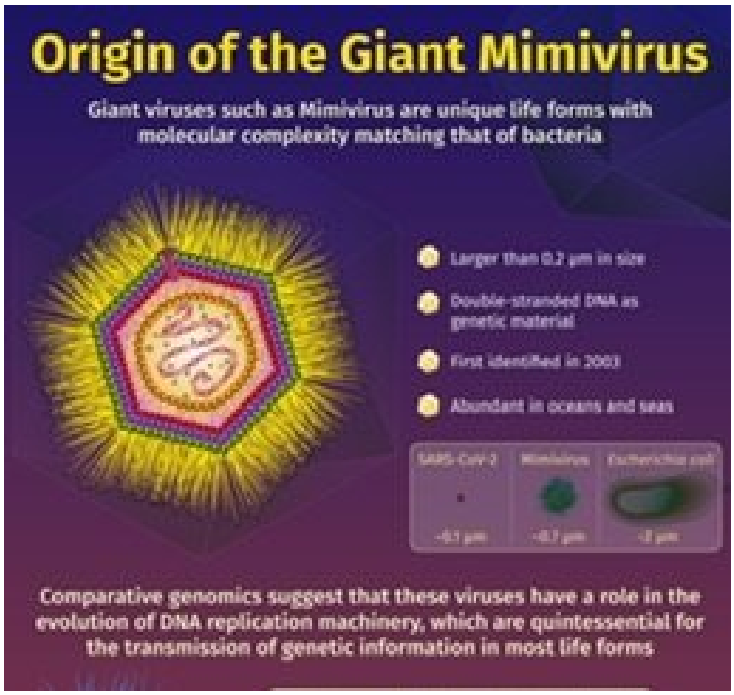
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Indian scientists shed light on evolution of Mimivirus and other giant viruses

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Researchers from the Indian Institute of Technology Bombay investigate the evolution of one of the world's largest viruses, helping in better understanding biological forms that shaped life on earth



Researchers from the Indian Institute of Technology Bombay shed light on the origins of Mimivirus and other giant viruses, helping us better understand a group of unique biological forms that shaped life on earth. In their latest study published in Molecular Biology and Evolution, the researchers show that giant viruses may have come from a complex single-cell ancestor, keeping DNA replication machinery but shedding genes that code for other vital processes like metabolism.

Even though giant viruses are not what most people would think of when it comes to viruses, they are actually very common in oceans and other water bodies. They infect single-celled aquatic organisms and have major effects on the latter's population. In fact, Dr. Kiran Kondabagil, molecular virologist at the Indian Institute of Technology (IIT) Bombay, suggests, "Because these single-celled organisms greatly influence the carbon turnover in the ocean, the viruses have an important role in our world's ecology. So, it is just as important to study them and their evolution, as it is to study the disease-causing viruses."

In a recent study, the findings of which have been published in Molecular Biology and Evolution, Dr. Kondabagil and co-researcher Dr. Supriya Patil performed a series of analyses on major genes and proteins involved in the DNA replication machinery of Mimivirus, the first group of giant viruses to be identified. They aimed to determine which of two major suggestions regarding Mimivirus evolution—the reduction and the virus-first hypotheses—were more supported by their results. The reduction hypothesis suggests that the giant viruses emerged from unicellular organisms and shed genes over time; the virus-first hypothesis suggests that they were around before single-celled organisms and gained genes, instead.

“Our findings are very exciting because they inform how life on earth has evolved,” Dr. Kondabagil says. “Because these giant viruses probably predate the diversification of the unicellular ancestor into bacteria, archaea, and eukaryotes, they should have had major influence on the subsequent evolutionary trajectory of eukaryotes, which are their hosts.”