CUTTING – EDGE SEMINAR SERIES IN BIOMEDICINE & MEDICAL BIOTECHNOLOGY

Prof. Dr. Sunny Luke

Scientist, Medical Geneticist, Tissue Engineer and International Educationist

SHARING AMERICAN TRANSLATIONAL RESEARCH EXPERIENCE OF 35 YEARS

POSITIONS HELD IN THE USA

Director of International Education
IISAC, NJ, USA (1998-2024)

Distinguished Medical Scientist
Stem cell therapeutics and Tissue Engineering (R & D), Ortec International at Columbia University School of Medicine, New York (1998-2008)

Graduate Professor (Adjunct)
Medical Biotechnology & Genetics, Dept. of Biology, Adelphi University, Garden City, New York (1994-2008)

Associate Director, Molecular Pathology
Assistant Director, Medical Genetics, Dept. of Pathology, Maimonides Medical Centre, Brooklyn, New York (1993-1998)

Research Scientist, Medical Genetics
Division of Genetics, Long Island College Hospital, State University of New York Health Science Centre, Brooklyn, New York (1988-1993)

Clinical Lab specialist in Diagnostic Genetics
Prenatal diagnosis, Pediatric Genetics and Birth Defects.
Dept. of Pediatrics, Greater Baltimore Medical Center (GBMC), Maryland, USA (1987 – 1988)

IISAC

International Institute for Scientific & Academic Collaboration, Inc., (IISAC)
New Jersey, USA

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FEELER

I am offering a great opportunity to higher education institutions in Kerala to conduct international seminars on Tissue Engineering, Stem Cell Technology, Medical Genetics, Genomics, Cancer Biology, and Human Evolution. This offer is based on my 35 years of teaching and research experience in the USA. These topics reflect the advanced knowledge in the field of biomedicine, with great job potential and research opportunities. Please feel free to contact me with your preferred topic and probable date for an exciting seminar for your students and professors. I am currently retired and settled in Kottayam, Kerala.

LIST OF SCIENTIFIC SEMINAR TOPICS

1. **Stem Cell Technology and Tissue Engineering**
2. **Cytogenomics - methodological approach and clinical applications**
3. **Pathobiology of Cancer - from diagnosis to treatment**
4. **Molecular Oncology and Precision Medicine**
5. **Breast Cancer - gene alterations, clonal heterogeneity, and targeted therapy**
6. **Genomic alterations in children with intellectual disabilities**
7. **Genetics of sex and it's collision with gender**
8. **Chromosomal, Molecular, and Genomic evidence For Human Evolution**
9. **The emerging field of Genetic Medicine and Clinical Genomics**
10. **Molecular Biology of wound healing**
11. **Human Genome - structural organization and applications in Molecular Medicine**
12. **Genotoxicity, Cytotoxicity, and Teratology**
13. **Cells are the new cure (Cellular Medicine)**
14. **Cell Cycle, Apoptosis, and Cell Differentiation**
15. **Pharmaceutical Biotechnology and Biologicals**

Prof. Sunny Luke is with his American students in Kerala as a part of a *faculty-led* program.
This was for conducting field studies in emerging infectious diseases.

SEMINAR DESCRIPTIONS

STEM CELL TECHNOLOGY AND TISSUE ENGINEERING

Stem cells are a class of undifferentiated cells that can differentiate into specialized cells and tissue types. Tissue engineering is an interdisciplinary field that applies the principles and methods of bioengineering, polymer chemistry, and life sciences towards assembling biological substitutes to restore, maintain, and improve tissue functions following damage caused by disease or trauma. It involves combining living cells/stem cells with suitable scaffolds derived from biomaterials to build a three-dimensional living construct that is functionally, structurally, and mechanically equal to or better than the tissue to be replaced. This talk is based on the research experience of the speaker for 10 years in tissue engineering.

