

Report of the  
TSCHE & KU Sponsored  
**National Seminar on  
Recent Innovations in Health & Life Science  
Research  
(RIHLR-2023)**



24-25 February 2023



*Organised by:*  
Department of Zoology & Biochemistry,  
Kakatiya University,  
Warangal-506009 TS

*Seminar Director/Organising Secretary:*

**Dr. Estari Mamidala**, PhD, PDF (USA)  
Associate Professor & Head,  
Department of Zoology,  
Kakatiya University, Warangal-506 009. TS

*Sponsored by:*

Telangana State Council of Higher Education  
(TSCHE), Hyderabad &  
Kakatiya University, Warangal

National Seminar on  
Recent Innovations in Health & Life Science Research  
(RIHLSR-2023)  
February 24-25, 2023 | Warangal, Telangana

## INAUGURAL SESSION

The National Seminar on Recent Innovations in Health & Life Science Research (RIHLSR-2023) was inaugurated in the morning of February 24, 2023 by Prof. P. Malla Reddy, Dean, Faculty of Science, Kakatiya University, Warangal in the presence of Prof. Y. Venkaiah, Vice-Principal of University College, Kakatiya University and Chairman, Board of Studies of Zoology & Biochemistry; Dr. Estari Mamidala, Head, Department of Zoology & Biochemistry, Kakatiya University and Organising Secretary of the RIHLSR-2023. The inaugural session was attended by a large number of distinguished academicians, Heads and Faculty of various Departments of University, Senior functionaries from the University, lecturers of various degree colleges of Telangana state, research scholars and students of Post-graduation.

Dean, Faculty of Science, **Prof. P. Malla Reddy**, while delivering his inaugural address emphasized that India must take advantage of the capacity of contemporary science to benefit society. He believed that some areas where Indian science should strive for world leadership include inexpensive breakthroughs for human healthcare, sustainable agriculture, renewable energy, and comprehensive answers for health research concerns. Indian scientists must connect with the present, reflect on the past, and look towards the future. According to him, science should be the engine that propels India as a revived civilisation that offers both hope and opportunity to young people. "Our basic research must be directed to produce new discoveries with imaginative attempts to develop cheap solution and the successes of science should be communicated to the general public" he stated. Prof. P. Malla Reddy stressed the value of science communication in his inauguration speech. He emphasised that scientific communicators should concentrate more on the work being done in the labs, where the actual advancement of science is taking place, he continued.

In the presidential address, **Dr. Estari Mamidala**, Organising Secretary of this National Seminar and Head, Department of Zoology & Biochemistry, Kakatiya University stressed upon the event objectives. Dr. Estari Mamidala said that, "Health is a crucial factor in national prosperity. Life Science and Health Research is essential for improving global health, health equity and economic development. The primary purpose of the seminar is to explore the existing concepts, recent findings and challenges in all avenues of life sciences and health research. Also he states that, this event is an interdisciplinary event that invites participants from various Universities, research institutes, industries and diagnostic health centres to share their research experiences and exchange ideas on various aspects of Life Sciences, Medical,

Environmental and Health Research. He stated that, this seminar also provides an opportunity to communicate with leading scientists, researchers, academicians and students from all around the India with the themes like: Life Sciences (Zoology, Botany, Biochemistry, Microbiology, Biotechnology and Ecology); Pharmaceutical biotechnology; Medical research and ethical issues; Drug discovery, trials, and development; Toxicity studies; Novel therapeutic techniques; Stem Cells and Cancer Research and Treatment; Bioinformatics and Computational Biology; Public Health and Sanitation; Healthcare technology and Research and Natural, Environmental and Health Sciences qualities of Science Communications.

