

Carbon-based nanomaterials show promising results against SARS-CoV-2 and 12 other viruses

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Credit: Asociacion RUVID

Professor Ángel Serrano, principal investigator at the Biomaterials and Bioengineering Laboratory of the Catholic University of Valencia

(UCV), recently published an article in journal *ACS Nano*, from the American Chemical Society, which shows that carbon-based nanomaterials (CBNs) with low or zero toxicity for humans, are "promising treatments" against the pneumonia caused by COVID-19, as well as other viruses, bacteria and fungi, including those that are multi-resistant to medicines.

Serrano and his fellow researchers from the group have reviewed [scientific literature](#) on the antiviral activity and broad-spectrum antimicrobial properties of carbon-based nanomaterials such as fullerene, carbon dots, graphene and its by-products. In their research, they have verified that CBNs have [antiviral activity](#) against 13 positive single-stranded RNA viruses, including SARS-CoV-2.

As well as its broad-spectrum antimicrobial activity, biocompatibility, biodegradability and ability to induce tissue regeneration, the mode of action of CBNs is "mainly physical" and is characterized by a low risk of antimicrobial resistance.

COVID-19, worsened by bacteria

Research in this field is of vital importance given the urgent need for therapeutic options against COVID-19. The treatments proposed against the viral pneumonia and acute respiratory syndrome connected to this disease have heretofore shown little or no effect in clinical practice.

The situation is worsened mainly because bacterial pathogens can significantly exacerbate the pneumonia caused by this coronavirus. Antibiotic resistance in treating the pneumonia is increasing at an alarming rate, which is why new-generation treatments such as the ones proposed in this study "can provide a lasting solution."

Scientists from over 10 countries from around the world who are part of

the SACRED (Self-Assembled COVID Research and Education Directive) consortium, which jointly works against SARS-CoV-2, have taken part in this research led by the Biomaterials and Bioengineering Laboratory of the UCV.

More information: Ángel Serrano-Aroca et al, Carbon-Based Nanomaterials: Promising Antiviral Agents to Combat COVID-19 in the Microbial-Resistant Era, *ACS Nano* (2021). [DOI: 10.1021/acsnano.1c00629](https://doi.org/10.1021/acsnano.1c00629)

Provided by Asociacion RUVID

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