

Organizing Committee

Course Convenor: **Dr.M. Anusuyadevi Jayachandran**
Associate Professor,
Dept of Biochemistry,
Bharathidasan University.

Course Coordinator: **Dr.K.S. Jayachandran**
Assistant Professor,
Dept of Bioinformatics,
Bharathidasan University.

Course Coordinator: **Dr.Mahesh Kandasamy**
UGC-Assistant Professor,
Dept of Animal Science,
Bharathidasan University.

Executive Members:

- **Dr.V. Ravi Kumar**, Associate Professor & Head, Dept of Biochemistry
- **Dr.C. Prahalathan**, Associate Professor, Dept of Biochemistry
- **Dr.A. Antony Joseph Velanganni**, Assistant Professor, Dept of Biochemistry

Members of the Committee:

- **Meher Nisha** - **PhD., Research Scholar**
- **Surya** - **PhD., Research Scholar**
- **Abir Biswas** - **PhD., Research Scholar**
- **Syed Aasish Roshan** - **PhD., Research Scholar**
- **Dharani** - **PhD., Research Scholar**
- **Gayathri** - **PhD., Research Scholar**
- **Arul Salomee** - **PhD**
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- **Jemi Fiona** - **PhD., Research Scholar**
- **Divya Bharathi** - **PhD., Research Scholar**
- **Jerly** - **PhD., Research Scholar**

Research Scholars, MSc Students of Dept of Biochemistry, Bioinformatics.

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Messages



BHARATHIDASAN UNIVERSITY

(Accredited with A* Grade by NAAC in the Third Cycle)
Palkalaiperur, Tiruchirappalli - 620 024, Tamil Nadu, India

Prof. M. SELVAM, Ph.D.
Vice-Chancellor

Office: 0431 2407048
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FELICITATION MESSAGE

I am happy to know that the team led by Dr. M. Anusuyadevi Jayachandran, Dr. KS. Jayachandran, and Dr. Mahesh Kandasamy, Department of Bio-Chemistry is organizing a DST-Purse Sponsored one-day Workshop entitled "Introductory Course on Surgical Models of Ageing Disorders- Special Emphasis on Brain and Heart" on 20th December 2021.

I appreciate the noble, relevant, and unique efforts of the team in organizing such an interesting event particularly when we are faced with the challenges of COVID-19. The theme of the Workshop focuses on familiarizing the students with surgical models in ageing disorders, which indeed are very crucial topics that the future and current generation should strive to research on.

I extend my greetings and felicitations to all the brains and hearts associated with the Workshop as well as the Department and wish the Workshop all the success.


Prof. M. SELVAM

பாரதிதாசன் பல்கலைக்கழகம்
திருச்சிராப்பள்ளி - 620024



**BHARATHIDASAN
UNIVERSITY**
TIRUCHIRAPPALLI - 620 024
TAMILNADU, INDIA

Dr. G. Gopinath
Registrar i/c

(Accredited with A⁺ Grade by NAAC in the Third Cycle)



MESSAGE

Greetings!

As Registrar of BDU, Trichy, I take great pride in welcoming all the attendees of the DST-Purse Sponsored one day workshop on "Introductory course on surgical models of Ageing disorders- special emphasis on Brain and Heart". Ageing disorders is one of the most common causes of death, accounting for 2/3rd of all the deaths around the world. Cardio Vascular disease, Alzheimer's Disease, Stroke rank at the top among these diseases. There are, however, many people working to fight the disease. This workshop could serve as a platform for those who have come to understand the basics of these disorders, and possibly To help find a cure in the future. I welcome you to our University and wish you a successful workshop.

