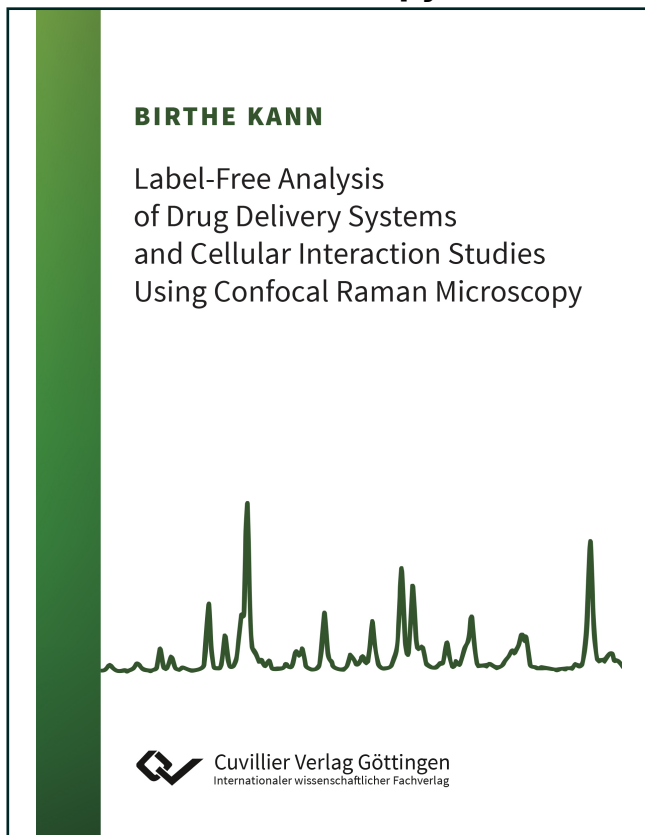




Birthe Kann (Autor)

Label-Free Analysis of Drug Delivery Systems and Cellular Interaction Studies Using Confocal Raman Microscopy



<https://cuvillier.de/de/shop/publications/7316>

Copyright:

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

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



Table of Contents

I	Summary	ix
II	Zusammenfassung	xi
III	List of Original Publications Included in this Thesis	xiii
IV	Abbreviations	xv
1	Introduction	1
1.1	Basic Principles of Raman Spectroscopy	1
1.2	Confocal Raman Microscopy for Chemical Imaging	2
1.3	Pharmaceutical Applications of Confocal Raman Microscopy	7
2	Aims of the Thesis	14
3	Results and Discussion	15
3.1	Elucidating the Impact of Drying on Drug Distribution and Release in Wet-Extruded Pellets by Raman Imaging.....	15
3.2	Investigating Drug Delivery Systems with Structured Surfaces – Overcoming the Pitfalls of a Confocal Setup.....	18
3.3	Novel Insight into the Development Process of a Lipid-Based Drug Permeation Assay by Raman Imaging	22
3.4	Non-Invasive Visualization of Nanoparticle Uptake in Human Cells.....	25
4	Conclusions and Outlook	29
5	Original Publications	31
5.1	Microstructure of Calcium Stearate Matrix-Pellets: A Function of the Drying Process..	31
5.2	Impact of Drying on Solid State Modifications and Drug Distribution in Ibuprofen-Loaded Calcium Stearate Pellets	43
5.3	The Effect of the Drying Temperature on the Properties of Wet-Extruded Calcium Stearate Pellets: Pellet Microstructure, Drug Distribution, Solid State and Drug Dissolution.....	55
5.4	Chemical Imaging of Drug Delivery Systems with Structured Surfaces – a Combined Analytical Approach of Confocal Raman Microscopy and Optical Profilometry	65
5.5	Solid Dispersions Prepared by Continuous Cogrinding in an Air Jet Mill.....	72
5.6	Submicron Polymeric Particles Prepared by Vibrational Spray-Drying: Semisolid Formulation and Skin Penetration/Permeation Studies.....	81
5.7	Characterization and Evaluation of a Modified PVPA Barrier in Comparison to Caco-2 Cell Monolayers for Combined Dissolution and Permeation Testing.....	94
5.8	Label-free In Vitro Visualization of Particle Uptake into Human Oral Buccal Epithelial Cells by Confocal Raman Microscopy	107
5.9	Intracellular Delivery of Poorly Soluble Polyphenols - Elucidating the Interplay of Self-Assembling Nanocarriers and Human Chondrocytes	115
6	References	125
7	Acknowledgments	132