


Name of the Teaching Staff	Dr. R. Nandhakumar				
Designation	Associate Professor				
Department	CHEMISTRY / SSAMM				
Date of Joining the Institution	03 Jan 2011				
Qualification with Class / Grade	B.Sc	M.Sc	M.Phil	Ph.D.	
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Area of Specialization	Bioorganic and Medicinal Chemistry, Fluorescent Chemosensors, Supramolecular Chemistry, Chirality and Carbon based materials for Varied Applications				
Subjects Teaching					
Under Graduate		Post Graduate			
APPLIED CHEMISTRY – 12CH201 ENVIRONMENTAL SCIENCES – 12CH203 APPLIED CHEMISTRY LAB – 12CH202		ADVANCED PHARMACEUTICAL CHEMISTRY - 12CH316 ORGANIC CHEMISTRY III - 10CH308 MOLECULAR AND MATERIALS SELF ASSEMBLY - 10NT216 MOLECULAR MACHINES AND MATERIALS - 10NT218 NANOTECHNOLOGY, GREEN CHEMISTRY AND ENVIRONMENTAL HEALTH - 10NT215 MEDICINAL CHEMISTRY - 10NT212 SUPRAMOLECULAR CHEMISTRY – 12CH213 INSTRUMENTAL METHODS OF ANALYSIS - 15CH3016 TRITIMETRIC AND GRAVIMETRIC ANALYSIS PRACTICAL LAB - 10NT208 SYNTHESIS OF ORGANIC COMPOUNDS AND CHROMATOGRAPHY LAB - 10NT219 QUALITATIVE ANALYSIS AND INORGANIC PREPARATIONS LAB - 10NT202 HALF SEMESTER PROJECT - 09CH998			
Total Experience in Years	Teaching	Industry		Research	
	8 years	0.6 yrs		21	
Papers Published	National	8	International	105	
Papers Presented in Conference	National	45	International	44	
Conferences / Symposiums Participated	National	15	International	10	
FDP / STTP / MDP / Summer / Winter School attended	FDP at KITS				
Ph.D. Guide? Give Field & University	Field		University		
	Yes, Bioorganic Chemistry & Fluorescent Chemosensors		Karunya Institute of Technology and Sciences (Deemed-to-be University)		
Ph.D. Projects Guided	Ph.D.s	2 completed	Project at Master's Level	10	
		4 pursuing			
Books Published / IPRs / Patents	PATENTS: 1. Kim, Kimoon; Samal, S.; Raju Nandhakumar. ; Selvapalam, N.; Oh, Dong-Hyun. Processes of preparing glycolurils and cucurbiturils using microwave" <i>PCT Int. Appl. W00511030353, 2005.</i>				