**Prof. Y. Venkaiah**, Chairman, Board of Studies, Department of Zoology & Biochemistry as a guest of honour he expresses the importance of this event and about the Department of Zoology. He stating that, the Department of Zoology was established in the year 1968 as PG Centre under Osmania University, Hyderabad. Later, it was shifted to the existing campus in 1973 as a full-fledged Department, with spacious classrooms, laboratories for students and research labs for faculty members in addition to museum, library and state-of-the-art Conference Hall, Computer Lab with internet facility, all housed in a built area of about 15,000 sft and Laboratory space of about 8,000 sft. Since then it is flourishing into a quality education centre for the students and research scholars in the subject ZOOLOGY. He also stated that, the Department of Biochemistry was established in 2005 bifurcating the subject from the Chemistry department. Bio-chemistry was one of the optional papers in M.Sc. course and realizing the potential for this subject, the M.Sc. Bio-Chemistry course was started in 1999 under self-finance Scheme. It has all the necessary equipment to carry out practical class work and the faculty is putting efforts in research. Prof. Y. Venkaiah stated that, “the both the Departments has well equipped laboratories, advanced research facilities. The Department does exceedingly well in the fields of higher education and research and also establishes the thrust areas like physiology, Enzymology, Seri-biotechnology, Infectious Diseases, Metabolic Disorders, Bioinformatics, Computational Biology, Environmental Biology and Entomology”.

On the occasion of the Inaugural session of the RIHLSR-2023, the Dean, Faculty of Science, Kakatiya University released the proceedings (ISBN: 978-93-5780-733-3) of this scientific event which includes keynote lecture, invited talks and abstracts of participants, which was edited by Dr. Estari Mamidala.

**Prof. G. Shamitha**, Dean, Academic Audit and Professor of Zoology, Kakatiya University and organising committee member of the Seminar, has introduced the distinguished guests on before the speeches of guests. The distinguished guests were honoured by mementos.

The inaugural session was ended with vote of thanks by **Dr. K. Sujatha**, faculty of Sericulture Unit, Kakatiya University. All the guests were invited for a short tea break, which was immediately followed by the Key note address.

## Keynote Address

The keynote address was delivered by Prof. Anita Jagota, Neurobiology and Molecular Chronobiology Laboratory, Department of Animal Biology, School of Life Sciences, University of Hyderabad, Hyderabad on the topic entitled: “*Circadian Rhythms and their Impact on Healthy Ageing and Longevity*”.

In her address **Prof. Anita Jagota** said that, the circadian timing system (CTS) consists of Suprachiasmatic nucleus (SCN), biological clock localised in hypothalamus which perceives the photic cues and regulates the rhythmic production and release of melatonin (messenger of darkness) from pineal gland regulating internal rhythm of the individual through complex molecular feedback loops. “The circadian clock that regulates these rhythms is dynamic throughout the lifespan of mammals and aging is associated with changes in several regulatory mechanisms responsible for age-related changes in CTS,” she added. Prof. Anita further said that, Disturbances in the circadian rhythms cause a breakdown in the homeostatic balance. Such disruptions in normal circadian rhythms and sleep cycles affects aging and profoundly affect health thus leading to sleep disorders, metabolic and behavioural disruptions resulting in variety of diseases. She also said that, several factors contribute to these changes, emerging research suggests age-related modifications to the CTS is the key factor resulting in sleep disorders, cancer, metabolic, cardiovascular and neurodegenerative diseases like PD, AD, HD, ALS, dementia etc.

In her keynote address, she expressed her laboratory’s focus research which is to understand underlying mechanisms in the age induced stoichiometric alterations in interactomes of daily chronomics in neurodegenerative changes in the functional integrity of CTS, daily rhythms in various physiological, biochemical and molecular parameters. She concluded her keynote address with the following words: “Due to increase in life span in 21<sup>st</sup> century, there is a pressing need to understand therapeutic interventions towards targeting novel treatments for circadian dysfunction, good health and longevity”.

## Technical Session-I: INVITED TALKS

The technical session-I, chaired by Prof. Y. Venkaiah and Prof. G. Shamitha, began in the seminar hall of Department of Zoology by Dr. K. Rajender Rao, Scientist from ICMR-National Institute of Nutrition, Hyderabad and after completed the technical session-I by Dr. Perugu Shyam, Department of Biotechnology from National Institute of Technology, Warangal.

**Dr. K. Rajender Rao**, delivered a lecture on “Non-Communicable Diseases and Obesity (Diet Gene Interaction)”. In his talk he highlighted the various dimensions of Non-communicable diseases (NCDs) and obesity which is chronic but slow growing non-infectious pathology of body organization is need of the hour.

