



**MANGALORE UNIVERSITY**

*NAAC Accredited 'A' Grade*

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Global Initiative on Academic Network (GIAN) Program  
on  
**NEUROPEPTIDES IN SOCIO-EMOTIONAL BEHAVIOUR:  
FROM HEALTH TO DISEASE**  
July 2-6 2019

**Overview:**

Exposure to negative social and environmental factors such as acute or chronic stress, either early on in life or in adulthood, activate the stress system and influence behavioural and brain activity. Environmental/social influences can induce long-lasting changes in neurons, which were earlier detected by neuromorphological studies. In recent times, however, small molecules called neuropeptides have emerged as neurotransmitters or neuromodulators and are significantly involved in the modulation of and fine-tuning of stress-related behaviours and physiological responses. Some examples of these are oxytocin, vasopressin, corticotrophin releasing hormone and neuropeptide S. Thus, the respective brain neuropeptide systems could constitute innovative therapeutic targets. Neuropeptides have emerged as markers that enable distinction of anxiety and depression, which are commonly co-morbid.

Stress-related adaptations commonly lead to drastic changes in stress-sensitive areas such as the amygdala-hippocampus-prefrontal circuitry, affect the hypothalamo-pituitary-adrenal axis and can have far-reaching effects on social and emotional behaviour impacting aggression, learning and memory, maternal behaviour and can induce psychopathologies. Some of the psychopathologies are depression- and anxiety-related disorders, specifically

social anxiety disorder, post traumatic stress disorder, all of which have been modelled with greater or lesser success in rodents. Although being extensively researched at present, the underlying molecular, neuronal and circuitry-based mechanisms of actions of these neuropeptides and their involvement in complex behaviour and physiology is still far from being understood. Hence, there is an urgent need to consider this as an important aspect, both in academic and research spheres, both in animal as well as human research with important clinical extrapolation. Biomarkers for early detection of neurodegenerative diseases may emerge for therapeutic interventions and sites, areas or circuitries identified as excessively susceptible may prove useful for therapeutic interventions or site-specific drug-based applications.

### **Objectives:**

- To provide the participants with a detailed perspective of the socio-emotional brain, constructs and circuits.
- To develop an understanding of the neuropeptidome associated with health and disease with a translational approach.
- To instruct participants by giving them a primer on the normal brain functioning and as seen in neurodegenerative disorders.
- To facilitate understanding of the effects of various environmental influences on brain circuitries that can be modeled through acute as well as chronic stressors and impact social behaviour.
- To enable screening and assessment at the neural and behavioural levels in an animal model.

### **Who can attend?**

- M.Sc. (Life sciences and Psychology); M.Pharma; MBBS, MD Students, PhD Students, Post-docs, young faculty and researchers in the Life/Medical Sciences from both colleges (including medical/pharmaceutical) and universities.

**Course Duration: 2-6 July 2019**

## Course Schedule:

Date	Lectures
<b>Tuesday, 2.7.19</b>	
<b>3:00 pm</b>	<b>Inauguration and Introduction</b>
<b>4:00 – 5:00 pm</b>	The limbic system - Social and emotional circuits in the brain (IDN)
<b>5:00 – 6:00 pm</b>	The stress response: Physiology and pathophysiology (IDN)
<b>Wednesday, 3.7.19</b>	<b>ANXIETY</b>
<b>10:00 – 11:00 am</b>	Neurobiological criteria and definition of neuropeptides as neuromodulators of the brain: methodological aspects (IDN)
<b>11:30 – 12:30 pm</b>	Neuropeptide regulation of anxiety I: oxytocin and vasopressin (IDN)
<b>1:30 – 2:30 pm</b>	Neuropeptide regulation of anxiety II: neuropeptide S (IDN)
<b>2:30 – 4:30 pm</b>	Animal models of anxiety - Laboratory/Practical Session (IDN+MS)
<b>Thursday, 4.7.19</b>	<b>SOCIAL BEHAVIOUR</b>
<b>10:00 – 11:00 am</b>	Brain neuropeptides: maternal behaviour (IDN)
<b>11:30 – 12:30 pm</b>	Brain neuropeptides: from social preference to social fear (IDN)
<b>1:30 – 4:30 pm</b>	Molecular neuropharmacology – tools and techniques – Laboratory / Practical Session (IDN+MS)
<b>Friday, 5.7.19</b>	<b>STRESS/CHRONIC STRESS</b>
<b>10:00 – 11:00 am</b>	Impacts of chronic psychosocial stress – implications in humans (IDN)
<b>11:30 – 12:30 pm</b>	Consequences of chronic psychosocial stress on physiology, immune system and behaviour (IDN)
<b>1:30 – 4:30 pm</b>	Animal models of depression - Laboratory / Practical Session) (MS)
<b>Saturday, 6.7.19</b>	
<b>10:00 – 11:00 am</b>	Early life effects on stress responsiveness, and socio-emotional behaviour (IDN)
<b>11:30 – 12:30 pm</b>	Test your learning
<b>3:00 pm</b>	<b>Concluding remarks and Valedictory</b>

