Wallabies, bats harbour 'fossil' genes from deadly human viruses

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Washington, July 3 (ANI): Modern marsupials, like wallabies and bats, harbour a "fossil" copy of a gene that codes for filoviruses, which cause Ebola and Marburg hemorrhagic fevers and are the most lethal viruses known to humans, revealed University at Buffalo biologists.

The study has for the first time shown that mammals have harboured filoviruses for at least tens of millions of years, in contrast to the existing estimate of a few thousand.

It suggests that these species, which maintain a filovirus infection without negative health consequences, could have selectively maintained these so-called "fossil" genes as a genetic defense.

The work has important implications for the development of potential human vaccines, as well as for the modelling of disease outbreaks and the discovery of emerging diseases, including new filoviruses.

"This paper identifies the first captured 'fossil' copies of filovirus-like genes in mammalian genomes. Our results confirm for the first time that several groups of mammals, including groups such as marsupials that never colonized Africa, have had an association with filoviruses," said Dr. Derek J. Taylor, co-author of the study.

The researchers say that if the rarely captured genes represent antiviral defenses or genomic scars from persistent infections, then the work opens up new possibilities for identifying reservoir species for filoviruses, which harbour the virus but remain asymptomatic.

"The reservoir for filovirus has remained a huge mystery. We need to identify it because once a filovirus hits humans, it can be deadly," said Jeremy A. Bruenn, co-author of the study.

When the UB researchers studied samples from the fur of a wallaby at the Buffalo Zoo and a brown bat caught on the UB campus, they found that the genomes of both animals as well as some other small mammals contain "fossil" copies of the gene for these deadly viruses, and thus could be candidate reservoir species for them.

"Who knew that the bats in the attic as well as modern marsupials harbored fossil gene copies of the group of viruses that is most lethal to humans," said Taylor.

The research also demonstrates a new mechanism by which different species of mammals can acquire genes, through non-retroviral integrated RNA viruses, which the UB scientists had previously identified in eukaryotes but was unknown in mammals.

The study is published in the online journal BMC Evolutionary Biology. (ANI)