



MANGALORE UNIVERSITY

MANGALAGANGOTHRI-574199, KARNATAKA STATE, INDIA.

Global Initiative on Academic Network (GIAN) program on

Customized Natural Products To Evade Multidrug Resistance In Cancer

May 16-22, 2019

Overview

Cancer, a catastrophic disease, is one of the major causes of death irrespective of age and gender. To date, safe treatment for cancer is not yet available. Over the past several years considerable improvements have been made in therapeutics, however this disease still remains one of the major causes of death. Resistance to chemotherapeutic drugs is one of the main obstacles for effective cancer treatment. Multidrug resistance is the principal mechanism by which many cancers develop resistance to chemotherapeutic drugs. Chemotherapy kills drug-sensitive cells, but leaves behind a higher proportion of drug-resistant cells. As the tumor begins to grow again, chemotherapy may fail because the remaining tumor cells are now resistant to them. Synthetic organic chemistry as well as natural product chemistry has contributed immensely to the anticancer drug development program. It is thus of vital importance to put further efforts into better understanding on mechanism of cancer development and design new lead molecules for chemotherapy. This course has been designed to focus on evolving strategies to develop newer lead molecules from natural products utilizing organic chemistry, which will not only treat cancer but also overcome any future resistance caused by them.

Objectives

- The overall philosophy of this program is to integrate organic chemistry with applied cancer research. The scientific focus is on exploring novel targets and therapeutic strategies that will facilitate overcoming drug resistance during clinical use.
- This program emphasizes in providing an in-depth understanding of Oncogenesis and the opportunity to explore the scientific rationale for various therapeutic options. The curriculum includes core course in tumor biology, special topics about drug resistance, drug design (concepts and strategies) and perceptive on

translational cancer research. To achieve these goals, this program utilizes instructors with expertise in the area of synthetic chemistry, cell biology, and molecular pharmacology.

Who can attend?

- Faculty Members
- Postdoctoral fellows and Researchers (all levels) from various organizations including R&D laboratories and Industries.
- Students at all levels (M.Sc./B.Tech/Ph.D./M.Tech.)

Course Duration: May 16-22, 2019

Course Schedule:

Date	Lectures/ Tutorials
<p>May 16, 2019</p> <p>10:00 - 10:30 AM</p> <p>11:00 AM – 12:00 PM</p> <p>12:00 – 1:00 PM</p> <p>2:30 – 4:30 PM (Tutorials)</p>	<p>Inaugural Program.</p> <p>Introduction to Cancer biology- Cancer and types, Overview on hallmarks of cancer; Carcinogens, mutagens and mutations.</p> <p>Cell cycle control, tumor suppressor genes, apoptosis and cellular senescence; Mechanism of oncogene activation.</p> <p>Discussion Topics: Cancer Therapy targets</p>
<p>May 17, 2019</p> <p>10:00 – 11:00 AM</p> <p>11:30 AM – 12:30 PM</p> <p>2:00 – 4:00 PM (Tutorials)</p>	<p>Rationale to design Cancer therapeutics, Current chemotherapies: benefits and pitfalls, Introduction to Natural Products and their pharmacology</p> <p>Targeted drug therapy: concepts and design, Developments in the area of pharmacological chemistry- Current areas of interest such as DNA-adducts, oxidative stress, antioxidants, Cyclooxygenases, anti-estrogens, and Farnesyl transferase inhibitors.</p> <p>Discussion on techniques used for drug design such as analysis of drug-receptor interactions, QSAR, combinatorial chemistry, and structure-based design.</p>
<p>May 18, 2019</p> <p>10:00 – 11:00 AM</p> <p>11:30 AM – 12:30 PM</p> <p>2:00 – 3:00 PM (Tutorials)</p>	<p>Multidrug Resistance (MDR) in cancer chemotherapy-Introduction, Chemo-sensitizers for reversing MDR in cancer cells</p> <p>Role of P-glycoprotein in cancer cells., How to reverse the acquired resistance of the cancer cells by Phenoxazines and Acridones?</p> <p>Discussion Topics: What classes of molecules might be good targets for the development of new anti-cancer therapies? Why may some molecules be better?</p>

May 19, 2019 SUNDAY

May 20, 2019	
10:00 – 11:00 AM	Multidrug Chemistry of anticancer <i>Vinca</i> alkaloids: Introduction, chemical modification of <i>Vinca</i> alkaloids for improved anticancer activity.
11:30 AM – 12:30 PM	Metabolism of <i>Vinca</i> alkaloids in animal model systems and cancer patients; Mechanism of action of <i>Vinca</i> alkaloids.
2:00 – 3:00 PM	Rapamycin, an immunosuppressive drug, induces massive apoptosis in cancer cells.
3:00 – 4:00 PM (Tutorials)	Discussion Topics: What classes of Natural products might be good targets for the development of new generation anti-cancer therapies?
May 21, 2019	
10:00 – 11:00 AM	Phenoxazines as potent anticancer drugs: Introduction, synthesis and chemical characterization.
11:30 AM – 12:30 PM	Phenoxazines induce massive apoptosis in cancer cells by blocking signal transduction.
2:00 – 3:00 PM (Tutorials)	Discussion Topics: Targets for the development of new anti-cancer therapies?
May 22, 2019	
10:00 – 11:00 AM	TEST
11:30 AM onwards	Valedictory Program

