

## Topic : FDP on “ Exploring New Frontiers in Chemical and Biological Sciences

Date:31<sup>st</sup> Jan-5<sup>th</sup> Feb2022

- Resource Person:**
1. Dr. Desigan Kumaran,  
Structural Biologist, Biology Department,  
Brookhaven National Laboratory,  
Upton, New York, USA
  2. Dr. Suguna Perumal,  
International research professor,  
School of Chemical Engineering  
Yeungnam University  
South Korea
  3. Dr P. YUVARAJ,  
Senior Scientist,  
CSIR- North East Institute of Science & Technology Branch Laboratory,  
Imphal, Manipur, India
  4. Dr. P. PonSathiesh Kumar,  
IBS Senior Post Doc Researcher,  
Institute of Basic Science,  
POSTECH, South Korea.
  5. Dr. Parthiban Marimuthu  
Institute of Organic BioHospitals,  
E-71, Greater Kailash Enclave 1,  
New Delhi
  6. Dr. Kathiresan V. Sathasivam,  
Senior Associate Professor,  
Department of Biotechnology,  
(Former Registrar) AIMST University, Semeling,  
08100 Bedong, Kedah Darul Aman, Malaysia.

### Invitation:

**ORGANISING COMMITTEE**

**Patron:**  
Mrs. St. Rosemary  
Secretary  
St. Mary's College (Autonomous), Tirunelveli

**Chairman:**  
Mrs. St. S.A.S. Lorna Rose  
St. Mary's College (Autonomous), Tirunelveli

**Convener:**  
Dr. S. Sathasivam  
Head, Department of Chemistry,  
St. Mary's College (Autonomous), Tirunelveli

**Organising Secretary:**  
Dr. T. Latha Parvathi  
Associate Professor of Chemistry,  
St. Mary's College (Autonomous), Tirunelveli

**Programme Coordinator:**  
Dr. S. Anitha Selvakumaran  
General Coordinator & Member Secretary  
STAR College Scheme  
Associate Professor of Science,  
St. Mary's College (Autonomous), Tirunelveli

**Department Coordinator:**  
Dr. Pradeep Arshad Saifi  
Assistant Professor of Chemistry,  
St. Mary's College (Autonomous), Tirunelveli

**Executive Members:**  
Dr. J. Manoj Kumar  
Associate Professor of Chemistry  
Dr. A. Lakshmi  
Associate Professor of Chemistry  
Dr. B. Siva  
Associate Professor of Chemistry  
Dr. S. Pavan Kumar  
Assistant Professor of Chemistry  
Dr. N. Anand Kumar  
Assistant Professor of Chemistry

**Faculty Development Programme**  
On  
"Exploring New Frontiers in Chemical and Biological Sciences"  
**UNDER STAR COLLEGE SCHEME**  
(2021-2022)

**Sponsored By**  
  
Department of Biotechnology,  
Government of India, New Delhi

**21<sup>st</sup> January - 5<sup>th</sup> February 2022**

**Organized by**  
  
Marian Star Centre  
Department of Chemistry  
St. Mary's College (Autonomous)  
Recognized by NAAC with 'A+' Grade  
Telephone: 439 991  
Toll free: 1800  
Email:  
mstarcentre@stms.ac.in  
stmaryscollege@gmail.com  
stmaryscollege@gmail.com  
https://www.gstc.ac.in/Star/1444A\_20A

**About the college**

St. Mary's College, a Catholic institution of higher education for women, established in 1948 enjoys a heritage of 73 years as a Catholic Minority Institution. The college is accredited with 'A' grade by NAAC in the fourth cycle. Affiliated to Annamalai University, Tirunelveli, the College offers programs, post graduate, M.Phil. and Ph.D. programmes in various disciplines. The college has attained Autonomous Status in the year 2008 recognizing the great potential within the campus, the NAAC has re-accredited the institution with 'A' grade in the fourth cycle. With the motto FIDES VIVANT (Live by Faith) the college has groomed generations of young women through its successful efforts and has nurtured the vision of its promoters by imparting value conscious integrated education to the young women ensuring their continual growth for more than seven decades.

**Recent IIST STAR College Scheme**

"IIST College Scheme" has been initiated by the Department of Biotechnology (DBT) to support colleges offering undergraduate programmes to promote and facilitate science teaching. The scheme aims to hone the skills of the teachers by helping the institution to organize faculty building programmes, to offer important contribution towards up with the current trends and to emphasize on applied learning and practical training for students by providing access to specialized infrastructure and resources. The college continues to formulate plans and also to address environmental safety, develop scientific thinking and creativity among students.