CYTOGENOMICS – METHODOLOGICAL APPROACH AND CLINICAL APPLICATIONS

Cytogenomics is the latest cutting-edge research and diagnostic technology in human genetics, where chromosomes are addressed in the context of genomics and bioinformatics. The origin of cytogenomics can be traced back to the early 1970s when chromosome banding technologies were introduced for a quick scan of the human genome. This technology later gave way to the highly sophisticated molecular techniques on chromosomes of the 21st century such as fluorescence in situ hybridization (FISH), chromosome painting, comparative genomic hybridization, spectral karyotyping, and chromosome microarray. In this scientific seminar, Prof. Sunny Luke will talk about the modern diagnostic and research applications of cytogenomics, in medical genetics, cancer biology and evolution based on his research findings.

PATHOBIOLOGY OF CANCER – FROM DIAGNOSIS TO TREATMENT

Cancer is the third leading cause of death in the adult population while the second leading cause of death in children. In any family, one of the most emotionally draining experience is to hear the diagnosis of cancer and later seeing such sick family member suffering from the disease and the side effects from the toxic therapies. Cancer involve an abnormal cell growth with the potential to invade or spread to the other parts of the body. In this seminar, emphasis will be given to causes, pathophysiology, diagnosis, treatment of cancers and pathobiological technology including microtomy, cryotomy, immunohistochemistry, flow cytometry, cell cycle analysis, karyotyping and fluorescence in situ hybridization.

MOLECULAR ONCOLOGY AND PRECISION MEDICINE

Cancer is a disorder of cellular growth resulting from changes in DNA sequences in specific genes. When cells grow out of control, it form a mass called tumor. Changes in DNA sequence arise from errors in DNA replication and repair, chromosomal changes and exposure of cells to environmental carcinogens. In this cutting edge seminar, the speaker will emphasis on oncogenes, tumor suppressor genes, DNA repair genes, cell cycle regulation, apoptosis, molecular markers, and targets that can be used in diagnosis, prognosis, monitoring therapy and treatment. Special mention will be on precision medicine based on molecular genotyping where treatments are based on modern drugs developed from recombinant DNA technology, monoclonal antibodies and engineered T-cells. For students interested in jobs and research in the future, this seminar will be highly helpful.

BREAST CANCER – GENE ALTERATIONS, CLONAL HETEROGENEITY, AND TARGETED THERAPY

This is the most fearful cancer among women as it affects 1 out of 8 women in their lifetime. Close to 8 to 10% of breast cancers are familial in origin because of genetic mutations in BRCA1 and BRCA2 genes. The speaker, based on his research with more than 200 breast cancer cases, will provide an up-to-date seminar on current targeted therapy. At the research level, the focus of the seminar will be on identifying genetic alterations in various histotypes of breast cancer, from ductal to lobular types.

GENOMIC ALTERATIONS IN CHILDREN WITH INTELLECTUAL DISABILITIES

Intellectual Disabilities (IDs) or Neurodevelopmental Disorders, previously known as mental retardation, affect close to 3% of the population. When learning disabilities are included (the neurodiverse group), this figure may rise to 10%, according to a recent WHO report. The Intellectual Disability group is characterized by limitations in both intellectual functioning (IQ less than 70) and adaptive behaviors. Individuals may show dysfunctions in attention, memory, perception, language, problem-solving, or social interaction. Pinpointing the genetic cause is important as it allows for accurate diagnosis, better prognostication, and tailored rehabilitation and special education. In this cutting-edge seminar, the speaker, drawing from his research experience, will highlight the genetic factors that play a major role

in the etiology of birth defects, global developmental delays, and intellectual disabilities. Technologies related to the alterations of chromosomes, genes, and genomes will be emphasized, along with their direct applications in diagnosis and early interventional therapy.

GENETICS OF SEX AND ITS COLLISION WITH GENDER

Sex is a person's genetic makeup and when under the influence of right hormones, the physical manifestations of a male and female emerge with the psychological feelings of a male or female with heterosexual attraction. This binary condition of sex, the nature has created is to meet the reproductive needs of humans. However, gender is a social construct and the gender role changes across time and culture and is always in collision with sex as observed in LGBTQ group. When gender is not for the reproductive purpose, the "binary "role the nature has created is lost. In this seminar, the genetics of sex with chromosome constitution, XX in females and XY in males will be highlighted and when altered how they can develop into intersex conditions manifesting in to more than 15 sexual anomalies. The seminar will also emphasis on the recent research showing the secrets of heterosexual attraction, the new scientific field emerging called "Molecular Monogamy."

