

Research shows that ferroptosis, a form of cell death, occurs in severe COVID-19 patient lungs

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In some severe cases of COVID-19, the lungs undergo extreme damage, resulting in a range of life-threatening conditions like pneumonia, inflammation, and acute respiratory distress syndrome. The root cause of those wide-ranging reactions in the lungs has until now remained unclear.

A new study by researchers at Columbia and the Columbia University Irving Medical Center sheds light on this mystery.

The study, [published](#) in *Nature Communications*, found that [ferroptosis, a form of cell death first named and identified at Columbia in 2012](#), is the major [cell death](#) mechanism that underlies COVID-19 lung disease. The finding indicates that deliberately halting ferroptosis with therapeutic drug candidates could improve COVID-19 outcomes.

"This finding adds crucial insight to our understanding of how COVID-19 affects the body that will significantly improve our ability to fight life-threatening cases of the disease," said professor Brent Stockwell, one of the study's lead authors.

Ferroptosis was first reported by professor Stockwell in 2012. Ferroptosis is an unusual form of cell death in which certain cells die because their outer fat layers collapse. It differs from the most common kind of cell death, which occurs both in disease contexts and in normal processes like aging and involves cells chopping up the molecules in their interior.

Since proposing the concept of ferroptosis, Stockwell's lab has demonstrated that it is instrumental to normal bodily processes, but that it can also attack and kill [healthy cells](#) in patients with [neurodegenerative diseases](#) like Parkinson's, Alzheimer's, and Lou Gehrig's disease.

Though ferroptosis can be destructive, recent studies indicate that it could also be harnessed for good. Intentionally inducing ferroptosis could counteract diseases like cancer where rampant cell growth is dangerously occurring. The ability to inhibit ferroptosis, on the other hand, could offer doctors new ways of combating cell death that should not be occurring, as in the case of COVID-19 lung disease.

"We're hopeful that these important new findings could improve our ability to confront this pernicious disease, which, in too many cases, still diminishes [health outcomes](#) and results in death," Stockwell said.

More information: Baiyu Qiu et al, Fatal COVID-19 pulmonary disease involves ferroptosis, *Nature Communications* (2024). [DOI: 10.1038/s41467-024-48055-0](#).
www.nature.com/articles/s41467-024-48055-0

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