

Neurosciences conference*

The Indian Academy of Neurosciences (IAN) has completed 25 years of its establishment and celebrated 2007 as its silver jubilee year. The academic activities of this celebration started last year with the successful organization of the 24th Conference of the IAN at Lucknow. As part of the silver jubilee celebration, four symposia were organized throughout 2007 at Chicago (USA), Lucknow, Gwalior and New Delhi. Taking into account the rapid progress in different areas of neuroscience research, the four-day 'International Symposium on Advances in Neurosciences' was held at Varanasi. The main theme of the conference was molecular and cellular basis of brain functions and disorders. The conference was attended by about 450 delegates, including 390 from India.

The inaugural function was held in the evening of first day and was presided by S. Lele (BHU, Varanasi). M. K. Thakur (BHU) presented a glimpse of diverse areas of neurosciences and elucidated the theme of the conference. P. N. Tandon (National Brain Research Centre, Manesar) inaugurated the function and stressed on the need for socio-legal policy planning regarding researches in neurosciences, so that advances in the field can be utilized for public interest. This was followed by felicitation of Tandon and M. S. Kanungo (BHU), and presentation of the IAN fellowship and awards. Vijayalakshmi Ravindranath (National Brain Research Centre, Manesar) introduced the chief guest, Colin Blakemore (Oxford University) who delivered the keynote lecture on the plasticity of the brain.

The presentation of scientific papers started from the morning of the first day and continued till the noon of the fourth day. In total, there were 265 presentations, including one keynote lecture, one special lecture, four plenary lectures, two invited lectures, 11 symposia sessions containing 48 papers, eight oral sessions containing 35 papers and 145 posters. In addition, the B. K. Bachhawat Memorial

Oration was delivered by P. K. Seth (Biotech Park). He spoke on 'Cytochrome P450s: Lab to land' and was presented the lifetime achievement award and citation. The most interesting session was the young scientists' colloquium, wherein 18 papers were presented – six for the Tul-sabai Somani Educational Trust Award and 12 for the D. M. Kar Prize. These presentations were evaluated by a panel of judges and the best presentation was selected for the award.

In the symposium session on molecular and cellular basis of aging and Alzheimer's disease (AD), Debomoy Lahiri (Indianapolis University, USA) discussed the recently proposed 'LEARn' (Latent Early-Life Associated Regulation) model and explained how it can help understand the role of development, environment, nutrition and genes in aging and AD. Raj Kalaria (Newcastle, UK) elucidated the contribution of microvascular pathology, cerebral amyloid angiopathy and cerebral micro-haemorrhages in AD. Kumar Sambamurti (Charleston, USA) described the misprocessing of proteins in neurodegeneration. Roberto Cappai (Melbourne, Australia) spoke on the molecular determinants of amyloid beta toxicity in AD. Debashis Mukhopadhyay (Kolkata) explained the role of intrinsically disordered proteins in neurodegenerative diseases. Ved Chauhan (New York, USA) described the role of gelsolin and proteases in AD. Rai Ajit K. Srivastava (New Jersey, USA) explained the role of oxysterols, liver X receptors and apolipoprotein E in the pathogenesis of AD. Regarding therapeutic approach, Pradeep Banerjee (New York) explained how memantine lowers brain level of beta-amyloid in transgenic mouse models of AD. Girish Kotwal (Cape Town, South Africa) informed that the intracranial administration of vaccinia virus complement control protein in transgenic mice at an early age regulates the progression of familial form of AD. Shyamal Das Gupta and Debjani Guha (Kolkata) spoke on the selective loss of brain cholinergic and monoaminergic neurons and EEG wave pattern in rat model of AD and protection by *Moringa oleifera*.