	<p>2. Kim, Kimoon; Oh, Dong-Hyun; Erumaipatty Rajagounder, Nagarajan; Raju Nandhakumar.; Choi, Ju-Young; Ko, Young-Ho. Disubstituted cucurbituril-bonded silica gel <i>PCT Int. Appl. W005113564, 2005.</i></p> <p>BOOK CHAPTER R, Nandhakumar. A grapheme-Organic Composite as a Fluorescent Chemosensor for Ag⁺. <i>Nanoelectronics and Sensors</i>, eds. K.E. Geckeler et al, Bloomsbury Publishing India Pvt. Ltd, New Delhi, pp – 173-178, 2015. ISBN : 978-93-85436-94-9</p>
Professional Memberships	<ul style="list-style-type: none"> • Life Member of the Materials Research Society of India (MRSI) – LMB2481 • Life Member of the Indian Council of Chemists (ICC) – LF/1628 • Life Member of the Indian Science Congress Association (ISCA) – L22119 • Member of the Research Board of Advisors, The American Biographical Institute. Since 2004 • Life Member of the International Association of Engineers - IAENG
Consultancy Activities	AminoLogics, SouthKorea.
Awards	<ul style="list-style-type: none"> • Achievers Award, 2017, KITS, Coimbatore , India • <i>Best Poster Presentation</i> – (pp-72) - 2016 - International Conference On Materials For Sustainable Future (ICMSF 2016) by the Department of Chemistry, School of Chemical and Biotechnology, SASTRA University, Thanjavur – 613 401, TamilNadu on July 14–15. • <i>Best Researcher Award-</i> 2013, Karunya University, Coimbatore, India • <i>Best Faculty Award in Chemistry</i> – 2013, Nehru College of Educational and Charitable Trust, Coimbatore, India , • <i>DST Young Scientist Scheme</i>, New Delhi, India; • <i>NRL-Post.Doc Fellowship</i>, Ewha Womans University, Seoul, South Korea; • <i>BK-21 Post.Doc Fellowship</i>, POSTECH, Pohang, South Korea; • <i>CSIR-SRF</i>, New Delhi, India; • <i>URF</i>, Bharathiar University, Coimbatore, India; • <i>III rank at M.Sc.</i>, PSGCAS, India; • <i>I rank at B.Sc.</i>, SRKVCAS, India.
Grants Fetched	<ul style="list-style-type: none"> ➤ Department of Science and Technology (DST), Science and Engineering Research Board (SERB – EMR), Government of India, New Delhi, India. (No. EMR/2016/001123 for Rs. 34 lakhs) – June 2017 – Ongoing. ➤ Karunya Short Term Research Grant Rs. 30,000 /- December 2016 – <i>Successfully Completed</i> ➤ Department of Science and Technology (DST), Government of India, New Delhi, India. (No. SR/FT/CS-95/2010 for Rs. 20.30 lakhs) – Jan 2011 to July 2014 – <i>Successfully Completed</i> ➤ Karunya Short Term Research Grant for my students (Rs. 25,000 /- for Mr. J. Prabhu, Ph.D. Research Scholar and Rs. 6000 / - for Mr. Derin Don, M.Sc., Chemistry) – 2014, <i>Successfully Completed</i> ➤ Karunya Short Term Research Grant for my students (Rs. 15,000 /- for Mr. S. Suresh, Ph.D. Research Scholar and Rs. 5000 / - for Mr. Derin Don, M.Phil., Chemistry) – 2014, <i>Successfully Completed</i> ➤ Karunya Short Term Research Grant for my student (Rs. 10,000 /- for Mr. Felix, M.Sc., Nanosciences and Nanotechnology) – 2015, <i>Successfully Completed</i>

Interaction with Professional Institutions	Ewha Womans University, South Korea; Bohai University, China; Bharathiar University, India; Bharathidasan University, India. CLRI, Chennai, India; Periyar University, India
Contact Details	Room No. : 008 Intercom : 4001 Building : Science & Humanities – Ground Floor Phone Number : 91-80984-70837 Email : nandhakumar@karunya.edu Webpage : http://sites.google.com/site/rajunandha/Home

