



Universiteit
Leiden
The Netherlands

Chromatin modifiers in DNA repair and human disease

Helfricht, A.

Citation

Helfricht, A. (2016, November 1). *Chromatin modifiers in DNA repair and human disease*. Retrieved from <https://hdl.handle.net/1887/43800>

Version: Not Applicable (or Unknown)

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

Downloaded from: <https://hdl.handle.net/1887/43800>

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

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/43800> holds various files of this Leiden University dissertation.

Author: Helfricht, A.

Title: Chromatin modifiers in DNA repair and human disease

Issue Date: 2016-11-01

Chromatin modifiers in DNA repair and human disease

Angela Helfricht



Cover design & layout: Angela Helfricht

Printing: Off Page, Amsterdam, the Netherlands
www.offpage.nl

ISBN: 978-94-6182-719-7

© Copyright 2016 by Angela Helfricht

All rights reserved. No parts of this thesis may be reprinted, reproduced or utilised in any form or by electronic, mechanical, or other means, now known or hereafter devised, including photocopying and recording in any information storage or retrieval system without the expressed, written consent of the author.

Chromatin modifiers in DNA repair and human disease

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 dinsdag 1 november 2016
klokke 13:45 uur

door

Angela Helfricht

geboren te Dresden, Duitsland
in 1984

Promotor: Prof.dr.ir. S. M. van der Maarel

Co-promotoren: Dr. H. van Attikum

Dr. A.C.O. Vertegaal

Leden promotiecommissie: Prof.dr. M. Tijsterman

Prof.dr. R. Kanaar (Erasmus MC)

Dr. M. v. d. Burg (Erasmus MC)

Willst du dich am Ganzen erquicken,
so musst du das Ganze im Kleinsten erblicken.

Johan Wolfgang von Goethe (1827)

TABLE OF CONTENTS

CHAPTER 1

General introduction	10
Aim of this study	37

CHAPTER 2

Identification of EHMT1 as a chromatin factor that negatively regulates 53BP1 accrual during the DNA double-strand break response	52
---	----

CHAPTER 3

Remodeling and spacing factor 1 (RSF1) deposits centromere proteins at DNA double-strand breaks to promote non-homologous end-joining	80
---	----

CHAPTER 4

Investigating DNA damage-induced RSF1 SUMOylation	108
---	-----

CHAPTER 5

Loss of ZBTB24, a novel non-homologous end-joining protein, impairs class-switch recombination in ICF syndrome	126
--	-----

CHAPTER 6

Perspectives	168
--------------	-----

CHAPTER 7

Appendix: English summary	182
Nederlandse samenvatting	184
Deutsche Zusammenfassung	186
Curriculum vitae	188
List of publications	189
Acknowledgements	190