

transition in mixed perovskites. Other speakers in the materials science session, D. Chakraborty (IACS), K. Chattopadhyay (IISc), J. K. Bhattacharjee (IACS) and A. Mukherjee (SNBNCBS) delivered lectures on nanoscale magnetic heterostructures, quasicrystals, second-order structural phase transitions and properties of materials from first principles.

The lectures by M. Mukherjee (IACS) and D. Velmurugan (University of Madras) were on *ab-initio* phasing of proteins by multisolution direct methods and combination of direct methods with anomalous scattering/isomorphous replacement. The topics of the last session with speakers

G. D. Nigam (IIT Kharagpur), A. K. Mukherjee (Jadavpur University), S. Paul (North Bengal University) and S. Gupta (IACS) were on some aspects of probability distribution functions, crystallographic disorder and structures of liquid crystals.

A 'Reminiscences' session on K. Banerjee was arranged in the evening of 15 September 2000 with some of his senior students Amal Roy Chowdhury, R. K. Sen, S. C. Chakraborty, K. C. Banerjee, A. K. Datta and A. K. Pant as speakers chaired by B. S. Basak.

An endowment fund was established by the family members, students and

admirers of Banerjee with a proposal to arrange an annual memorial lecture in his name. Helliwell, the recipient of Professor Banerjee Silver Medal, delivered the first Professor Banerjee Endowment Lecture on 'New opportunities in biological and chemical crystallography' on 19 September 2000 at IACS.

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**S. P. Sen Gupta\*** and **Monika Mukherjee**, Indian Association for the Cultivation of Science, Jadavpur, Calcutta 700 032, India. \*For correspondence. (e-mail: msspsg@mahendra.iacs.res.in).

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## Organic synthesis in drug discovery and development\*

A workshop on 'Synthetic organic chemistry in drug discovery and development' was held at the B.V. Patel PERD Centre as a part of its continuing education programme. A total of 35 participants (30 from the industry and the rest from academics) attended the workshop.

The chemical industry has shown a much higher growth rate compared to other industries as a whole during the last century. The triggers for this excellence and high productivity have been the ability of the synthetic chemical industry to judiciously and gainfully utilize the emerging new knowledge, new science and new technology and/or invent new chemical reactions to devise more cost-effective, safe chemistry, green chemistry and sometimes even chemistry with atom economy. Harish Padh (Director, PERD), while inaugurating the workshop emphasized these aspects and also the theme of

the workshop with respect to the significance of synthetic organic chemistry in shaping various molecules, which are used as therapeutic agents.

K. Nagarajan, in his plenary lecture outlined the current therapeutic scenario, which is witnessing rapid strides due to advances in biological sciences. He outlined the synthetic strategy being followed to build some of the recently developed molecules, which have come about both due to the pull of medical needs and the push of new knowledge. He cited that now newer drugs derived from biotechnology are few in number compared to those derived by synthetic means.

Various other topics relevant to the theme of the workshop were dealt with by other speakers well-versed in the art of organic synthesis in process development and the science of drug discovery. The topics covered included unusual reactions which could provide opportunities in designing new structural entities and/or developing patentable process technologies, the wide array of methodologies for synthesizing fluoro organics, on which more than twenty thousand patents

were filed during the last decade and the utilization of phase-transfer catalysis in industrial chemistry. Specific topics such as Suzuki coupling in drug synthesis, utilization of alkyl lithium in process development and chirality in industrial chemistry were covered in great depth. Detailed case histories of the synthesis of some specific drugs provided insight into how the laboratory process from the medicinal chemists has been upgraded, refined, optimized and updated to suit industrial manufacture, keeping in view the raw material cost and process adaptability to large-scale manufacture in a cost-effective and safe manner.

The deliberations at the concluding session reaffirmed the pivotal role of organic synthesis in drug discovery and development and the key role that the synthetic organic chemists would be playing in shaping the new molecules.

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**Harish Padh**, B.V. Patel Pharmaceutical Education and Research Development (PERD) Centre, Thaltej, Ahmedabad 380 054, India (e-mail: perd@wilnetonline.net).

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\*A report on the two-day workshop on 'Synthetic organic chemistry in drug discovery and development' held at the B.V. Patel PERD Centre, Ahmedabad, during 18–19 November 2000.