

SANJEEWA K. RODRIGO, Ph.D.

Senior Lecturer

The Open University of Sri Lanka

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EDUCATION

Ph.D. in Chemistry (2008-2014)

University of Cincinnati, Cincinnati, Ohio, USA

Dissertation: *Nickel catalyzed regioselective reductive coupling reactions*, Advisor: Prof. Hairong Guan

BSc. Special Degree in Chemistry (Hons, Second Class Upper Division) (2003-2007)

Minor in Biology, Molecular Biology, Statistics

University of Peradeniya, Sri Lanka

Dissertation: *Bioactivity of Acronychia pedunculata and Adenanthera pavonina and Isolation of antimicrobial compounds from Acronychia pedunculata*, Adviser: Prof. B.M.R. Bandara

WORK EXPERIENCE

Senior Lecturer

The Open University of Sri Lanka

2020-current

Senior Research Scientist

Sri Lanka Institute of Nanotechnology (SLINTEC)

01/2018-/09/2020

Postdoctoral Fellow

Dept. of Biomedical, Chemical, and Environmental Engineering, University of Cincinnati

12/2016-12/2017

Scientist

Pegasus Technical Services Inc., Cincinnati, OH, USA

04/2015-11/2016

Postdoctoral Scholar

Department of Molecular and Cellular Biochemistry, University of Kentucky, Lexington, KY

06/2014-04/2015

PhD Intern

Beauty Technology Division, Procter and Gamble Company, Cincinnati, OH, USA

05/2013-08/2013

Research Assistant

Department of Chemistry, University of Cincinnati, Cincinnati, OH, USA

09/2008-04/2014

Lecturer

Department of Physical Sciences, Rajarata University of Sri Lanka

12/2007-04/2008

Teaching Assistant

Department of Physical Sciences, Rajarata University of Sri Lanka

09/2007-11/2007

Industrial Intern

Lankem Paints Limited, Sri Lanka

05/2006-07/2006

SKILLS AND QUALIFICATIONS

- Highly Proficient with **organic chemistry, multistep-organic synthesis, C-C coupling reactions** and **column chromatographic techniques**
- Highly experienced with **inorganic/organometallic chemistry**
- Highly experienced in utilizing **polymers** for the development of **drug delivery** methods
- Highly experienced in **electrospinning/spraying polymers** for various applications
- Highly experienced in nanotechnology, nanomaterial synthesis, electrohydrodynamic technology, nanomedicine, drug delivery
- Highly experienced in **handling air and moisture sensitive materials** using Schlenk line and glove box techniques
- Highly experienced in utilizing **electrospray aerosol technology** for **encapsulation** and to make **nanomaterial**
- Highly experienced with **Isolation of natural products from medicinal plants**
- Proficient with LCMS, GCMS, FT-IR, *in situ* reactor IR to study reaction kinetics, NMR (2D, multi nuclear), UV-Vis, Electro spray aerosol generator, Wide-range particle spectrometer (WPS), analytical techniques
- Creative problem solving, fast learning, and strategic planning abilities evidenced by meeting multiple independent/collaborative project goals within the research career

- **Strong oral and written communication skills** demonstrated with several conference presentations and publications
- Proficient with relevant softwares and scientific databases (Chemdraw, Mesrenova, Minitab, Kaleidagraph, Scifinder, Reaxys, Scopus)

INDUSTRIAL INTERNSHIPS

Ph.D. summer internship working on hair color in the Beauty Technology Division at the **Procter and Gamble Company**, Cincinnati, Ohio, USA

- Worked on mechanistic aspects of dye formation
- Leveraged in house **LCMS, UV-VIS** and **MALDI-MS** instruments and expertise to support mechanistic insights
- Collaborated with internal experts in hair color mechanism team
- Developed insights for a top priority hair color program
- Demonstrated strong teamwork skills

Internship at **Lankem Robbialac**, Sri Lanka, at the paint-manufacturing facility

- Formulated a new phosphate pre-treatment system

RESEARCH EXPERIENCE

Sri Lanka Institute of Nanotechnology

Senior Research Scientist

2018-current

- Peptide synthesis for drug development
- Developed a multi axial electro spraying system for nanomaterial synthesis
- Nutraceutical development
- Drug delivery method development

University of Cincinnati, Cincinnati, OH

Postdoctoral Fellow

2016-2017

- Development of dual capillary electro spray systems and synthesis of core-shell micro/nanomaterial
- Designed and built an electro spray instrument