Continuing the discussion on neurodegenerative disorders, A. Kanthasamy (Ames,

USA) presented his work on transcriptional regulation of proapoptotic kinase PKC δ expression by alpha-synuclein via an NF κ B-dependent mechanism in Parkinson's disease model. James Geddes (Kentucky, USA) explained how the high cyclophilin D content in neuronal mitochondria results in greater vulnerability to calcium overload. Monika Vinish (Chandigarh) spoke on unaltered oxidative stress levels in Indian Parkinson's disease patients with PARK2 mutations. S. Chakraborty (Kolkata) discussed experimental data on dopamine-induced mitochondrial dysfunctions in rat brain and its implications in Parkinson's disease. M. M. Srinivas Bharath (Bangalore) spoke on mitochondrial complex I inhibition in Parkinson's disease and its protection by curcumin. Phalguni Anand Alladi (Bangalore) reported that the neurons of substantia nigra pars compacta of humans show no age-related loss, apoptosis or morphological changes and this finding has relevance to lower prevalence of Parkinson's disease in Asian Indians. Nitai Bhattacharyya (Kolkata) discussed huntingtin-interacting proteins and their partners, modulation of aggregates formation and apoptosis induction by huntingtin exon1 containing CAG repeats in the pathogenic range. Ajay Rana (Chicago, USA) spoke on mixed lineage kinase 3 from a mixed character to drug target of neurodegenerative diseases, while Ravindra N. Singh (Ames, USA) elucidated the correction of spinal muscular atrophy gene using short, antisense oligonucleotides.

In the symposium on neuro-perception of interventional aging, Shuji Hanai (Tsukuba, Japan) spoke on neurobiology of the circadian clock, from *Drosophila* to mammals. Masami Kojima (Osaka) presented findings on brain-derived neurotrophic factor and its single nucleotide polymorphisms. Renu Wadhwa (Tsukuba) discussed recent work on mortalin and degenerative diseases. Sunil Kaul (Tsukuba) demonstrated how ashwagandha extracts can be employed as anti-aging agent and for the treatment of cancer and neurodegeneration. Gurcharan Kaur (Amritsar) explained how intermittent dietary restriction can be used for reversing the age-related neuronal plasticity impairments.

*A report on the 'International Symposium on Advances in Neurosciences and Silver Jubilee Conference of the Indian Academy of Neurosciences', held at Banaras Hindu University, Varanasi, during 22–25 November 2007.

There were six speakers for the symposium on autism. Ved Chauhan (New York) described the abnormalities in membrane lipids and signal transduction in autism, while Abha Chauhan (New York) spoke on oxidative stress, inflammation and immune abnormalities in autism. Debomoy Lahiri (Indianapolis) correlated AD markers, beta-amyloid precursor protein and acetylcholinesterase, with aggression in autism. Pankaj D. Mehta (New York) mentioned biomarkers of autism, whereas M. K. C. Nair (Thiruvananthapuram) explained the early detection of autism spectrum disorders. Vijendra K. Singh (Bellingham, USA) spoke on neuro-autoimmunity and immune therapy in autism. In the symposium on recent progress in understanding the neurobiology of mood disorders and suicides, J. John Mann (New York) spoke on the biologic intermediate phenotypes for major depression and suicidal behaviour. Yogesh Dwivedi (Chicago) presented the findings on neurotrophin receptor activation and expression, and extracellular signal-regulated kinase (ERK)5 signalling in human postmortem brain, and the effect of suicide. Mahadik Sahebaro (Georgia, USA) explained the increased oxidative stress and reduced growth factors in neurodevelopmental deficits and treatment of schizophrenia.

In the symposium on neural plasticity, Evelyne Sernagor (Newcastle) explained early neural activity during the development of retinal circuitry in health and disease. P. G. Joshi (Bangalore) discussed the mechanism of synaptic regulation by astrocytes. C. S. Paulose (Cochin) discussed muscarinic M1 and M3 receptor functional regulation in the cerebral cortex of streptozotocin-induced diabetic rats as a function of age. B. S. S. Rao (Bangalore) demonstrated how the stress-induced cognitive deficits can be restored by activation of resident stem cells in the adult hippocampus.

Discussing about the sensory processing from vision to action, A. S. Mandal (Pilani) spoke on the development of orientation selectivity and orientation tuning of the cortical cells using a mathematical model-based study. S. Narayanan (Allahabad) discussed multistable perception with Rubins face-vase figure. Aditya Murthy (Manesar) explained the control of saccadic decision-making. Rema Velayudhan (Manesar) elucidated the modulation of sensory information processing following lesion of motor cortex.

In the symposium on computational neuroscience, P. K. Roy (Manesar) spoke on the dynamic space-time representation in the neural system with fresh insides from tensor image analysis. Nandini Singh (Manesar) explained speech rhythms in children learning two languages. Mahua Bhattacharya (Gwalior) spoke about the computational techniques for investigation of brain diseases by registration of multimodality imaging.