Trichy - 620 024
20th December-2021

Registrar i/c

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All Communications are to be addressed to the Registrar only.
Please quote our reference in all your replies

Dr. N. THAJUDDIN
Professor

DEPARTMENT OF MICROBIOLOGY
SCHOOL OF LIFE SCIENCES

Coordinator
DST-PURSE Phase II Programme



BHARATHIDASAN
UNIVERSITY

Chair & Coordinator
School of Life Sciences

Principal Investigator

National Repository for Microalgae & Cyanobacteria – Freshwater
(Sponsored by DBT, Govt. of India)



Greeting Message,

It gives me immense pleasure to know that the Department of Biochemistry, Bharathidasan University, Tiruchirappalli for organizing DST-PURSE, Phase II Sponsored one day workshop on "Introductory course on surgical models of Ageing disorders- special emphasis on Brain and Heart" on 20.12 2021. Every progress related to human health has been achieved through biological research and every medical intervention in use today is the result of innumerable discoveries in biology through handling optimized, internationally accepted, basic and applied research tools and techniques. The organizers should be appreciated for choosing this topic, which sets a platform on exposing the participants to various surgical models in rodents, immunofluorescence techniques etc. I am sure that the participants will have confidence in handling these techniques and pursue their research in the frontiers of biological research. Taking this opportunity, I congratulate the Course Convenor **Dr. M Anusuyadevi** and Course Coordinators **Dr. K.S. Jayachandran** and **Dr. Mahesh Kandasamy** and her team for organizing this workshop.

I wish this Hands-on Training workshop a significant one with a great success.


(N. THAJUDDIN)

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17.12.2021

With millions of people affected and living with diseases such as Alzheimer's and Parkinson's whose mental functions are severely impaired, discovery and development of new therapies are need of the hour. Use of appropriate research models play an important role in development and testing of novel therapeutic strategies for the treatment of these diseases. Neurological surgical procedures in rat and mouse models mimicking the human brain disease conditions enable research and discovery of new therapies. This one-day workshop on '*Introductory course on surgical models of ageing disorders - special emphasis on Brain and Heart*' aims to introduce graduate students in life sciences to research tools and models such as ischemia reperfusion surgery and stoelting stereotaxic AD surgery. These tools enable researchers to study disease pathogenesis and testing of new treatment strategies. I appreciate the efforts made by Dr M Anusuyadevi Jayachandran, workshop convenor and course coordinators Dr K S Jayachandran and Dr Mahesh Kandasamy for facilitating this workshop and wish them all the success.


(Dr V Ravikumar)

Dr. C. PRAHALATHAN,
Associate Professor,
Department of Biochemistry,
Bharathidasan University



MESSAGE

I am pleased to note that the workshop entitled - “**Introductory course on surgical models of aging disorders - special emphasis on Brain and Heart**” is organized by Dr. M. Anusuyadevi Jayachandran, Department of Biochemistry, Bharathidasan University on 20th December, 2021. I like to congratulate the entire organizing team for their efforts toward organizing such a fascinating workshop. The participating students would be exposed to a wealth of knowledge on surgical models of aging disorders, affecting the Brain and Heart. At present, much research is focused on such diseases and therefore, students would be benefitted by participating in this workshop. I sincerely express my hearty wishes for the grand success of this workshop.

Dr. A. ANTONY JOSEPH VELANGANNI, Ph.D.
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December 17,
2021

I am happy to know that Molecular Gerontology Lab, Department of Biochemistry is going to organize a DST-PURSE sponsored one day Introductory course on surgical model of aging disorder- emphasis on heart and brain at Bharathidasan University on 20th December 2021. I hope that the workshop will be highly useful to students and scholars doing research on the particular field.

I wish a grand success of the workshop

Thanks

Sincerely

Antony Joseph Velanganni, Ph.D.



Koneru Lakshmaiah Education Foundation

(Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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Dear Prof. Anusuyadevi

Greetings

I am delighted to know about your DST-PURSE workshop on surgical models of ageing disorders with special emphasis on brain on 20-12-2021. I know your university and your department is doing excellent work in brain disorders. We are very proud of this. The current work is very important for students, faculty and industry team work. We are very happy that you have taken a great initiative on this. I am very happy to be part of this workshop and give a talk and contribute my knowledge to the participants.

We wish you the best of luck and we are proud of your university for this wonderful initiative.

