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Biological Fate of hydrid Nanocarries for drug delivery: Biodistribution, Degradation and surface Interactions of Nanomaterials in biological Environments.

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The successful clinical translation of nanocarriers strongly depends on their biodistribution, biodegradation and elimination patterns in vivo.[1] However, the visualization and quantification of nanomaterials in in vivo models is highly not trivial. A fundamental aspect of nanocarriers fate is their degradation.[2] The stability of the nanomaterial and/or the nanomaterial coatings is a fundamental aspect concerning the proper delivery of encapsulated drug. A premature degradation or the loss of the nanocarrier coating may prevent the delivery of the drug to the targeted tissue or result in the rapid clearance of the nanocarrier. Overall, the study of the degradation of nanocarriers brings fundamental knowledge for the assessment of the efficacy of these carries in drug delivery. In this presentation issues related to the biological fate and stability of nanocarriers (inorganic, polymeric and hybrid) in biological matrixes will be discussed: the interaction of the nanocarriers with proteins, the biodistribution of the nanocarriers, their biological fate, and the stability of the core and surface coating of nanocarriers. The interface of nanocarriers plays a fundamental role in their translocation and interaction with the biological milieu as well as on nanocarrier degradation. Physico chemical properties of the nanocarriers will be related to fate and transformation in biological matrixes.[3,4] Positron Emission Tomography and Single Photon Emission Tomography will be applied to study the biodistribution of nanocarriers, the stability of surface coatings and nanocarrier dissolution in animal models, using advanced radiolabelling strategies.

References

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