

Omar Green, Ph. D.

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EDUCATION

University of Wisconsin

Ph D. Chemistry

Thesis: "Design of Coinage-Metal-Based Luminescent Small Molecule Sensors"

Advisor: Professor J. N. Burstyn

Madison, WI

2005

University of Toronto

Chemistry Specialist Hon. B. Sc. with distinction

Thesis: "Preparation of electropolymerized surface-bound organometallic catalysts"

Advisor: Professor A. K. Yudin

Toronto, ON, Canada

1999

WORK EXPERIENCE

Ionica Sciences

Co-Founder and Chief Executive Officer

○ Won **DARPA Phase I SBIR** for surface enhanced Raman scattering assay to measure low hormone concentrations

○ Won **Air Force Phase I STTR** for infrared based detection of stress & fatigue markers in breath and saliva

Ithaca, NY

2013-present

Agave Biosystems

Staff scientist-Lead Chemist

Organize team efforts towards completing SBIR funded research, submit grant applications and serve in an advisory role for staff mainly composed of biologists and biomedical engineers, winning approximately \$2.5 mil. in funding

○ Founding researcher of Agave Biosystems chemistry division

○ Won **DARPA Phase I SBIR** funding for application of ionic liquids for storage of biological samples

○ Won **two Air Force Phase I SBIR** grants for sensor development targeting VOCs and chemical warfare agents

○ Won **Phase II** grant for transdermal materials (i.e. tattoos) capable of detecting chemical warfare agents

○ Won **Phase II** grant for nanoparticle-based personalized medicines for hard-to-address pathogens

○ **SBIR Phase II** selected as "success story" by Air Force

Ithaca, NY

2010-2013

Argonne National Laboratory

Assistant Chemist, Material Science Division

Investigated role of water in gel formation with an amide-containing imidazolium ionic liquid

○ Designed and synthesized amide-containing ionic liquid as the basis for self assembled, stimulus responsive materials

- Designed 2D NOE NMR-based analytical methods applicable to water/ionic liquid interactions to investigate unique characteristics of amide-containing ionic liquids

Engineered mesoporous, biocompatible scaffold supports for membrane proteins

○ Introduced use of chemical additives to facilitate formation of polystyrene bead templates for ionic liquid scaffolds

- Introduced the use of ionic liquids as the support medium for membrane proteins

- Designed IR- and AFM-based assessment of bead array composition and surface morphology

Argonne, IL

2007-2009

California Institute of Technology

Postdoctoral Researcher, Professor J.K. Barton

Time-resolved protein kinetics investigated through electrochemistry

○ Proposed, designed and demonstrated viability of anthraquinone-modified oligonucleotides to facilitate electrochemical investigations of DNA-protein interactions

○ Initiated time-resolved, electrochemical investigation of enzyme kinetics using anthraquinone-modified DNA

Pasadena, CA

2006-2007

GRADUATE RESEARCH

University of Wisconsin

Research Assistant, Professor J.N. Burstyn

Ag(I)-Impregnated Polymer films as olefin sensors

○ Proposed and demonstrated viability of a Ag(I)-impregnated polymers as ethylene sensing films

Madison, WI

2001-2005

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- Determined spectroscopic characteristics of the polymer films
 - Employed optical and vibrational spectroscopy to understand photophysical origin of emissive phenomenon
 - Investigated paradigm breadth with respect to polymers, analytes and metal salts
 - Designed equipment for luminescent sensor applications including glassware and optics

Synthesis and spectroscopic interrogation of highly luminescent phenanthroline ligated Cu(I) coordination complexes

- Initiated study of luminescent Cu(I)-phenanthroline complex demonstrating the largest quantum yield and longest lifetime in class of molecules, rivaling photophysical properties of dyes used in solar cells
 - Designed and performed synthesis of organic ligands and coordination complexes
 - Devised optical (i.e. absorption and emission) spectroscopic methods to observe changes in optical and luminescent properties of the Cu(I) complexes both in the solid state and in solution
 - Devised vibrational (i.e. FTIR and Raman) spectroscopic methods to observe changes in coordination of Cu(I) center upon exposure to small molecules to determine suitability of complexes for sensing applications

PERTINENT PUBLICATIONS & GRANTS AWARDED

Ionica Sciences Awards

1. **Green, O.** & Tabb, J., “Real Time Detection of Stress & Fatigue Related Biomarkers Using Vibrational Spectroscopy”, **Air Force Phase I STTR**, Solicitation AF14-AT21, **2014**
2. **Green, O.** & Tabb, J., “Surface Enhanced Raman Scattering-Based Oxytocin Quantitation”, **DARPA Phase I SBIR**, Solicitation SB132-001, **2013**

Agave BioSystems Awards

1. **Green, O.** & Tabb, J., “Intracellular Detection of Small Molecules in Live Cells”, **Air Force Phase I & II SBIR**, Solicitation AF11-BT09, **2012**
2. **Green, O.** (PI) & Tabb, J., “Improved Dried Biological Specimen Materials, Recovery and Processing for Diagnostics”, **DARPA Phase I SBIR**, Solicitation SB112-005, **2011**
3. **Green, O.**, (PI) “Continuous Indoor Vapor Intrusion Monitoring System for VOCs”, **Air Force Phase I SBIR**, Solicitation AF103-226, **2011**

Publications

1. Santiago Cintron, M., **Green, O.**; Burstyn, J.N., “Ethylene Sensing by Silver(I) Salt-Impregnated Luminescent Films”, *Inorg. Chem.*, **2012**, 51, 2737-2746
2. **Green, O.**; Grubjesic, S.; Lee, S.; Firestone, M.A., “The Design of Polymeric Ionic Liquids for the Preparation of Functional Materials” *Polym. Rev.*, **2009**, 49, 339-360
3. **Green, O.**; Gandhi, B.A.; Burstyn, J.N., “Photophysical Characteristics and Reactivity of Bis(2,9- di-tert-butyl-1,10-phenanthroline)Cu(I)” *Inorg. Chem.*, **2009**, 48, 5704–5714.
4. Gorodetsky, A.A.; **Green, O.**; Yavin, E.; Barton, J.K. “Coupling into the Base Pair Stack Is Necessary for DNA Mediated Electrochemistry” *Bioconjugate Chem.*, **2007**, 18, 1434–1441
5. **Green, O.**; Smith, N. A.; Ellis, A.B.; Burstyn, J. N. “AgBF₄-Impregnated poly(vinyl phenyl ketone): an ethylene sensing film” *J. Am. Chem. Soc.*, **2004**, 126, 5952-5953

PATENTS

1. Burstyn, J. N., Ellis, A.B., **Green, O.**, Smith, N.A., “Photoluminescent Ethylene Sensors”, U.S. #7,105,274, **2006**
3. Burstyn, J. N., **Green, O.**, Gandhi, B., Bis(2,9-di-tert-butyl-1,10-phenanthroline)Cu(I) complexes, methods of synthesis and uses thereof” U.S. Patent Application #P06445US (utility application, **2007**)

AWARDS

University of Wisconsin

Samuel McElvain Travel Grant

Samuel McElvain Fellowship Awardee

Madison, WI

2004

2000

University of Toronto

University of Toronto In-Course Regents Award

Toronto, ON, Canada

1998 & 1999