Best wishes to all of you

Prof. K. S. JAGANNATHA RAO, FNASc, FABAP, FABS, FLS (UK), FRSB (UK), FRSC (UK), FAPAS, FTWAS

Pro-Chancellor, KL Deemed to be University, Guntur, India
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MESSAGE

I am pleased to know that the Department of Biochemistry, Bharathidasan University, Tamilnadu is organizing a one day workshop on 20.12.2021 with the challenging theme "INTRODUCTORY COURSE ON SURGICAL MODELS OF AGEING DISORDERS – SPECIAL EMPHASIS ON BRAIN AND HEART". The content of this workshop is highly exciting as it attempts to address the basic and technical aspects of model systems involved in neurodegenerative and cardiovascular disease biology. This is highly relevant at present due to the lack of appropriate and reliable models to mimic neurodegeneration and cardiovascular disorders.

Notably, the demonstration of surgical methods in a workshop is a rare phenomenon since it requires special skills developed over years with immense confidence. Therefore, the organizer's attempt to involve generous resource personnel to share their expertise will motivate young talents to undertake scientific research in the area of neurodegeneration and cardiovascular diseases in a meticulous manner.

I wish whole programme a great success.

(J. TAMILSELVAN)

Dr Mahesh Kandasamy,
UGC-Assistant Professor,
Department of Animal Science,
Bharathidasan University



MESSAGE

According to the World Health Organization - “Dementia is a syndrome – usually of a chronic or progressive nature – that leads to deterioration in cognitive function (i.e. the ability to process thought) beyond what might be expected from the usual consequences of biological ageing.” Dementia has many causes and Alzheimer’s Disease (AD) contributes to 60-70% of Dementia cases. Since the major risk factor of AD is age, the disease falls under the category of aging disorders. At present, AD has no treatment and medical research is investing its effort towards finding one.

In the one-day workshop entitled - “**Introductory course on surgical models of aging disorders - special emphasis on Brain and Heart**”, participating students will come to know about creation of these models. I want to congratulate the organizing team for the noble cause of educating the students and together we can make the life of an AD patient a little better than yesterday.

Dr. K.S.JAYACHANDRAN Ph.D.

Assistant Professor,

Department of Bioinformatics,

Bharathidasan University.



It is indeed a matter of pleasure to note that Molecular Neurogerontology Lab, Department of Biochemistry, Bharathidasan University is organizing a workshop on “Introductory course on surgical models of Ageing disorders- special emphasis on Brain and Heart”. Research in molecular neurology is a unique profession because it caters to the most important aspects of life. Molecular Neurogerontology Lab, Department of Biochemistry, School of Lifesciences Bharathidasan University, which has created a space for itself in the field of Neurodegenerative disease research in India by its high level of research excellence. I feel very proud of this Department for the reputation it has acquired as a vibrant centre of Molecular research and publications. The rapid advances in technology during the twenty-first century have changed the main focus of Neurosurgery towards science and technology. In such circumstances, the advancement towards the international research on Neurodegenerative research has become essential to compete with the international scientific community, for which I believe that the workshop arranged by the Molecular Neurogerontology Lab, Department of Biochemistry for sure will help the development of scientific research. I hope the workshop enhances the professionalism and capabilities of all the participants which promotes the future advancement of Neurogerontology.

I wish the workshop great success.

Dr. M. Anusuyadevi Jayachandran,
Associate Professor,
Department of Biochemistry,
Bharathidasan University



MESSAGE

Aging disorders are the diseases suffered by a person generally during old age. In India, the aging population is on the rise and it is estimated that by 2050, people over the age of 60 would constitute 19.1% of the population. Now with the ever-increasing ageing population, various ageing disorders are also increasing in the country. For example Dementia, one of the ageing disorders in which the patient loses his/her memory affected approximately 5.3 million people in 2020 and this number is projected to exceed 14 million by 2050. Dementia can be caused by a number of factors, among which Alzheimer's Disease (AD) is the most common. In AD, there is an abnormal deposition of Amyloid-beta polypeptide in the patient's brain, which ultimately leads to the death of neurons and thereby Dementia. Apart from Familial AD which has a genetic role, the major risk factor of Sporadic AD (SAD) is age.

