

EDUCATION

Doctor of Philosophy (Ph.D.) in Chemistry

August 2012-August 2017

Emphasis in Nanomaterial and Analytical Chemistry

Dissertation Title: Multi-component Ligand Interactions with Colloidal Gold and Silver Nanoparticles in Water

Dissertation Director: Dongmao Zhang, Ph.D.

Mississippi State University, MS, USA.

Bachelor of Science (Special Degree in Chemistry)

October 2007-October 2011

First Class Honors (GPA 3.79)

Honors Thesis: Investigation of Food Colorant in Candies

Thesis Director: K.R.R.Mahanama, Ph.D.

University of Colombo, Colombo, Sri Lanka.

School

1992-2005

Sanghamitta Girls' College, Galle, Sri Lanka.

PUBLICATIONS

1. **Siriwardana, K.;** Xu, J. X. Zou, Y.; Zhou, S.; Zhang, D.; **(2018)** “*Quantification of Gold Nanoparticle Ultraviolet-Visible Extinction, Absorption, and Scattering Cross-Section Spectra and Scattering Depolarization Spectra: The Effects of Nanoparticle Geometry, Solvent Composition, Ligand Functionalization, and Nanoparticle Aggregation*”. Analytical Chemistry. 90, 785-793.
2. **Siriwardana, K.;** Nettles, C.B.; Vithanage, B.C.N.; Zhou, S.; Zhang, D.; **(2017)** “*Quantification of the Depolarization and Anisotropy of Fluorophore Stokes-Shifted Fluorescence, On-Resonance-Fluorescence, and Rayleigh-Scattering*”. Analytical Chemistry. 89, 6686-6694.
3. **Siriwardana, K.;** Nettles, C.B.; Vithanage, B.C.N.; Zhou, Y.; Zhou, S.; Zhang, D.; **(2016)** “*On-Resonance Fluorescence, Resonance Rayleigh Scattering, and Ratiometric Resonance Synchronous Spectroscopy of Molecular- and Quantum Dot-Fluorophores*”. Analytical Chemistry. 88, 9199-9206.
4. **Siriwardana, K.;** LaCour, A.; Zhang, D.; **(2016)** “*Critical Sequence Dependence in Multicomponent Ligand Binding to Gold Nanoparticles*”. The Journal of Physical Chemistry C. 120, 6900-6905.
5. Suwandaratne, N.; Hu, J.; **Siriwardana, K.;** Gadogbe, M.; Zhang, D.; **(2016)** “*Evaluation of Thiol Raman Activities and pKa Values using Internally-referenced Raman-based pH Titration.*” Analytical Chemistry. 88, 3624-3631.

6. **Siriwardana, K.**; Suwandarate N.; Perera G.S.; Collier W.; Perez, F.; Zhang, D.; (2015) “*Contradictory Dual Effects: Organothiol Induced Both Silver Nanoparticle Disintegration and Formation under Ambient Conditions*”. The Journal of Physical Chemistry C. 119, 20975-20984.
7. **Siriwardana, K.**; Wang, A.; Gadogbe, M.; Collier, W. E.; Fitzkee, N.C.; Zhang, D.; (2015) “*Probing the Effect of Cysteine Residue on Protein Interactions with Silver Nanoparticles*”. The Journal of Physical Chemistry C. 119, 2910-2916.
8. **Siriwardana, K.**; Gadogbe, M.; Ansar, S. M.; Vasquez, E. S.; Collier, W. E.; Zou, S.; Walters, K. B.; Zhang, D.; (2014) “*Ligand Adsorption and Exchange on Pegylated Gold Nanoparticles*”. The Journal of Physical Chemistry C. 118, 11111-11119.
9. Ansar, S. M.; Gadogbe, M.; **Siriwardana, K.**; Collier, W. E.; Rodriguez, J.; Zou, S.; Zhang, D.; (2014) “*Dispersion Stability, Ligand Structure and Conformation, and SERS Activities of 1-Alkanethiol Functionalized Gold and Silver Nanoparticles*”. The Journal of Physical Chemistry C. 118, 24925-24934.
10. **Siriwardana, K.**; Wang, A.; Vangala, K.; Fitzkee, N.C.; Zhang, D.; (2013) “*Probing the Effects of Cysteine Residues on Protein Adsorption onto Gold Nanoparticles using Wild-type and Mutated GB3 Proteins*”. Langmuir. 29, 10990-10996.
11. Ameer, F. S.; Hu, W.; Ansar, S. M.; **Siriwardana, K.**; Collier, W. E.; Zou, S.; Zhang, D.; (2013) “*Robust and Reproducible Quantification of SERS Enhancement Factors Using a Combination of Time-Resolved Raman Spectroscopy and Solvent Internal Reference Method*”. The Journal of Physical Chemistry C. 117, 3483-3488.
12. Vangala, K.; **Siriwardana, K.**; Vasquez, E. S.; Xin, Y.; Pittman, C. U.; Walters, K. B.; Zhang, D.; (2013) “*Simultaneous and Sequential Protein and Organothiol Interactions with Gold Nanoparticles*”. The Journal of Physical Chemistry C. 117, 1366-1374.

