



K.G. Upul Ranjan Kumarasinghe, PhD

University of Sri Jayewardenepura

Department of Chemistry, Gangodawila, Nugegoda, Sri Lanka

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Education

Mississippi State University, Starkville, MS, USA

Doctor of Philosophy (Ph.D.) in Organic Chemistry, August 2011 - August 2016

Dissertation Title: Rhodium Catalyzed Coupling of *in situ* Generated Alpha-Lactams with Indoles and Synthesis and Surface Immobilization of Bis-corannulene Molecular Receptors

Adviser: Dr. Andrzej Sygula

University of Sri Jayewardenepura, Nugegoda, Sri Lanka

Bachelor of Science (B.Sc.) Special Degree in Chemistry with First Class, April 2005 – August 2009 (Overall best performance of the B.Sc. Special Degree in Chemistry, August 2009)

Work and Teaching Experience

University of Sri Jayewardenepura, Department of Chemistry, Nugegoda, Sri Lanka

Senior Lecturer Grade II – May 2017 – Present

Visiting Lecturer, M.Sc. / Master / Postgraduate Diploma in Industrial Organic Chemistry-2023 to present

Visiting Lecturer, M.Sc. / Postgraduate Diploma in Industrial Analytical Chemistry – 2018 to present

Visiting Lecturer, M.Sc. in Polymer Science and Technology – 2018 to 2022

Senior Lecturer Grade II (On Contract) – September 2016 – May 2017

Lecturer (Temporary) – September 2010 – July 2011

Demonstrator (Temporary) – August 2009 – August 2010

Mississippi State University, Department of Chemistry, Starkville, MS, USA

Graduate Teaching Assistant – May 2012 – August 2016

University of Sri Jayewardenepura, Faculty of Medicine, Nugegoda, Sri Lanka

Visiting Lecturer – October 2010 – March 2011

Research Activities

University of Sri Jayewardenepura, Department of Chemistry, Nugegoda, Sri Lanka

Senior Lecturer Grade II – May 2017 – Present

Postgraduate Research Projects

Co-investigator of research project of M.Phil. degree on “Novel supported nano zero-valent iron, composites for the remediation of persistent organic pollutants” funded by the Institute of Chemistry, Ceylon, 2023-present.

Co-investigator of research project of M.Phil. degree on “Formulation of antifungal cream/ointment including 3-benzylidene-indolin-2-one as the active ingredient” funded by Open University, Sri Lanka, 2023-present.

Principle investigator of research project on “Development of Silver Nanoparticle Impregnated Nitrocellulose Spray Paint with Antimicrobial Properties”, Research Grant Number: ASP/01/RE/SCI/2019/14, funded by the University of Sri Jayewardenepura, 2019-2021.

Principle investigator of research project of M.Phil. degree on “A Green Approach to the Synthesis of Novel Indole and Oxindole Derivatives”, Research Grant Number: ASP/01/RE/SCI/2017/81, funded by the University of Sri Jayewardenepura, 2018-2021.

Co-investigator of research project of M.Phil. degree on “Analysis of Biochemical Compounds During Fermentation of Black Tea to Study Correlation with the Digi-Nose Aroma Detecting System and Colorimetric Sensors” funded by the University of Sri Jayewardenepura, 2019-2021.

Co-investigator of research project of M.Phil. degree on “Anti-microbial Activity of Silver Nanoparticles Capped with Garcinol and Garcinia Cambogia Extract” funded by the University of Sri Jayewardenepura, 2018-2021.

Principle investigator of M.Sc. degree research project on “Phytochemical Screening, Investigation of Antioxidant and Antibacterial Activities and Preparation of Medicinal Soap from *Actiniopteris Radiata* Crude Extract” – 2019.