He discussed on the different characteristic features of NCDs, risk factors for NCDs, metabolic risk factors and NCDs distribution according to age, comorbidities associated with obesity. He said that NCDs are the number one cause of death and disability in the world and it is reaching epidemic levels in both developed and developing countries and one of the most challenging global nutritional problems prevalent over the last two decades, eclipsing infectious diseases and under-nutrition as a significant mortality and ill-health contributor.

Dr. Rajender Rao also mentioned that, “obesity represents a major health challenge and increases the risk of diseases such as type 2 diabetes mellitus, fatty liver disease, hypertension, myocardial infarction, stroke, dementia, osteoarthritis, obstructive sleep apnoea and several cancers, thereby contributing to a decline in both quality of life and life expectancy”. He said about body mass index, facts and stats of India’s obesity epidemic, genetic causes of obesity (monogenic, polygenic, syndromic obesity) and also expressed, the interaction of genotype and environment which leads to phenotype. He also expressed regarding epigenomic responses that influence obesity and stated that, “it is important to understand how the allelic variation and environmental variation interact to each other to determine obesity phenotype are critical for understanding Obesity epidemic”

He also mentioned that, the lack of will power, life style with different food habits, global epidemic of obesity with risk factors for obesity development and good and bad bacterial flora.

The key points came out from his lecture are:

- Genetic studies on obesity
- Epigenetic studies on obesity
- Investigation on three rat strains regarding cumulative role of genetics and diet.
- Potential role of oxidative stress, glucocorticoid stress towards pro-inflammatory status.
- Effect of high calorie environment towards glucose homeostasis in genetically different rat strains.

- Regulation of gluconeogenesis under high calorie environment in genetically different rat strains.
- Regulation of Insulin signalling cascade under high calorie environment.
- Gene-environment interaction by epigenetic regulation in genetically different rat strains.

The second invited talk in the technical session-I delivered by **Dr. Perugu Shyam** from NIT, Warangal. In his invited talk, Dr. Perugu Shyam given lecture on “*Phytochemicals and Its Role in Treatment of Breast Cancer*”.

Dr. Perugu Shyam discussed on the Phytochemical supplementation which can benefit human health through supplying specific bioactive compounds which have preventive role in numerous diseases and these phytochemicals often act via regulating molecular pathways which are implicated in growth and progression of cancer.

He explained the most common phytochemicals - flavonoids, that provide anticancer, anti-inflammatory, antimicrobial, antioxidant, wound-healing activities, carcinogen inactivation, inhibiting proliferation, induction of cell cycle arrest and apoptosis; and regulation of the immune system

He mentioned that, despite numerous reports of the phytochemical effects on cancer, an overview of the mechanisms of their action and their effects on various cellular and molecular functions important in the inhibition of cancer progression has been lacking. He explained the effect of phytochemicals in cancer initiation, promotion, signalling and epigenetic changes which are his lab studies.

The key points came out from his lecture are:

- Phytochemicals hold great anti-cancer potential to improve breast cancer survival.
- The efficacy of isolated and FDA-approved phytochemical chemotherapeutic agents in the treatment of breast cancer, with specific promise for the treatment of metastatic breast cancer.
- Phytochemical effects on cell cycle and mitochondrial targets in their mechanisms of action.

After the lecture, audience and the speakers of the technical session-I interacted with each other to discuss about present and future scenario of non-communicable diseases, obesity and phytochemicals role in the treatment of different diseases if all would not be aware about it.

After the felicitation of the keynote addressee by department faculty, it was followed by lunch in the corridor of the Department of Zoology with participants, guests, delegates, university staff and students, and others.

## Technical Session-II: ORAL PRESENTATIONS

The post-lunch schedule had the technical session-II started up under the chairmanship of Prof. G. Shamitha, Department of Zoology, Kakatiya University and Prof. Mustafa, Head, Department of Botany, Kakatiya University by a series of oral presentations from delegates of SR & BGNR Govt. Arts & Science College, Khammam, Telangana; Kakatiya University; MS Ramaiah College of Arts, Science and Commerce, Bangalore; TSWRDC (W), Department of Microbiology, Mancherial; Jangaon College of Education, Nidigonda, Jangaon; Government Degree College for Women, Begumpet; and from PG Department of Zoology, Magadh University Bodh Gaya, India and also from other various universities, colleges and institutes.

