MEETING REPORT

Brain ageing and dementia*

For the first time in India, the Fifth Congress of the Federation of Asian–Oceanian Neuroscience Societies (FAONS) was held along with the 28th Annual Conference of the Indian Academy of Neurosciences (IAN) at Lucknow from 25 to 28 November 2010. On this occasion, three satellite meetings on focused themes were organized at different institutions in the country. One of these meetings was on 'brain ageing and dementia'.

The main theme of the symposium was to discuss the brain-ageing associated anatomical and functional changes and correlate them with dementia and recent advancements in therapeutic strategies. It was attended by more than 160 Indian and foreign delegates, including neuroscientists, clinicians, corporates, physicians, psychiatrists and psychologists.

In total, there were 78 presentations, including six symposia sessions containing 30 papers, one oral session by young scientists containing 8 papers and 40 posters. The most interesting session was the interaction of Bindu Dey (Adviser, DBT) with budding research scholars, wherein she not only answered the queries satisfactorily but also offered tips and encouragement. Another stimulating session was oral and poster presentations in diverse areas of neurobiology by young scientists, which were evaluated by a panel of judges and the best presentations selected for awards.

In the session on brain plasticity, Masami Kojima (AIST, Japan) discussed different aspects of pro-BDNF (brain derived neurotrophic factor) and its role as a new modulator of synaptic plasticity in the nervous system. B. S. S. Rao (NIMHANS, Bangalore) elucidated the role of presenilins in age-dependent neurodegeneration, and impairment of synaptic plasticity and memory. I. L. Soo Moon (Dongguk University, Korea) explained how *N*-acetylglucosamine kinase regulates the development of neuronal dendrites, whereas W. H. Yung (CUHK, Hong Kong) revealed the mechanism of ionic plasticity in GABA transmission. Gurcharan Kaur (GNDU, Amritsar) enlightened on how late-onset short-term dietary restriction can partially compensate for the age-associated decline in brain plasticity.

Continuing the discussion on brain function, Y. S. Chan (HKU, Hong Kong) spoke on the subcortical contributions to spatial navigation and Hitoshi Okamoto (RIKEN, Japan) on habenula as a novel multimodal switching board for controlling behaviours in zebra fish animal models. Further, Raj Mehra (AIIMS, New Delhi) focused on the non-reproductive role of estrogen in the brain, and Renu Wadhwa (AIST, Japan) elucidated the consequences of altered mortalin expression in controlling cell proliferation. Thereafter, K. Subba Rao (JNTU, Hyderabad) talked in detail on the mechanism of base excision DNA repair, the housekeeping guardian for genomic stability in the brain.

Understanding of the ageing brain is incomplete unless one knows about the transition of normal ageing to pathological ageing, and how it leads to dementia and other brain disorders. Presentations on the second day centred around brain ageing, dementia, Alzheimer's disease and therapeutic interventions, mainly using ayurvedic approaches. R. H. Singh (Institute of Medical Sciences, BHU, Varanasi) elaborated on the use of rasayana therapy for mental health care. G. P. Dubey (Institute of Medical Sciences) talked about the beneficial role of ayurvedic drugs in cognitive decline among the elderly caused by the hypoadiponectemia-associated obesity. He also explained the targeted action of a plant-based formulation on biomarkers involved in neurodegenerative disorders. Ranil De Silva (University of Sri Jayewardenepura, Sri Lanka) presented his experiences on the development of cognitive screening instruments in developing countries. Andrea Zangara (Swinburne University, Australia) discussed the issues and challenges in developing, testing and marketing natural cognitive enhancers and their possible role in preserving cognitive functions.

In the session on Alzheimer's disease, Sasanka Chakrabarti (IPGMER, Kolkata) discussed various animal models and proposed the development of a holistic model based on epidemiological data. Peter Dodd (University of Queensland, Australia) presented his experimental findings on the excitotoxicity in Alzheimer's disease, the role of glutamate receptors and postsynaptic proteins. Yoo-Hun Suh (SNU, South Korea) explained the therapeutic potential of adipose-derived stem cells in Alzheimer's disease, and Abha Chauhan (NYSIBRDD, USA) presented evidences to show how a diet with walnuts improves memory, learning skills and motor coordination in transgenic mouse model of Alzheimer's disease.

In the session on brain ageing and therapeutic interventions, Mahdi Hasan (CSMU, Lucknow) presented laboratory data to demonstrate how aluminum accelerates neuronal ageing and this effect is reduced by the extract of *Bacopa monniera*. Con Stough (Swinburne University, Australia) provided a systemic review of the cognitive enhancing effects of *B. monniera* in humans. Hemant Singh (CDRI, Lucknow) discussed the unique features of the effects of a bacosides-enriched standardized extract of *B. monniera* on learning and memory. Sunil Kaul (AIST, Japan) talked on the loss-of-function screenings for molecular insights to the Ashwagandha-based age therapeutics and focused on cancer and neuodegeneration. P. D. Gupta (Manipal University) explained how pineal hormone, melatonin regulates the process of ageing. Jamuna Subramaniam (IIT, Kanpur) described the delay in ageing and neurodegenerative disease protection using *Caenorhabditis elegans* models. Anita Jagota (University of Hyderabad) talked about the biological clock and its relevance to age-induced neurodegeneration. Bhaweshwar Singh (LNMU, Darbhanga) gave an account of the

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biogerontological interface and behavioural implications in fading memory in late age. M. K. Thakur (BHU) presented an overview of the experimental findings on brain ageing reported by the research team from the Brain Research Centre at BHU.

Above all, the symposium successfully highlighted the recent advances in brain ageing and dementia, and discussed how the basic findings can be translated into therapeutic interventions with a focus on ayurvedic approaches. As an outcome of the symposium, it was emphasized that the research on brain ageing is of great relevance in India. With a rise in the ageing population and cases of neurodegenerative diseases, it is necessary to search for novel interventions which can prevent the onset or slow down the progression of cognitive decline and dementia in elderly people. In this context, the Indian traditional medicine system, ayurveda, provides a unique holistic approach to promote rejuvenation and healthy brain ageing. Therefore, basic and clinical research should be encouraged so as to develop therapeutic and interventional strategies.

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Smile with Science

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