

Prof. Dr. Bernhard Lüscher
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RWTH Aachen University
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Education

- 1976-1981 Studies in Natural Sciences, Eidgenössische Technische Hochschule (ETH), Zürich, Switzerland
- 1981 Diploma thesis: Effect of cAMP on spektrin in human erythrocytes
Institute of Biochemistry, ETH Zürich, Switzerland, Prof. Dr. G. Semenza and Dr. H. Lutz
- 1982-1985 Ph.D. thesis: Structure, function and maturation of the T cell surface antigens Lyt-2/3 and Thy-1, Institute of Biochemistry, University of Lausanne, Switzerland, Prof. Dr. C. Bron

Postdoctoral training

- 1985-1987 Postdoctoral Fellow, Basic Sciences Division, Fred Hutchinson Cancer Research Center, Seattle, WA, Prof. Dr. R. N. Eisenman
- 1988-1991 Staff Scientist, Basic Sciences Division, Fred Hutchinson Cancer Research Center, Seattle, WA, Prof. Dr. R. N. Eisenman

Academic appointments

- 1991-2001 Associate Professor, Institute for Molecular Biology, MHH, Hannover, Germany
- 1994-2004 Adjunct Associate Professor, Department of Biology, University of Hannover, Hannover, Germany
- 1998-2001 Member, MD – PhD Committee, MHH, Hannover, Germany
- 2001-2007 Professor and Head, Division of Biochemistry and Molecular Biology, Medical School, RWTH Aachen University, Aachen, Germany
- 2002-2008 Member, Research committee of the Medical School, RWTH Aachen University
- 2002-2008 Head, Library committee of the Medical School, RWTH Aachen University
- 2004- Adjunct Professor, Department of Biology, RWTH Aachen University
- 2004-2008 Member, Faculty Council of the Medical School, RWTH Aachen University
- 2004-2012 Chair, Program in Development of Molecular Tumor Markers and Molecular Imaging, RWTH University
- 2005-2011 Vice Chair, SFB542
- 2007-2025 Director, Institute of Biochemistry and Molecular Biology, Medical School, RWTH Aachen University
- 2009-2011 Vice Dean (permanent deputy of the Dean), Medical School, RWTH Aachen University
- 2009-2016 Vice Chair, IZKF Aachen, Medical School, RWTH Aachen University
- 2010-2016 Member, Steering Committee of the Euregional Comprehensive Cancer Center Aachen
- 2012-2016 Vice Dean for Research, Medical School, RWTH Aachen University
- 2016-2023 Chair, Assembly of Preclinical Faculty (Fachgruppe A), Faculty of Medicine, RWTH Aachen University, Germany

- 2017-2020 Member, Steering Committee IZKF (interdisciplinary research center), Faculty of Medicine, RWTH Aachen University, Germany
- 2017-2021 Member, Steering Committee “Molecular Science & Engineering”, RWTH Aachen University, Germany
- 2021-2022 Member, Senate of the RWTH Aachen University, Germany
- 2025- Acting Director, Institute of Biochemistry and Molecular Biology, Medical School, RWTH Aachen University
- 2026- Associated Senior Professor, Human Genetics and Genome Medicine, Medical School, RWTH Aachen University

Major teaching activities

- 2002- Course in basic aspects of Cell Biology, Biochemistry and Molecular Biology (1st year Medical Students)
- 2003- Course in “Molecular Tumor Biology” (senior Medical Students, Master Biology and Biotechnology)
- 2004-2024 Course in “Regulation of Gene Expression” (senior Medical Students, Master Biology and Biotechnology)
- 2008- Course in “Signaling” (senior Medical Students, Master Biology and Biotechnology)
- 2011-2021 Course in “Regulation of Protein Structure, Expression and Function” (senior Medical Students, Master Biology and Biotechnology)