CHROMOSOMAL, MOLECULAR AND GENOMIC EVIDENCE FOR HUMAN EVOLUTION

Human evolutionary genetics throws light on how human genome is different from our closest living relatives comprising of chimpanzee, gorilla and orangutan. The human genome contains 23 pairs of chromosomes while the higher apes' genomes contain 24 pairs of chromosomes. This seminar will examine how, during human evolution this 24 pairs of higher apes chromosomes got reduced to 23 pairs in humans and how some genes got shuffled and mutated to make humans the real *Homo sapiens*. The divergence of humans from other apes is always a great interest for the scientific community as well as with the common people. The mystery of human evolution is now get answered with the techniques of cytogenomics and molecular biology. Students will learn about the most modern research tools in comparative genomics.

THE EMERGING FIELD OF GENETIC MEDICINE AND CLINICAL GENOMICS

The genetic medicine is the application of genetics in clinical medicine while clinical genomics is the treatment of patients based on the molecular targets found in the genome. Being the latest sub speciality in modern medicine, the speaker based on his experience as a medical geneticist in the US, provide the baffling principles of genetics that underline genetic disorders and common adult diseases and cancer. Today more than 8000 inherited traits have been identified and the gene locations for more than 1000 genetic disease have been mapped to chromosomes. Recently, new technology from molecular biology and cytogenomics can help the detection, prevention and management of genetic diseases. This seminar will discuss the latest methods of prenatal diagnosis to prevent birth defects and reproductive options available to couples where genetic disease are running in families.

MOLECULAR BIOLOGY OF WOUND HEALING

Wound healing is a cellular and molecular reaction to tissue injury orchestrated by numerous cell types, cytokines, signaling molecules and the vascular system. In this seminar, the speaker based his research experience in wound biology, will highlight timing and phases of wound healing from clot formation to remodeling through the intermediary granulation tissue. Emphasis will be given to wound healing through regeneration and scarring through repair by taking the example of skin wound healing as a model. Then the seminar will progress to scarring in the major organs like liver, kidney, heart and brain. Applications of wound healing in surgery, trauma, burn victims, and ulcers will be explained by showing different types of healing the body has developed.

HUMAN GENOME – STRUCTURAL ORGANIZATION AND APPLICATIONS IN MOLECULAR MEDICINE

The total DNA content of the human nucleus is called the genome, and in humans, there are two genomes: the nuclear genome and the mitochondrial genome. In this seminar, a survey of the nuclear and mitochondrial genomes will be explored in detail, and the techniques used in the analysis of the human genome will be focused on, as well as their localization in human chromosomes. Genic DNA, non-genic DNA, pseudogenes, repetitive DNA sequences, transposons, microsatellites, and SNPs will be discussed and their applications in DNA diagnostics and precision medicine. The advanced technical revolution of NGS (next-generation DNA sequencing) in genome and exome sequencing and its impact on health and diseases will be a part of this seminar.

GENOTOXICITY, CYTOTOXICITY & TERATOLOGY

They are all toxins having a profound impact on humans and developing fetus. They play a major role in the development of genetic diseases, cancers, and birth defects. This seminar will emphasize the techniques for evaluating suspected chemicals and environmental pollutants at the cellular and gene levels. These are important tests for pharmaceutical companies and research students. Emphasis will be on techniques related to genetic toxicology such as SCE (sister chromatid exchange) assay, chromosome aberration assays, CBMN (cytokinesis-block micronucleus) assay, COMET assay,

bacterial reverse mutation test (AMES test), and the consequences of mutagenic effects in humans.