Presently, AD is incurable. The drugs which are available now cause temporary improvement or deal with the symptoms associated with AD but none can cure or stop the progression of the disease. Therefore, at present, more scientific research is focused on finding a treatment for the disease. One and probably the best way of tackling this problem is by making a model for the disease and performing experiments on it. In the Molecular Gerontology lab, Department of Biochemistry, Bharathidasan University, we do experiments on surgically created rat models for AD.

In this workshop, I want to introduce students to the procedure of a surgically created rat model for AD. I am sure this one-day workshop will be immensely helpful to the participating students in future. I congratulate the entire organizing team for their efforts toward organizing and express my hearty wishes for the success of this workshop.

About the University

Bharathidasan University was established in February 1982, and was named after the great revolutionary Tamil Poet, Bharathidasan (1891-1964). The motto of the University "We will create a brave new world" has been framed from Bharathidasan's poetic words "புதியதோர் உலகம் செய்வோம்". The University endeavours to be true to such a vision by creating in the region a brave new world of academic innovation for social change.

The University's Main Campus was located in a sprawling area of over 1000 acres in Palkalaiperur. The administrative complex, which includes the Vice-Chancellor's Secretariat, Registrar's Office, Finance and Examination offices, most of the academic departments and research laboratories are located in the main Palkalaiperur Campus. Among the academic units in the Palkalaiperur Campus are Schools of Mathematics, Physics, Chemistry, Life Sciences, Basic Medical Sciences, Geosciences, Social Sciences, Marine Sciences and the Schools of Languages. Besides these, the Bharathidasan Institute of Management popularly known as BIM (adjudged as one of the top business schools in the country) is located within the BHEL premises, a public sector undertaking at Thiruverumbur.

The University has 4 Faculties, 16 Schools, 37 Departments and 29 Specialized Research Centers. There are 263 faculty members catering to 2564 students and scholars in the University. The University Departments/Schools are offering 151 programmes including 40 PG programmes in M.A., M.Sc. and M.Tech. The above programmes are conducted under the Choice Based Credit System (CBCS) in Semesters: 31 M.Phil., 33 Ph.D., 19 P.G. Diploma, 11 Diploma and 10 Certificates. The University's supporting staff strength is 457. In addition to the regular teaching programmes in the Departments and Schools, the University under its Distance Education mode is conducting 15 UG and 26 PG programmes.

About the School of Life Sciences

During 1989, the Botany Department was elevated into School of Life Sciences with four constituent Departments viz. Plant Science (now Botany), Animal Science, Microbiology and Biotechnology. In the year 2005, two more Departments viz. Bioinformatics and Biochemistry are started as constituent Departments of the School of Life Sciences. The School of Life Sciences has a separate library with more than 6000 books catering to the requirements of the M.Sc. students, research scholars and faculty members of the constituent Departments.

The School of Life Sciences of Bharathidasan University has gone from strength to strength and it has recently been recognized as a "Center of Excellence in Life Sciences" by the Govt. of Tamil Nadu with a grant of Rupees One Crore.

About the Department

The Department of Biochemistry was established in the year 2005. Department offers a two-year M.Sc., Programme in Biochemistry, one-year M.Phil., Programme and Ph.D., programme in various specializations. We are also actively involved in teaching M.Sc., Life Science students and handle courses related to Biochemistry. Biochemistry is an integrated subject fulfilling the need for basic as well as applied aspects of biology and prepares the students to become entrepreneur, teacher, researcher, or to fit into equipping themselves to the future needs along with the basic and applied knowledge of modern biology. Keeping in view the updates and trends among international institutes around the world, we frequently update the syllabus inculcating international standards and modernizing the curriculum that will benefit our younger generation and qualify them to contribute to the welfare of society.

