

Learning the pharmacology and toxicokinetics of biologically-relevant graphene materials

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The use of nanomaterials in medicine is growing at an unprecedented rate for a variety of therapeutic, diagnostic or combinatory applications. Graphene and other 2D materials possess properties that make them attractive materials for biomedical applications, however, their impact on the physiology of live organisms is still unexplored. What is needed today is the determination of the specific characteristics graphene and 2D materials should possess in order to determine the toxicological and adverse reaction risks following administration or implantation. This talk will illustrate how biological-grade graphene oxide (GO) sheets exhibit very interesting behaviour on interaction with tissues of living animals (*in vivo*). The pharmacokinetic and toxicokinetic profile of the GO sheets in correlation with their physicochemical characteristics (thickness, lateral dimensions) can allow the determination of the critical parameters that can allow their further development towards the clinic. Development of GO for therapeutic or diagnostic applications requires determination of the fundamental *in vivo* pharmacological parameters such as blood circulation half-life, tissue biodistribution, excretion rates, and kinetics of material biodegradation which will constitute the emerging research area of graphene pharmacology.

References

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