Chang Soo Kim, Ph.D.

Department of Chemistry, 710 North Pleasant St. University of Massachusetts,
Amherst, MA 01003
Cell (310) 415-2522; cskim@chem.umass.edu

EDUCATION:

University of California, Irvine Dec 2010
Ph.D. degree in chemical engineering and biochemical engineering
PIs: Dr. Zhongping Chen and Dr. Young Jik Kwon
Title: Optimized Delivery of Tailored Gold Nanoparticles for Enhanced Optical Coherence Tomography Imaging
GPA: 3.868 / 4.000

California State University, Long Beach May 2004
Master of Science in Engineering, Concentration: Chemical Engineering
GPA: 3.818 / 4.000

Sung Kyun Kwan University, South Korea Aug 2001
B. S. in Chemical Engineering
GPA: 3.440 / 4.500
HONORS: Chemical Engineering Departmental Full Scholarship in 2000

RESEARCH:

Postdoctoral researcher in University of Massachusetts, Amherst Sept 2011 to Mar 2015
- Synthesized nanoparticle-stabilized nanocapsules for cancer imaging and drug delivery
- Developed animal cancer models for cancer stage sensing and nanoparticle distribution
- Managed multiple projects and seek grant applications

Postdoctoral researcher in University of California, Irvine Jan 2011 to Aug 2012
- Developed hybrid optical coherence tomography to cancer imaging with nanoparticle contrast agents
- Improved stimuli-responsive nanoparticle applications for gene delivery
- Prepared publications and presentations for current projects

Research Assistant in University of California, Irvine Sept 2005 to Dec 2010
- Synthesized and characterized gold nanoparticles with different sizes and shapes using TEM, SEM and DLS
- Performed in vitro and in vivo animal experiments and analyzed the data with MATLAB
- Developed contrast agent for Optical Coherence Tomography / Optical Doppler Tomography

R&D Lab technician in Avery Dennison Research Center, Pasadena July 2004 to June 2005
- Formulated polymer adhesives and coatings for pH sensitive labeling
- Developed pressure and temperature sensitive adhesives
- Performed material characterization using Instron tensile tester

SPECIAL SKILLS:

- **Nanotechnology**: nanoparticle synthesis, surface modification, and characterization using Dynamic Light Scattering (DLS), UV-vis spectroscopy
- **Microscopy:** Scanning Electron Microscope (SEM), Transmission Electron Microscope (TEM), confocal scanning light microscopy (CSLM), cellular TEM
- **Cellular biology:** culture of cells and cell viability assay
- **Tumor biology:** breast cancer and melanoma animal tumor models

PUBLICATIONS

1. Mizuhara, T.; Saha, K.; Moyano, D. F.; **Kim, Chang Soo**; Yan, B.; Kim, Y.; Rotello, V. M. "Acylsulfonamide-Functionalized Zwitterionic Gold Nanoparticles for Enhanced Cellular Uptake at Tumor pH" Angew. Chem. Int. Ed. Engl. 2015 Just accepted.

