

# GEORGETA CAMELIA LICA

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## OBJECTIVE

Looking for a research & development position that maximally utilizes my current skill set in analytical chemistry, electrochemistry, material synthesis and characterization.

## EDUCATION

**PhD in Analytical Chemistry, Georgetown University, Washington DC** Expected graduation: August 2006

PhD Thesis: *Synthesis and Characterization of Organic and Inorganic Ligand-Protected Coinage Metal Nanoparticles*

Advisor: Dr. YuYe Tong GPA: 3.7 / 4

**MSc in Analytical Chemistry, University of Bucharest, Romania** 2001

MSc Thesis: *Influence of Competitive Chemical Reactions on Electrode Processes in Electrochemistry*

Advisor: Dr. Ion Tanase GPA: 4 / 4

**BS in Analytical Chemistry, University of Bucharest, Romania** 1999

BS Thesis: *Electrochemical Study of Tocopherols*

Advisor: Dr. Ion Tanase GPA: 3.8 / 4

## EXPERIENCE

### Research

**Research Assistant, Department of Chemistry, Georgetown University, Washington DC** 2001-present

- Developed and optimized synthetic methods of organic and inorganic ligand-protected metal nanoparticles of high technological importance in fields such as electrocatalysis, sensors or molecular electronics.
- Studied the electronic and optical properties of the resulting materials as a function of the nature of the metallic core (Au, Ag, Pd), size and charge of the nanoparticle, nature and length of the protective ligand (alkanethiols or polyoxometalates).
- Investigated the possibility of utilizing these nanostructures for the development of field-effect based electronic devices.

**Research Assistant, Department of Chemistry, University of Bucharest, Romania** 2000-2001

- Developed diagnostic methods to determine the electrode reaction mechanism of various redox systems.
- Confirmed experimental results with predictions of digital simulations.

**Research Assistant, Institute of Biological Research, Bucharest, Romania** 1998-1999

Analyzed the electrochemical properties of individual and mixtures of isomers of antioxidants, using electrochemical techniques.

**AAS Training Program, Institute of Veterinary Research, Bucharest, Romania** 1998

Used Atomic Absorption Spectroscopy to analyze biological samples for iron and lead content.

### Teaching

**Teaching Assistant, Department of Chemistry, Georgetown University, Washington DC** 2001-2004

Taught the Analytical Chemistry, Chemical Instrumentation and General Chemistry laboratories.

## SKILLS

Electrochemical Methods: Voltammetry, Impedance, Chronoamperometry, Chronocoulometry

Metal Deposition: Sputtering, Metal Evaporation, Plasma Enhanced CVD, Lithography

Imaging Techniques: SEM

Spectroscopy: IR, Raman, UV-Vis, AAS

Chromatography: LC, GC/MS

NMR: experience operating and maintaining 300 MHz Bruker, 400 MHz Oxford and 500 MHz Varian Spectrometers;  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{29}\text{Si}$ ,  $^{31}\text{P}$ ,  $^{183}\text{W}$  NMR

Thermal Analysis: TGA

Immunoassay: ELISA

## AWARDS AND SCHOLARSHIPS

Collin G. Fink Award - ECS Summer Fellowship	2005
General Society Student Poster Session Award - Honorable Mention - ECS, Orlando, FL	2003
High Performance Scholarship, University of Bucharest (awarded to top 1% or GPA 4 / 4)	1997-2001
Performance Scholarship, University of Bucharest (awarded to top 20%)	1996-1997

## PROFESSIONAL AFFILIATIONS

Electrochemistry Society	2003-present
American Chemical Society	2006

## LANGUAGES

English (fluent) Romanian (native) French (fluent) Italian (intermediate)