Commission of trust

- 2013 - 2022 Member, Committee for Clinically Related Basic Research ('Klinische Forschung, klinische Grundlagenforschung') of the German Cancer Aid, Bonn, Germany
- 2012 Chair, evaluation committee Biotechnology Center (BiO), University of Oslo, Norway

Publications (selection)

1. Ikenga NJ, Vervoorts J, **Lüscher B**, Žaja R, Feijs-Žaja KLH. 2025. PARP7 is a proteotoxic stress sensor which labels proteins for autophagic degradation. *EMBO J.* 44, 5463-5481.
2. Weixler L, Roko Žaja R, Ikenga NJ, Siefert J, Mohan G, Aydin G, Wijngaarden S, Filippov DV, **Lüscher B**, Feijs-Žaja KLH. 2025. Family-wide analysis of human macrodomains reveals novel activities. *Communications Biology* 8, 453.
3. Barsoum M, Sayadi-Boroujeni R, Stenzel AT, Bussmann P, Lüscher-Firzlaff J, **Lüscher B**. 2023. Sequential deregulation of histone marks, chromatin accessibility and gene expression in response to PROTAC-induced degradation of ASH2L. *Scientific Reports* 19, 22565.
4. Krieg S, Pott F, Potthoff L, Verheirstraeten M, Bütepage M, Golzmann A, Lippok B, Goffinet C, Lüscher B, Korn P. 2023. Mono-ADP-ribosylation by PARP10 inhibits Chikungunya virus nsP2 proteolytic activity and viral replication. *Cell Mol Life Sci.* 80, 72.
5. Bochyńska A, Stenzel AT, Sayadi Boroujeni R, Kuo CC, Barsoum M, Liang W, Bussmann P, Costa IG, Lüscher-Firzlaff J and **Lüscher B**. 2022. Induction of senescence upon loss of the Ash2L core subunit of H3K4 methyltransferase complexes. *Nucleic Acids Research* 50, 7889-7905.
6. Zhao Q, Capelli R, Carloni P, **Lüscher B**, Li J and Rossetti G. 2021. Enhanced Sampling Approach to the Induced-Fit Docking Problem in Protein-Ligand Binding: The Case of Mono-ADP-Ribosylation Hydrolase Inhibitors. *J Chem Theory Comput.* 17, 7899-7911.
7. Nowak K, Rosenthal F, Karlberg T, Bütepage M, Thorsell AG, Dreier B, Grossmann J, Sobek J, Imhof R, **Lüscher B**, Schueler H, Plückthun A, Pedrioli DL and Hottiger M. 2020. Engineering