US EPA, Cincinnati, OH

Scientist at Pegasus Technical Services Inc., (onsite contractor to US EPA)

2015-2016

- Development of an oil simulant using aerosol technology to be utilized in oil spill studies at US EPA, Cincinnati following project related QAPP and QA&QC procedures
- Prepared monthly reports on research progress

University of Kentucky, Lexington, KY

Postdoctoral Scholar

2014-2015

- Synthesis of *Pittsburgh compound B (PIB)* analogs as photoaffinity probes to chemically map the Alzheimer's brain (*manuscript in preparation*) in collaboration with Sanders-Brown Center on Aging, University of Kentucky.
- Synthesis of Isoprenoid analogs as drug candidates for breast cancers

University of Cincinnati, Cincinnati, OH

Graduate Research Assistant

2008-2014

- Developed a new synthetic method for 1,4-difunctionalized compounds using nickel-catalyzed reductive coupling of propiolate esters and aldehydes
- Designed and synthesized *N*-heterocyclic carbene ligands to carry out asymmetric version of propiolate ester and aldehydes coupling
- Designed a kinetic model to study the mechanism of nickel-catalyzed reductive coupling of propiolate esters and aldehydes
- Developed a new synthetic method for substituted arenes using nickel-catalyzed cyclotrimerization of propiolate esters and related alkynes
- Discovered a nickel-based catalytic system for the hydrogenation of esters

University of Peradeniya, Sri Lanka
Undergraduate Researcher

2006-2007

- Studied biological activities (*antimicrobial, cytotoxic, antifungal and antioxidant*) of plant materials from *Acronychia pedunculata* and *Adenanthera pavonina*
- Isolated three antimicrobial compounds, which are active against MRSA (Methicillin-resistant *Staphylococcus aureus*) from *Acronychia pedunculata* root extract
- Compared Soxhlet and sonicator methods for plant material extraction

AWARDS & RECOGNITION

University of Cincinnati, Cincinnati, OH, 2008-2014

- Graduate Student Governance Association (GSGA), University of Cincinnati, Research fellowship, 2014
- Procter and Gamble (P&G) award for “Most applicable work for industry” for “Efficient and Regioselective [2 + 2 + 2] cyclotrimerization of ynoates and related alkynes catalyzed by nickel”, November 15th, 2013-Runner-up
- One of the 60 participants of CENTC (NSF Center for Enabling New Technologies Through Catalysis) summer school, University of Washington, Seattle, Washington, June 22nd - 26th 2013.
- 30th Brown Lectures, Purdue University, USA, poster competition winner, 2013.
- University research council (university of Cincinnati) summer fellowship proposal ranked 12 out of 200 applications, April 2013.
- Henry Hochstetter award for excellence in teaching, university of Cincinnati, 2012.

University of Peradeniya, Peradeniya, Sri Lanka, 2003-2007

- University Colors awards for best performance in cricket, 2004, 2005, 2006, University of Peradeniya, Sri Lanka

Professional Affiliations

- American Chemical Society (ACS)

PUBLICATIONS

Invited articles

- “Electrohydrodynamics in fabricating drug delivery systems”, *Chemistry in Sri Lanka*, 2020, 37, 2, 34

Articles in International Peer Reviewed Journals

- Karunarathna, S. C**Rodrigo, S. K.** *et al* 56 of the world’s deadliest mushrooms, *under review (Fungal Diversity*, 2021)
- Perera, K. D. C.; Weragoda, G. K.; Haputhanthri, R.; **Rodrigo, S. K.** “Quantification of Curcumin in Human Serum for in vivo Applications using Attenuated Total Reflectance Infrared Spectroscopy Combined with Multivariate Analysis”, accepted by *Vibrational Spectroscopy* (2021)
- Ekanayake, U. G. M.; Dissanayake, D. M. S. N.; Rathuwadu, N.; Kumarasinghe, R. K. K. G. R. G.; **Rodrigo, S. K.**; Mantilaka, M.M. M. G. P. G, “Facile fabrication of fluoropolymer self-assembled ZnO nanoparticles mediated, durable and robust omniphobic surfaces on polyester fabrics”, *Journal of Fluorine Chemistry*, 2020, <https://doi.org/10.1016/j.jfluchem.2020.109565>
- **Rodrigo, S. K.**; Guan, H. “Mechanistic Study of Nickel-Catalyzed Reductive Coupling of Ynoates and Aldehydes” *J. Org. Chem.* 2017, 82, 5230-5235
- **Rodrigo, S.K.**; Powell, V. I.; Coleman, G. M.; Krause, J. A.; Guan, H. “Efficient and Regioselective Nickel-Catalyzed [2+2+2] Cyclotrimerization of Ynoates and Related Alkynes.” *Org. Biomol. Chem.* 2013, 11, 7653-7657
- **Rodrigo, S.K.**; Guan, H. “Quick Installation of a 1,4-Difunctionality via Regioselective Nickel-Catalyzed Reductive Coupling of Ynoates and Aldehydes” *J. Org. Chem.* 2012, 77, 8303-8309

