

nanoBiomaterials for Neurology: one (powerful) tool, many applications

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Nervous system problems are common and encompass a large spectrum of traumatic injuries, diseases or iatrogenic lesions. The poor regenerative capacity, particularly in the case of the central nervous system (CNS), cannot be attributed to an intrinsic inability of neurons to sprout and re-grow after injury, as axons are able to regenerate in the presence of a permissive growth environment. One of the challenges facing the neuroscience field is the development of effective therapies that can enhance the regenerative capacity of the nervous system based on the advances achieved in basic research.

We have been dedicated to using nano-enabled solutions to the design of new therapeutic approaches based on biomaterials to promote neuroprotection and neuroregeneration. In this talk, two main strategies will be presented that represent two of the main lines of research of my group:

- i) the design of biomaterial-based nanoparticles for targeted nucleic acid delivery to neurons [1];
- ii) the design of bioactive hydrogels for neural stem cell delivery in the spinal cord[2].

Emphasis will also be given to the application of novel strategies proposed to assess the potential of the developed systems[3-5].

References

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