Undergraduate Research Projects - Principle Investigator

One-pot Multicomponent Synthesis of Indole-Derived Fluorometric Chemosensor for Detection of Fe³⁺ in Aqueous Media-2022

Stabilization of Natural Dyes Using Rice Husk Silica Nanoparticles-2022

“On-water” Catalyst-Free Synthesis of 3-Alkenyl Oxindoles-2021

Microwave-Assisted Synthesis of Silica-Supported Indole Derived Fluorometric Probe for the Selective Detection of Fe³⁺ Ions-2021

Microwave-Assisted One-Pot Multi Component Synthesis of Indole Derived Fluorometric Probe for Detection of Cobalt Ions– 2020

Microwave-Assisted One-Pot synthesis of 3-Alkenyl oxindole Derivatives from Naturally Occurring Carbonyl Compounds and Their Fluorescence Properties - 2020

Green Approach to Develop Antimicrobial Fabric using *Garcinia Zeylanica* and Tea Waste Extract - 2019

Phytochemical Screening, Synthesis of Silver Nanoparticles, and *in-vitro* Biological Assays of Crude Extracts of *Annona Muricata* Fruit – 2019

Green Synthesis of 3, 4 – Dihydropyrimidinones and *N*-acetylated Derivatives Using Biosurfactants – 2019

A Green Approach for Synthesis of Dibenzobarrelene Compounds and Solid-Phase Immobilization of 9,10-Dihydroanthracene-9,10- α,β -succinic Anhydride on Silica Support – 2018

Green Synthesis of Biolubricant from Palm Oil Biodiesel - 2018

Mississippi State University, Department of Chemistry, Starkville, MS, USA

Doctor of Philosophy – August 2011- August 2016

Synthesis of Biological Active Molecules

Synthesized new class of indole containing α -amino amides via *in situ* generated α -lactams and indole derivatives in the presence of rhodium catalyst by one-pot methodology and microwave-assisted reactions.

Attempted to develop a new methodology to synthesize oxindoles from aryl halides and amides in the presence of copper catalyst by one-pot methodology.

Synthesis of Polyaromatic Hydrocarbons

Synthesized bis-corannuleneanthracene, the first ever corannulene-based pentacene, from isocorannulene furan and bisbenzyne precursor.

Synthesis of Molecular Receptors and Determination of Binding Affinity by NMR Titrations

Synthesized barrelene tethered corannulene based molecular receptors from bis-corannuleneanthracene and evaluated their binding affinity towards fullerenes by NMR titration.

Solid-Phase Organic Synthesis

Immobilized barrelene tethered corannulene based molecular receptors on surface modified silica gel and studied the potential application of molecular receptors immobilized silica gel by separation of different size/shape fullerenes.

Synthesis of Prodrugs of Doxorubicin

Synthesized acid cleavable doxorubicin hydrochloric (DOX.HCl) drug attached thiomaleamic linker.

University of Sri Jayewardenepura, Department of Chemistry, Nugegoda, Sri Lanka

Undergraduate research project, B.Sc. Special Degree in Chemistry – 2009

Determined trace levels of lead in chocolates, mercury in fish and potassium bromate (KBrO₃) content in bakery products

Government Analyst's Department, Sri Lanka

Industrial training project, B.Sc. Special Degree in Chemistry – 2008

Determined adulterants in coconut oils available in Sri Lankan market.

Skills and Techniques

Organic Synthesis

Synthesis, isolation and characterization of organic compounds, Microwave-assisted organic synthesis, Solid-phase organic synthesis, Organic synthesis in inert gas environment (in glove box), One-pot organic synthesis, Chromatographic separations of organic compounds including flash chromatography

Characterization Techniques

NMR spectroscopy including NMR titrations, High Resolution Mass Spectrometry (HRMS), Gas Chromatography/Mass Spectrometry (GC/MS), High Performance Liquid Chromatography (HPLC), Infra-Red Spectrometry (FTIR, ATR and DRIFTS), UV-Visible Spectroscopy, Florescence Spectroscopy, Crystal growth and characterization, X-Ray Diffraction (XRD), Thermogravimetric Analysis (TGA), Elemental Analysis

Research Related Software's

Chemdraw, Chem3D, ACD ChemSketch, Spinworks, Topspin, Mercury, and Origin software's, Molecular mechanics optimizations by Chem3D

Publications in Peer-Reviewed Journals

Wanniarachchi, P.C; **Kumarasinghe, K.G.U.R.**, Jayathilake, C. Recent advancements in chemosensors for the detection of food spoilage, Food Chemistry, 2024, 436, 137733.

