



Carola Brus (Autor)

**Physicochemical and Biological Properties of  
Polyethylenimine Based Delivery Systems for  
Oligonucleotides and Ribozymes**

CAROLA BRUS

---

PHYSICOCHEMICAL AND BIOLOGICAL PROPERTIES  
OF POLYETHYLENIMINE BASED DELIVERY SYSTEMS  
FOR OLIGONUCLEOTIDES AND RIBOZYMES

---



CUVILLIER VERLAG GÖTTINGEN

<https://cuvillier.de/de/shop/publications/2982>

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

<b>CHAPTER 1 INTRODUCTION.....</b>	<b>1</b>
INTRODUCTION .....	3
OLIGONUCLEOTIDE TECHNOLOGY .....	2
OLIGONUCLEOTIDE STABILITY .....	3
OLIGONUCLEOTIDE DELIVERY .....	4
POLYETHYLENIMINE.....	5
WATER SOLUBLE BLOCK COPOLYMERS .....	8
DERMAL DELIVERY OF OLIGONUCLEOTIDES .....	9
OBJECTIVES OF THIS WORK .....	10
REFERENCES.....	12
<b>CHAPTER 2       EFFICIENCY   OF   POLYETHYLENIMINES   AND</b>	
<b>POLYETHYLENIMIN – GRAFT - POLY(ETHYLENE GLYCOL) BLOCK</b>	
<b>COPOLYMERS TO PROTECT OLIGONUCLEOTIDES AGAINST ENZYMATIC</b>	
<b>DEGRADATION.....</b>	<b>21</b>
SUMMARY .....	22
INTRODUCTION .....	22
MATERIALS AND METHODS .....	24
RESULTS AND DISCUSSION .....	26
CONCLUSION .....	31
REFERENCES.....	31

**CHAPTER 3                    STABILIZATION            OF            OLIGONUCLEOTIDE-  
POLYETHYLENIMINE            COMPLEXES            BY            FREEZE-DRYING:  
PHYSICOCHEMICAL AND BIOLOGICAL CHARACTERIZATION. .... 33**

SUMMARY ..... 34  
INTRODUCTION ..... 35  
MATERIALS AND METHODS ..... 37  
RESULTS AND DISCUSSION ..... 41  
CONCLUSION ..... 55  
ACKNOWLEDGEMENTS ..... 56  
REFERENCES ..... 56

**CHAPTER 4                    PHYSICOCHEMICAL            AND            BIOLOGICAL  
CHARACTERIZATION OF POLYETHYLENIMINE-GRAFT-POLY(ETHYLENE  
GLYCOL) BLOCK COPOLYMERS AS DELIVERY SYSTEMS FOR  
OLIGONUCLEOTIDES AND RIBOZYMES. .... 61**

SUMMARY ..... 62  
INTRODUCTION ..... 63  
MATERIALS AND METHODS ..... 64  
RESULTS AND DISCUSSION ..... 68  
CONCLUSION ..... 81  
ACKNOWLEDGEMENTS ..... 82  
REFERENCES ..... 82

**CHAPTER 5            DISTRIBUTION    AND    QUANTIFICATION    OF  
POLYETHYLENIMINE OLIGODEOXYNUCLEOTIDE COMPLEXES IN HUMAN  
SKIN AFTER IONTOPHORETIC DELIVERY USING CONFOCAL SCANNING  
LASER MICROSCOPY. .... 87**

SUMMARY ..... 88

INTRODUCTION ..... 88

MATERIALS AND METHODS..... 91

RESULTS ..... 94

DISCUSSION ..... 101

CONCLUSION ..... 106

ACKNOWLEDGMENTS ..... 106

REFERENCES..... 106

**CHAPTER 6 SUMMARY AND OUTLOOK..... 111**

SUMMARY AND OUTLOOK ..... 112

ZUSAMMENFASSUNG UND AUSBLICK ..... 120

**APPENDICES ..... 131**

ABBREVIATIONS ..... 132

LIST OF PUBLICATIONS ..... 134

CURRICULUM VITAE..... 137