- Koralegedara, N.H.; Al-Abed, S.R.; **Rodrigo, S. K.**; Karna, R.R.; Scheckel K.G.; Dionysiou, D.D.; “Alterations of Pb Speciation by sulfate from addition of flue gas desulfurization gypsum in two Contaminated Soils”, *Sci Total Environ*. 2016, DOI: 10.1016/j.scitotenv.2016.10.027
- Yang, W.M.; **Rodrigo, S.K.**; Zimmer, T “Synthesis of Environmental Simulants or Tracers Using Novel Aerosol Based Techniques”, *manuscript in preparation*

Abstract Publications in Local Conferences

- **Rodrigo, S. K.**; Jayasingha, U. L. B.; Bandara B. M. R. “Antifungal, antioxidant and cytotoxic activity of *Acronychia pedunculata* and *Adenantha pavonina*.” *Proc. Peradeniya Univ. Res. Sessions*, 2007, 12, 94-95

Abstract Publications in International Conferences

- Ekanayake, U.G. Mihiri; Palihawadana, T; Mantilaka, M.M.M.G.P.G; **Rodrigo, S. K.**; Kostya (Ken) Ostrikov, Facile fabrication of superhydrophobic surfaces with silica aerogel embedded polyurethane using electrospraying process, ICONN 2020, Brisbane, Australia, 2020 (Oral)
- Liyanaarachchi, S. U; **Rodrigo, S. K.**; Kottegoda, N; Karunaratne, V. “Black seed oil incorporated polycaprolactone microspheres as an effective oil encapsulation approach”, World Summit on Advanced Materials and Engineering New materials and new technologies, Singapore, 2019 (Oral)
- Rodrigo, S.K.**; Yang, W; Conmy, R; Sorial, G; Zimmer, A. “Electrospray Aerosol Synthesis of Crude Oil Surfactant/tracer to mimic the Behavior of Oil Droplets in Water” 254th ACS National Meeting, Washington DC, 2017 (**Poster**)
- Rodrigo, S.K.**; Powell, I; Guan, H. “Efficient and regioselective [2+2+2] cyclootrimerization of ynones and related alkynes catalyzed by nickel” 247th ACS National Meeting, Dallas, TX, 2014 (**Poster**)
- Rodrigo, S.K.**; Guan, H. “Quick Installation of a 1,4-Difunctionality via Regioselective Nickel- Catalyzed Reductive Coupling of Ynones and Aldehydes.” Graduate Poster Forum, University of Cincinnati, 2013 (**Poster**)
- Rodrigo, S.K.**; Powell, I; Guan, H. “Nickel-Catalyzed Regioselective cyclootrimerization of Alkynes to Synthesize Substituted Aromatic Compounds.” Oesper Symposium, ACS Local Meeting, Cincinnati, OH, 2012. (**Poster**)
- Rodrigo, S.K.**; Krause, J. A.; Guan, H. “Ni-Catalyzed Multi component coupling: A new approach to synthesize 1,4-Difunctionalized Compounds.” 243rd ACS National Meeting, San Diego, CA, 2012 (**Oral**)
- Rodrigo, S.K.**; Guan, H. “Ni-Catalyzed Direct Synthesis of 1,4-Difunctionalized Compounds.” Graduate Poster Forum, University of Cincinnati, 2012 (**Poster**)
- Rodrigo, S.K.**; Krause, J. A.; Guan, H. “Nickel-Catalyzed Multicomponent Coupling: A New Approach to Synthesize 1,4-Difunctionalized Compounds.” Ohio Inorganic Weekend, Cincinnati, OH, 2011 (**Poster**)
- Rodrigo, S.K.**; Krause, J. A.; Guan, H. “Nickel-Catalyzed Multicomponent Coupling: A New Approach to Synthesize 1,4-Difunctionalized Compounds.” Oesper Symposium, ACS Local Meeting, Cincinnati, OH, 2011 (**Poster**)
- Rodrigo, S.K.**; Krause, J. A.; Guan, H. “Ni-Catalyzed Direct synthesis of 1,4-Difunctionalized Compounds.” Oesper Symposium, ACS Local Meeting, Cincinnati, OH, 2010 (**Poster**)
- Rodrigo, S.K.**; Krause, J. A.; Guan, H. “Ni-Catalyzed Direct Synthesis of 1,4-Difunctionalized Compounds.” 240th ACS National Meeting, Boston, MA, 2010 (**Oral**)
- Rodrigo, S.K.**; Guan, H. “Ni-Catalyzed Direct Synthesis of 1,4-Difunctionalized Compounds.” 41st ACS Central Regional Meeting, Dayton, OH, 2010 (**Oral**)
- Rodrigo, S.K.**; Guan, H. “Ni-Catalyzed Direct Synthesis of 1,4-Difunctionalized Compounds.” Graduate Poster Forum, University of Cincinnati, 2009 (**Poster**)
- Rodrigo, S.K.**; Jayasinghe, U. L. B.; Bandara, B. M. R. “Antifungal, Antioxidant and Cytotoxic activity of *Acronychia pedunculata* and *Adenantha pavonina*.” Peradeniya University Research Session (PURS) 2007 (**Oral**)