Concluding remarks were given by chairmans of the session after completing the oral presentations of delegates. All the guests were invited for a short tea break, which was immediately followed by the technical session-III.

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## Technical Session-III: ORAL PRESENTATIONS

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The technical session-III after tea break was chaired by Prof. Y. Venkaiah, Chairman, Board of Studies, Department of Zoology, Kakatiya University. The delegates from Palamuru University; Government Degree College for Women, Begumpet, Hyderabad; GDC Ibrahimpatnam, Rangareddy; Government Degree College, Thorrur; GDC, Mahadevapur; Osmania University; Chaitanya Deemed to be University, Warangal; and from other various universities, colleges and institutes were given their oral presentations.

The first day sessions were completed with the concluding remarks of chairman of the session.

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## Technical Session-IV: INVITED TALKS

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The technical session IV, on the second day, i.e., Saturday, February 25, 2022, started at 10 a.m. in the Seminar Hall, Department of Zoology, KU. The three invited talks (3rd, 4th, and 5th) are arranged in this session. Prof. Sreenivasa Rao from NIT, Warangal, Prof. N. Vijaya Kumar, retired professor of KU, and Dr. J. Kotesch Kumar from CSIR-CMAP, Hyderabad, gave invited talks.

**Dr. P. Sreenivasa Rao**, Professor from Department of Biotechnology, National Institute of Technology (NIT), Warangal on “*Bioreactor Development For Stem Cell Differentiation*” who has thrown light on the modern methods of improving bioreactor for stem cells differentiation.

He illustrated that, widely progressed tissue engineering from the field of biomaterials, where a combination of implants, Stem cells, and biological molecules gives rise to 3D

functional tissue constructs and these constructs restore and improve damaged tissues or whole organs.

He discussed the success stories of artificial grafts hold for the smaller skin and cartilage implants; however, cures for complex, often chronic diseases are a distant goal to be achieved.

Prof. Sreenivasa Rao, reported the development of successful bone grafts which is one of the many medical applications of bone tissue engineering and these bioreactors provide the microenvironment needed for neo-tissue regeneration and can also be used to investigate the physio-chemical cues that influence stem cell proliferation and differentiation in order to produce functional tissue.

He also reported, “the Improvements in the perfusion reactor system allowed for the production of multiple tissueengineered constructs with uniform stem cell distribution, simple protocols, and the ability to effectively handle functional tissue development in order to meet the demand for engineered grafts in clinical applications”.

In his talk, he explained that, “continued assessment of tissue development and the limitations of the bioreactors leads to the progression of the perfusion flow bioreactor system and in this direction, various bioreactors have been developed and evaluated for the successful development of engineered bone tissue”.

- The key points came out from his lecture are:
- Bioreactor development
- Progression of tissue engineering.
- The development of successful bone grafts
- Neo-tissue regeneration.
- Stem-cell Differentiation.
- Progression of the perfusion flow bioreactor system

Subsequently, an invited lecture by retired Professor of Kakatiya University **Prof. N. Vijaya Kumar**, gave an impressive account on ‘*Energy Balance, Life Style and Diabetes*’.

Prof. Vijaya Kumar discussed on food and supply of daily energy requirements and also the constituents of food and energy stores in the body. He explained homeostasis, energy regulation and the hormones of energy regulation. He mentioned that obesity is caused by imbalance of energy intake and energy expenditure. He added, the factors like type 2 diabetes, hyperlipidemia, obstructive sleep apnea, reproductive disorders, cancer, osteoarthritis, hypertension and heart disease are the responsible for obesity. He explained, the action of insulin, leptin and ghrelin hormones on the lipid profile and sugar levels of the body. He also described, the factors like HbA1c, blood glucose, insulin involving to diagnosis the diabetes and how uncontrolled diabetes damages your brain, teeth, nerves, eyes, heart and kidneys with respective diseases like cerebrovascular disease, early gum disease, sensorimotor polyneuropathy, autonomic nerve damage, diabetic nephropathy, coronary artery disease and diabetic retinopathy



respectively. He finally quoted the words of Benjamin Franklin, i.e., “Eat to live, and not live to eat” and “to lengthen thy life lessen thy meals”.

