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From the nanomaterials fabrication to the development of strategies for therapy and diagnosis of chronic diseases

The advent of nanotechnology has radically changed the way we diagnose, image and treat diseases, with novel nanoplatforms capable clinically important functions, including detecting cancer at its earliest stages and location, as well as delivering therapeutics specifically to specific sites in the body.

The nanotechnology approach to chronic diseases has focused on three main avenues: early detection; imaging for diagnostics or assessment of targeted delivery. Also multifunctional therapeutics are of interest, whereby nanoplattforms are loaded with multiple functional moieties capable of selective targeting, imaging and delivery of specific drugs to malignant cells [1,2,3]. In relation with this is possible to mention the so called theranostics which consist in the diagnostic and treatment of pathologies in a unique procedure [4,5].

In the talk will be discussed the fabrication of nanomaterials of different compositions (gold, magnetic, liposomes, cyclodextrins, silica, proteins, etc) for drug delivery, diagnostic, therapy and theranostics of cancer [1], cardiovascular [6] and Alzheimer's diseases [4]. For the preparation of the nanoplatforms different methodologies as 3D impression have been used [7]. To evaluate efficacy and safety, in vitro systems as microfluidics [8] and Blood Brain Barrier on a chip [9] and in vivo assays have been assayed. Will be discussed the steps to reach the clinical applications of the developed nanomaterials.

References

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