All the faculty members of the Department of Biochemistry have got their research specialization from various leading laboratories around the world and got intense training during their post-doctoral experience. The main areas of research includes Membrane Biochemistry, Cancer Biology, Neuro Gerontology, Reproductive Biology

etc., We have produced more than 20 PhD students who have got placed as scientist, postdoctoral fellows in various leading international institutes in the USA, Korea, Sweden. Within a short span of time, the Department has grown into a vibrant academic department and research centre in Biochemistry, where we have made great strides in higher education, research and extension activities in the area of specialization. The Department was recognized for DST-FIST Program in the year 2012. The department has generated funds worth five-plus crores for Research and Infrastructure from various funding agencies like CSIR, NFMP, DST, DBT, ICMR and UGC etc., To add on to the credentials, more high impact factor publications has been made in well-reputed Journals and published many book chapters in the core area of research. The department has hosted many national level conferences and workshops benefiting student.

About the Sponsors

DST-PURSE:



विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

Promotion of University Research and Scientific Excellence (PURSE)" is one of the Flagship Infrastructure programs of Department of Science and Technology, which was commenced in the year 2009 exclusively for the University sector. The main objective of the scheme is to strengthen the research capacity of performing Indian Universities and provide support for nurturing the research ecosystem and strengthening the R&D base of the Universities in the country. Department of Science & Technology has restructured and re-oriented PURSE in the year 2020. A combination of I10 index of faculty members in the University, H index of the University along with NIRF Ranking is used to formulate the new criteria for selection of Universities under PURSE. Universities have been encouraged to carry out Mission mode research activities to focus on thrust areas which align with National priorities of Excellence in Manufacturing, Waste processing, Clean Energy, Water and Start up India. Universities are encouraged to harness their areas of excellence into thematic effort of an accomplished team, with clearly articulated objectives. The broad objective is to support potentially high impact, interdisciplinary research (both basic and applied) aligned to national priorities and missions. The research should also align well with goals of Self-Reliant India (Atma Nirbhar Bharat) and Start-up India etc. Universities supported under PURSE have been communicated to promote optimal utilization of these resources through a public notice. Programme Management Board comprising eminent academicians is involved in the process of evaluation of fresh proposals, reviews the technical progress and suggest mid-course correction's in supported projects under PURSE.

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Zelle Biotechnology Pvt. Ltd. Offering State-of-the-art technologies for Biopharma & Life Sciences Industry Zelle Biotechnology Pvt. Ltd., founded in October 2004 is responsible for niche products, technologies, and services to the Biotech and Life Sciences industry in India. Building on our strong scientific focus, and client-driven attitude, Zelle has established itself as one of the most valuable and preferred partners within the industry. We are responsible for supporting biopharmaceutical companies to accelerate their therapeutic pipeline from development and approval stages right to the global markets. With an experienced and fast-growing team which is spread across India, Zelle is a very competent partner with expertise in specialized areas. Bringing forth Creativity, Scientific vigilance, and Customer-oriented approach With over 5000 sq. ft. dedicated to our fully equipped analytical and process development laboratory at a prime location in Mumbai, we deliver significant value to our customers by leveraging our scientific skills and almost two decades of experience, that has helped us to get a pulse of the biotechnology industry and markets in India. The unparalleled creativity, scientific vigilance, and customer-oriented approach give us an edge over our competition in the market. This is further ensured through the 50 man-years of experience and expertise of Zelle's technically adept team and, our prestigious association with more than 12 leading global companies in the Bio-Pharma & Life Sciences spectrum like the New England Biolabs; Cell Signaling Technology, Minerva Biolabs, speaks for itself. Zelle's products and outsourced services portfolio encompasses Host Cell Protein, Host Cell DNA detection products, mycoplasma detection, cell culture media and Molecular Biology Reagents among others. And to top it off, they also outsource cell line development for biosimilars, biological and physicochemical testing services