Samaradiwakara, D.M.T.A; Kandambi, H.H; **Kumarasinghe, K.G.U.R.** Recent advances in green approaches for synthesis of oxindole derivatives. Current Scientia (Special Issue). Current Scientia - Special Issue of Review Articles. 2023, 1(s1), 208-236.

De Silva, A.U.T.; **Kumarasinghe, K.G.U.R.** Indole-based fluorometric and colorimetric chemosensors for the selective detection of Cu²⁺: A brief review from the year 2011-2021. *Current Scientia - Special Issue of Review Articles*. 2023, 1(s1), 191-207.

Wijekoon, S; Gunasekara, C; Palliyaguru, L; Fernando, N; Jayaweera, P.M; **Kumarasinghe, K.G.U.R.** Solvent-free synthesis and antifungal activity of 3-alkenyl oxindole derivatives, *Asian Journal of Green Chemistry*, 2022, 6(4), 297-319.

Rizana, A; Cooray, A.T; **Kumarasinghe, K.G.U.R.** Microwave-assisted one-pot multicomponent synthesis of indole derived fluorometric probe for detection of Co²⁺ ions. *Vidyodaya Journal of Science* 2022, 24 (2), 27-42.

Weerasinghe, K; Liyanage, S; **Kumarasinghe, K.G.U.R.**, Cooray, A.T. Synthesis of a bifunctional EDTA–carboxymethyl chitosan derivative and its potential as an adsorbent for the removal of Cu²⁺ ions from aqueous solutions, *Polymers from Renewable Resources*, 2022,13 (3), 170-187.

Kumarasinghe, K. G. U. R.; Silva, W. C. H.; Fernando, M. D. A.; Palliyaguru, L.; Jayawardena, P. S.; Shimomura, M.; Fernando, S. S. N.; Gunasekara, T. D. C. P.; Jayaweera, P. M. One-Pot Reducing Agent-Free Synthesis of Silver Nanoparticles/Nitrocellulose Composite Surface Coating with Antimicrobial and Antibiofilm Activities, *BioMed Research International*, 2021, 2021, 1-16.

Fernando, H.N.; **Kumarasinghe, K. G. U. R.**; Gunasekara, T. D. C. P.; Wijekoon, H. P. S. K.; Ekanayaka, E. M. A. K.; Rajapaksha, S. P.; Fernando, S. S. N.; Jayaweera, P.M. Synthesis, characterization and Antimicrobial Activity of Garcinol Capped Silver Nanoparticles, *J. Microbiol. Biotechnol*, 2019, 29 (11), 1841-1851.

Palliyaguru, L.; Kulathunga, M. U. S.; **Kumarasinghe, K. G. U. R.**; Jayaweera, C. D.; Jayaweera, P.M. Facile Synthesis of Titanium Phosphates from Ilmenite mineral Sand: Potential White Pigments for Cosmetic Applications, *J. Cosmet. Sci*, 2019, 70 (3) 149.

Kumarasinghe, K. G. U. R.; Fronczek, F. R.; Valle, H. U.; Sygula, A. Bis corannulenoanthracene: An Angularly Fused Pentacene as a Precursor for Barrelene-Tethered Receptors for Fullerenes. *Org. Lett.* **2016**, 18, 3054-3057.

Kumarasinghe, K. G. U. R.[†]; Box, H. K.[†]; Nareddy, R. R; Akurathi, G.; Chakraborty, A.; Raji, B.; Rowland, G. B. Rhodium-catalyzed coupling of α -lactams with indole derivatives. *Tetrahedron* **2014**, 70, 9709 –9717. [†]Both authors contributed equally.

International /National Symposium / Conference Proceedings

Umaya, T; Cooray, A.T; **Kumarasinghe, K.G.U.R.** Microwave-assisted synthesis of silica-supported indole-derived fluorometric chemosensor for the detection of Ag⁺ ions. ACS Fall Meeting 2023. Control ID: 3923168

Kandambi, H.H.; **Kumarasinghe, K.G.U.R.** One-pot multicomponent synthesis of indole-derived fluorometric chemosensor for detection of Fe³⁺ ions in aqueous media, iPURSE, 2023/9, Volume 24, Pages 195.

