



Central University of Haryana,  
Mahendergarh



GLOBAL INITIATIVE OF ACADEMIC NETWORKS



सत्यमेव जयते  
Government of India  
Ministry of Human Resource  
Development

# A GIAN Course on Cerebral Blood Vessels in Health and Disease: Translational Insights (April 16<sup>th</sup>-20<sup>th</sup>, 2018)



Department of Biochemistry, School of Interdisciplinary and Applied Life Sciences (SIAL),  
Central University of Haryana (CUH), Mahendergarh,  
Haryana-123031. Website: [www.cuh.ac.in](http://www.cuh.ac.in)



### **PATRON**

Prof. R.C. Kuhad  
Vice Chancellor,  
Central University of Haryana

### **LOCAL COORDINATOR**

Dr. Aditya Saxena  
Associate Professor  
Director, IQAC,  
Central University of Haryana

### **COURSE COORDINATOR**

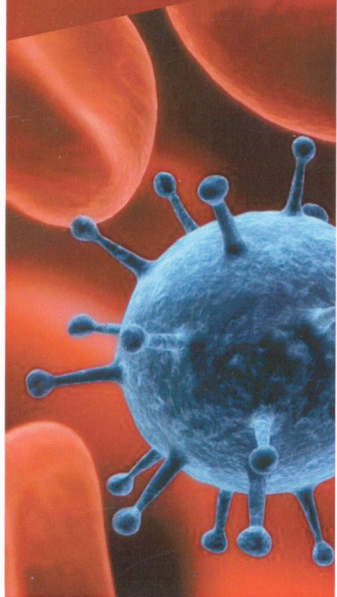
Dr. Vikas Yadav  
Assistant Professor &  
Ramalingaswami Fellow  
Department of Biochemistry  
Central University of Haryana

## **Course Overview**

The blood vessels in the brain are critical for normal brain functioning. In humans, cerebral blood vessels form a highly precise network, supporting the major brain circuits tasked with sensation, memory, and movement. It has been estimated that nearly every neuron in the human brain has its own blood capillary. The blood vessels assist neural function by delivering oxygen and nutrients, and removing metabolic wastes. In humans, the brain receives up to 20% of the total blood supply. The importance of the blood vessels in the human brain is highlighted by the fact that when blood flow stops, the neurons start dying within minutes. Blood vessels in the brain form a unique neurovascular unit that enables the tight regulation of blood flow in the brain. Blood vessels in the brain also form a blood-brain barrier that prevents pathogens and several toxins in the blood to reach neurons. The vascular dysfunction can diminish transport of energy substrates and nutrients into the brain, and reduce the clearance of metabolic wastes across the blood-brain barrier that lead to neurodegenerative diseases. Brain vascular dysfunction is associated with age-related vascular dementia, Alzheimer's disease, Parkinson's disease, amyotrophic lateral sclerosis, multiple sclerosis, and others. Blockage of blood vessels by a blood clot or a rupture of blood vessels cause ischemic stroke and hemorrhagic stroke, respectively. The development of new therapeutic approaches for these neurological disorders involves the blood-brain barrier and other non-neuronal cells. However, the translational approaches for the neurological diseases have a unique limitations, because most of biological agents and large molecule pharmaceuticals do not cross the blood-brain barrier. The GIAN course would shed lights on the current status and future avenues to combat diseases associated with neurovascular complications.

## **Course Objectives**

1. To improve the understanding of key components of neurovascular system and their relation to the neurodegenerative diseases.
2. To recognize the strengths and weaknesses of current neurovascular research methodologies.
3. To enhance the scientific understanding by providing insight into the cutting edge therapeutic approaches.
4. To understand the drug development process from target identification to screening the potential drug candidates.





## Faculty



**Dr. Itender Singh; PhD:** Dr. Singh is an Assistant Professor at the Department of Neurological Surgery at Washington University School of Medicine, St. Louis, MO, USA. He attended University of Delhi, India where he received a Ph.D. degree in Microbiology. Later, he completed post-doctoral research training in the laboratory of Professor Berislav V. Zlokovic at University of Rochester Medical Center, Rochester, NY, USA. His primary research focus for the last decade is to understand neurovascular dysfunction in Alzheimer's disease (AD) and stroke. He has published his studies in top-tier scientific journals including Journal of Clinical Investigation (JCI), Proceedings of the National Academy of Sciences (PNAS) and Blood. Dr. Itender Singh is currently leading translational studies directed toward identifying molecular mechanisms and therapeutic targets for Alzheimer's disease, vascular dementia and stroke.