TECHNICAL PROFICIENCY

Nanotechnology | Organic synthesis | Inorganic/organometallic synthesis | Natural product chemistry | Nanomaterial synthesis | Purification techniques | Schlenk and glove-box techniques | Solvent purification systems | Multi-nuclear NMR spectroscopy | HPLC | Gas chromatography | FT-IR spectroscopy | Fluorescence and UV-Vis spectroscopy | Wide-range particle spectrometer | Electrospray aerosol techniques | Particle size analysis

DISSEMINATION OF KNOWLEDGE

Review of International Journal Articles

- Organometallics (impact factor 3.862)
- Journal of Organic Chemistry (impact factor 4.849)

Workshops and Science Camps

- Have contributed to science camps organized by CGSA at local schools

Teaching

- Open University of Sri Lanka

Taught Concepts in spectroscopy (Level 05), Coordination chemistry (Level 04)
Organic lab (level 05), Organic chemistry (Level 06, special students)

- PGIS, Peradeniya

Visiting lecturer

- Sri Lanka Institute of Nanotechnology Academy, Senior lecturer II

Taught Organic chemistry, Characterization techniques

- University of Cincinnati

Teaching assistant: 2008-2014

Taught freshman recitation, Organic lab and Organic recitation, Inorganic lab.

- Rajarata University of Sri Lanka

Temporary Lecturer: 2007-2008

Taught Physical Chemistry for first year and second year undergraduate students.

Temporary Demonstrator: 2007

Taught first year General Chemistry Lab, second year Organic Chemistry Lab.

- Academy of the Sri Lanka Institute of Nanotechnology

Senior Lecturer (Grade II)

Conduct Organic chemistry lectures and Instrumentation
Supervision of MPhil and PhD

Mentoring

- Ichem students (literature survey projects)
- Mentoring MPhil and PhD students and postdocs at SLINTEC
- Mentored & guided five undergraduate students and two PhD students at university of Cincinnati

RESERCH GRANTS

- Graduate Student Governance Association (GSGA), University of Cincinnati, Research fellowship, 2014 - \$1200
- University research council summer fellowship, April 2013-\$3000 (proposal ranked 12 out of 200 applications)

COMPUTER SKILLS

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|---|--|
| • Operating Systems | Microsoft Windows, Apple Mac OS X, Linux |
| • Programming | Python, C |
| • Word Processing & Presentation | Microsoft Office, Endnote |

LEISURE INTRESTS

Cricket | Travelling | Programming & building circuits with Arduino

PROFESSIONAL REFERENCES

Prof. Hairong Guan (Ph.D. adviser)

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University of Cincinnati
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E-mail: hairong.guan@uc.edu

Prof. B. M. R. Bandara (Undergraduate research adviser)

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Faculty of Science
University of Peradeniya
Phone: 0812394440
E-mail: rbandara@pdn.ac.lk