On the Path of Becoming a Global CRO Over the years, the team has worked on a variety of therapeutics like monoclonal antibodies, anti-clotting factors, insulin analogs, fusion proteins and immune modulators. The data generated by the laboratory has been used in submissions to the USFDA, RCGM (India), TGA (Australia) and PEI – Paul Ehrlich Institute (Germany). Good documentation practices, fully compliant software and IT systems utilization to run the laboratory gives them the needed credibility in conducting research at the facility. With a GLP certification in the pipeline, Zelle Lab is on track to become a global CRO. Furthermore, this is backed by its laboratory which is equipped with state of the art analytical equipment like the QTOF, CD, DSC and multi-mode plate readers. The team regularly conducts bio similarity studies in post translational modifications, secondary and tertiary structure as well as thermal stability.

ADInstruments Company Profile

ADInstruments is a world leading manufacturer of computer-based data acquisition and analysis equipment for life sciences.

Since its inception three decades ago, the company's proactive product development and focus on customer needs has resulted in a broad range of products used by researchers and educators.

The core product in ADInstruments' range is the award-winning **PowerLab**. It offers comprehensive and intuitive functionality with safety certifications for biomedical research and education. PowerLab systems are installed in reputed universities, hospitals and research institutes worldwide.

The success of PowerLab has been achieved through continued innovation and the pursuit of excellence in both product quality and support.

Sumant Bhat
Training and Technical Support Manager
ADInstruments, Bengaluru

5+ years of industry experience in data acquisition and analysis of various biological and physiological signals in life science education and research applications



Presentation will be on, "ADInstruments in Life Science Education and Research"

About the Workshop

The population of the elderly in India has been increasing steadily since 1961 as it touched 13.8 crore in 2021, growing faster due to a decrease in death rate, according to a study by the National Statistical Office (NSO). "According to the Report of the Technical Group on Population Projections for India and States 2011-2036, there are nearly 138 million (13.8 crores), elderly persons, in India in 2021 comprising 67 million males and 71 million females," the NSO study 'Elderly in India 2021' said.

Workshop stands with the motto of introducing the basic understanding of geriatric disorders with a special focus on neuroscience and cardiovascular disorder (CVD), enabling the young researchers to identify pathfinding solutions to extend or prolong the lifetime of senior citizens and simultaneously target healthy ageing. the smooth life period of senior citizens.

The surgical protocols clarify the current scenario model development for Alzheimer's and CVD with highly equipped instruments in international standards. Along with immunohistological techniques which aid to enhance molecular level visualization of biomolecules.

The workshop welcomes participants from wide angles of the nation which includes students, research scholars, faculty and industrial delegates to explore the entrance gate of ageing disorders.

EVENTS

Time	Detail	Location
9:00am- 9:30am	Registration	Seminar Hall, Dept of Biochemistry
9:30am- 10:00am	Inauguration of Robotic Rodent Neurosurgery facility	Dr MAJ Lab, Dept of Biochemistry
10:00am- 10:30am	Inauguration of the One day workshop	Seminar Hall, Dept of Microbiology
10:30am- 11:30am	Guest Lecture talk by Dr Jagannatha Rao	Seminar Hall, Dept of Microbiology
11:30am- 11:45am	Tea Break	Seminar Hall, Dept of Microbiology
11:45am- 12:30pm	Guest Lecture Talk by Mr Sumant From AD	Seminar Hall, Dept of Microbiology
12:30pm- 1:00pm	Lunch Break	Dept of Biochemistry
Afternoon Session: Participants will be split into two teams		
Time	Session for Team A	Session for Team B
1:00pm- 2:00pm	I/R @ DrKSJ lab	AD @ DrMAJ lab
2:00pm- 3:00pm	IF @ DrMK lab	I/R @ DrKSJ lab
3:00pm- 4:00pm	MCAo @ DrKSJ lab	IF @ DrMK lab
4:00pm-5:00pm	AD @ DrMAJ lab	MCAo @ DrKSJlab
5:00pm- 5:30pm	Valedictory function with High Tea	

DrKSJ lab- Dr KS Jayachandran Lab, Dept of Bioinformatics;

DrMAJ lab- Dr M Anusuyadevi Jayachandran Lab, Dept of Biochemistry;

DrMK lab- Dr Mahesh Kandasamy Lab, Dept of Animal Science.

