

Palaeoseismicity and active tectonics in north-east India

A short course on the 'palaeoseismicity and the active tectonics in the north-east India' was held from 15 to 20 November 1999 at the Department of Earth Sciences, Manipur University, Manipur. The objectives of the course were to provide a forum for discussion of earthquake geology, to exchange field experience and to debate on the methodologies used in palaeoseismology. Manipur being a seismically active zone, was quite apt as a venue. This was the second in the series after the first course that was held in September 1998 at the Indian Institute of Science, Bangalore. Twenty participants with diverse background in geology and geophysics attended the course.

The course on palaeoseismology was handled by the Course Director C. P. Rajendran. Scope of palaeoseismology as a tool to supplement historical and instrumental catalogues and its application for seismic hazard assessment was the underlying theme of his lectures. Kusala Rajendran who dealt with basics of seismology and components of earthquake geology, stressed the need to integrate seismology and geology to understand the mechanics of faulting. The highlights of the course included a presentation on the palaeoseismological studies in Lower Assam by Harsh K.

Gupta. The lectures by D. P. Mahapatra and R. K. Gartia brought out the impressive progress made in India on dating techniques. While Mahapatra explained the usefulness of the Accelerator Mass Spectrometry facility (at the Institute of Physics) in palaeoseismological studies, Gartia talked about the thermoluminescence (TL) dating techniques and the TL laboratory being established at the Manipur University. The Course Convenor, Arun Kumar stressed the need for Remote Sensing and GIS applications in understanding tectonic geomorphology. These presentations were complemented by discussions of allied topics. To mention a few, J. R. Kayal (GSI), M. Mukhopadhyay (ISM), S. Ibotombi (Manipur University), Madhav N. Kulkarni (IIT, Bombay), and S. K. Nath (IIT, Kharagpur) highlighted regional tectonics, seismicity, dynamics, GPS applications and ground acceleration studies and their relevance in seismic hazard assessment. Practical classes were held on determination of fault plane solution using the first motions. The final day was devoted to presentations by the participants. In the group discussion it was stressed that the subject of palaeoseismology and active tectonics needs to be taught in India at the university level. It was also pointed out that

north-east India, site of large and great earthquakes, may be ideal to apply palaeoseismological methods. The course was followed by a fieldwork led by C. P. Rajendran at Liwa Sarei, 60 km from Imphal, where hands-on training was given for trench excavation studies and criteria for selecting sites for studying the earthquake-induced deformation.

Short courses of this nature are important in advancing the knowledge base of the student community, especially when the syllabi followed in many Indian universities continue to be outdated. Classical approaches to Earth sciences are changing over to quantitative methods and the emphasis is now on solving problems. Unless the students are exposed to new ideas in their formative years there is little hope that the quality of research will ever be improved. Well-coordinated short-term courses aim to supplement what is being taught in the colleges and enthruse students to take up exciting research topics. The present course has accomplished that task.

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XIII International Biophysics Congress, New Delhi

The XIII International Biophysics Congress (held during 19–24 September 1999) was inaugurated by G. Mehta, President, Indian National Science Academy. G. Govil, D. A. D. Parry (the outgoing president of IUPAB) and A. Saran welcomed the gathering and spoke about the Congress at the opening ceremony. A volume in honour of G. N. Ramachandran was released* by Manju Sharma. The G. N. Ramachandran lecture on 'Molecular principles of protein structure and protein-protein interaction' was the evening talk by V. Sasisekharan, a leading collaborator and student of Rama-

chandran involved in many of his important contributions. Sasisekharan traced the history of the discovery of the celebrated triple helical structure of collagen and described how the early controversies surrounding it led to the work on the well-known Ramachandran map and other investigations on biomolecular conformation, which form the basis of much of modern structural biology.

The scientific programme on each of the following four days started with a plenary lecture. In the first of these, entitled 'Molecular recognition in relation to certain oligonucleotides and protein structures', M. A. Viswamitra described an intercalated tetraplex oligonucleotide structure and discussed the thermal sta-

bility of xylanases from two thermophilic fungi in terms of the interactions present in their structures. The plenary lecture on the next day, named after the famous biophysicist and former president of Israel Katzir-Katchalsky, was delivered by I. C. P. Smith. He dealt with the 'Present and future roles of spectroscopy in medical diagnosis' and discussed in particular the latest developments in magnetic resonance imaging. R. R. Ernst, the Nobel Laureate, in his plenary lecture on 'Protein dynamics explored by NMR', described studies using NMR on the backbone and side-chain motions as well as folding and unfolding processes under various temperature and pressure conditions. The last plenary lecture on

*Available with Universities Press, Hyderabad.

'Calcium signals and short-term synaptic plasticity' was given by another Nobel Laureate, E. Neher. He discussed plastic changes in the connectivity between neurons underlying the adaptive information processing of the central nervous system.