PAPERS PRESENTED

- **Siriwardana, K.**; Zhang, D. “On-Resonance Fluorescence, Resonance Rayleigh Scattering, and Ratiometric Resonance Synchronous Spectroscopy of Molecular- and Quantum Dot-Fluorophores” Oral presentation at Pittcon conference & Expo, Chicago, IL. March, 2017.
- **Siriwardana, K.**; Zhang, D. “Critical Sequence Dependence in Multicomponent Ligand Binding to Gold Nanoparticles” Oral presentation at Southeast Regional Meeting of the American Chemical Society, Columbia, SC. November, 2016.
- **Siriwardana, K.**; Zhang, D. “Contradictory Dual Effects: Thiols Can Induce Both Silver Nanoparticle Disintegration and Formation under Ambient Conditions” Oral presentation at Southeast Regional Meeting of the American Chemical Society, Memphis, TN. November, 2015.
- **Siriwardana, K.**; Zhang, D. “Mechanistic Study of Protein Interactions with Silver Nanoparticles using Chemically- and Biologically-Modified Proteins” Oral presentation at

Southeast Regional Meeting of the American Chemical Society, Nashville, TN. October, 2014.

- **Siriwardana, K.;** Zhang, D. “Studying the Assembly and Structure of Pegylated Gold Nanoparticles using Adenine and 2-Mercaptobenzimidazole as Molecular Probes” Oral presentation at 247th American Chemical Society National Meeting, Dallas, TX. March, 2014.

AWARDS

2017 Graduate student travel award, Mississippi State University, MS, USA.

2016 Graduate student travel award, Mississippi State University, MS, USA.

2011 Dharmachandra & Tamarasa Gunawardhana Memorial Gold Medal for Analytical Chemistry, University of Colombo, Sri Lanka.

TECHNICAL PROFICIENCY

Nanoparticle synthesis and characterization | Nanoparticle surface functionalization and analysis | Raman spectroscopy | Surface enhanced Raman spectroscopy (SERS) | UV-vis spectroscopy | Fluorescence spectroscopy | HR-TEM | Dynamic light scattering (DLS)/Zeta potential | ICP-MS | ATR-FTIR | Separation and purification techniques

TEACHING AND LABORATORY EXPERIENCE

Teaching Assistant and Laboratory Instructor:

- **Mississippi State University, Mississippi State, Mississippi.**
CH 1211 and 1221 Chemistry I and II Laboratory August 2012-August 2017

Teaching labs included: Presented a 15-20 minute lecture over background, procedure and safety, attend weekly meetings to prepare the next experiment, met with the lab coordinator to adjust the procedure as needed, supervised ~24 students during the experiment to ensure safety procedures were followed, graded lab reports, quizzes, homework and posted grades, and proctored the final exam for the laboratory course and graded final exams.

- **University of Colombo, Colombo, Sri Lanka**
Inorganic and Analytical Chemistry Laboratories October 2011-June 2012

Labs included: Preparation of chemicals for all experiments including final exams. Supervised ~50 students during the experiment. Graded lab reports. Proctored final laboratory exams and others.

Student Tutor:

- **Mississippi State University, Mississippi State, Mississippi.**
For all chemistry undergraduate students August 2012-December 2015

- **University of Colombo, Colombo, Sri Lanka**
For second year undergraduate students October 2011-June 2012

Recitation Instructor:

- **Mississippi State University, Mississippi State, Mississippi.**
For freshmen chemistry undergraduate students December 2015-August 2017

Recitation session included: Short summarization of the lecture materials. Covered worksheets. Assigned home works, quizzes and graded the materials. Grading exams. Each recitation section includes ~ 40 students. Five recitation sections were taught for a semester.

ADDITIONAL RELEVANT EXPERIENCE

- **Chemistry Summer Camp for High School Student:**
Mississippi State University, Mississippi State, Mississippi. Summer 2014 - 2016

Chemistry hands on experience was given for selected group of high school students from different high schools located near Starkville area. Basic chemistry principles were taught and students were allowed to do laboratory experiments by their own.

- **Research Assistant:**
Mississippi State University, Mississippi State, Mississippi. August 2014-August 2015

AFFILIATES

- Chemistry Graduate Student Association 2012-2017
Member, Mississippi State University
- American Chemical Society 2014-2017
Member
- Chemical Society 2009-2011
Member, University of Colombo