## JOURNAL ARTICLES

- Lica, G. C., Browne, K. P., Tong, Y.Y.: *Interactions between Keggin-type Lacunary Polyoxometalates and Ag Nanoparticles: A Surface-Enhanced Raman Scattering Spectroscopic Investigation*, *Journal of Cluster Science* 2006, in press
- Lica, G. C.: *Effects of the Ligand Chain Length: A Potential Dependence of Charge Transfer over Alkenethiol-Protected Au Nanoparticle Thin Layers*, *Interface* 2005, 14, 57-58 – student report
- Lica, G.C., Zelakiewicz, B. S., Constantinescu, M., Tong, Y. Y.: *Charge Dependence of Surface Plasma Resonance on 2 nm Octanethiol-Protected Au Nanoparticles: Evidence of a Free-Electron System*, *J. Phys. Chem. B* 2004, 108, 19896-19900.
- Zelakiewicz, B. S., Lica, G. C., Deacon, M., Tong, Y. Y.: *<sup>13</sup>C NMR and Infrared Evidence of a Dioctyl-Disulfide Structure on Octanethiol-Protected Palladium Nanoparticle Surfaces*, *J. Am. Chem. Soc.* 2004, 126, 10053.
- Lica, G. C., Zelakiewicz, B. S., Tong, Y.Y.: *Electrochemical and NMR Characterization of Octanethiol-Protected Gold Nanoparticles*, *J. Electroanal. Chem.*, 2003, 554, 127-132.

## CONFERENCE PUBLICATIONS

- Lica, G. C., Tong, Y.Y.: *Tunable Charge-Transfer Properties Across Thin-Layers of Au Nanoparticles*, 231<sup>st</sup> ACS National Meeting, Atlanta, GA, March 2006, poster.
- Lica, G. C., Browne, K. P., Tong, Y.Y.: *Surface-Enhanced Raman Scattering Investigations of Polyoxometalate-Protected Silver Nanoparticles*, PACIFICHEM, Honolulu, Hawaii, December 2005.
- Lica, G. C., Constantinescu, M., Tong, Y.Y.: *Surface-Enhanced Raman Spectroscopy of Inorganic and Organic Ligand-Protected Silver Nanoparticles*, 230<sup>th</sup> ACS National Meeting, Washington DC, August 2005, poster.
- Lica, G. C.; Smeeding, L. B., Tong, Y.Y. *Spectroscopic and Electrochemical Investigations of Polyoxometalate-Protected Silver Nanoparticles*, International Symposium on Nanostructures and Physicochemical Properties of Polyoxometalate Superclusters and Related Colloid Particles, Shonan Village Center, Kanagawa, Japan, November, 2004.
- Lica, G.C., Tong, Y. Y.: *Potential and Particle-Size Dependent Charge Transfer Across Ligand-Protected Au Nanoparticle Thin Layers*, ECS 206<sup>th</sup> Meeting, Honolulu, Hawaii, 2004.
- Lica, G. C., Zelakiewicz, B. S., Smeeding, L., Tong, Y.Y.: *Electrochemistry, Spectrophotometry and NMR Investigation of Chemisorption of Polyoxometalate on Silver Nanoparticle Surfaces*, ECS 204<sup>th</sup> Meeting, Orlando, Florida, 2003.
- Lica G.C., Zelakiewicz, B.S., Tong, Y.Y.: *Potential of Zero-Charge of Monolayer-Protected Metal-Clusters*, ECS 204<sup>th</sup> Meeting, Orlando, Florida, 2003, poster.

## INVITED TALK

Lica, G. C.: *Polyoxometalate - Protected Metal Nanoparticles*, Symposium in Honor of Professor Michael T. Pope, Georgetown University, April 2006

## REFERENCES

Dr. YuYe Tong (Advisor)	Phone: 202-687-5872	E-mail: <a href="mailto:vyt@georgetown.edu">vyt@georgetown.edu</a>
Dr. Sarah Stoll (Professor)	Phone: 202-687-5839	E-mail: <a href="mailto:sls55@georgetown.edu">sls55@georgetown.edu</a>
Dr. Faye Rubinson (Professor)	Phone: 202-687-2066	Email: <a href="mailto:jfr@georgetown.edu">jfr@georgetown.edu</a>