2. Kim, C.; Tonga, G. Y.; Yan, B.; **Kim, Chang Soo**; Kim, S. T.; Park, M.-H.; Zhu, Z.; Duncan, B.; Creran, B.; Rotello, V. M. "Regulating Exocytosis of Nanoparticles via Host-Guest Chemistry" Org. Biomol. Chem. 2015. 13, 2474-2479.
3. Creran, B.; Li, X.; Duncan, B.; **Kim, Chang Soo**; Moyano, D. F.; Rotello, V. M. "Detection of Bacteria Using Inkjet-Printed Enzymatic Test Strips" ACS Appl. Mater. Interfaces 2014. 6, 19525-19530.
4. Scaletti, F; **Kim, Chang Soo**; Messori, L.; Rotello, V.M. "Rapid purification of gold nanorods for biomedical applications" MethodsX. 2014. 1, 118-123.
5. **Kim, Chang Soo**; Le, N. D. B.;Xing, Y.; Yan, B.; Tonga, G. Y.; Kim, C.; Vachet, R. W. ; Rotello, V. M. "The role of surface functionality in nanoparticle exocytosis" Adv. Healthc. Mater. 2014. 3, 1200-1202.
6. Tonga, G. Y.; Moyano, D. F.; **Kim, Chang Soo**.; Rotello, V. M. "Inorganic Nanoparticles for Therapeutic Delivery: Trials, Tribulations and Promise" Curr. Opin. Colloid Interface Sci. 2014. 19, 49-55.
7. Ding, Y.; Jiang, Z.; Saha, K.; **Kim, Chang Soo**; Kim, S.T.; Rotello, V. "Gold Nanoparticles for Nucleic Acid Delivery" Mol. Ther. 2014. 22, 1075-1083.
8. **Kim, Chang Soo**; Qi, W.; Zhang, J.; Kwon, Y. J.; Chen, Z. "Imaging and Quantifying Brownian Motion of Micro- and Nanoparticles Using Phase-Resolved Doppler Variance Optical Coherence Tomography" J. Biomed. Opt. 2013, 18, 030504.
9. Yan, B.; Kim, S. T.; **Kim, Chang Soo**; Saha, K.; Moyano, D. F.; Xing, Y.; Jiang, Y.; Roberts, A. L.; Alfonso, F. S.; Rotello, V. M.; Vachet, R. W. "Multiplexed Imaging of Nanoparticles in Tissues Using Laser Desorption/Ionization Mass Spectrometry" J. Am. Chem. Soc. 2013, 135, 12564-12567.
10. **Kim, Chang Soo**.; Duncan, B.; Creran, B.; Rotello, V. M. "Triggered Nanoparticles as Therapeutics" Nano Today 2013, 8, 439-447.
11. Tang, R.; **Kim, Chang Soo**.; Solfiell, D. J.; Rana, S.; Mout, R.; Velzquez-Delgado, E. M.; Chompoosor, A.; Jeong, Y.; Yan, B.; Zhu, Z.-J.; Kim, C.; Hardy, J. A.; Rotello, V. M. "Direct Delivery of Functional Proteins and Enzymes to the Cytosol Using Nanoparticle-Stabilized Nanocapsules" ACS Nano 2013, 7, 6667-6673.
12. **Kim, Chang Soo**; Tonga, G. Y.; Solfiell, D.; Rotello, V. M. "Inorganic nanosystems for therapeutic delivery: Status and prospects" Adv. Drug Deliv. Rev. 2012, 65, 93-99.
13. **Kim, Chang Soo**, Ahn Y., Wilder-Smith P., Oh S., Chen Z., Kwon YJ. "Efficient and facile delivery of gold nanoparticles in vivo using dissolvable microneedles for contrast-enhanced optical coherence tomography" Biomed. Opt. Express. 2010, 1, 106-113.
14. Shim M.S. **Kim, Chang Soo**, Ahn Y., Chen Z., Kwon Y.J. "Combined multi-modal optical imaging and targeted gene silencing using stimuli-transforming nanotheragnostics" J. Am. Chem. Soc. 2010, 132, 8316-8324.
15. **Kim, Chang Soo,** Wilder-Smith P., Ahn Y., Liaw L.L., Chen Z. Kwon Y.J. "Overcoming barriers in topical administration of gold nanoparticles for optical coherence tomography using multimodal delivery" Proc. SPIE. 2010. Vol. 7554, 755421.
16. **Kim, Chang Soo,** Wilder-Smith P., Ahn Y., Liaw L., Chen Z., Kwon, Y. "Enhanced detection of early stage oral cancer in vivo by optical coherence tomography using multi-modal delivery of gold nanoparticles" J. Biomed. Opt. 2009. 14, 034008.
17. Baek J.H., Krasieva T., Tang S., Ahn Y., **Kim, Chang Soo**, Vu D., Chen Z., Wilder-Smith P. An "Optical approach to the salivary pellicle" J. Biomed. Opt. 2009. 14, 044001.
18. Wang Q., Ahn Y., **Kim, Chang Soo**, Yu L., Jia W., Rao B., Chen Z. "Thermoelastic optical Doppler tomography of biological tissues" Proc. SPIE. 2008. 6847, 68471B.