Papers Published : Selected

- Krishnaswamy, Velmurugan.; Jeyaraj, Prabhu.; Arunachalam, Raman.; Natarajan, Duraipandy.; Manikantan, Syamala Kiran.; Shanmugam, Easwaramoorthi.; Lijun, Tang.; **Raju Nandhakumar***. Dual Functional Fluorescent Chemosensor for discriminative detection of Ni²⁺ and Al³⁺ -ions and its imaging in living cells. *ACS Sustainable Chem. Eng.*, **2018**, DOI: 10.1021/acssuschemeng.8b03625
- Mukesh Ekanath Shirbhate, **Raju Nandhakumar***, Youngmee Kim, Sung-Jin Kim, Seong Kyu Kim,* and Kwan Mook Kim,* Discrimination of the Chirality of the α -Amino Acids in ZnII Complexes of DPA-Appended Binaphthyl Imine. *Eur. J. Org. Chem.*, **2018**, 4959-4964.
- David John, Dmonte.; A, Pandiyarajan.; N, Bhuvanesh.; S, Suresh.; **R. Nandhakumar,*** Graphene oxide resorcinol hybrid material as fluorescent chemosensor for detection of cerium ion. *Mater. Lett.*, **2018**, 227, 154-157.
- N, Bhuvanesh.; S, Suresh.; J, Prabhu.; K, Kannan.; V, Rajesh Kannan.; **R, Nandhakumar*** Ratiometric fluorescent Chemosensor for Silver Ion and its bacterial cell imaging. *Opt. Mater.*, **2018**, 82, 123-129.
- J, Prabhu.; K, Velmurugan.; A, Raman.; N, Duraipandy.; M.S, Kiran.; S, Easwaramoorthi.; **R, Nandhakumar.*** A Simple Chalcone Based Ratiometric Chemosensor for Sensitive and Selective Detection of Nickel Ion and its Imaging in live cells. *Sensor Actuat B-Chemical*, **2017**, 238, 306-317
- Karthikeyan, Krishnamoorthy.; Sakthivel, Thangavel.; Jipsa, Chelora Veetil.; **Nandhakumar, Raju.**; Gunasekaran, Venugopal*.; Sang, Jae Kim.; Graphdiyne nanostructures as a new electrode material for electrochemical supercapacitors. *Int. J Hydrogen Energ.* **2016**, 41, 1672 – 1678.
- K, Velmurugan.; A, Raman.; Derin, Don.; Lijun, Tang.; S, Easwaramoorthi.; **R, Nandhakumar.*** Quinoline benzimidazole-conjugate for the highly selective detection of Zn(II) by dual colorimetric and fluorescent turn-on responses. *RSC Adv.*, **2015**, 5, 44463-44469.
- Sakthivel, Thangavel.; Karthikeyan, Krishnamoorthy.; Velmurugan, Krishnaswamy.; **Raju, Nandhakumar.**; Sang Jae, Kim.; Gunasekaran, Venugopal*. Graphdiyne-ZnO Nanohybrids as an Advanced Photocatalytic Material. *J. Phys. Chem. C.*, **2015**, 119, 38, 22057-22065
- K, Velmurugan.; **R, Nandhakumar.*** Binol based "turn on" fluorescent chemosensor for mercury ion. *J. Lumin.*, **2015**, 162, 8-13. [*Most downloaded article - <http://www.journals.elsevier.com/journal-of-luminescence/most-downloaded-articles/>*]
- J, Prabhu.; K, Velmurugan.; **R, Nandhakumar.*** Development of fluorescent Lead II sensor based on anthracene derived chalcone. *Spectrochim. Acta A*, **2015**, 144, 23-28.
- Lijun, Tang*.; Zhuxuan, Zheng.; Zhenlong, Huang.; Keli, Zhong.; Yanjiang, Bian.; **Raju, Nandhakumar.*** Multi-analyte, ratiometric and relay recognition of a 2,5-diphenyl-1,3,4-oxadiazole-based fluorescent sensor through modulating ESIPT. *RSC Adv.* **2015**, 5, 10505-10511.
- Paranthaman, Vijayan.; Periasamy, Viswanathamurthi.; Paramasivam Sugumar.; Mondikalipudur, Nanjappagounder, Ponnuswamy.; Manickam, Dakshinamoorthi Balakumaran.; Pudupalayam, Thangavelu, Kalaichelvan.; Krishnaswamy,

Velmurugan.; **Raju, Nandhakumar.**; Ray, Jay Butcher. Unprecedented formation of organo-ruthenium(II) complexes containing 2-hydroxy-1-naphthaldehyde S-benzoyldithiocarbamate: Synthesis, X-ray crystal structure, DFT study and biological activities in vitro. *Inorg. Chem. Front.*, 70, 8, 943–948.

