

In this issue

BioSuite

The last decade has witnessed an exponential growth of information in the field of biological macromolecules such as proteins and nucleic acids and their interactions with other molecules. Computational analysis and predictions based on such information are now an essential and integral part of modern biology. To address the growing need to develop versatile bioinformatics software packages which are efficient and incorporate the latest developments in this field, the Council of Scientific and Industrial Research (CSIR), India, undertook an initiative to promote a unique industry-academia collaboration, to develop a comprehensive bioinformatics software package, under its New Millennium Initiative for Technology Leadership in India (NMITLI) programme. BioSuite, a product of that effort, has been developed by Tata Consultancy Services who took the primary coding responsibility with significant backing from a large academic community who participated on advisory roles through the project period. BioSuite integrates the functions of macromolecular sequence and structural analysis, chemoinformatics and algorithms for aiding drug discovery. The suite organized into four major modules, contains 79 different programs, making it one of the few comprehensive suites covering a major part of the spectrum of bioinformatics applications. The package will be valuable for high quality research and teaching. See **page 29**.

BioBusiness

Conotoxins, small peptides of 10–40 amino acid residues, derived from *Conus* spp, are valuable tools for pain therapy. After suitable further development, they can be used directly as drugs, or can serve as leads for drug development. On **page 39**,

Mehdiratta and Saberwal give a brief overview of conotoxins: their structure, function, classification based on target molecules, and the methodology to isolate and purify the peptides. They also mention which groups in India are working on these peptides.

The article also discusses some of the hurdles faced in drug development, the 1 conotoxin that is approved as a drug and a few others that are in trials. The companies involved in drug development based on these peptides are mentioned.

The article introduces readers to various aspects of intellectual property. In the area of conotoxins, it lists the number of patents granted to some of the companies working with conotoxins, and briefly discusses some of these patents. It goes on to critique a conotoxin patent filed from India. The article touches upon the patents: the anatomy of a patent, writing specifications, how to do a patent search and patent drafting. A glossary of terms routinely used in IP protection is included.

The Indian biotech industry is aiming to go up the value chain. This will necessitate greater investment in R&D. Some of the R&D could be based on research in academic labs. This article outlines one potential area of interest.

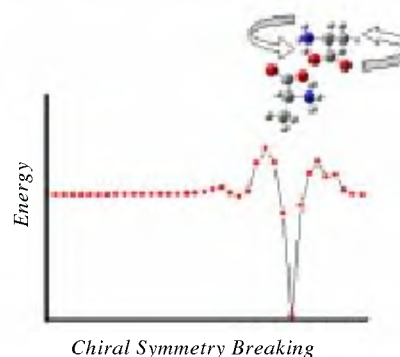
High-speed schlieren facility

K. Satheesh *et al.* describe (**page 56**) the development of a high speed schlieren set-up for shock tunnel applications. Using this newly established high-speed schlieren facility at the Indian Institute of Science (IISc) hypersonic shock tunnel HST2, the time-dependent evolution of the flow around a 120 degree blunt-cone model with a base radius of 60 mm has been visualized at Mach 8.8 and 9.2. The tests are conducted using both air and argon as the working fluids. The establishment and termination process of hypersonic flow in the shock

tunnel is visualized and the temporal evolution of the hypersonic flow as observed from the schlieren images is found consistent with the pitot pressure measurements. The shock stand-off distance around the blunt cone model observed from the experiments matches well with the results from the computational fluid dynamic study.

Chiral discrimination

In the peptide biosynthesis, L-enantiomers of amino acid are exclusively accepted and D-enantiomers are rejected accurately. This is vital for functionality of synthesized proteins. How this discrimination occurs is puzzling considering the subtle difference between the two enantiomers. This problem is related with the fundamental problem of *homochiral evolution* and exclusive chiral pre-



ference for L-enantiomeric amino acids in proteins as observed in Nature. Thirumoorthy and Nandi explore (**page 75**) the possibility that the rotatory motion of A- and P-terminal can lead to significant chiral discrimination. They show that the non-bonded interaction energy profiles are different as a function of orientation and distance for L-L and D-L nonbonded pair of alanine molecules. It is considered that during the rotatory process, the molecular pairs can be rigid as well as flexible and discrimination is noted in both cases.