**Dr. Vikas Yadav, PhD:** Dr. Yadav is a Assistant Professor and Ramalingaswami Fellow at the Department of Biochemistry, Central University of Haryana. He has received his MSc, MPhil and PhD degrees from Jawaharlal Nehru University, New Delhi, India. He completed post-doctoral research training from Prof. David Kaplan's lab at Tufts University, Boston, USA; Prof. Ramesh Shivdasani's lab at Dana-Farber Cancer Institute, Harvard Medical School, Boston, USA; and Prof. Vihang Narkar's lab at University of Texas, Houston, USA. He has more than 9 yrs research and teaching experience. His research interests are to explore the therapeutic role of nuclear receptor ERRs and their coactivators (PGCs) in diabetes mediated vascular complication. He has been awarded the prestigious Ramalingaswami Fellowship from the Department of Biotechnology, Govt of India. The long term goals of his studies is to find out the therapeutic molecules to restore the endothelium function in diseases associated with vascular dysfunctions. He has published his research findings in top-tier scientific journals including Journal of Biological Chemistry (JBC), Circulation Research, The FASEB, Cell Reports, Scientific Reports, PLOS ONE and many more.

## Who can attend the course

Engineers and researchers from manufacturing, service and government organizations including R&D laboratories. Students at MSc/MTech/PhD levels. Faculties from academic and technical institutions.

## Registration Process And Fee

**Overseas Participants:** US\$ 200.00

**Faculty/Scientists:** Rs. 2000.00 (Rs. 750.00 for SC/ST participants)

**Industry Participants:** Rs. 3000.00

**Research Scholars/Students/Alumni:** Rs.1000.00 (Rs.500.00 for SC/ST participants) The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The paid hostel/guest house accommodation may be provided on first come first serve basis with prior request. The shortlisted candidates will be informed via e-mails.



**Day-1 (16.04.2018)**

**Lecture-1:** Fundamentals of neurovascular system in health.

**Lecture-2:** Blood-brain barrier and its components in aging.

**Tutorial-1:** Problem solving exercises and review of potential problems with drug deliver across the blood-brain barrier.

**Day-2 (17.04.2018)**

**Lecture-3:** Vascular cognitive impairment and dementia: current advances in basic science

**Lecture-4:** Vascular cognitive impairment and dementia: therapeutic approaches

**Tutorial-2:** Discuss methods of the blood vascular research, and hands-on demonstration of in vitro methods of angiogenesis.

**Day-3 (18.04.2018)**

**Lecture-5:** Neurovascular components of neuromuscular diseases.

**Lecture-6:** Neurovascular degeneration in Alzheimers disease: cause or effect?

**Tutorial-3:** Discuss methods for the analysis of blood-brain barrier and hands-on demonstration of in vitro methods of blood brain barrier.

**Day-4 (19.04.2018)**

**Lecture-7:** Autophagy in neuromuscular diseases: current understanding and perspectives

**Lecture-8:** Problems and novel approach for drug discovery for Alzheimer's disease

**Tutorial-4:** Discuss the neurodegenerative diseases in Indian scenario. Methods of cognitive function test – Hands-on approach.

**Day-5 (20.04.2018)**

**Lecture-9:** Ischemic and hemorrhagic stroke: new discoveries and cutting-edge therapeutic approaches

**Lecture-10:** Role of PCG1-beta in neoangiogenesis in neuromuscular ischemia

**Tutorial-5:** Discuss the stroke in Indian population and the challenges in epidemiological and therapeutic approaches. Discuss the potential to initiate collaborative efforts.

**Tutorial-6:** Strategies to modulate angiogenesis for neuromuscular diseases. Discuss the new avenues of drug discoveries for neuromuscular ischemia.

**Exam: April 20, 2018**

**---FOR MORE INFORMATION, PLEASE CONTACT---**

**Dr. Aditya Saxena**

Local Coordinator

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**Dr. Vikas Yadav**

Course Coordinator

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Cerebral Blood Vessels in Health and Disease:  
Translational Insights  
(April 16<sup>th</sup>-20<sup>th</sup>, 2018)**

(Sponsored by Ministry of Human Resource Development (MHRD)  
under the scheme Global Initiative for Academic Network)

**REGISTRATION FORM**

**PERSONAL DETAILS**

Name of the Applicant :  
Occupation :  
Institution Address :

E-mail :  
Mobile Number :

Paste recent  
passport size  
coloured  
photograph

**REGISTRATION FEE DETAILS**

By Cheque	
Amount (INR) :	
Account Number :	
Account Holder's Name :	
Cheque No. & Date :	

By NEFT	
Amount (INR) :	
Account Number :	
Account Holder's Name :	
Transaction ID & Date :	

By Demand Draft	
Amount:	DD No.
Bank:	Date:

**Signature**

**Note:**

- Registration should be made in favour of **GIAN, Central University of Haryana A/c** via **cheque/online transfer mode** only. (**Bank Name & Address:** Punjab National Bank, Jant-Pali, Mahendergarh, Pin-123031; **Account no.** 7824000100009605; **MICR** 123024106; **IFSC** PUNB0782400)
- Proof of Registration fee should be sent to Dr. Vikas Yadav, Department of Biochemistry, School of Interdisciplinary and Applied Life, Central University of Haryana, Mahendergarh - 123031
- The scanned copy of filled Registration form duly signed by the applicant along with the proof of fee submission should also be sent by E-mail to Dr. Vikas Yadav (vikasyadav@cuh.ac.in)
- In case the candidate requires an accommodation a separate E-mail regarding this should be sent to vikasyadav@cuh.ac.in before **5 April, 2018**

**Contact Person:**

**Dr. Vikas Yadav**

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