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Chromatin modifiers in DNA repair and human disease

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CURRICULUM VITAE

Angela Helfricht was born on the 28th of December 1984 in Dresden, Germany. After obtaining her diploma from the German Gymnasium in 2003, she continued her studies with a Bachelor in Life Science and Technology at Leiden University and the Technical University in Delft, both in the Netherlands. She conducted her Bachelor internship in the group of Dr. Nora Goosen at the Leiden University in 2007. During this internship, she worked on a project entitled 'The road to the lesion for the E.coli NER proteins UvrA and UvrB'. She then completed her master education in Life Science and Technology with a particular focus on Functional Genomics at Leiden University, which included a company internship of 3 months at ProteoNic in Leiden in 2008 and a final research internship. She undertook the latter in 2009 at the Department of Human Genetics in the FSHD group of Prof. Dr. Silvère van der Maarel at the Leiden University Medical Center (LUMC), where she spent 8 months investigating how chromatin is organized at the nuclear lamina during human myoblast differentiation. In October 2009, she joined the laboratories of Dr. Haico van Attikum at the Department of Human Genetics and Dr. Alfred C. O. Vertegaal at the Department of Molecular Cell Biology in the LUMC to start her PhD and identify novel chromatin factors involved in the response to DNA double-strands breaks. During her occupation as a PhD student, she participated in organizing the 2012 edition of the MGC PhD student workshop in Düsseldorf, Germany. After the completion of the practical part of her PhD project, she continued her carrier in the laboratory of Prof. Dr. Wim Vermeulen under the supervision of Dr. Hannes Lans at the Erasmus Medical Center in Rotterdam in the Netherlands. There she is currently investigating the role of chromatin factors in response to DNA damage induced by UV light.



LIST OF PUBLICATIONS

Helfricht,A.*, Thijssen,P.E.*, IJspeert,H., Shah,R.G., van Ostaijen-ten Dam,M.M., Luijsterburg,M.S., Stoepker,C., Jak,R., Grootaers,G., Wang,J., Rao,P., Vertegaal,A.C.O., van Tol,M.J.D., Pan-Hammarström,Q., Shah,G.M., van der Burg,M., van der Maarel, S.M. and van Attikum,H. (2016). Loss of ZBTB24, a novel non-homologous end-joining protein, impairs class-switch recombination in ICF syndrome. * equal contribution. *In preparation for publication*.

Pfeiffer,A., Luijsterburg,M.S., Acs,K., Wiegant,W.W., **Helfricht,A.**, Herzog,L.K., Minoia,M., Böttcher,C., Salomons,F.A., van Attikum,H., Dantuma,N.P. (2016). Ataxin-3 is a SUMO-targeted deubiquitylation enzyme that consolidates the MDC1-dependent DNA double-strand break response. *Under review at EMBO*.

Typas,D., Luijsterburg,M.S., Wiegant,W.W., Diakatou,M., **Helfricht,A.**, Thijssen,P.E., van de Broek,B., Mullenders,L.H., and van Attikum,H. (2015). The de-ubiquitylating enzymes USP26 and USP37 regulate homologous recombination by counteracting RAP80. *Nucleic Acids Research*. 43. 6916-6933.

Helfricht,A. and van Attikum,H. (2014). Remodeling and spacing factor 1 (RSF1): a rising star in DNA repair. *Epigenomics*. 6, 261-265.

Helfricht,A., Wiegant,W.W., Thijssen,P.E., Vertegaal,A.C., Luijsterburg,M.S., and van Attikum,H. (2013). Remodeling and spacing factor 1 (RSF1) deposits centromere proteins at DNA double-strand breaks to promote non-homologous end-joining. *Cell Cycle*. 12, 3070-3082.

Vyas,R., Kumar,R., Clermont,F., **Helfricht,A.**, Kalev,P., Sotiropoulou,P., Hendriks,I.A., Radaelli,E., Hochepped,T., Blanpain,C., Sablina,A., van,A.H., Olsen,J.V., Jochemsen,A.G., Vertegaal,A.C., and Marine,J.C. (2013). RNF4 is required for DNA double-strand break repair in vivo. *Cell Death and Differentiation*. 20, 490-502.

Neumayer,G., **Helfricht,A.**, Shim,S.Y., Le,H.T., Lundin,C., Belzil,C., Chansard,M., Yu,Y., Lees-Miller,S.P., Gruss,O.J., van Attikum,H., Helleday,T., and Nguyen,M.D. (2012). Targeting protein for xenopus kinesin-like protein 2 (TPX2) regulates gamma-histone 2AX (gamma-H2AX) levels upon ionizing radiation. *Journal of Biological Chemistry*. 287, 42206-42222.



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Here it is: my thesis. For years I worked towards this point and I am proud and relieved that I have reached the finish line. It's been a more than interesting journey during which I learned a lot, not only about molecular cell biology but also about myself. I feel grateful for the opportunities I got and like to thank all the people, I met along the way and who made valuable contributions to this thesis in one way or another.

During my Master internship in Silvère's FSHD group, I got caught by your enthusiasm for scientific work, Peter. You convinced me that doing a PhD would not be a bad idea, since I would actually get payed for the same work I was already doing as a student. Who would have known by that time that we would end up working so closely side by side on the same project? The lack of hierarchy and very enjoyable conversations made work more feel like spending time with a good friend. I could learn a lot from you and am very lucky with having you as a colleague and paranymp.

But to start a PhD, one need an actual position, to which I was kindly patched through by Silvère. After accepting me for my Master internship you eventually also became my promotor. Thank you for guiding me towards the subject I found most interesting to work on and for your support.

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