of record

*Publication date:*  
2022

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*  
van der Zouwen, A. J. (2022). *Modular Chemical Probes: enabled by hydrazone and iminoboronate chemistry*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.  
<https://doi.org/10.33612/diss.195936165>

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

# Modular Chemical Probes

*Enabled by hydrazone and iminoboronate chemistry*

Antonie Jacobus van der Zouwen

The work described in this thesis was executed at the Stratingh Institute for Chemistry, University of Groningen, The Netherlands



**rijksuniversiteit  
 groningen**

The author of this thesis wishes to thank the Nederlandse Organisatie voor Wetenschappelijk Onderzoek for funding



Printed by Ipskamp



rijksuniversiteit  
groningen

# Modular Chemical Probes

Enabled by hydrazone and iminoboronate chemistry

## Proefschrift

ter verkrijging van de graad van doctor aan de  
Rijksuniversiteit Groningen  
op gezag van de  
rector magnificus prof. dr. C. Wijmenga  
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op  
maandag 10 januari 2022 om 16.15 uur

door

**Antonie Jacobus van der Zouwen**

geboren op 18 juli 1992  
te Helmond

## **Promotores**

Prof. dr. M.D. Witte

Prof. dr. A.J. Minnaard

## **Beoordelingscommissie**

Prof. dr. J.G. Roelfes

Prof. dr. F.J. Dekker

Prof. dr. R. Breinbauer

# Table of contents |

<b>Chapter 1</b>	Existing modular approaches to synthesize activity- and affinity-based chemical probes	7
<b>Chapter 2</b>	An <i>in situ</i> combinatorial methodology to synthesize and screen chemical probes	31
<b>Chapter 3</b>	Boron-assisted hydrazone and oxime ligations: rapid, reversible and versatile bioorthogonal reactions	85
<b>Chapter 4</b>	Iminoboronates as dual-purpose linkers in chemical probe development	99
<b>Chapter 5</b>	Optimization of the iminoboronate exchange reaction enables the profiling of probe libraries	141
<b>Chapter 6</b>	Investigation of the palladium-catalyzed Suzuki reaction as read-out of iminoboronate probe labeling	191
<b>Chapter 7</b>	Summary, overall conclusions and future directions	205
<b>Chapter 8</b>	Samenvatting en algehele conclusies	215
<b>Chapter 9</b>	Dankwoord	221

