

New discoveries on Long COVID: link identified between SARS-CoV-2, cellular senescence, and retroviral proteins in mitochondria

Researchers announce major scientific advances and invite the public to Toulouse on July 6–7 for the Annual Consortium Meeting and a public outreach event. The scientific community has taken an important step forward in understanding the biological basis of COVID-19 and Long COVID. The latest findings from the European HERVCOV project have identified a key mechanism linking SARS-CoV-2 infection to cellular senescence and the presence of retroviral proteins inside mitochondria, the “powerhouses” of the cell.

Progress in HERVCOV Research

The current work of the consortium has demonstrated that the SARS-CoV-2 virus induces the expression of a human endogenous retroviral protein called HERV-W ENV, which is also detectable in the subset of Long COVID patients.

The most interesting discovery concerns the localization of this protein: researchers have observed that the variant of HERV-W ENV accumulates in the mitochondria of senescent cells — cells that have stopped replicating but remain metabolically active. This accumulation may contribute to the mitochondrial dysfunction observed in patients suffering from Long COVID.

Using advanced mass spectrometry techniques and specific antibodies, the research team also identified that the protein involved is a truncated form, likely corresponding to ERVWE2, located on the X chromosome. HERV-W ENV is also detected in blood samples from some patients with COVID-19 and Long COVID, suggesting a possible role both as a biomarker and as a potential therapeutic target, particularly for the neurological manifestations associated with the syndrome.

CONSORTIUM MEETING 2026 in Toulouse

To discuss these findings and define the next phases of the research, the international HERVCOV consortium will meet in Toulouse on July 6–7 during the Annual Consortium Meeting.

The event will provide an important opportunity for discussion among experts in virology, cellular biology, and clinical medicine. In addition to scientific and technical sessions, the program will also include an Outreach Event open to the public, patient associations, and institutions.

The goal is to share research progress and highlight the urgent need to find concrete answers for the millions of people still living with the long-term consequences of SARS-CoV-2 infection.

The Podcast

To promote the dissemination of accurate scientific information to the wider public, the [HERVCOV project has launched an English-language podcast](#) available on major streaming platforms.

The first episode introduces the project and explores the role of human endogenous retroviruses (HERVs) and their possible connection with COVID-19 and Long COVID.

The episode examines how ancient viral fragments embedded in human DNA may influence modern immune responses. It also tells the story behind the creation of the HERVCOV project, the contribution of its European partners, and the search for biomarkers useful for the development of personalized treatments.

The Project

HERVCOV is a European Union-funded project with a total budget of €6 million. It brings together research institutions, foundations, companies, and associations from Croatia, France, Greece, Italy, and Spain.

At the center of the study is the HERV-W ENV protein, found at elevated levels in the blood of COVID-19 patients both during the acute phase of infection and in the later stages associated with Long COVID.

These proteins, found particularly in T lymphocytes, are encoded by human endogenous retroviruses (HERVs), viral sequences integrated into the human genome during evolution following infections that occurred millions of years ago.

Endogenous retroviruses make up approximately 8% of the human genome, and most of their sequences are normally silenced by evolutionary mechanisms. During the SARS-CoV-2 pandemic, however, a reactivation of the HERV-W ENV protein was observed in patients affected by the most severe forms of the disease.

THE PARTNERS

The project is funded by the European Commission under the HORIZON-HLTH-2021-DISEASE program and involves the following partners: the Institut National de la Santé et de la Recherche Médicale (France), the Ethniko Kai Kapodistriako Panepistimio Athinon (Greece), the University of Rome Tor Vergata (Italy), the Instituto Aragonés de Ciencias de la Salud (Spain), the Fundación Agencia Aragonesa para la Investigación y el Desarrollo (Spain), Geneuro Innovation SAS (France), Inserm Transfert (France), Klinicki Bolnicki Centar Rijeka (Croatia), and the Frascati Scienza Association (Italy), the latter responsible for dissemination activities.



**Funded by
the European Union**