

## RUGMANI MEENAMBAL



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DST-Inspire Faculty

Department of Clinical Psychopharmacology and Neurotoxicology  
National Institute of Mental Health and Neuro Science (NIMHANS)

Bangalore, India-560029

### PRINCIPAL INVESTIGATOR

Experience in biomaterial science including structural, optical and magnetic properties and biomedical application. 3 years of experience as principal investigator in independent research project. 4 years of dedicated Ph.D. research experience in nanotechnology and biomaterials. 10 publications in International journal.

### RESEARCH AREAS

Synthesis of nano-biomaterials, characterization and analysis of materials, development of functional materials for bioimaging and drug delivery application.

### PROFESSIONAL EXPERIENCE

DST-Inspire Faculty

Since Oct 2018

Department of Clinical Psychopharmacology and Neurotoxicology

National Institute of Mental Health and Neuro Science (NIMHANS), India

### EDUCATIONAL QUALIFICATIONS

Pondicherry University

July 2018

Ph.D. Nanoscience and Technology

Thesis title: *Synthesis and structural insights of Ln<sup>3+</sup> doped  $\beta$ -Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> and LnPO<sub>4</sub> contrast agents for multimodal imaging applications*

Pondicherry University

May 2014

M. Tech Nanoscience and Technology

Kerala University

May 2012

B. Tech Biotechnology and Biochemical Engineering

### PUBLICATIONS

- 1 **R. Meenambal**, Srinivas Bharath M M, Nanocarriers for effective nutraceutical delivery to the brain, *Neurochemistry International*, 140, 104851 (2020) (**Impact factor – 3.921**).
- 2 K. Srigurunathan, **R. Meenambal**, A. Guleria, D. Kumar, JMF Ferreira, S. Kannan, Unveiling the Effects of Rare-Earth Substitutions on the Structure, Mechanical, Optical, and Imaging Features of ZrO<sub>2</sub> for Biomedical Applications, *ACS Biomater. Sci. Eng.*, 5(4), 1725-1743 (2019) (**Impact factor – 4.749**).
- 3 **R Meenambal**, S Kannan, Design and structural investigations of Yb<sup>3+</sup> substituted  $\beta$ -Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> contrast agents for bimodal NIR luminescence and X-ray CT imaging, *Mater. Sci. Eng. C*, 91, 817-823 (2018) (**Impact factor – 7.328**).
- 4 V Ponnillavan, **R Meenambal**, S Kannan, Crystallization and Polymorphic Phase Transitions in Zirconia-Toughened Alumina Systems Induced by Dy<sup>3+</sup>/Gd<sup>3+</sup> Cosubstitutions, *Cryst. Growth Des*, 18 (8), 4449-4459 (2018) (**Impact factor – 4.076**).

- 5 **R Meenambal**, P Poojar, S Geethanath, TS Anitha, S Kannan, Lanthanide phosphate ( $\text{LnPO}_4$ ) rods as bio-probes: A systematic investigation on structural, optical, magnetic, and biological characteristics, *J. Biomed. Mater. Res. Part B*, 107 B, 1372-1383 (2019) (**Impact factor – 3.368**).
- 6 **R Meenambal**, S Kannan, Co-substitution of lanthanides ( $\text{Gd}^{3+}/\text{Dy}^{3+}/\text{Yb}^{3+}$ ) in  $\beta\text{-Ca}_3(\text{PO}_4)_2$  for upconversion luminescence, CT/ MRI multimodal imaging, *ACS Biomater. Sci. Eng.*, 4, 47-56 (2018) (**Impact factor – 4.749**).
- 7 **R Meenambal**, P Poojar, S Geethanath, S Kannan, Substitutional limit of Gadolinium in  $\beta$ -Tricalcium phosphate and its Magnetic Resonance Imaging Characteristics, *J Biomed Mater Res B Appl Biomater*, 105, 2545-2552 (2017) (**Impact factor – 3.368**).
- 8 **R Meenambal**, P Poojar, S Geethanath, S Kannan, Structural insights in  $\text{Dy}^{3+}$  doped  $\beta$ -Tricalcium phosphate and its Multimodal Imaging Characteristics, *J. Am. Ceram. Soc.*, 100, 1831-1841 (2017) (**Impact factor – 3.784**).
- 9 **R Meenambal**, P Nandha Kumar, P Poojar, S Geethanath, S Kannan, Simultaneous substitutions of  $\text{Gd}^{3+}$  and  $\text{Dy}^{3+}$  in  $\beta\text{-Ca}_3(\text{PO}_4)_2$  as a potential multifunctional bio-probe, *Mater. Des.*, 120, 336-344 (2017) (**Impact factor – 7.991**).
- 10 **R Meenambal**, R K Singh, P Nandha Kumar, S Kannan, Synthesis, structure, thermal stability, mechanical and antibacterial behaviour of lanthanum ( $\text{La}^{3+}$ ) substitutions in  $\beta$ -tricalcium phosphate, *Mater. Sci. Eng. C*, 43, 598-606 (2014) (**Impact factor – 7.328**).