In the symposium on stress, alcoholism and drug abuse, Howard Becker (South Carolina, USA) presented the findings on brain regional changes in gene expression in a mouse model of ethanol dependence and relapse. Subhash Pandey (Chicago) explained brain chromatin remodelling during alcohol dependence. Gary Wand (Baltimore, USA) correlated the association of amphetamine-induced striatal dopamine release and cortisol responses to psychological stress. Fulton Crews (North Carolina, USA) explained the mechanisms of degeneration and regeneration in addiction and recovery. Ratna Sircar (New York) spoke on the developing brain and addictive drugs. Yousef Tizabi (Washington, USA) explained how nicotine acts as a neuroprotectant. Dipak K. Sarkar (New Jersey) discussed the potential use of stem cell-derived beta-endorphin cell therapy in stress diseases in alcohol exposed foetus. B. N. Dhawan (Lucknow) spoke on alternative medicine in the treatment of alcoholism.

In the oral session on brain stress and neurotoxicants, Shashi Bala Singh (New Delhi) explained the neuronal mechanisms pertaining to hypobaric hypoxia-induced memory impairment. P. K. Gangopadhyay (Kolkata) presented evidences for the role of homocysteine in dementia. Romain Fontaine (Paris, France) demonstrated how the down regulation of glutamate receptor subunits in mice confers resistance of developing white matter towards antenatal hypoxia. Tushar Ghosh (Medinapore) described the effect of hypobaric hypoxia on some immune responses in rats. Vinay Khanna (Lucknow) discussed the forced swim stress and neuro-behavioural toxicity of lead in rats. S. L. Maheswari (Chennai) presented the neurotoxic profile of ayurvedic metallic products.

While unravelling the mysteries of brain structure and functions, Shubha Tole (Mumbai) explained cell fate and migration in the embryonic brain. T. S.

Roy (New Delhi) discussed the morphology of the developing human inferior colliculus, whereas T. C. Nag (New Delhi) demonstrated the immunolocalization of spectrin (alpha and beta) in the human retina and its distribution at different ages. Suman Jain (New Delhi) presented evidences to show how the prenatal auditory stimulation in domestic chicks facilitates the learning process. B. G. Unni (Jorhat) discussed the brain-regulated juvenile hormone biosynthesis in Lepidopteran insects. Sreedhar Varadarajan (RAK, UAE) explained the modelling of oculocardiac reflex, whereas Bhoomika Kar (Allahabad) elucidated the cognitive mechanisms for attention-emotion interactions.

Continuing the discussion on brain disorders, S. B. Ray (New Delhi) presented data on differential expression of *N*- and *L*-types of voltage-sensitive calcium channels in the spinal cord of morphine/nimodipine-treated rats. P. Prakash Babu (Hyderabad) explained granzyme-B mediated cell death in the spinal cord-injured rat model. M. P. Save (Mumbai) discussed the aberrant MAP kinase signalling events which converge to axonal cytoskeletal protein alterations in leprosy nerves. Akshay Anand (Chandigarh) elucidated how mutations in CFH loci are responsible for AMD in North India. Jamuna Subramaniam (Kanpur) spoke on the accumulation of synaptic vesicles in the motor neuron cell bodies in an aggregate model of ALS in *C. elegans*. R. Shukla (Lucknow) described the biochemical alterations in migraine. Kiran Yashpal (Toronto, Canada) discussed the central post-stroke pain through a novel animal model, linking function to structural and vascular changes. James L. Henry (Toronto) explained the elusive nature of osteoarthritis pain. Aparna Rajagopalan (Sydney, Australia) described the viscous properties of the arthritic metacarpophalangeal joint during constant and dynamic contractions.

Regarding neuroprotective strategies, R. V. Murali (Chennai) explained the effect of hydro-alcoholic leaf extract of *Aegles marmelos* on CNS functions in Wistar albino rats. Fakhru Islam (New Delhi) showed how selenium protects cognitive impairments in rats. M. Sabesan (Annamalainagar) demonstrated the neuroprotective effect of *Hypericum perforatum* extracts against 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine-induced neurotoxicity in mice. Raj Mehra (New Delhi)

reviewed the role of estrogen in memory process, S. ThyagaRajan (Kattankulathur) discussed the neuroimmunomodulation of splenic sympathetic noradrenergic nerve fibres by estrogen in rats.

