

**INTRACELLULAR TRANSPORT IN CANCER TREATMENTS: CARBON  
NANOHORNS CONJUGATED TO QUANTUM DOTS AND CHEMOTHERAPEUTIC  
AGENTS**

Kristen Ann Zimmermann

Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in  
partial fulfillment of the requirements for the degree of

Master of Science  
In  
Biomedical Engineering and Sciences

M. Nichole Rylander, Co-Chair  
Christopher G. Rylander, Co-Chair  
Timothy E. Long

April 26, 2012  
Blacksburg, VA

Keywords: Cancer, carbon nanohorn, quantum dot, transport, cellular uptake kinetics,  
Intracellular distribution, chemotherapy, hyperthermia

Copyright 2012, Kristen Zimmermann

**APPENDIX A: COPYRIGHT PERMISSIONS**  
**NATURE PUBLISHING GROUP LICENSE**  
**TERMS AND CONDITIONS**

May 10, 2012

---

---

This is a License Agreement between Kristen Zimmermann ("You") and Nature Publishing Group ("Nature Publishing Group") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by Nature Publishing Group, and the payment terms and conditions.

**All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.**

License Number	2901541439129
License date	May 03, 2012
Licensed content publisher	Nature Publishing Group
Licensed content publication	Nature Reviews Drug Discovery
Licensed content title	Nanoparticle therapeutics: an emerging treatment modality for cancer
Licensed content author	Mark E. Davis, Zhuo (Georgia) Chen, Dong M. Shin
Licensed content date	Sep 1, 2008
Type of Use	reuse in a thesis/dissertation
Requestor type	academic/educational
Format	print and electronic
Portion	figures/tables/illustrations
Number of figures/tables/illustrations	1
High-res required	no
Figures	Table 1. Nanoscaled Systems for systemic cancer therapy
Author of this NPG article	no
Your reference number	
Title of your thesis / dissertation	Intracellular Transport in Cancer Treatments: Carbon Nanohorns Conjugated to Quantum Dots and Chemotherapeutic Agents
Expected completion date	May 2012
Estimated size (number of pages)	100
Total	0.00 USD
Terms and Conditions	

**ELSEVIER LICENSE**

## TERMS AND CONDITIONS

May 10, 2012

---

---

This is a License Agreement between Kristen Zimmermann ("You") and Elsevier ("Elsevier") provided by Copyright Clearance Center ("CCC"). The license consists of your order details, the terms and conditions provided by Elsevier, and the payment terms and conditions.

**All payments must be made in full to CCC. For payment instructions, please see information listed at the bottom of this form.**

Supplier	Elsevier Limited The Boulevard, Langford Lane Kidlington, Oxford, OX5 1GB, UK
Registered Company Number	1982084
Customer name	Kristen Zimmermann
Customer address	340 ICTAS Bldg. (MC 0298) Blacksburg, VA 24060
License number	2901550662591
License date	May 03, 2012
Licensed content publisher	Elsevier
Licensed content publication	Advanced Drug Delivery Reviews
Licensed content title	Delivery of nanomedicines to extracellular and intracellular compartments of a solid tumor
Licensed content author	Yinghuan Li, Jie Wang, M. Guillaume Wientjes, Jessie L.-S. Au
Licensed content date	January 2012
Licensed content volume number	64
Licensed content issue number	1
Number of pages	11
Start Page	29
End Page	39
Type of Use	reuse in a thesis/dissertation
Intended publisher of new work	other
Portion	figures/tables/illustrations
Number of figures/tables/illustrations	1

Format	both print and electronic
Are you the author of this Elsevier article?	No
Will you be translating?	No
Order reference number	
Title of your thesis/dissertation	Intracellular Transport in Cancer Treatments: Carbon Nanohorns Conjugated to Quantum Dots and Chemotherapeutic Agents
Expected completion date	May 2012
Estimated size (number of pages)	100
Elsevier VAT number	GB 494 6272 12
Permissions price	0.00 USD
VAT/Local Sales Tax	0.0 USD / 0.0 GBP
Total	0.00 USD
Terms and Conditions	