




Rick Scavetta (Autor)

# Genomic Destabilization at Copy Number Variable Loci in Intersubspecific Hybrids of *Mus musculus* ssp.

Genomic Destabilization at Copy Number Variable Loci in Intersubspecific Hybrids of *Mus musculus* ssp.

Dissertation zur Erlangung des Doktorgrades  
der Mathematisch-Naturwissenschaftlichen Fakultät  
der Universität zu Köln

Vorgelegt von  
**Rick J. Scavetta**

 Cuvillier Verlag Göttingen  
Internationaler wissenschaftlicher Fachverlag

<https://cuvillier.de/de/shop/publications/783>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentzsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen, Germany

Telefon: +49 (0)551 54724-0, E-Mail: [info@cuvillier.de](mailto:info@cuvillier.de), Website: <https://cuvillier.de>

# Table of Contents

Dedication .....	i
Epigraph.....	iii
List of Tables and Figures .....	vii
List of Abbreviations .....	ix
Acknowledgments .....	xi
Zusammenfassung .....	xiii
Abstract.....	xv
Declaration .....	xvii
1.0 Introduction .....	1
1.1 <i>Mus musculus</i> <i>ssps.</i> : A Model for Evolutionary Genetics.....	1
1.1.1 The Origins of <i>Mus musculus</i> <i>ssps.</i> .....	1
1.2 A Portrait of Copy Number Variation .....	3
1.2.1 The Genomic Landscape of Copy Number Variation .....	3
1.2.2 Consequences of Copy Number Variation .....	5
1.2.3 The Origin of Copy Number Variations.....	7
1.3 Genetic Divergence and Reproductive Isolation .....	11
1.3.1 Speciation Genetics of <i>Mus musculus</i> <i>ssps.</i> .....	11
1.3.2 The <i>Xlr</i> Superfamily.....	13
1.4 The Aim and Relevance of this study .....	15
2.0 CNV Destabilization <i>Mus musculus</i> <i>ssp.</i> Hybrids .....	17
2.1 The <i>Slx</i> Gene Family .....	17
2.1.1 Genomic Architecture .....	17
2.1.2 Variation in <i>Slx</i> cDNA .....	18
2.2 CNV Destabilizations in Intersubspecific Hybrids .....	21
2.2.1 CNVs in Wild Populations .....	21
2.2.2 CNVs in Wild Hybrid Populations.....	25
2.3 CNVs in Laboratory-Bred Hybrids .....	31
2.3.1 CNVs in the F1 and F2 Generation.....	31
2.3.2 Detection of CNV Destabilization by aCGH .....	36
2.4 Discussion.....	40
3.0 DNA Repair Pathways in Hybrid Mice .....	43
3.1 Genome Maintenance and Instability .....	43
3.2 Organogenesis and Genome Maintenance .....	44
3.3 Experimental Outline .....	45
3.4 A Description of Embryonic DNA Repair Pathways .....	49
3.5 Discussion.....	56
4.0 Concluding Remarks.....	61
4.1 A General Summary.....	61
4.2 Novel Alleles and Hybrid Speciation.....	61
4.3 Outlook.....	62
5.0 Materials & Methods .....	63
6.0 References .....	67
7.0 Lebenslauf.....	79