About the Talk

Therapeutic Intervention in neurodegeneration: challenges and complexes

Prof. K. S. JAGANNATHA RAO,

Pro-Chancellor, KL Deemed to be University, Guntur, India

Director, Institute for Scientific Research and Technology Services,

Distinguished Professor and Scientist,

National Science System Building 208,

Clayton City of Knowledge,

Republic of Panama.

Neurodegenerative disorders are challenging and complex, and even after centuries of discovery of the aetiology, and pathology, drug discovery is still a complex issue. But one of the pieces of evidence in these diseases is the accumulation of toxic proteins like amyloid-beta, and alpha-synuclein, among others. In this talk, Dr Rao will address many of his ventures against these proteins and explain how the interplay of suspected neurodegenerative etiological factors in causing an imbalance in genome damage/repair, and will also debate the consequences of the resulting accumulation of unrepaired genome damage in causing neuronal death.

Brief Info About Demonstrations

Cardiac Ischemia/ Reperfusion Surgery

Endotracheal intubation:

The anaesthetized rats were placed in supine position on a table with a heat source to maintain 37 ± 1 °C. The mouth was opened and the tongue was pulled to the left side. A 2 mm pediatric endotracheal tube was fitted over a 1.9 mm semi-flexible endoscope with portable light source (FM-1.67 × 20, MDS INCORPORATED, USA) and placed inside the buccal cavity and vocal cords were visualized. The tracheal tube was gently released into the trachea and intubation was confirmed by the presence of condensation forming on a glass slide placed near the endotracheal tube. After successful tracheal intubation, cardiac function was monitored using an electrocardiogram (ECG) to ensure normal sinus rhythm.

ECG analysis to determine variations in cardiac electrophysiology

The right (negative) and left (positive) arm electrodes were inserted subcutaneously in the respective hemithoraces and the neutral electrode was inserted near the right hind limb. The electrodes were connected to a monitoring system. Single lead ECG was obtained with a sampling rate of 1 kHz using Power lab 4/35 FE136 Animal Bio Amp (AD instruments, Australia). The high and low pass filters were set to 0.1 Hz and 50 Hz respectively. The ECG and heart rate were measured for 10 min prior to surgery and then continuously during surgery and till the

recovery of animals. ECG was analyzed using Lab chart 7.1. Animals with normal sinus rhythm were used for LAD ligation to induce ischemia.

I/R Surgery:

Rats were anaesthetized with 2.5–3.5% isoflurane (Isoflurane Funnel Fill Vaporizer, Smiths Medical ASD, USA) in a mixture of 100% oxygen. Animals were ventilated using a small animal ventilator (Harvard apparatus, USA) with cylinder capacity of 100 ml. The respiratory rate was fixed based on the animal's body weight. Temperature was monitored throughout the process using digital thermometer (DT-610B Thermocouple Thermometer, CEM, China). Left thoracotomy was performed by making small incision into the 4th and 5th intercostal space through the ribs. The ribs were spread using a retractor to expose the heart. The pericardial layer was removed. The LAD was identified with blunt end needle and ligated using 5.0 catgut sutures. ECG measurements and visualization of pale ischemic tissue confirmed successful LAD ligation. After 30 min of ischemia, the ligature was removed for reperfusion. Air was manually evacuated and thoracotomy site was sutured. Anesthesia was discontinued gradually and by ventilating with room air for 5 min, the animal was weaned out from the ventilator.