- Jeyaraj, Prabhu.; Krishnaswamy, Velmurugan.; **Raju, Nandhakumar***. A highly selective and sensitive naphthalene-based chemodosimeter for Hg²⁺ ions. *J. Lumin.*, **2014**, 145, 733–736.
- Rajendran, Manikandan.; Periasamy, Viswanathamurthi.; Krishnaswamy, Velmurugan.; **Raju, Nandhakumar.**; Takeshi, Hashimoto.; Akira, Endo. Synthesis, characterization and crystal structure of cobalt(III) complexes containing 2-acetylpyridine thiosemicarbazones: DNA/protein interaction, radical scavenging and cytotoxic activities. *J. Photochem. Photobiol. B*, **2014**, 130, 205–216.
- Fang, Wang.; **Raju, Nandhakumar.**; Ying, Hu.; Dabin, Kim.; Kwan, Mook Kim*.; Juyoung, Yoon*.BINOL-Based Chiral Receptors as Fluorescent and Colorimetric Chemosensors for Amino Acids. *J. Org. Chem.*, **2013**. 78 (22), 11571–11576.
- Fang, Wang.; Jong, Hun Moon.; **Raju, Nandhakumar.**; Baotao, Kang.; Dabin, Kim.; Kwan, Mook Kim*.; Jin, Yong Lee*.; Juyoung, Yoon*. Zn²⁺-induced conformational changes in a binaphthyl-pyrene derivative monitored by using fluorescence and CD spectroscopy. *Chem. Commun.*, **2013**, 49, 7228–7230.
- Lijun, Tang.; Mingjun, Cai.; Zhenlong, Huang.; Keli, Zhong.; Shuhua, Hou.; Yanjiang, Bian.; **Raju, Nandhakumar.*** Rapid and highly selective relay recognition of Cu(II) and sulfide ions by a simple benzimidazole based fluorescent sensor in water. *Sensor Actuat B-Chemical*, **2013**, 185, 188–194.
- Haofei, Huang.; **Raju, Nandhakumar.**; Misun, Choi.; Zhishan, Su.*; Kwan, Mook kim.* Enantioselective Liquid-Liquid Extractions of Underivatized General Amino Acids with a Chiral Ketone Extractant. *J. Am. Chem. Soc.*, **2013**, 135, 7, 2653–2658.
- Lijun, Tang.; Nannan, Wang.; Qiang, Zhang.; Jiaojiao, Guo.; **Raju, Nandhakumar.*** A new benzimidazole-based quinazoline derivative for highlyselective sequential recognition of Cu²⁺ and CN⁻. *Tetrahedron Lett.*, **2013**, 54, 6, 536–540.
- Fang, Wang.; [‡] **Raju, Nandhakumar.**; [‡] Jong Hun, Moon.; Kwan Mook, Kim.*; [‡] Jin Yong, Lee.*; [‡] and Juyoung, Yoon.* Ratiometric Fluorescent Chemosensor for Silver Ion at Physiological pH. *Inorg. Chem.*, **2011**, 50, 6, 2240–2245 (*‡ Equally contributed*).
- Ying, Zhou.;[‡] Ji Whan, Kim.;[‡] **Nandhakumar, Raju.**;[‡] Min Jung, Kim.; Eunae, Cho.; Youn Soo, Kim.; Chongmok, Lee.; Seungwu, Han.; Dong Ha, Kim.; Kwan Mook, Kim.*; Jang-Joo, Kim.*; Juyoung, Yoon.* Novel Binaphthyl-Containing Bi-Nuclear Boron Complex with Low Concentration Quenching Effect for Efficiency Organic Light-Emitting Diodes. *Chem. Comm.*, **2010**, 46, 6512–6514. (*‡ Equally contributed*)
- **Raju Nandhakumar.**; Ahn, Yun Soo.; Jooyeon Hong.; Sihyun Ham*.; Kwan Mook Kim.* Enantioselective Recognition of 1,2-Aminoalcohols by the Binol Receptor Dangled with Pyrrole-2-carboxamide and Its Analogues. *Tetrahedron*, **2009**, 65, 3, 666–671.
- Lijun, Tang.; Hyerim, Ga.; Jiyoung, Kim.; Sujung, Choi.; **Raju Nandhakumar.**; Kwan Mook Kim.* Chirality Conversion and Enantioselective Extraction of Amino Acids by Imidazolium-Based Binol-Aldehyde. *Tetrahedron Lett.*, **2008**, 49, 48, 6914–6916.
- Hyunjung Park.; **Raju Nandhakumar.**; Jooyeon Hong.; Sihyun Ham*.; Jik Chin.; Kwan Mook Kim.* Stereo-Conversion of Amino Acids and Peptides in Uryl-Pendant Binol Schiff Bases. *Chem. Eur. J.*, **2008**, 14, 9935–9942.
- **Raju Nandhakumar.**; Jayoung Ryu.; Hyunjung Park.; Lijun Tang.; Sujung Choi.; Kwan Mook Kim.* Effects of Ring Substituents on Enantioselective Recognition of Amino Alcohols and Acids in Uryl Based Binol Receptors. *Tetrahedron*, **2008**, 64, 33, 7704–7708.
- Lijun Tang.; Sujung Choi.; **Raju Nandhakumar.**; Hyunjung Park.; Hyein Chung.; Jik Chin.; Kwan Mook Kim.* Reactive Extraction of Enantiomers of 1,2-Amino Alcohols via Stereoselective Thermodynamic and Kinetic Processes. *J. Org. Chem.*, **2008**, 73, 15, 5996–5999.
- **Nandhakumar, R*.**; Suresh, T.; Calistus Jude, A.L.; Rajesh kannan, V.; Mohan, P.S.* Synthesis, antimicrobial activities and cytogenetic studies of newer diazepino quinoline derivatives via Vilsmeier Haack reaction. *Euro. J. Med. Chem.*, **2007**, 42, 8, 1128–1136.