Samaradiwakara, D.M.T.A.; **Kumarasinghe, K.G.U.R.** On-water Catalyst-free Synthesis of 3-Alkenyl Oxindoles, Proceedings of the 27th International Forestry and Environment Symposium, 2023, Vol. 27.

Rizana, A; Cooray, A.T; **Kumarasinghe, K.G.U.R.** Microwave-assisted one-pot multicomponent synthesis of indole derived fluorometric probe for detection of Co²⁺ ions. ACS Fall Meeting 2021. Control ID: 3591631

Wijekoon H.P.S.K., Palliyaguru N.P.L.N., Gunasekarsa T.D.C.P., Fernando S.S.N., Jayaweera P.M., **Kumarasinghe K.G.U.R.**, “Solvent-free microwave assisted synthesis of oxindole derivatives as effective antifungal agents”, 8th Ruhuna International Science and Technology Conference, 2021. (oral presentation)

Wijekoon H.P.S.K., Palliyaguru N.P.L.N., Gunasekarsa T.D.C.P., Fernando S.S.N., Jayaweera P.M., **Kumarasinghe K.G.U.R.**, “Microwave Assisted Solvent-Free Green Approach to Synthesis of Oxindole Derivatives using surface Modified Silica from Rice Husk Waste”, 25th International Forestry and Environment, University of Sri Jayewardenepura 2021. (oral presentation)

Alwis M.K.S.C., Bogahawatte L.B.A.E., Gunasekara T.D.C.P., Jayaweera P.M, **Kumarasinghe K.G.U.R.** “Green approach to develop antimicrobial fabric using *Garcinia zeylanica* and tea waste extract”, 25th International Forestry and Environment, University of Sri Jayewardenepura 2021. (oral presentation)

Wijekoon H.P.S.K., Palliyaguru N.P.L.N., Gunasekarsa T.D.C.P., Fernando S.S.N., Jayaweera P.M., **Kumarasinghe K.G.U.R.** “Anti-fungal activity and structural relationship of 3-benzylidene indolin-2-one synthesized from microwave-assisted green method”, Research conference in health sciences, 2021. University of Sri Jayewardenepura, 2020. (oral presentation)

Fernando H.N., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M., Soysa S.S.S.B.D.P, Rajapaksha S.P, “Cytotoxicity and Anticancer Activity of Few Garcinol Associated Metal Systems on BHK- and RD cell lines” 13th International Research Conference, General Sir John Kotelawala Defence University, Sri Lanka, 2020. (oral presentation)

Wijekoon H.P.S.K., Palliyaguru N.P.L.N., Gunasekarsa T.D.C.P., Fernando S.S.N., Jayaweera P.M., **Kumarasinghe K.G.U.R.** “Microwave assisted synthesis and investigation of antifungal activity of 3-substituted-indolin-2-ones”, 75th Annual session of Sri Lanka Association For the Advancement of Science (SLAAS) under section E2-chemical sciences, 2020. (poster presentation)

Samarasiri V., **Kumarasinghe K. G. U. R.**, Cooray A., “Modification of the SPADNS method to develop a sensor as a dye sensitized strip in assessing fluoride levels in drinking water”, Abstract of Papers of the American Chemical Society 258, 2019. (oral presentation)

Wijesinghe W., Jayaweera P.M., **Kumarasinghe K.G.U.R.**, “Green Synthesis of biolubricant from palm oil biodiesel”, Proceeding of International Forestry and Environmental Symposium, Faculty of Applied Sciences, University of Sri Jayewardenepura, 2019. (oral presentation)

Fernando H.N., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M., Rajapaksha S.P.; “Synthesis, Characterization and Antimicrobial Activity of Garcinol coated Titanium Dioxide Nanoparticles”, International Conference on Health Sciences 2019, Faculty of Medical Sciences, University of Sri Jayewardenepura, 18th December 2019. (oral presentation)

Fernando H.N., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M., Rajapaksha S.P.; “synthesis, Characterization and Antimicrobial Activity of Garcinol Iron Complex”, 75th Annual session of Sri Lanka Association For the Advancement of Science (SLAAS) under section E2-chemical sciences, 12th December 2019. (oral presentation)

