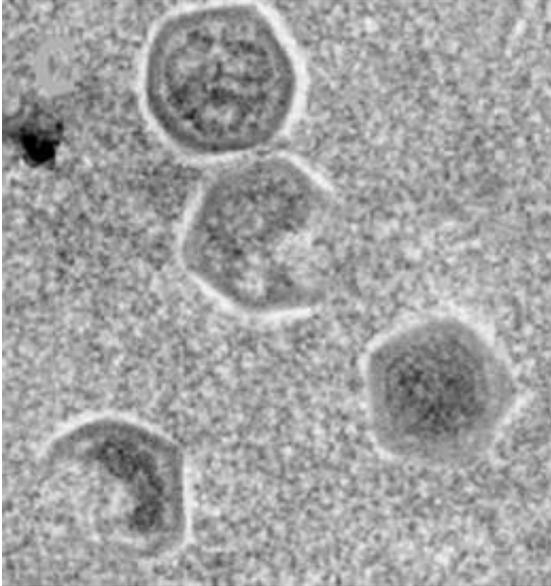


Marseillevirus, new giant virus discovered

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Marseillevirus at different stages of its formation in an amoeba. © Raoult / URMITE

Scientists in France have isolated a new giant virus that lurks inside amoeba and whose gene pool includes genetic material from other species.

After Mimivirus, Mamavirus and the virophage, the group of giant viruses now has a new member called Marseillevirus.

Discovered in an amoeba by the team led by Didier Raoult at the Unité de Recherche sur les Maladies Infectieuses et Tropicales Emergentes

research group (CNRS, France), a description of this new virus was published this week on the website of the *Proceedings of the National Academy of Sciences (PNAS)*. These findings suggest the exchange of genes in amoebae that may lead to the constitution of different gene repertoires that could be a source of new pathogens.

Amoebae are single-cell, eukaryote (possessing a nucleus) living organisms, some of which are human or animal parasites and may cause a variety of pathologies. Most amoebae live in water, damp soils or mosses. They are mobile and capable of ingesting a wide variety of different organisms (for example, viruses or bacteria with extraordinarily broadly ranging sizes and lifestyles). Thus amoebae provide a site for numerous exchanges of genetic material arising from the many organisms that "colonize" them.

The team led by Didier Raoult at URMITE has recently discovered, in an amoeba, a member of a new family of giant viruses, which it has called the *Marseillevirus*, smaller than *Mimivirus*, which is the largest giant virus known at present. With a chimeric genome (containing both DNA and RNA) of 368,000 base pairs, *Marseillevirus* is indeed the fifth largest viral genome to be sequenced. It has an icosahedral shape and a diameter of about 250 nanometers (or 250 millionths of a millimeter). In addition, the researchers discovered that it contained genes from markedly differing sources, i.e. of bacterial, viral or eukaryote origin, or arising from Archae.

The genome of *Marseillevirus*, a mosaic of genes from very different organisms, thus demonstrates the exchange of genes between the organisms that "colonize" amoebae. These studies have also revealed the role of amoebae, and more generally phagocytic protists (or single-cell eukaryotes) that feed on microbes in the environment, in the constitution of new gene "repertoires" which may be capable of generating new agents that will be pathogenic to multicellular organisms such as animals,

plants or humans.

More information: Giant Marseillevirus highlights the role of amoebae as a melting pot in emergence of chimaeric microorganism: Boyer M., Raoult D. and al., PNAS, 2009

Provided by CNRS

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