CELLS ARE THE NEW CURE (CELLULAR MEDICINE)

Cellular medicine is a new emerging field of modern medicine where stem cells, engineered immune cells, peptides, antioxidants, and telomere lengthening are used to treat patients suffering from the loss or dysfunction of specialized cells due to aging, trauma, and genetics. The loss or dysfunction of differentiated cells is the root cause of many diseases leading to morbidity. Some notable examples are heart failure, stroke, spinal cord injury, Parkinson's disease, Alzheimer's disease, fibrosis in the liver, kidney, and lungs, arthritis in the knee joint, ALS (amyotrophic lateral sclerosis), and a host of other diseases, including autoimmune diseases. There is no actual cure for such diseases. The seminar will address cutting-edge research in the field of cellular therapy, such as stem cell therapy, CAR-T and monoclonal immune therapy, peptide therapy, antioxidant therapy, and DNA repair therapy. Successful cases will be illustrated to show the benefits of cellular medicine.

CELL CYCLE, APOPTOSIS AND CELL DIFFERENTIATION-TARGETS FOR DRUG DISCOVERY

The cell cycle is a sequential series of events in which a cell replicates its DNA and divides its cytoplasm and organelles, leading to the formation of new daughter cells. This process is controlled by specific genes at checkpoints G1/S and G2/M. During the cell cycle any damage with the genetic content will be repaired and if it is beyond the repair the cell instead of completing the cell cycle will be directed for programed cell dead called apoptosis. Once the cell cycle is completed through the mitosis, the daughter cells can continue the cells cycle or leave the cell cycle into differentiation pathway. Once the cells are differentiated they will become specialized cells with specific functions. In this seminar, the speaker will discuss the importance of the cell cycle, apoptosis, and cell differentiation in cellular medicine, and also the advanced techniques related to their detection based on his years of research in cancer and regenerative medicine. Cell cycle, apoptosis and differentiation are now served as the targets for developing new drugs for cellular medicine.

PHARMACEUTICAL BIOTECHNOLOGY AND BIOLOGICALS

The mainstay of pharmaceutical biotechnology includes gene cloning, protein isolation and characterization, cell culture, and bioreactors. The products emerging from pharmaceutical biotechnology are called biologicals, otherwise known as biological drugs. Currently, close to 30% - 40% of treatments for all diseases involve biologicals, which include recombinant proteins, monoclonal antibodies, chimeric antibodies, genetic vaccines, engineered immune cells, novel drug delivery systems, gene therapy, and CRISPR-mediated gene corrections. This seminar will address the cutting-edge technologies in the production of biologicals and the FDA-approved biologicals ready for the treatment of many ailments that cannot be treated with conventional drugs derived from traditional chemistry. The seminar will also provide insights into how drugs are developed from genome sequences, bioinformatics, and structural biology principles, using the coronavirus (COVID -19) as a model.

ADDITIONAL SEMINAR TOPICS

- **Prenatal and preimplantation genetic diagnosis in high risk pregnancies**
- **Human telomeres – the secrets of human aging and immortality in cancer cells**
- **Genetic complexities in psychiatric and neurological disorders**
- **Autism Spectrum Disorders-Emerging Research in Genomic Science**
- **Reproductive Biotechnology, IVF, ART & Animal Cloning**

CAREER SEMINAR

HIGHER EDUCATION AND JOB OPPORTUNITIES IN CELLULAR, MOLECULAR, GENETIC AND GENOMIC MEDICINES AND MOLECULAR PATHOLOGY

Specialization in these fields will offer great jobs in medical diagnostics, vaccine production, pharmaceutical biotechnology, clinical trials, and research positions in translational medicine. Jobs are also available in scientific publishing and journalism. Students interested in entering to this field should have basic knowledge and skills in a wide range of biomedical sciences, including genetics, cell biology, molecular biology, biochemistry, microbiology, biotechnology, toxicology, cancer biology, transfusion and transplantation science, DNA forensics, infectious disease control, and emerging infections. The speaker, based on his experience in developing many medical scientists, pharmaceutical drug discovery scientists, and biomedicine professors, will highlight transferable employable and entrepreneurial skills to secure lacerative jobs of your dreams.