## Foreign Faculty:



**Prof. Dr. Inga D. Neumann**  
**Chair of Neurobiology & Animal Physiology**  
**Dean of Faculty of Biology and Preclinical Medicine**  
**University of Regensburg**  
**93040 Regensburg, Germany**

**Prof. Dr. Inga D. Neumann** is Professor of Neurobiology/Animal Physiology, University of Regensburg, Germany. She is also Chair of Behavioral and Molecular Neurobiology, University of Regensburg, Germany. She has received the prestigious Heisenberg award of the German Research Council (DFG) and has carried out her post-doctoral work at the University of Calgary, Canada and was Senior Scientist at the Max Planck Institute, Munich, Germany.

She is Director of the Neuroscience Graduate Program and has been Director of the Elite Master's Program at the University of Regensburg, Germany. She has been Visiting Professor at the University of Sydney from 2011-2012. She has been invited speaker/chaired several sessions at International symposia and conferences and organized several seminal meetings. She is member of the Editorial Board of several reputed journals including *Stress*, *J Sc* and *Neuropsychopharmacol*, *Horm Behav*, *J Neuroendocrinol*, *Front Neuroendocrinol*, *Psychoneuroendocrinology*, *World Journal of Biological Psychiatry* and Member of several reputed academic and professional societies. She has more than 140 research publications to her credit.

She has carried out several major research projects funded by the German Research Council, State Research Foundation, German Academic Exchange Program (DAAD), Federal Ministry for Education and Research and Volkswagen Foundation and collaborative projects with the Universities of Rostock, Berlin, Hamburg and countries such as Australia and US. Her research areas and her major funded projects have been on Prenatal stress, anxiety and neurogenesis; Interactions between anxiety and aggression, Role of relevant brain neuropeptides; Effects of chronic stress in pregnancy on neuronal, neuroendocrine and behavioural adaptations in late pregnancy and lactation; Chronic oxytocin and NPS administration, Neurobiology of emotion dysfunction; The role of the emotional network and neuropeptidergic modulation in normal and impaired social cognition; Identification and Validation of new target structures of the brain for anti-depressive medication in animal models-SP1; Sexual activity and anxiolysis; Oxytocin actions in social fear conditioning; Epigenetic mechanisms of oxytocin actions in fear conditioning; Neurobiology and treatment of adolescent female conduct disorder: The central role of emotion processing, Neuropeptide physiology of grieving; Emotional network neuropeptidergic modulation in impaired social cognition.

### Course Coordinator:



**Dr. Monika Sadananda, Professor, Department of Biosciences** did her Ph.D. at the University of Bielefeld, Germany and was recipient of the German Government's *Graduierten Foerderung*. She was first rank holder in M.Sc. and received the Dr. M. Appaswamy Rao prize. She has carried out post-doctoral research at the University of Bielefeld, Germany in 2004 and Philipps University, Marburg, Germany from 2007-2008. Her field of research in Neuroscience. She was Visiting Faculty at Philipps University, Marburg, Germany during Winter Semester 2007-08. From 2001 to 2007 she worked as PI of two consecutive DST fast track young scientist projects.

She has completed major research projects funded by DST, SERB, DBT and UGC. She is currently PI of 2 ongoing major research projects funded by DBT and BRNS. She has peer-reviewed research publications and has presented papers/invited talks at national and international conferences. She has organized seminars/workshops sponsored by International Brain Research Organization (IBRO), France on Brain Awareness (2009) and Neurological disorders - causes and underlying mechanisms: current status and research trends (2010), IAS-INSA-NASI Science Academies on "Evolutionary Biology: Darwin and Beyond" (2009) and "Genomics, Transcriptomics and Beyond" (2017), SERB 14-day School in Chronobiology (2014-15), Lecture Series in Avian Neuroscience (2015), VGST, Govt. of Karnataka on "Frontier Areas in Biological Sciences" (2018) and National Seminar "Lab to clinic: Approaches and challenges in drug discovery, design and delivery" (2018).

### Course Fee:

Faculty	Rs. 2000
Research scholars and Guest Faculty	Rs. 1000
Students	Rs. 500
Companies and research organizations	Rs. 3000
Foreign participants	US \$ 500

### Accommodation:

Advance request is to be made and arrangements for the same will be made on payment basis.

### Contact:

Dr. Monika Sadananda

Professor & Course Coordinator

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