

# Nets, crowded body fluids, cell highways, and COVID-19: ten years of graphene applications in healthcare

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Nearly ten years ago, graphene and its derivatives have attracted a wide scientific community interest for possible applications in healthcare due to the first evidence of the effects on bacteria membranes and safety towards eukaryotic cells. However subsequent biophysical studies on graphene and graphene oxide elucidated the instability of these nanomaterials in body fluids rich in electrolytes, proteins, and more. With the formation of nets and the adsorption of soluble factors on the graphene surface, cells and microorganisms do not interact anymore with single bidimensional flakes of carbon but with large aggregates. In this talk, the behaviour of graphene in crowded fluids will be discussed. Specifically, how the adsorption of ions and molecules on nanomaterial's surface can be exploited for antimicrobial, drug delivery, and diagnostic applications [1-6]. Furthermore, the possibility of creating tridimensional graphene scaffolds and medical devices and how light can be exploited to enhance scaffold properties will be also debated [7-9]. On the whole, this presentation will represent a primer for the future improvement of graphene bioactivity. This Research is supported by Italian Association for Cancer Research and the Italian MoH Grant "Giovani Ricercatori 2019".

## References

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## Figures