- Af1521 improves ADP-ribose binding and identification of ADP-ribosylated proteins. *Nature Communications* 11, 5199.
8. Dohmen M*, Krieg S*, Agalaridis G, Zhu X, Shehata SN, Pfeifferberger E, Amelang J, Pfaff CM, Chanda D, Geley S, Preisinger C, Sakamoto K, **Lüscher B***, Neumann D* and Vervoorts J*. 2020. AMPK-dependent activation of the Cyclin Y/CDK16 complex controls autophagy. *Nature Communications* 11, 1032.
 9. Lüscher-Firzlaff J, Chatain N, Kuo CC, Braunschweig T, Bochyńska A, Ullius A, Denecke B, Costa IG, Koschmieder S and **Lüscher B**. 2019. Hematopoietic stem and progenitor cell proliferation and differentiation requires the trithorax protein Ash2l. *Scientific Reports* 9, 8262.
 10. Bütepage M, Preisinger P, von Kriegsheim A, Scheufen A, Lausberg E, Li J, Kappes F, Feederle R, Ernst S, Eckeï L, Krieg S, Müller-Newen G, Rossetti G, Feijs KLH, Verheugd P and **Lüscher B**. 2018. Nucleolar-nucleoplasmic shuttling of TARG1 and its control by DNA damage-induced poly-ADP-ribosylation and by nucleolar transcription. *Scientific Reports* 8, 6748.
 11. Eckeï L*, Krieg S*, Bütepage M, Lehmann A, Gross A, Lippok B, Grimm AR, Kümmerer BM, Rossetti G, **Lüscher B*** and Verheugd P*. 2017. The conserved macrodomains of the non-structural proteins of Chikungunya virus and other pathogenic positive strand RNA viruses function as mono-ADP-ribosylhydrolases. *Scientific Reports* 7, 41746.
 12. Venkannagari H, Verheugd P, Koivunen J, Haikarainen T, Obaji E, Ashok Y, Narwal M, Pihlajaniemi T, **Lüscher B** and Lehtiö L. 2016. Small-Molecule Chemical Probe Rescues Cells from Mono-ADP-Ribosyltransferase ARTD10/PARP10-Induced Apoptosis and Sensitizes Cancer Cells to DNA Damage. *Cell Chem Biol* 23, 1251-1260.
 13. Ullius A, Lüscher-Firzlaff JM, Costa IG, Walsemann G, Forst AH, Gusmao EG, Kapelle K, Kleine H, Kremmer E, Vervoorts J and **Lüscher B**. 2014. The interaction of MYC with the trithorax protein ASH2L promotes gene transcription by regulating H3K27 modification. *Nucleic Acids Research* 42, 6901-6920.
 15. Verheugd P, Forst AH, Milke L, Herzog N, Feijs KLH, Kremmer E, Kleine H and **Lüscher B**. 2013. Regulation of NF- κ B signaling by the mono-ADP-ribosyltransferase ARTD10. *Nature Communications* 4, 1683.
 16. Rosenthal F*, Feijs KLH*, Frugier E, Bonalli M, Forst AH, Imhof R, Winkler HC, Caflisch A, Hassa PO, **Lüscher B*** and Hottiger MO*. 2013. Macrodomain-containing proteins are novel mono-ADP-ribosylhydrolases. *Nat Struct Mol Biol* 20, 502-507.
 17. Forst AH, Karlberg T, Herzog N, Thorsell AG, Gross A, Feijs KLH, Verheugd P, Kursula P, Nijmeijer B, Kremmer E, Kleine H, Ladurner A, Schüler H and **Lüscher B**. 2013. Recognition of mono-ADP-ribosylated ARTD10 substrates by ARTD8 macrodomains. *Structure* 21, 462–475.
 18. Cornelissen C, Marquardt Y, Czaja K, Wenzel J, Frank J, Lüscher-Firzlaff JM, **Lüscher B*** and Baron JM*. 2012. IL-31 regulates differentiation and filaggrin expression in human organotypic skin models. *J Allergy Clin Immunol* 129, 426-433e8.
 19. Peters W, Willnow S, Duisken M, Kleine H, Macherey T, Duncan KE, Litchfield DW, **Lüscher B*** and Weinhold E* 2010. Enzymatic site-specific alkyne-functionalization of protein methyltransferase substrates for click labeling. *Angewandte Chemie English Edition* 49, 5170-5173.
 20. Hydbring P*, Bahram F*, Su Y*, Tronnersjö S, Högstrand K, von der Lehr N, Lilischkis R, Hein N, Wu S, Vervoorts J, Henriksson M, Grandien A, **Lüscher B** and Larsson LG. 2010. Phosphorylation by Cdk2 is required for Myc to repress Ras-induced senescence in cotransformation. *PNAS* 107, 58-63.
 21. Lüscher-Firzlaff* JM, Gawlista* I, Vervoorts J, Kapelle K, Braunschweig T, Walsemann G, Rodgarkia-Schamberger C, Schuchlantz H, Dreschers S, Kremmer E, Lilischkis R, Cerni C, Wellmann A and **Lüscher B**. 2008. The human trithorax protein hASH2 functions as an oncoprotein. *Cancer Res* 68, 749-758.