Surgical Protocol for AD model in rodents

____Stereotaxic surgery shall be performed by infusing oligomeric A β 25-35 into the hippocampus of male Wistar rats. Briefly, rats will be anaesthetized and fixed on a stereotaxic apparatus (Ambala instrument, India). The intrahippocampal injection can be made using 10 μ l Hamilton microsyringe (Hamilton- Reno, USA) and relative to the bregma coordinates for the hippocampus were -4.0 mm, 3.0 mm mediolateral and -3.6 mm for the dorsoventral region of rats using Paxinos and Watson Atlas (Seventh edition, 2013). A small incision will be made on the scalp and the periosteal will be scraped from the top of the skull. A hole will be drilled in the skull using a drill bar. Confirmation on the infusion site can be examined using trypan blue that displayed well-localized infusion to the dorsal hippocampus. The prepared oligomers of A β 25-35 at the rate of 1 μ g/ μ l will be then infused bilaterally into the hippocampus in a volume of 5.0 μ L After the injection, the needle should be left in place for 5 minutes to prevent backflow. The skin will be sutured and the rats will be allowed to recover from anesthesia, and returned to their home cages.

Immunofluorescence Protocol:

Perfusion and Tissue processing:

Deeply anesthetized animals will be subjected to transcardial perfusion, first with normal saline (0.9% NaCl) solution, followed by perfusion with 4% paraformaldehyde. The brain will be isolated and allowed for fixation in 4% PFA solution at 4°C overnight. Solution containing 30% sucrose will be used to cryoprotectant the tissue. Using a sliding microtome, the brain will be cut into 30-40 µm sagittal or coronal sections on dry ice. Sections will be stored in cryoprotectant solution (ethylene glycol, glycerol, 0.1 M phosphate buffer, 1:1:2 by volume) at -20°C. All solutions will be adjusted to pH 7.4 before usage.

Immunofluorescence staining:

For Immunofluorescence staining, cryosections were treated with tris-buffered saline (TBS) for 30 min and blocked by TBS containing Triton X 100 0.1%, bovine serum albumin 1% for 2hrs, followed by incubation with primary antibodies overnight at 4°C. Later sections will be further incubated with fluorochrome-conjugated species-specific secondary antibodies. Sections were mounted on slides and observed using a fluorescent microscope.

Animal model of Middle cerebral artery occlusion (MCAO) - stroke model:

LASER Doppler Probe Installation

Male Wistar rats 250g-300g of weight were taken. The animal is anaesthetised using isoflurane gas (5%) and maintained using 2% isoflurane. The animal is placed on its dorsal side. The neck region is shaved and the region is sterilized using repeated rubbing with 70% alcohol and povidone-iodine solution. Through a mid-line incision on the skin, the skull was exposed. Tissues were reorganised to expose the bregma point in the skull. With bregma as reference, the typical coordinates for the ischemic core are expected at bregma -1 mm, 5 mm lateral to the midline and mark the point. Place the Probe holder at the marked point and fix using cyanoacrylate. Fill the probe holder with ultrasound gel. Insert the LASER Doppler Probe into the probe holder, and fix the probe using additional supports. Suture the skin to close the openings made.

Middle Cerebral Artery Occlusion (MCAo)- Protocol

The animal is placed on its ventral side. The neck region is shaved and the region is sterilized using repeated rubbing with 70% alcohol and povidone-iodine solution. Once sterilized, an incision is made and slowly the left common carotid artery is approached. We follow the Koizumi method for MCAO surgery. The left common carotid artery is tagged

with a suture thread and slowly the left internal and the left external carotid arteries were also exposed. Both the left common carotid artery as well as the left external carotid arteries are permanently tied off. A temporary clamp is placed on the left internal carotid artery.

Through an incision in the left common carotid artery, silicone-coated nylon monofilament of specific diameter was inserted and guided towards the internal carotid artery and further pushed around 1.8 cms to eventually block the middle cerebral artery. Care should be taken to not insert the filament into the pterygopalatine artery, which could be avoided by inserting the filament towards the medial side. Once the filament blocks the middle cerebral artery, the occlusion time begins. For our work, we carry out an occlusion time ranging between 30 minutes and 60 minutes. After the said occlusion time was over, the filament was removed and the internal carotid artery was tied off. The exposed neck skin is sutured and a local anaesthetic like lidocaine is topically applied to relieve pain.