TALKS AND PRESENTATIONS

1. **Kim, Chang Soo,** Tang R., Solfiell D. J., Rana S., Mout R., Velázquez-Delgado E. M., Chompoosor A., Jeong Y., Yan B., Zhu Z., Kim C., Hardy J. A., and Rotello V. M. "Nanoparticle-stabilized capsules for protein delivery" *Gordon Research Conference-Cancer Nanotechnology*, July **2013**, West Dove, VT.
2. **Kim, Chang Soo,** Wilder-Smith P., Ahn Y., Liaw L.L., Chen Z., Kwon Y.J. "Efficient, convenient, and minimally invasive delivery of gold nanoparticles for diagnosis of early stage cancer using optical coherence tomography" *American Institute of Chemical Engineering (AICHE) Annual Meeting*, November **2010**, Salt Lake City, UT.
3. **Kim, Chang Soo,** Wilder-Smith P., Ahn Y., Liaw L.L., Chen Z., Kwon Y.J. "Overcoming barriers in topical administration of gold nanoparticles for optical coherence tomography

using multimodal delivery" *Society of Photonic and Instrumentation Engineers (SPIE) Photonics West*, January **2010**, San Francisco, CA.

4. **Kim, Chang Soo,** Ahn Y., Liaw L.L., Kawakami-Wong H., Wilder-Smith P., Brenner M., Kwon Y., Chen Z. "Enhanced optical coherence tomography by efficient permeation and distribution of gold nanoparticles in premalignant in vivo tissue" *Society of Photonic and Instrumentation Engineers (SPIE) Photonics West*, January **2009**, San Jose, CA.
5. **Kim, Chang Soo,** Ahn Y., Liaw L.L., Kawakami-Wong H., Wilder-Smith P., Brenner M., Chen Z., Kwon Y., "Multistage delivery of gold nanoparticles for detection of early stage oral cancer using optical coherence tomography" *American Institute of Chemical Engineering (AICHE) Annual Meeting*, November **2008**, Philadelphia, PA.
6. **Kim, Chang Soo,** Liaw L.L., Wilder-Smith P., Brenner M., Kwon Y., Chen Z., "Targeted delivery of gold nanoparticles for non-invasive diagnosis of early oral cancer using optical coherence tomography" *Conference on Translational Nanoscience in University of Southern California*, March **2008**, Los Angeles, CA.

Manuscripts submitted and under reviews:

1. **Kim, Chang Soo**; Dominiuque, I; Wilder-Smith, P.; Chen, Z.; Kwon, Y. J. "Stimuli-disassembling gold nanoclusters for molecular diagnosis of early-stage oral cancer by optical coherence tomography"
2. Mizuhara, T; Saha, K.; Moyano, D.M.; **Kim, Chang Soo**; Yan, B.; Rotello, V.M. "Acylsulfonamide-Functionalized Zwitterionic Gold Nanoparticle for Enhanced Cellular Uptake at Tumor pH"
3. Kim, C. ; Tonga, G.Y.; Yan, B.; **Kim, Chang Soo**; Kim, S. T.; Park, M.; Zhu, Z.; Duncan, B.; Creran, B.; Rotello, V. M. "Regulating Exocytosis of Nanoparticles via Host-Guest Chemistry"
4. Jeong, Y.; Kim, S. T.; Duncan, B.; **Kim, Chang Soo**; Saha, K.; Yeh, Y.; Yan, B.; Tang, R.; Hou, S.; Kim, C.; Park, M.; Rotello, V. M. "Tumor Therapy using Nanoparticle-Dendrimer Hybrid Nanocapsules"

TEACHING EXPERIENCE:

Teaching Assistant in University of California, Irvine Sept 2005 to 2010

• Teaching Assistant for Applied Engineering Math course in the Department of Biomedical Engineering

• Teaching Assistant for Pharmaceutical Science in the Department of Chemical Engineering and Material Science

• Teaching Assistant for Chemical Engineering Design course in the Department of Chemical Engineering and Material Science

• Teaching Assistant for Chemical Engineering Process control in the Department of Chemical Engineering and Material Science

Chemistry and math tutor in Cal. State Univ. of Long Beach 2002 to 2004

• Taught Calculus and General Chemistry

• Trained to provide Tutorial Services for various situations

Membership/Certificate:

• American Institute of Chemical Engineering (AICHE)

• American Chemical Society (ACS)

• Engineering-in-Training