22. Kleine H, Poreba E, Lesniewicz K, Hassa PO, Hottiger MO, Litchfield DW, Shilton BH and **Lüscher B**. 2008. Substrate-assisted catalysis by PARP10 limits its activity to mono-ADP-ribosylation. *Mol Cell* 32, 57-69.
23. Jiang K, Hein N*, Eckert K*, Lüscher-Firzlaff JM and **Lüscher B**. 2008. Regulation of the MAD1 promoter by G-CSF. *Nucleic Acids Research* 36, 1517-1531.
24. Pandithage R*, Lilischkis R*, Harting K, Wolf A, Jedamzik B, Lüscher-Firzlaff JM, Vervoorts J, Lasonder E, Kremmer E, Knöll B* and **Lüscher B***. 2008. The regulation of SIRT2 function by Cyclin-dependent kinases affects cell motility. *J Cell Biol* 180, 915-929.
25. Guccione E, Bassi C, Casadio F, Martinato F, Cesaroni M, Schuchlautz H, **Lüscher B** and Amati B. 2007. Methylation of histone H3R2 by PRMT6 and H3K4 by MLL complexes are mutually exclusive. *Nature* 449, 933-937.

Reviews (selection)

1. **Lüscher B**, Bussmann P, Müller J. 2025. Role of Histone H3 Lysine 4 Methylation in Chromatin Biology. *Molecules*, 30, 4075.
2. **Lüscher B**, Verheirstraeten M, Krieg S and Korn P. 2022. Intracellular mono-ADP-ribosyltransferases at the host-virus interphase. *Cell Mol Life Sci* 79, 288.
3. **Lüscher B**, Ahel I, Altmeyer M, Ashworth A, Bai P, Chang P, Cohen M, Corda D, Dantzer F, Daugherty MD, Dawson TM, Dawson VL, Deindl S, Fehr AR, Feijs KLH, Filippov DV, Gagné JP, Grimaldi G, Guettler S, Hoch NC, Hottiger MO, Korn P, Kraus WL, Ladurner A, Lehtiö L, Leung AKL, Lord CJ, Mangerich A, Matic I, Matthews J, Moldovan GL, Moss J, Natoli G, Nielsen ML, Niepel M, Nolte F, Pascal J, Paschal BM, Pawłowski K, Poirier GG, Smith S, Timinszky G, Wang ZQ, Yélamos J, Yu X, Zaja R and Ziegler M. 2021. ADP-ribosyltransferases, an update on function and nomenclature. *FEBS Journal*, 289, 7399-7410..
4. Weixler L, Schäring K, Momoh J, **Lüscher B**, Feijs KLH and Zaja R. 2021. ADP-ribosylation of RNA and DNA: from in vitro characterization to in vivo function. *Nucleic Acids Research* 49, 3634-3650.
5. Fu W, Yao H, Bütepage M, Zhao Q, **Lüscher B** and Li J. 2021. The search for inhibitors of macrodomains for targeting the readers and erasers of mono-ADP-ribosylation. *Drug Discov Today* 26, 2547-2558.
6. Bochyńska A, Lüscher-Firzlaff J and **Lüscher B**. 2018. Modes of Interaction of KMT2 Histone H3 Lysine 4 Methyltransferase/COMPASS Complexes with Chromatin. *Cells* 7(3).
7. **Lüscher B**, Bütepage M, Ecker L, Krieg S, Verheugd P and Shilton BH. 2018. ADP-Ribosylation, a Multifaceted Posttranslational Modification Involved in the Control of Cell Physiology in Health and Disease. *Chemical Reviews* 118, 1092-1136.
8. Feijs KLH, Forst AH, Verheugd P and **Lüscher B**. 2013. Macrodomain-containing proteins: regulating new intracellular functions of mono(ADP-ribosyl)ation. *Nature Reviews Molecular Cell Biology* 13, 443-451.
9. Kleine H and **Lüscher B**. 2009. Learning how to read ADP-ribosylation. *Cell* 139, 17-19.