## PROJECT UNDER IMPLEMENTATION

**Title:** Engineered gadolinium phosphate nanoparticles for image guided brain therapy

**Cost:** 35 lakhs

**Role:** Principal Investigator

**Funding Agency:** Department of Science and Technology-INSPIRE- Faculty Scheme

## INVITED LECTURES

- St. Thomas College, Palai invited lecture on “Nanocarriers for effective nutraceutical delivery to brain” at the International Seminar on Emerging trends in Neurotherapeutics in December 2021.
- Karnataka Science and Technology Academy invited talk for Talent Search-Webinar Series Program on “Basics of nanotechnology”, in November 2021
- Karnataka Science and Technology Academy India-Webinar talk on “Introduction to Nanotechnology: Interdisciplinary aspects of research in medicine” in July, 2021

## AWARDS AND ACHIEVEMENTS

- Best Oral Presentation award for the abstract titled “Probe into DNA interaction, cell toxicity and antifungal activities of phyto-synthesized yttrium oxide ( $\text{Y}_2\text{O}_3$ ) nanoparticles” presented at International conference on multi-disciplinary aspects of Materials in Engineering (IC-MAME 2021) held at University Institute of Engineering and Technology, Chandigarh, India.
- Best Oral Presentation award for the abstract titled “Synthesis, structural elucidation, optical, magnetic and *in vitro* evaluation of lanthanide phosphate crystals as bio-probes” presented at 3<sup>rd</sup> International Conference on Materials Sciences and Nanomaterials (ICMSN 2019) held at University of Oxford, the United Kingdom.
- Travel fellowship award sponsored by Centre for Co-operation in Science and Technology among Developing Societies (CCSTDS) to attend 3<sup>rd</sup> International Conference on Materials Sciences and Nanomaterials (ICMSN 2019).
- Department of Science and Technology- “Innovation in Science Pursuit for Inspired Research (INSPIRE)- Faculty Award 2018 for the project entitled “Engineered angiopep-conjugated gadolinium phosphate nanoparticles for image guided brain therapy”.

- Lady Tata Memorial Trust-Award of Scientific Research Scholarship (2016-17) for the project entitled “Development of lanthanide substituted  $\beta$ -Tricalcium phosphate contrast agents for Computed Tomography and Magnetic Resonance Imaging”.
- Best Oral Presentation award for the abstract titled “Tuning the structure of  $\beta$ - $\text{Ca}_3(\text{PO}_4)_2$  with  $\text{Gd}^{3+}/\text{Dy}^{3+}/\text{Yb}^{3+}$  for multimodal imaging applications” presented at 2<sup>nd</sup> International Conference on Recent Trends in Analytical Chemistry (ICORTAC-2018) held at University of Madras, India.