Prof. Sunny Luke's US students are at Kerala University for a Semester program. In this photo, they are holding the Book published by IISAC for their course on Kerala Studies

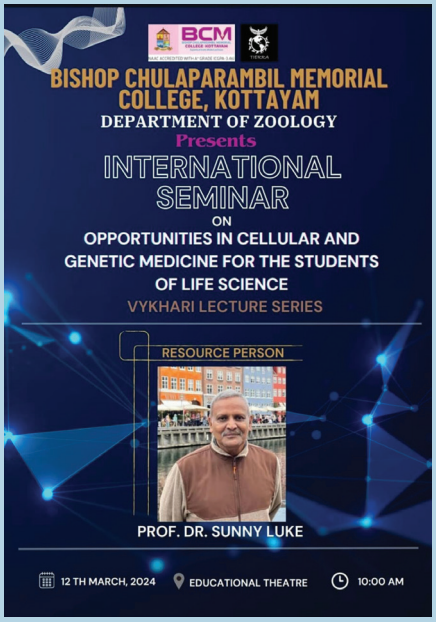
ABOUT THE SPEAKER

Dr. Sunny Luke pursued his graduate studies in Human Genetics, Cancer Biology, and Medical Biotechnology at Adelphi University in New York and the University of Toledo in Ohio. He underwent specialist training in diagnostic genetics at Greater Baltimore Medical Center (GBMC). His career began as a Research Scientist in Medical Genetics at Long Island College Hospital (1988–1993) in New York. Subsequently, he held positions as Assistant Director of Medical Genetics and Associate Director of Molecular Pathology at Maimonides Medical Center in New York (1993–1998). He later turned his focus towards stem cell therapeutics and tissue engineering research, becoming a "Distinguished Medical Scientist" at Ortec International in Columbia University School of Medicine (1998-2008). During his tenure, he was actively involved in skin, cartilage, fat and bone tissue engineering.

He also served as an Adjunct Graduate Professor (1994–2008) in the Department of Biology at Adelphi University, teaching various courses in Medical Biotechnology, including Medical Genetics, Molecular Oncology, Tissue Engineering, and Cell Pathobiology. He has published more than 70 scientific papers and several textbook chapters in reference books. His articles have been featured in prestigious international scientific journals such as Nature Genetics, Journal of Cell Science, American Journal of Human Genetics, Lancet, Genomics, Human Evolution, and American Journal of Medical Genetics. As one of the founders of IISAC, he has been guiding American study abroad students and professors in India for over 20 years (1998-2008).

After retiring from his medical profession, he now serves as a consultant and seminar speaker for various universities in India and the USA.

Click here for the partial list of his publications:
https://www.researchgate.net/scientific-contributions/Sunny-Luke-2077777554
https://www.researchgate.net/scientific-contributions/Sunny-Luke-40059638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BISHOP CHULAPARAMBIL MEMORIAL COLLEGE, KOTTAYAM
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Presents
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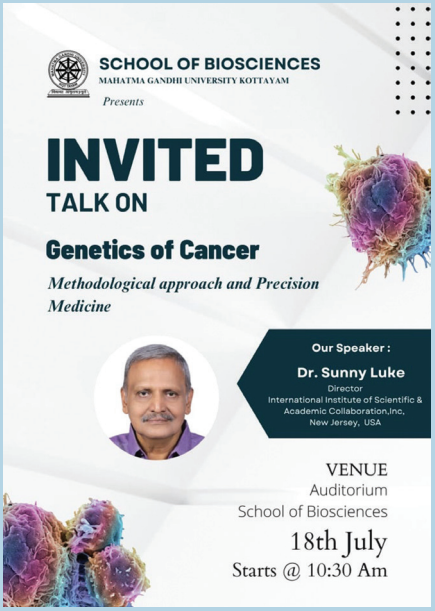
ON
OPPORTUNITIES IN CELLULAR AND GENETIC MEDICINE FOR THE STUDENTS OF LIFE SCIENCE
VYKHARI LECTURE SERIES
RESOURCE PERSON
PROF. DR. SUNNY LUKE
12 TH MARCH, 2024
EDUCATIONAL THEATRE
10:00 AM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MAHATMA GANDHI UNIVERSITY KOTTAYAM
Presents
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Genetics of Cancer
Methodological approach and Precision Medicine
Our Speaker :
Dr. Sunny Luke
Director
International Institute of Scientific & Academic Collaboration,Inc.
New Jersey, USA
VENUE
Auditorium
School of Biosciences
18th July
Starts @ 10:30 Am


