In this issue

Biology and pathogenesis of viruses

The idea of this special section had its origin during the IISc centenary symposium on the 'Biology and pathogenesis of viruses: molecular insights' held at the Indian Institute of Science during 4–5 May 2009. At this meeting a good number of molecular virologists deliberated on the basic mechanisms of virus replication and regulation, virus pathogenesis, host–virus interactions, virus structure and assembly, viral vectors as well as development of antiviral molecules. The meeting also provided a platform to discuss the scope for translational research in India. This meeting facilitated the sharing of knowledge, expertise and technologies. It was felt that the deliberations of this symposium could be brought out as a special section in *Current Science*, in the form of reviews highlighting the developments in each area with emphasis on research carried out in India. Thus, the reviews in the special section reflect upon the progress made in understanding the disease and its causative virus, highlighting the contributions made by the Indian research group wherever applicable.

The review on hepatitis viruses by Vijay Kumar *et al.* (**page 312**) provides an overview of the epidemiology, disease, diagnosis, treatment, molecular pathogenesis, replication and various vaccines as well as antiviral therapeutic approaches of the five viruses which cause viral hepatitis. The review by Dutta *et al.* (**page 326**) mainly focuses on Japanese Encephalitis virus – the disease, pathogenesis and prophylactic strategies encompassing vaccination and antivirals. The article on HIV/AIDS research in India by Udaykumar Ranga *et al.* (**page 335**) provides a comprehensive coverage of the molecular epidemiology of HIV infection in India and gives a glimpse of the natural history of Indian HIV epidemics and immunological studies related to the HIV infection, and summarizes the Indian efforts to understand the host and viral factors influencing the disease progression.

Murthy and Savithri (**page 346**) in their specific review of their research work on the structural insights into virus assembly have provided an exhaustive account of the pathway taken by Sesbania mosaic virus (plant virus) to assemble its particles through a systematic study of altering the capsid structure by site-directed mutagenesis and examining the mutant capsids for assembly characteristics. Yet another structure-based work carried out by Durga Rao and Suguna (**page 352**) summarizes the structure–function relationships in the non-structural proteins of human Rotavirus, responsible for infantile diarrhoea. The single-stranded DNA plant viruses belonging to the genus *Begomoviridae* are responsible for significant agro-economic losses across the world. The review by Yadava *et al.* (**page 360**) provides an insight into the potential biotechnological applications of the 'RNA silencing suppressors' of the viruses by attenuating the host RNAi-mediated interference targeted against the viruses. The review on vaccines against Dengue virus by Navin Khanna and Swaminathan (**page 369**) provides an overview of the problems encountered by researchers in Dengue vaccine development and the various approaches taken to develop Dengue vaccines dealing with the current progress and challenges that remain to be addressed. The last article of the section by Suryanarayana *et al.* (**page 379**) deals with the use of negative strand RNA viruses as viral vectors for vaccine development against a number of important human and animal viruses.

We thank all the authors who have contributed to the special section.

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Guest editors:
Biology and Pathogenesis of Viruses

AWESOME VLF receivers

Lightning discharges from thunderstorms are nature's most significant sources of electromagnetic radiation, the energy in these pulses varies over a wide frequency range from a few Hz to several Megahertz. However, maximum energy radiation is contained in the ELF/VLF band (30 Hz–30 kHz). Continuous monitoring of these ELF/VLF waves provides a powerful remote sensing tool for understanding the processes in ionosphere and magnetosphere. The earlier belief was that the VLF phenomena are confined to mid-high latitudes only. But the results from these latitudes encouraged to initiate extensive research in Indian low latitude during 1963 at Banaras Hindu University, Varanasi and subsequently several sites were setup in India. The observations in India have shown the occurrence of different types of whistlers, VLF emissions and generated most important results in low latitudes. These observations had some limitations due to use of analogue system of observation and single channel E_z measurements, which restricted the scientific applications and interpretation of the data, like direction finding of the events and studies of the lower *D*-region ionosphere perturbations. To study these aspects and to understand the *D*-region ionosphere and magnetosphere during quiet and disturbed geomagnetic conditions, three advanced AWESOME VLF receivers were setup at Allahabad, Nainital and Varanasi, by Indian Institute of Geomagnetism in collaboration with Stanford University, USA under International Heliophysical Year 2007/United Nations Basic Space Science Initiative (UNBSSI) program. Rajesh Singh *et al.* (**page 398**) discuss preliminary results obtained showing probing potentiality of VLF data in ionosphere and magnetosphere.