Silva W.C.H., **Kumarasinghe K.G.U.R.**, “Solid phase immobilization of 9,10-dihydroanthracene-9,10-alpha,beta-succinic anhydride on silica support, 75th Annual session of Sri Lanka Association For the Advancement of Science (SLAAS) under section E2-chemical sciences, 12th December 2019. (oral presentation)

Madhuranga B.K.S., Gunasekara T.D.C.P., **Kumarasinghe K.G.U.R.**, “Phytochemical screening, assessment antioxidant and antimicrobial activities of *Actinopteris radiata* (Sanjeewani) methanolic extract”, 75th Annual session of Sri Lanka Association For the Advancement of Science (SLAAS) under section E2-chemical sciences, 12th December 2019. (oral presentation)

Fernando H.N., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M., Rajapaksha S.P.; “Evaluation of antimicrobial activity of silver nanoparticles capped with garcinol, extracted from *Garcinia quaesita pierre*”, 74th Annual session of Sri Lanka Association For the Advancement of Science (SLAAS) held in the University of Colombo (**Dec 2018**), Page No: 117. (oral presentation)

Fernando H.N., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M., Rajapaksha S.P.; “Determination of the Antimicrobial and Antioxidant Activity of Garcinol Capped Silver Nanoparticles” International Conference on Health Sciences, Sri Lanka (oct 2018). Page No: 118. (oral presentation)

Ariyawansa M.C.B., Mahatantila K.C.P., **Kumarasinghe K.G.U.R.**; “Calcium oxalate crystallization inhibition activity of the leaf extracts of *Passiflora foetida*”; Peradeniya University International Research Sessions, Sri Lanka (**2017**), Volume 21(423). (poster presentation)

Wijekoon H.P.S.K., Ekanayaka E.M.A.K., Peiris M.M.K., Arachchi N.D.H., Palliyaguru L., **Kumarasinghe K.G.U.R.**, Gunasekara T.D.C.P., Fernando S.S.N., Jayaweera P.M.; “Antimicrobial activity of silver nanoparticles capped with crude extract of *Garcinia zeylanica* and garcinol”, Proceedings of the Scientific Sessions (**2017**), Faculty of Medical Sciences, University of Sri Jayewardenepura. (oral presentation)

Kumarasinghe, K. G. U. R.; Sygula, A. “Bis-corannulenoanthracene (C₅₀H₂₂): A Versatile Precursor for Benzocorannulene Molecular Receptors with Polar Tether”, 47th Central Regional Meeting of the American Chemical Society (CERM), Covington, KY, May 18-21, **2016**. (oral presentation)

Kumarasinghe, K. G. U. R.; Sygula, A. “An Angularly Fused Pentacene as a Precursor for Bis-corannulene Molecular Receptors with Polar Tethers”, Lester Andrews / MRBC Joint Research Symposium, Mississippi State University, May 23-25, **2016**. (oral presentation)

Kumarasinghe, K. G. U. R.; Sygula, A. “Novel Bis-corannulene Hydrocarbon (C₅₀H₂₂) with Pentacene Core”, Graduate research symposium, Mississippi State University, April 2, **2016**. (oral presentation)

Other Publications

Kumarasinghe, K.G.U.R. Green Chemistry for Schools: An Innovative Approach to Chemistry Education, *Adyapana Sanwada*-10. 2019/2020. 98-105.

Kumarasinghe, K. G. U. R. Chemistry of Aziridinones (α -lactams), *Chemistry in Sri Lanka*. **2017**, 34 (1), 16-19. (Review article)

Kumarasinghe, K. G. U. R.; Pathiratne, K. A. S.; Deraniyagala, S. P.; Samarasinghe, S. I.; A Preliminary Study to Determine Trace Levels of Lead in Chocolates. *Chemistry in Sri Lanka*. **2009**, 26 (2), 16-17.

Grants and Awards

Appreciation of the Research Council of the University of Sri Jayewardenepura for publishing full papers in recognized indexed journals in science citation index expanded in the year 2019. Research Grant – 2019, University of Sri Jayewardenepura.