In the plenary session Chanda Kulkarni (Bangalore) spoke on epilepsy update. Birendra Mallick (New Delhi) explained the role of calcium in REM sleep deprivation-induced increase in Na-K ATPase activity in the rat brain. Mahdi Hasan (Lucknow) presented a comprehensive study on the aluminum-induced, lipofuscin-associated apoptosis and macroglial proliferation in the old rat frontal cortex and basal nucleus. R. H. Singh (Varanasi) spoke on ayurveda and brain aging with special reference to Medhya Rasayana therapy. In a special session, Kanungo spoke on neuroscience research in BHU, Varanasi. M. C. Arunan (Mumbai) delivered a thought-provoking talk on 'Innovative teaching: Learning through hands-on research in neurosciences and developing simple model systems to ask sophisticated questions'.

Besides the presentation of scientific papers, a separate session on continued medical education entitled 'Recent advances in epilepsy' was conducted for students. In order to provide a basic understanding and stimulate interest in neurosciences, a special interactive session on brain awareness was organized for school students in collaboration with the Varanasi chapter of the National Academy of Sciences, India. This was attended by students of 10 + 2 level, undergraduates, postgraduates, research scholars and teachers, besides fellows and members of the Academy. It was co-ordinated by Anita Dey (Principal, WH Smith Memorial School, Sigra, Varanasi). About 300 students with their teachers from 15 different higher secondary schools of Varanasi participated in this session. In the beginning, Thakur welcomed the participants and explained that the aim of the event was to ignite the minds of enthusiastic students and make them aware of excitations and emerging challenges in neurosciences. Vijayalak-

shmi Ravindranath delivered a lucid and inspiring lecture on the structure, function and diseases of the brain, the most complex organ of the human body. Her lecture provoked students to ask a series of questions. The answers were provided by a panel of neuroscientists consisting of Tandon, Blakemore, Kanungo, Seth and Vijayalakshmi Ravindranath. At the end, all the students were given participation certificates.

Above all, the conference successfully highlighted the recent advances in emerging areas of neurosciences and pointed out that much of the brain functions and disorders still remain a mystery and need to be explored. The 26th conference of the IAN will be held in 2008 at Cochin.

M. K. Thakur, Department of Zoology, Banaras Hindu University, Varanasi 221 005, India.
e-mail: mkt_bhu@yahoo.com

MEETING REPORT

Fungal taxonomy*

An All-India Coordinated Project on Taxonomy (AICOPTAX) was launched in 2007 by the Ministry of Environment and Forests (MoEF), Government of India, to promote research on taxonomy. Work on fungal taxonomy was distributed to six centres of the country, namely Osmania University, Hyderabad; Madras University, Chennai; Goa University, Goa; R. D. University, Jabalpur; Christ Church College, Kanpur, and The Energy and Resources Institute, New Delhi. Hyderabad being the coordinating centre. The fungal group at the Kanpur centre is currently working on keratinophilic fungi and related dermatophytes.

In order to strengthen and disseminate knowledge on fungal taxonomy and train students in the taxonomy of fungi, a training workshop was arranged according to the MoEF research interface programme. The ten selected participants

were mostly doing their postgraduation in different disciplines such as botany, microbiology, life sciences, environmental sciences and biochemistry and a few were Ph D students.

The training course involved 28 inexpensive and easily implementable exercises. The training was started with the visualization of different fungal forms. Digital scanning of micro-cultures prepared for permanent fungal slides on polyvinyl alcohol and computer-aided measurements of fungal structures were conducted using available software. Visualization of fungi using a high resolution BX40 series Olympus trinocular microscope was a fascinating experience for the students. Different forms of fungi on culture media, hair, horns, hooves, nails, filter paper, cotton, seeds, dung, as well as phytopathogenic fungi were studied by the participants. The exact taxonomic position of some selected fungi were found using standard taxonomic features, including camera lucida, measurements and photomicrographs. The participants also became familiar with methods of

maintenance of fungal cultures as agar slants, water cultures, lyophilized cultures, dry herbarium and soil-hair cultures.

In addition to the practical exercises, elaborate lectures on classification of fungi, general methods of isolation of fungi and their purification, scope, function and exploitation of keratinophilic and non-dermatophytic keratinophilic fungi for utilization for the benefit of human beings were delivered. To make participants aware of the literature on the taxonomy of fungi, several monographs, books, reprints and electronically downloaded articles were displayed. Thus the young participants were able to identify at least some fungi using standard techniques. The training in taxonomy of different groups of fungi by experts may play a significant role in achieving the goal.

R. K. S. Kushwaha, Department of Botany, Christ Church College, Kanpur 208 001, India.
e-mail: kushwaharks@vsnl.net

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