Papers Presented in Conference & Symposiums: Selected

- **R, Nandhakumar.;*** K, Velmurugan.; J, Prabhu. Axially Chiral Binol based fluorescent chemosensors for detection of metal ions and its bioimaging. *2nd International Conference on Interdisciplinary approach in Science and Technology (ICIAST)*, Rotunda Gardens, Colombo, Sri Lanka, May 25-28, **2018**. OP- 2.
- J, Prabhu.;; K, Velmurugan.;; **R, Nandhakumar,*** Chalcone based ratiometric sensor for nickel ion and its bioimaging applications. *10th Mid-Year CRSI Symposium in Chemistry*, Department of Chemistry, NIT Trichy and Bharathidasan University, Trichy, TamilNadu, India, July 23-25, **2015**. POSTER – PP122
- K, Velmurugan.;; J, Prabhu.;; **R, Nandhakumar,*** Pyrene pyridine-conjugate as Ag Selective Fluorescence Chemosensor. *10th Mid-Year CRSI Symposium in Chemistry*, Department of Chemistry, NIT Trichy and Bharathidasan University, Trichy, TamilNadu, India, July 23-25, **2015**. POSTER – PP270.
- R. Vickram K. Velmurugan, N. Bhuvanesh and **R. Nandhakumar*** Dimeric Quinoline Schiff base fluorescent chemosensor for Pb²⁺-ion. *National Conference on Recent Advances in Chemical Sciences – RACS – 15*, Department of Chemistry, Gandhigram Rural Institute, Dindugal, Tamilnadu, India, march 5-6, **2015**. ORAL – OP-33
- S, Suresh.;; K, Velmurugan.;; N, Bhuvanesh.;; **R, Nandhakumar,*** A simple chalcone based fluorescence enhanced chemosensor for Al³⁺ ion detection in aqueous media. *10th Mid-Year CRSI Symposium in Chemistry*, Department of Chemistry, NIT Trichy and Bharathidasan University, Trichy, TamilNadu, India, July 23-25, **2015**. POSTER – PP38
- Krishnaswamy, Velmurugan.; Jeyaraj, Prabhu.; **Raju, Nandhakumar***, Quinoline-Imidazole conjugates as Fluorescent Chemosensors for metal ions. *III National Conference on "Innovations in Chemistry – Health and Energy" (iCHEM HE 2014)*, Karunya University, Coimbatore, India, February 6-8, **2014**, ORAL – 17
- **Raju, Nandhakumar.;*** Krishnaswamy, Velmurugan, Enantioselective Recognition of 1,2-Amino Alcohols by a Chiral Dimeric Binol based Receptor. *International Conference on "Chemistry – Frontiers & Challenges"*, PSGR Krishnammal College for Women, Coimbatore, India, February 5-7, **2014**. POSTER – P17
- Krishnaswamy, Velmurugan.; Jeyaraj, Prabhu.; **Raju, Nandhakumar***, A new quinoline-benzimidazole conjugate for the highly selective detection of Zn(II) by dual colorimetric and fluorescent turn-on responses. *International Conference on "Chemistry – Frontiers & Challenges"*, PSGR Krishnammal College for Women, Coimbatore, India, February 5-7, **2014**. ORAL – O14
- Jeyaraj, Prabhu.;; Krishnaswamy, Velmurugan.;; **Raju, Nandhakumar***, A pyrene Pyridine conjugate for Fluorescent Recognition of Ni²⁺ ion in Aqueous Media. *3rd International Science Congress (ISC – 2013)*, Karunya University, Coimbatore, India, December 8-9, **2013**. ORAL – ISCA-ISC–2013-4CS-18
- Krishnaswamy, Velmurugan.;; Jeyaraj, Prabhu.;; **Raju, Nandhakumar***, Imidazoquinoline based fluorescent sensors for the detection of metal ions. *National Conference on Chemosensors (NCC – 2013)*, National Institute of Technology, Tiruchirappalli (NIT-T), India, September 19-20, **2013**. ORAL – OP-10. **(Best Presentation Award)**
- Krishnaswamy, Velmurugan.;; Jeyaraj, Prabhu.;; **Raju, Nandhakumar***, A novel binol based fluorescent chemosensor for the detection of Hg²⁺ ions in aqueous media. *National Conference on Molecules to Materials – solving problems of mankind (NCMM – 2013)*, Karunya University, Coimbatore, India. February 15-16, **2013**. POSTER – PP-08. **(Second Prize for Best Presentation)**
- Krishnaswamy, Velmurugan.;; Jeyaraj, Prabhu.;; **Raju, Nandhakumar***, Highly Selective "Turn-On" Fluorescent Chemosensor for Hg²⁺ based on a Binaphthyl derivative. *National Conference on Advances on Science and Technology (NCAST 12)*, Saveetha University, Chennai, India. October 31, **2012**. ORAL -CH20. **(Best Presentation Award)**
- Fang, Wang.; **Raju, Nandhakumar.;** Kwan Mook, Kim.;;* Juyoung, Yoon.* Binaphthyl based fluorescent chemosensors for chiral recognition and anion recognition. *The International Chemical Congress of Pacific Basin Societies, (Pacific Chem)*, Honolulu, Hawaii, USA, December 15-20, **2010**. (Final Abstract ID: 2295).
- **Nandhakumar, Raju.;** Kwan Mook, Kim.* Enantioselective Recognition of Amino Alcohols and Chirality Conversion of Amino Acids by Carbonylurea-based Imine Receptors. *104th National Meeting of the Korean Chemical Society (KCS)*, Daejeon