**It enables interactive participation among different scientific disciplines and departments and the faculty members across the various fields. This scheme is implemented in the year 2015. The Department of Chemistry, St. Mary's College (Autonomous) Tirunelveli, has been recommended by the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India, New Delhi, to receive Star-Grade assistance under the College Scheme.**

**Objectives**

The end target under faculty development programme is intended to make the best available college faculty and to encourage advancement in Chemical and Biological Sciences with an objective to encourage young faculty to enhance their research abilities by providing an opportunity to attend events in the field and to formulate a plan to do so.

The successful completion of the Faculty Development Programme will be done by:

- Enabling faculty to be active in debate and about latest developments in Chemical Sciences and Biotechnology, to facilitate their experience with their peers.
- Organizing a forum for teachers to learn about the new developments in the field.
- Encouraging exposure to cutting edge research trends in the field.
- Promoting a culture of learning and self-improvement among faculty members.
- Providing platform for them to network their professional and personal activities, to enhance their research capabilities and to promote higher academic and professional standards by their own embarking.

**Programme Schedule**

27<sup>th</sup> January 2022 Day 1

8.30 A.M. - 10.30 A.M. Inauguration  
 Welcome Address  
**Dr. S. Radhadevi**  
 Head, Department of Chemistry  
 St. Mary's College (Autonomous)  
 Tirunelveli

10.30 A.M. - 12.30 P.M. Session 1

Topic: "A new Structural Paradigm in Heme Binding Proteins"

11<sup>th</sup> February 2022 Day 2

10.30 A.M. - 12.30 P.M. Session 2

Topic: "Hydrates For Multiple Heavy Metal Adsorption"

**Faculty**  
 Dr. S. A. J. Lucia Rose  
 Principal  
 St. Mary's College (Autonomous)  
 Tirunelveli

**Resource Person**  
 Dr. Debasmita Kumar  
 Structural Biologist, Biology Department  
 Brookhaven National Laboratory  
 Upton, New York, 11973  
 USA

**Resource Person**  
 Dr. Regina Permal  
 Biomedical Research Professor  
 School of Chemical Engineering  
 Youngstown University  
 South Korea

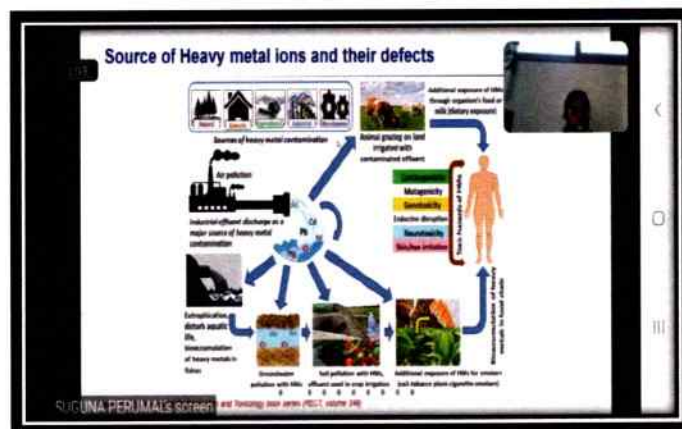
## Photos

**Overview**

1. Brief Intro about myself and Structural Biology
2. Brief Intro about the project
3. Predicted three new Heme Binding protein families
4. DUF2470 domain containing protein family  
 Protein production and Heme binding studies  
 Structure of DUF2470 and its complex with heme  
 New structural Paradigm in Heme Binding  
 Mutagenesis studies  
 Proposal of its biological function
5. DUF2470 fused with PNPO domain – Similar to GluTRBP protein family  
 Heme binding and degradation studies of HBPP  
 Structure of HBPP reveals new metal binding sites
6. Summary and Conclusion

Brookhaven National Laboratory ENERGY

zoom



**Synthesis of biologically active small molecules using sustainable C-H Activation approach and their Medicinal Application**

Faculty Development programme on Exploring New Frontiers in Chemical and Biological Science at St.mary's college

**Dr. Panneerselvam Yuvaraj**  
Senior Scientist

CSIR- North East Institute of Science & Technology  
Jorhat, Assam

02/02/2022





**Non-Viral Vectors - Deliveries**

- pH-sensitive biomaterials coated polymer/DNA nanocomplexes containing a high mobility group box 1 (HMGB1) were developed as an efficient non-viral gene delivery system. HMGB1 is a family of endogenous molecules that contains nuclear localizing sequences (NLS).
- Polyethylene glycol tethered carboxylated chitosan modified with folic acid (FA-PEG-CCTS) was synthesized and its buffering capacity was determined by acid base titration. A pH-sensitive core shell system FA-PEG-CCTS/PAMAM/HMGB1/pDNA nanocomplexes (FPCHPD1) was prepared and characterized.
- Exhibited less toxic effects on HepG2 and KB cells.
- Enhanced gene transfection and expression in KB.