The key points came out from his lecture are:

- Energy stores in the body.
- Homeostasis.
- Energy regulation.
- Leptin, Ghrelin.
- Obesity, Sedentary life style
- Natural history of obesity and diabetes
- Types of diabetes mellitus
- Action of glucose and glucose transporter
- Importance of glucose
- Diabetic maculopathy
- Glycaemic index and glycaemic load

The invited talk of Prof. N. Vijaya Kumar was followed by **Dr. J. Kotesch Kumar** from CSIR-CMAP, Hyderabad on “*Value Addition of Plant Metabolites as Potential Medicinal Agents*”.

He discussed on the medicinal plants, aromatic plants, general phytochemicals we use daily and different types of secondary metabolites. He said that, industrially, carotenoids are used in pharmaceuticals, nutraceuticals, and animal feed additives, as well as colorants in cosmetics and foods. The phenolic compounds inhibit the growth of bacteria and viruses and also protect the cells against the damage of free radicals and protect against cancers and heart attacks.

Dr. J. Kotesch Kumar also mentioned that, “different plant parts of *Silybum* have been used from the last 2000 years in the preparations of various traditional medicines. The most important use is its liver protecting property, which dates back to early Greek references”.

He said about the possible medicinal uses of stevia which are to cure diabetes, obesity, hyper activity, high blood pressure. Stevia is also used as a house hold sweetener. Andrographolide (diterpene lactones) is the principal biomarker of the herb. It exhibits Anti-pyretic, Anti-malarial and Anti-inflammatory activities”. He also mentioned that herbal technologies developed at CSIR-CIMAP, Value addition technologies for entrepreneurs and industries and improved process technologies for phyto-pharmaceuticals ‘farm to pharma’.

The key points came out from his lecture are:

- Secondary metabolites and their applications.
- Spectroscopic methods used in structure determination.

- Synthesis and novel anticancer derivatives from medicinal plants
- Synthesis and biological evaluation of terpenoids, cyclic 1,9 acetal derivatives, thiazolidinediones with triazole ring.
- CSIR-CIMAP improved distillation technologies and designs.
- CSIR-CIMAP innovative distillation units.

### Technical Session-V: ORAL PRESENTATIONS

A tea break has followed the technical session-V, chaired by Prof. E. Narayana, Department of Zoology, KU and Prof. N. Prasad, University College of Pharmaceutical Sciences, Kakatiya University. A series of oral presentations by delegates from Sree Vidyanikethan College of Pharmacy, Tirupathi, AP; Palamuru University; Department of Biochemistry, Kakatiya University; S.R.R. Govt. Arts & Science College (A), Karimngar; GDC Luxettipet, Mancherial Telangana; Yeshwant Mahavidyalay, Nanded, Maharashtra; Osmania University; Vaagdevi Degree & PG College, Hanumakonda; SVS Degree and PG College, Warangal; Telangana Social Welfare Residential College for Women, Warangal and other national institutes, universities and laboratories.

The concluding remarks were given by the chairpersons of the session, and the chairpersons of the technical session V were felicitated by the organising secretary of the seminar and the session followed by lunch, served to all the delegates and students.

### Technical Session-VI: (E-presentations)

After the lunch break, the technical session-VI and poster presentation session started simultaneously. The technical session VI has more than 20 oral online presentations and also has e-poster presentations. Dr. Madhukar and Mr. Sreenivas from the Department of Biochemistry at Kakatiya University conducted these online presentations using the provided Google Meet link.

From ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata; Vinoba Bhave University Hazaribagh, Jharkhand; Department of Bioengineering and Biotechnology, BIT Mesra, Ranchi; Chaitanya Deemed to be University; Madha Dental College, Kundrathur; Balaji Medical College, Chrompet, Chennai; Kakatiya Medical College; Government Degree College for Women, Begumpet; Vasavi College of engineering, Ibrahimbagh, Hyderabad; Sri Mallikarjuna Degree College, Nakrekal, Telangana; Ramkrishna Mahavidyalaya, Kailashahar, Tripura; Hyderabad Institute of Technology and Management, Hyderabad; Acharya Nagarjuna University, Nagarjuna Nagar, Guntur; Meenakshi Ammal Dental College and Hospital, Meenakshi Academy of Higher Education and Research, West KK Nagar, Chennai, Tamil Nadu; ICAR – Central Soil Salinity Research Institute, Karnal; Kurukshetra University, Kurukshetra; Maris Stella college (A) Vijayawada; Gangadhar Meher University, Amruta Vihar, Sambalpur Odisha; and Annai Vailankanni Arts and Science College (Affiliated to Bharathidasan University), Bishop Sundaram Campus, Thanjavur, Tamil Nadu; SVU,