### CONFERENCE PRESENTATIONS/PROCEEDINGS

- 3<sup>rd</sup> International Conference on Materials Sciences and Nanomaterials ICMSN 2019, “*Synthesis, structural elucidation, optical, magnetic and in vitro evaluation of lanthanide phosphate crystals as bio-probes*”, University of Oxford, the United Kingdom.
- 2<sup>nd</sup> International Conference on Recent Trends in Analytical Chemistry ICORTAC-2018, “*Tuning the structure of  $\beta$ - $\text{Ca}_3(\text{PO}_4)_2$  with  $\text{Gd}^{3+}/\text{Dy}^{3+}/\text{Yb}^{3+}$  for multimodal imaging applications*”, University of Madras, India.
- The 6<sup>th</sup> Asian Biomaterials Congress ABMC-2017, “*Simultaneous substitutions of  $\text{Gd}^{3+}$  and  $\text{Dy}^{3+}$  in  $\beta$ - $\text{Ca}_3(\text{PO}_4)_2$  as a potential multifunctional bio-probe*”, Sree Chitra Tirunal Institute for Medical Sciences and Technology, India.
- National Conference on Emerging Biomaterials NCEB-2016, “*Gadolinium substituted  $\beta$ -Tricalcium phosphate and its magnetic resonance imaging characteristics*”, Bharathiar University, India.
- International Conference on Recent Advances in Materials and Chemical Sciences ICRAMCS-2015, “*Effect of Lanthanum ( $\text{La}^{3+}$ ) substitutions in  $\beta$ -Tricalcium phosphate ( $\beta$ -  $\text{Ca}_3(\text{PO}_4)_2$ )*”, ISBN: 978-93-85477-46-1, The Gandhigram Rural Institute, India.

### GRADUATE SUPERVISIONS

1. Ms. Ritu Dewangan (MSc. Neuroscience, Jiwaji University, India)-March 2021
2. Ms. Shumaela Saman (MSc. Neuroscience, Amity University, Noida, India)- Jan 2021
3. Ms. Vedika Tomar (Integrated M.Tech in Nanotechnology, Amity University, India)- Feb 2020
4. Ms. Hema S K (M.Sc in Biotechnology, Vellore Institute of Technology, India)- Jan 2020

### RESEARCH SKILLS

- Synthesis and characterization of inorganic nanomaterials.
- Interpretation of results from various characterization techniques and use them to improve products and methodologies.
- X-ray Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) studies and data analysis of nanoparticle-based contrast agents.
- Biocompatibility tests and cell culture.
- *In vitro* drug loading, release assays, data interpretation and analysis.
- Excellent scientific writing and problem-solving skills.
- Structural refinement - GSAS/EXPGUI
- Graphing and Data analysis Software: OriginPro.8.5.1.

### SYMPOSIUMS/WORKSHOPS ATTENDED

- 11<sup>th</sup> Bengaluru India Nano, organised by the Department of IT, Biotechnology and Science & Technology, Government of Karnataka, Bengaluru (2020).
- 6<sup>th</sup> International Leadcon, organised by Indian Society for Lead Awareness (InSLAR), NIMHANS, Bangalore (2020).

- 15<sup>th</sup> National Research Scholars Meet in Life Science organized by Advanced Centre for Treatment, Research and Education in Cancer (ACTREC), Tata Memorial Centre (2019).
- 1<sup>st</sup> Toxicology Symposium organized by Department of Clinical Pharmacology and Toxicology, National Institute of Mental Health and Neurosciences (NIMHANS) (2019).
- Seminar on “Familiarization of HRTEM & XPS”, organized under DST-PURSE Phase II by Central Instrumentation Facility, Pondicherry University (2018).
- National Workshop on NMR/MRI, organised by Centre of Bio-Medical Research (CBMR) in association with University of Mysore (2015).
- National Symposium on “Molecular Techniques in Diagnosis and Research” organised by Central Inter-Disciplinary Research Facility (CIDRF), Mahatma Gandhi Medical College & Research Institute (2015).
- Workshop on URKUND, organised by INFLIBNET Centre, Pondicherry University (2015).
- Workshop on Fundamental Optics and Photonics organized by Department of Physics, Pondicherry University (2014).
- Author workshop organised by Springer, Pondicherry University (2014).
- TECHSYNOD’08, organised by Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram (2008).

### **PROFESSIONAL MEMBERSHIPS**

- Life member of NATIONAL MAGNETIC RESONANCE SOCIETY OF INDIA.