Course Fee:

Faculty Members	Rs. 2000
Industry/ Research organizations	Rs. 5000
Guest faculties / Research Scholars	Rs. 1000
Students	Rs. 500
International participants	\$ 300

Note: The participants will be provided with accommodation (on request in advance) on payment basis.

Please contact the Course Coordinator for all the queries pertaining to the GIAN course.

Foreign faculty:



PROF. K.N. THIMMAIAH

Professor of Chemistry
Division Chair, Natural Sciences
University of Mississippi/ Northwest Mississippi
Community College, DeSoto Center, Southaven,
MS 38671. USA.
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PROF. K.N. THIMMAIAH is currently a faculty of Chemistry and Division Chair, Natural Sciences at University of Mississippi, (Northwest Mississippi Community College) USA. Dr. Thimmaiah's research focus has been mainly on synthesis of novel molecules that may be directly or indirectly contributing towards anticancer activity. He has been actively working in the area of chemo-sensitizers and how new drugs can be designed to circumvent multi-drug resistance (MDR), that's commonly encountered during chemotherapy. He has been a passionate researcher who utilizes multidisciplinary cancer drug discovery and development approaches with a motto to "Drug the Undruggables". Dr. Thimmaiah has a tremendous research experience, which spans over 45 year and has authored over 250 research articles, two international patents and two books. He has been recipient of numerous research grants from national and international agencies such as National Institute of Health (NIH, USA) and DBT in India. He has served as peer reviewer for numerous government agencies including DBT, DST and UGC in India. He has been honored with awards nationally and internationally, which includes the President Award for excellent teaching at the University of Mississippi, USA, for the year 2014-2015. He has been an active life member of many societies such as American Association for Cancer Research (AACR), American Chemical Society (ACS), Indian Association for Cancer Research (IACR), Indian Association of Nuclear Chemists and Allied Scientists, and Indian Society of Analytical Scientists.

Course Coordinator:



PROF. B.K. SAROJINI

Professor and Chairperson
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PROF. B.K. SAROJINI presently heading the Department of Industrial Chemistry and as well as Coordinator for M.Sc. in Biochemistry course at Mangalore University. She has been working in the field of synthesis and Structural Chemistry and possible applications new small molecules in medicinal and optical field. Anticancer property of the synthetic compounds such as triazolothiadiazines, triazinothiadiazoles, pyrazolines, pyrimidinothiazolones was tested at NIH, Bethesda, USA and some of them have exhibited very good activity. Extensively worked on the antioxidant and radioprotective activities of Chalcone derivatives (curcumin analogs) in Drosophila Oregon K fly model system. Antiangiogenic effect of the curcumin analogs was studied in Ehrlich ascites tumor (EAT) cells transplanted mouse in vivo. Presently working on the radiosensitizing effect of imidazothiazole compounds funded by BRNS. She has published more than 300 articles in reputed international journals especially in the field of crystallography and medicinal chemistry. She was awarded 'Career Award for Young Teachers [CAYT]' from AICTE for the year 2003. Under this project she has done extensive work on Non Linear Optical materials and published series of research papers in peer reviewed Journals. She has been Principal Investigator of Major research Grants funded by BRNS, MoES GOI amounting for Rs. 65.72 lakhs and another Rs.60 lakhs as Co-PI. She has been presenting papers in national and international conferences at India and abroad. Delivered many Invited lectures at national and international conferences. She is also recognized as one of the mentor for DST-inspire program. Her publications have received good no. of citations which accounts for her h-index: 23 in Scopus and 27 in Google Scholar. Listed as one of the top five researchers of the country in Material Science Category in a survey conducted by "Careers360" magazine based on the publication citations in the Scopus (Elsevier) for the period 2011-2013. She was listed as one of the Top 20 most productive authors of India in Biochemistry, Genetics and Molecular Biology during 1998-2007, DESIDOC, Journal of Library & Information Technology in 2010. She has published about 340+ papers in the peer-reviewed journals mainly focusing on the synthesis and characterization of new organic small molecules of importance. Publications appeared in European Journal of Medicinal Chemistry, Bioorganic and Medicinal Chemistry, Acta C, Journal of Chemical Crystallography, Polymer, Journal of Crystal growth, etc. She was visiting faculty at Institute of Chemistry Taiwan and She has also established collaboration with national and international scientists of repute. Apart from that she writes popular articles of social issues and science in Kannada language.