There were altogether 23 different symposia spread over four days. On an average, three symposia were held in parallel. The symposia, covering different aspects of biophysics, were on protein structure and dynamics, protein folding and stability, protein design and ligand binding, DNA structure and dynamics, ribozymes and RNA structures, nucleic acid-protein interaction, membrane structure, dynamics and functions, ion-channels, pumps and carriers, transmembrane signalling and transduction, structure of macromolecular assemblies, biophysics of immune systems, cell surface interaction, metabolic regulatory and control networks, photosynthetic systems and primary processes, electron/proton transport, biomechanics, bioinformatics and data analysis, computational modelling, genomics and proteomics, medical and environmental biophysics, biomaterials and biosensors, innovative biophysical techniques, and education and development. Generally each symposium had two major presentations by invited speakers. There were altogether 57 invited speakers from 17 countries. A larger number of contributed abstracts than in previous Congresses were chosen for oral presen-

tation in the symposia. Of the 55 speakers chosen for contributed oral presentations, 19 were IUPAB young travel fellows and 11 women. The speakers represented 26 different countries. More than 500 posters were presented which were displayed throughout the Congress. Two late afternoon sessions were set apart exclusively for poster viewing. The authors of half the posters were available for discussion on each of the two days. The poster sessions were well attended and the discussions on both the days extended well into the night.

The final (sixth) day of the Congress opened with a plenary session on 'Hot topics' which consisted of a talk on 'Single molecular mechanics and models of myosin motor' by T. Yanagida and a panel discussion on 'Membrane proteins and channels' organized by K. R. K. Easwaran and led by E. Neher, M. Montal and O. Anderson. This was followed by a symposium on 'Biophysics in the 21st century' organized by C. R. Cantor with J. R. Helliwell, J. Garnier, S. I. Chan and Cantor as speakers. Cantor gave an overview of his vision of the likely progress in Biophysics in the next century while the other speakers dealt with specific topics. Helliwell spoke on synchrotron X-radiation and neutron protein crystallography while Garnier was concerned with bioinformatics. The topic of Chan's presentation was protein folding and unfolding.

At the closing ceremony, M. Vijayan,

bade farewell to the participants while M. Parisi invited them to XIV International Biophysics Congress to be held in Argentina in the year 2002. The Congress came to an end with closing remarks by Israel Pecht, the newly elected president of IUPAB.

Close to 650 scientists from 49 different countries participated in the Congress. This is the largest country-wise representation at an international biophysics meeting, with several countries participating for the first time in an IUPAB Congress. Interestingly, almost one-third of the total participants were students coming for the first time to an international congress. Many of them were supported by IUPAB and DST. The presence of such a large proportion of young scientists added to the vitality of the Congress.

The Congress provided a golden opportunity for the nearly 230 Indian participants to discuss their work and rub shoulders with distinguished peers and international leaders from other countries. The abstracts of the Congress were published in the *Journal of Biosciences* of the Indian Academy of Sciences, Bangalore. In addition to the main Congress at New Delhi, three satellite symposia were conducted at Hyderabad, Mumbai and Calcutta.

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Aspirin hits a new target

Mehran Arabi

Take two aspirins in the morning and get relief. For many common physical ailments, low doses of aspirin (acetylsalicylic acid) will make you feel better, and high doses of the drug give sustained relief from the symptoms of rheumatoid arthritis. Aspirin irreversibly inhibits cyclo-oxygenases – the enzymes that control the production of prostaglandins (small molecules that induce pain and fever associated with infection and trauma).

However, differences in the clinical activities of aspirin at low and high doses have led to a speculation that not all

the benefits of aspirin are derived by inhibition of cyclo-oxygenases. So what might be the target for high doses of the drug?

For the first time, Yin *et al.*¹ reported that high concentrations of aspirin (IC₅₀ approximately 50 μ m) inhibit the recently discovered enzyme, I κ B kinase- β (IKK- β), and they proposed that this effect partially explains the clinical efficacy of high doses of aspirin. IKK enzymes (α and β) catalyse the transfer of phosphate moieties from ATP to I κ B. Phosphorylation leads to the degradation of I κ B and

release of nuclear factor kappa B (NF- κ B) which is a ubiquitous, inducible transcription factor involved in immune, inflammatory, stress and developmental processes, and is retained in a latent form in the cytoplasm of non-stimulated cells by inhibitory molecules, I κ Bs. Its activation is a paradigm for a signal-transduction cascade that integrates an inducible kinase and the ubiquitin-proteasome system to eliminate inhibitory regulators, the enzyme ρ I κ B α -ubiquitin ligase². ρ I κ B α -E3 attaches ubiquitin – a small protein found universally in eukar-