

**Cordially Invites you to the  
INSTITUTE COLLOQUIUM  
(Divn. Of Biological Sciences)**

**by**

**Professor C Durga Rao**

**Department of Microbiology & Cell Biology**

**“Viruses and Humans: Living in symbiosis and pathogenesis -  
research from dirt to discoveries.”**

**Date : Wednesday, 20<sup>th</sup> January 2016**

**Venue : Faculty Hall, Main Building**

**Time : 4-00 p.m.**

**Prof Anurag Kumar, Director  
will preside**

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**Abstract:**

Viruses are obligate intracellular parasites. They are ubiquitous and there is no known living system devoid of virus infections. How did viruses arise and why they are obligate intracellular living systems? To answer these questions, we need to understand the origin of our planet and that of life, both molecular and cellular. Further, why majority of the viruses in nature are RNA viruses, while every cellular living system contains DNA as the genetic material? Following discussion on some of the intriguing aspects on viruses, which impact our life on a day-to-day basis, I will discuss our research on two important human viruses, rotavirus and enterovirus, that are of great public health importance, starting from dirt to unravelling translational and fundamental discoveries.

Rotavirus is a major cause of acute infantile diarrhoea and accounts for about 500,000 deaths, especially in developing countries. Starting from the scratch in the absence any information on these viruses in the country, our contributions in the discovery of unusual human-bovine combination rotaviruses, natural vaccination of children in Karnataka by these viruses, development of an indigenous live attenuated vaccine, and novel discoveries towards understanding the basic biology of these viruses will be discussed. Our fundamental findings on the structure and function of the viral enterotoxin, large-scale relocalization of nuclear proteins to the cytoplasm and their sequestration in the viroplasm structures, and the union of the Triad of the viroplasm-stress granule-P-body (akin to Brahma-Vishnu-Shiva) for progeny virus production are game changers for a paradigm shift in rotavirus biology.

Enteroviruses consist of a large group of RNA viruses associated with a variety of diseases in children, including paralysis, type-1-diabetes, aseptic meningitis, encephalitis, cardiomyopathy, conjunctivitis, hand-foot-and-mouth disease (HFMD), sudden death syndrome, diarrhoea etc. Poliovirus, Coxsackievirus, Echovirus and Rhinovirus are well-known members of the genus Enterovirus. With the eradication of poliomyelitis caused by wild poliovirus infection in India in 2012, diseases caused by the non-polio enteroviruses (NPEVs), which are cousins of poliovirus, have taken the centre stage. During the last 2 years, we have encountered two large epidemics of HFMD in children in Bangalore, including the one this year. However, there is no active research being carried out on these pathogenic viruses in the country. Initiating research on NPEVs about seven years back, several findings of clinical and fundamental significance were made, which include NPEV association with about 40% of paralysis cases, NPEVs as a major cause of acute as well as persistent diarrhoea, contrasting seasonal occurrence of rotavirus and enterovirus diarrhoea,

their association with an unrecognized clinical symptom termed as Non-diarrheal Increased Frequency of Bowel Movements (IFoBM-ND), development of a newborn mouse model to demonstrate the diarrhoea-causing ability of NPEVs to fulfil Koch's postulates, and elucidation of the molecular mechanism of enterovirus pathogenesis. The talk will be general, peppered with specific findings.

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**Tea : 5-00 p.m.**

**ALL ARE WELCOME**