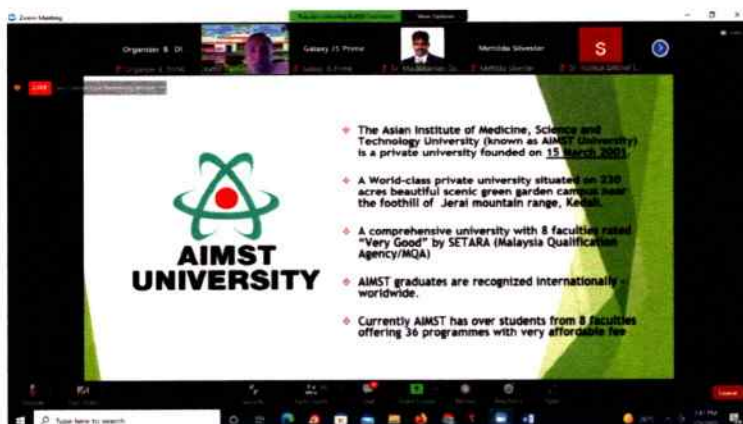

**Air is important for living things**

People need to breathe, and so do lots of other animals — and plants! Breathing is part of a process called respiration. During respiration, a living thing takes in oxygen from the air and gives out carbon dioxide. This process gives animals and plants the energy to eat, grow, and live life!



Fundamental Chemistry of GC in Basic Formulas by Dr.Padmanabhan Murthy





**No. of Beneficiaries:** Day 1: 252

Day 2: 290

Day 3: 217

Day 4: 186

Day 5: 204

Day 6: 201

## Certificate



## YouTube links

Day 1 <https://youtu.be/178bf7nFro8>

Day 2 <https://youtu.be/hbT4mbcm128>

Day 3 <https://youtu.be/LSVw6cTgIWc>

Day 4 <https://youtu.be/fje5dqNvz1E>

Day 5 <https://youtu.be/ekhf04ZYQ>

Day 6 <https://youtu.be/rxA20kefCIE>

## Report

One Week Faculty Development Programme sponsored by Department of Biotechnology, New Delhi was organized under star college scheme by Marian Star Centre, Department of Chemistry, St. Mary's College (Autonomous), Thoothukudi, Tamil Nadu, India from Jan 31<sup>st</sup> to Feb.5<sup>th</sup> 2022 through online mode. On the first day (31st January 2022) Dr.Desigan Kumaran, Structural Biologist, Biology Department, Brookhaven National Laboratory, Upton, New York, USA delivered a lecture on "A new Structural Paradigm in Heme Binding Proteins". On the second day Dr. Suguna Perumal, International research professor, School of Chemical Engineering Yeungnam University South Korea was the resource person. She addressed the participants on "Hydrogels For Multiple Heavy Metal Adsorption". On the third of the day Dr P. YUVARAJ, Senior Scientist, CSIR- North East Institute of Science & Technology Branch Laboratory, Imphal, Manipur, India was the resource person. He addressed the virtual gathering on the topic "Synthesis of Biologically Active Small Molecules Using Sustainable C-H Activation Approach and Their Medicinal Applications". On the fourth day Dr.P.Pon SathieshKumar, IBS Senior Post Doc Researcher, Institute of Basic Science, POSTECH, South Korea was the resource person. He delivered a lecture on "Gene Delivery-Challenges, Advancement and Applications". He briefed different non viral vectors and their transfection. He also discussed the mechanism and its biological function. On the fifth day Dr.Parthiban Marimuthu Institute of Organic BioHospitals, E-71, Greater Kailash Enclave 1, New Delhi-110048 was the resource person He delivered a lecture on "Fundamentals of Oxygen Biochemistry with special Reference to Body Immunity". On the sixth day Dr.Kathiresan V.Sathasivam, Senior Associate Professor, Department of Biotechnology, (Former Registrar) AIMST University, Semeling,08100 Bedong, Kedah Darul Aman, Malaysia was the resource person He delivered a lecture on "Conversion of waste into wealth Research to Commercialization". Participants from various parts of the country participated in this programme.

  
**Head of The Department**

Head  
Department of Chemistry,  
St.Mary's College (Autonomous),  
Thoothukudi

B. Serena Margaret  
IQAC Co-ordinator  
IQAC Co-ordinator  
St. Mary's College (Autonomous)  
Thoothukudi

  
Principal  
St. Mary's College (Autonomous)  
Thoothukudi-628 001.