Conventional Center (DCC), Daejeon, South Korea, October 29-30, **2009**, III37P248.

- Wang, Fang; Zhou, Ying; Jou, Minjung; **Nandhakumar, Raju.**; Yoon, Juyoung.* Synthesis and characterization of novel derivative of [1,1']binaphthalene containing dihydro-pyrene ring. Abstracts of Papers, 238th American Chemical Society National Meeting (ACS), Washington, DC, United States, August 16-20, **2009**, ORGN-504.
- **Nandhakumar, Raju.**; Jiyoung, kim.; Hyunjung, Park.; Kwan Mook, Kim.* Resonance Assisted Hydrogen Bonding: Enantioselective recognition of 1,2-amino alcohols by chiral binol based receptors. 101st National Meeting of the Korean Chemical Society (KCS), Kintex, Seoul, South Korea, April 17-18, **2008**, V32P165.
- **Nandhakumar, Raju.**; Jayoung, Ryu.; Hyunjung, Park.; Lijun, Tang.; Sujung, Choi.; Kwan Mook, Kim.* Effects of Substituents on Uryl Based Binol Aldehyde Receptor: Enantioselective Recognition of Amino Acids and Amino Alcohols. 19th International Symposium on Chirality, Chirality-2007, San Deigo, California, USA, July 8-11, **2007**, P-243.