
Application of fluorescence imaging to assess in vivo the biodistribution of nanoparticles

Armond Daci

Department of Pharmacy, Faculty of Medicine, University of Prishtina, Prishtina, Kosovo

armond.daci@uni-pr.edu

The use of nanoscale materials and nanotechnology in medication delivery and diagnostics is known as nanomedicine. Improved drug delivery is possible when the therapeutic is delivered to the site of action via nanoparticles. This includes specificity/targeted delivery, controlled or stimuli-responsive delivery, protection of the therapeutic from the biological milieu, penetration of biological barriers, and access to intracellular sites of action. ^[1] The bioavailability of nanomedicines is confronted with several obstacles, even with the advancements in nanotechnology. In order to better understand how nanoparticles, interact with living things in terms of pharmacokinetics and to ascertain how well they reach target tissues, it is crucial to evaluate their bioavailability in vivo. ^[2] Fluorescence imaging is one of the primary imaging techniques and approaches used in this method. To facilitate these studies, fluorescent markers are frequently applied to the nanoparticles to monitor their accumulation and dispersion within tissues. With reference to this in vivo imaging system, it is a fluorescent imaging platform intended for targeted imaging of small animals in order to monitor biodistribution, accumulation, and clearance in real time. ^{[3][4]} This enables real-time observation of the activity of nanoparticles in living things by tracking their distribution, effectiveness of targeting, release of drugs, and therapeutic results. In this presentation, we will provide an overview of application of Near-infrared (NIR) fluorescent imaging for detection of nanoparticles in live animals and excised tissue.

References

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