Principle investigator, funding research proposal “Development of Silver Nanoparticle Impregnated Nitrocellulose Spray Paint with Antimicrobial Properties”, Grant No-ASP/01/RE/SCI/2019/14.

Research Grant – 2018, University of Sri Jayewardenepura - Principle investigator, funding research proposal “A Green Approach to the Synthesis of Novel Indole and Oxindole Derivatives”, Grant No-ASP/01/RE/SCI/2017/81.

Research Grant - 2017, University of Sri Jayewardenepura - co-investigator, funding research proposal “Anti-cancer Activity of Garcinol Capped Silver Nanoparticles”, Grant No – ASP/01/RE/SCI/2017/19.

Graduate Teaching Assistantship, Department of Chemistry, Mississippi State University, USA - August 2011- August 2016

Professor Tuley De Silva Gold medal for the overall best performance of B.Sc. Special Degree in Chemistry – 2009

Professor W.S. Fernando Gold medal for the best performance of Inorganic and Physical Chemistry in third and fourth year in B.Sc. Special Degree in Chemistry – 2009

Chemical Industries (Colombo) Limited Scholarship for the second best performance in B.Sc. Special Degree in Chemistry (Part I) examination – 2007-2008

Merit award for the Inter University Chemistry Competition organized by the Sri Lankan Section of the Royal Society of Chemistry - 2010.

Guest Lectures

“Sustainable Organic Synthesis: Shades of Green”, organized by E-2 section, Sri Lanka Association for the Advancement of Science (SLAAS) presented at Department of Chemistry, University of Kelaniya, May 2018.

“Green Chemistry in Action: Towards Sustainable Organic Synthesis”, organized by Chemical Society, Department of Chemistry, University of Sri Jayewardenepura, May 2018.

Leadership Activities

Coordinator, M.Sc./Master/PGD in Industrial Organic Chemistry 2021 to present

Coordinator, M.Sc. in Science and Technology of Herbal Products 2019-2021

Secretary, Chemistry Olympiad Sri Lanka (COSL) Committee 2020-2023

Committee member, Chemistry Olympiad Sri Lanka (COSL) Committee 2019 to present

Treasurer, Sri Lankan Academy of Young Scientists (SLAYS) 2022/2023

Council member, Sri Lankan Academy of Young Scientists (SLAYS) 2021/2022 & 2022/2023.

President, Vidujaya Science Teachers' Association (VSTA) 2023/2024

Treasurer, Vidujaya Science Teachers' Association (VSTA) 2022/2023

Executive Committee Member of the Vidujaya Science Teachers' Association (VSTA) 2020/2021 & 2021/2022

Organizing committee of the 3rd Biannual International Symposium on Polymer Science and Technology, Department of Chemistry, University of Sri Jayewardenepura – 2017

Member of the review panel (oral and poster presentations) of the 3rd “Uni – In Alliance 2017” Undergraduate Research Symposium, Faculty of Applied Sciences, University of Sri Jayewardenepura – 2017

Treasurer of the Sri Lankan Student Association, Mississippi State University, USA – 2013-2014

Treasurer of the Softball Cricket Club, Mississippi State University, USA – 2013-2014

Committee member of the Chemical Society, Department of chemistry, University of Sri Jayewardenepura, Sri Lanka – 2008-2009

Chief coordinator representing the Department of Chemistry in the 50th Anniversary Exhibition of University of Sri Jayewardenepura, Sri Lanka – 2008

Certifications

Occupational Safety and Health Administration (OSHA), Mississippi State University - May 2012

Affiliations and Memberships

Institute of Chemistry, Ceylon – 2018 - present

Sri Lanka Association for the Advancement of Science (SLAAS) – November 2016 – present

Sri Lankan Academy of Young Scientist- 2021-2023

American Chemical Society - 2015 to 2017

Graduate Student Association, Department of Chemistry, Mississippi State University, USA – August 2011- August 2016

References

Dr. Andrzej Sygula

Professor

Department of Chemistry

Mississippi State University

Box 9573, Mississippi State, MS 39762

USA

Prof. S.P. Deraniyagala

Senior Professor

Department of Chemistry

University of Sri Jayewardenepura

Gangodawila, Nugegoda

Sri Lanka