



Universiteit  
Leiden  
The Netherlands

## Blueprints of disease: precision platforms for modelling breast cancer

Lutz, C.

### Citation

Lutz, C. (2026, March 10). *Blueprints of disease: precision platforms for modelling breast cancer*. Retrieved from <https://hdl.handle.net/1887/4296062>

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/1887/4296062>

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

# **Blueprints of Disease**

**Precision Platforms for Modelling Breast Cancer**

**Catrin Lutz**

*About the cover:* The drawings on this cover were created by Milo, one of my first students, who contributed significantly to the animal work included in this thesis. Alongside experimental updates, Milo often added these small illustrated comics capturing highlights of the day or week in the animal facility. Years later, I still find these little drawings in drawers, notebooks, folders or lab spaces, so these little mice and rats (as well as the Dutch family that came through the friendship with Milo) have kept me company during my entire PhD time. Including them on the cover is a small acknowledgement of the shared work, and the reminder that science is shaped not only by the experiments, but also by the people who contributed to it along the way.

ISBN: 978-94-6496-548-3

*Cover design:* Milo van Batenburg

*Thesis lay-out:* Douwe Oppewal

*Printing:* Gildeprint Enschede | [www.gildeprint.nl](http://www.gildeprint.nl)

© Copyright, Catrin Lutz, 2026

All rights reserved. No part of this book may be reproduced in any form or by any means without permission of the author.

# **Blueprints of Disease**

## **Precision Platforms for Modelling Breast Cancer**

### **Proefschrift**

ter verkrijging van  
de graad van doctor aan de Universiteit Leiden,  
op gezag van rector magnificus prof.dr. S. de Rijcke,  
volgens besluit van het college voor promoties  
te verdedigen op dinsdag 10 maart 2026  
klokke 11:30 uur

door  
Catrin Lutz

**Promotor:**

Prof. Dr. J.M.M. Jonkers

**Co-promotor:**

Dr. H.A. Messal

**Promotiecommissie:**

Prof. Dr. M. van Eck

Prof. Dr. E.C.M. de Lange

Prof. Dr. K.E. de Visser

Prof. Dr. J. van Rheezen, Utrecht University, Utrecht, The Netherlands

Prof. Dr. J. Martens, Erasmus MC, Rotterdam, The Netherlands

The research described in this thesis was performed at the division of Molecular Pathology at the Netherlands Cancer Institute - Antoni van Leeuwenhoek Hospital (NKI-AvL) (Amsterdam, The Netherlands). The research was financially supported by Cancer Research UK, KWF Kankerbestrijding, and Oncode Institute.

## TABLE OF CONTENTS

<b>Chapter 1</b>	Outline of this thesis	7
<b>Chapter 2</b>	General introduction: The complex landscape of luminal breast cancer <i>Endocrine-Related Cancer. 2024 December;32,1</i>	11
<b>Chapter 3</b>	Rat models of hormone receptor-positive breast cancer <i>Journal of Mammary Gland Biology and Neoplasia. 2024 June;29:12</i>	63
<b>Chapter 4</b>	Somatically modified autochthonous rat tumour models uncover genotype-phenotype relationships underlying luminal breast cancer heterogeneity <i>(manuscript in revision)</i>	125
<b>Chapter 5</b>	In situ CRISPR-Cas9 base editing for the development of novel mouse models of breast cancer <i>EMBO Journal. 2020 March 2;39(5):e102169</i>	191
<b>Chapter 6</b>	Large-scale characterisation of orthotopic cell line-derived xenografts identifies TGF- $\beta$ signalling as a key regulator of breast cancer morphology and aggressiveness <i>Cancer Research. 2025 July 85 (14): 2608-2625</i>	235
<b>Chapter 7</b>	General discussion	303
<b>Appendices</b>	English Summary	326
	Nederlandse samenvatting	329
	Curriculum Vitae	332
	List of Publications	333