Tirupati were presented their oral presentations and e-posters by using the provided Google Meet link.

## POSTER PRESENTATIONS

The posters were presented after the oral presentations. The post-lunch schedule of this poster presentations was evaluated by Dr Kaneez Fathima and Dr Kuntamalla Sujatha, Faculty of Sericulture Unit, Department of Zoology, Kakatiya University. More than 30 posters were presented in the corridor of first floor of Department of Zoology. From the following different universities and institutions scholars, students were presented their posters: Telangana Social Welfare Residential Degree College (W), Mancherla; Department of Pharmacy, Chaitanya Deemed to be University, Warangal; GDC Nelakondapally, Khammam; Department of Biochemistry, Department of Biotechnology, Department of Microbiology & Department of Zoology, Kakatiya University, Warangal; MS Ramaiah College of Arts, Science and Commerce, Bangalore; Singareni Womens Junior College, Bhadradi Kothagudem; Vaagdevi Degree College; and TTWRDC, Mahabubabad.

## VALEDICTORY SESSION

The National Seminar on Recent Innovations in Health & Life Science Research (RIHLSR-2023) concluded on February 25, 2023, in which Prof. T. Ramesh, Vice-chancellor of Kakatiya University (Chief Guest); Prof. T. Srinivasa Rao, Registrar of Kakatiya University; Prof. R. Mallikarjun Reddy, Co-ordinating Officer of UGC Unit, Kakatiya University (Distinguished guests) were occupied the dias of valedictory session. All the guests of the dias were invited and introduced by Dr. Kaneez Fathima, Assistant Professor of Sericulture Unit, was invited as a guest on the dias and introduced.

In his Valedictory speech, **Prof. T. Ramesh**, the Hon'ble Vice-Chancellor of Kakatiya University, noted that society and science had a significant impact on shaping the world and that science literacy was a crucial component of societal trust in science, without which science cannot flourish or serve society. He also emphasised the importance of science and technology in addressing the two most pressing issues facing society today: economic growth and social reform. He emphasised how research should be integrated with society's broader requirements and warned against its commercialization, which has become a major problem for society.

**Prof. T. Srinivasa Rao**, Registrar of Kakatiya University, said that "the health of a nation now depends, more and more, on, among other factors, the health of the state of its science and technology", adding that the interface between science and society has been a major influence in shaping the world, "particularly in our times". He pointed out that technology and science are having an increasing impact on people's lives.

The need of utilising science, technology, and inventions for the benefit of the general public was emphasised by **Prof. R. Mallikarjun Reddy**, Co-ordinating Officer of UGC Unit, Kakatiya University. He continued by stating that the state's total development and expansion depended on the use of scientific discoveries and technological improvement in these domains. “I want to see the results of laboratory research easily applied to everyday life and for the improvement of the general populace”, he noted.

The organising secretary and Head, Department of Zoology & Biochemistry, Kakatiya University given total report on the RIHLSR-2023. In his report he said that, the participants coming from more than 50 different institutions, universities and laboratories and more than 100 participants were registered to attend and present their presentations in oral and in poster made. He stated that, there were five invited talks and one key-note lecture on various and diverse kinds of topics in human health and life sciences research. Dr. Estari Mamidala reported, “other than invited talks, there were more than 50 oral presentations in different technical sessions and 30 poster presentations and 22 e-poste / online oral presentations were presented, who showcase their research activities and results on different aspects and on various topics of the seminar theme”.

The certificates were distributed to all the participants by the guests. At the end, a valedictory speech, vote of thanks was given by **Mr. Sreenivas**, Department of Biochemistry, and organising committee member of this seminar.