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on
Cytogenomics in Genetic and Cancer Diagnostics & Prognosis.
DR. SUNNY LUKE
(Director IISAC)
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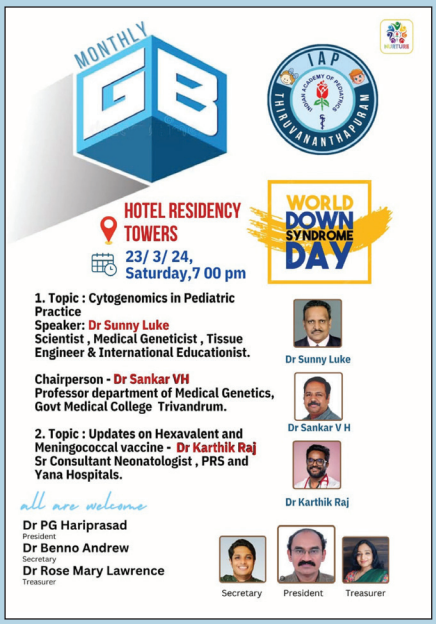
MONTHLY GB
IAP
THIRUVANANTHAPURAM
HOTEL RESIDENCY TOWERS
23/ 3/ 24, Saturday,7 00 pm
WORLD DOWN SYNDROME DAY
1. Topic : Cytogenomics in Pediatric Practice
Speaker: Dr Sunny Luke
Scientist , Medical Geneticist , Tissue Engineer & International Educationist.
Dr Sunny Luke
Chairperson - Dr Sankar VH
Professor department of Medical Genetics, Govt Medical College Trivandrum.
Dr Sankar V H
2. Topic : Updates on Hexavalent and Meningococcal vaccine - Dr Karthik Raj
Sr Consultant Neonatologist , PRS and Yana Hospitals.
Dr Karthik Raj
all are welcome
Dr PG Hariprasad
President
Dr Benno Andrew
Secretary
Dr Rose Mary Lawrence
Treasurer
Secretary
President
Treasurer


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RE ACCREDITED WITH A++ GRADE BY NAAC (CGPA 3.56)
ARUNAPURAM P.O KOTTAYAM KERALA 686574 INDIA
POST GRADUATE DEPARTMENT OF BIOTECHNOLOGY
INTERNATIONAL SEMINAR
ON
CYTOGENOMICS IN HUMAN HEALTH, DISEASE AND EVOLUTION AND BIOMEDICAL CAREER OPPORTUNITIES
PROF.DR. SUNNY KURIAKOSE
Development Officer
St Thomas College Palai
PROF.DR.JAMES JOHN MANGALATHU
Principal, St Thomas College Palai
PROF.DR. SUNNY LUKE
Chief Guest
29TH FEBRUARY 2024
TISSERANT HALL
10:00 AM


St Berchmans College
AUTONOMOUS
INTERNATIONAL SEMINAR ON
Stem Cell Technology & Tissue Engineering
Jointly organised by
Departments of Zoology, Botany, Microbiology & Biotechnology
Prof. Dr. Sunny Luke
Director, International Education and Research. IISAC, New Jersey. USA
VENUE
KAVUKATTU HALL
DATE
FRIDAY, 24 NOVEMBER 2023
TIME
10:30 AM
Dr. Monichan K K
Convener
Fr. Reji P. Kurian
Principal
Joint Conveners
Dr. Salvy Thomas
Dr. Jiji Jacob
Mr. Shobin Varghese