

My research deals with:

-The role of microRNAs in the pathophysiology of spinal cord injury (SCI) and their therapeutic potential particularly for neuroprotection. My research in this line is focused on: 1) the changes in circulating microRNAs following SCI and their consequences; 2) the development of technologies for microRNA modulation *in vivo* and their clinical application; and 3) the evaluation of their biomarker potential.

-The role of sphingolipids in SCI, paying special attention to their neuroprotective potential. This is a recent research line that we are developing in collaboration with researchers from the UCB and IQAC in Barcelona.

-The regeneration and fast axonal growth during the annual regeneration cycle of deer antlers. In these studies we have been able to show the promoting effects of the substrates and the molecules secreted by the antler skin (the velvet) on neurite growth in different *in vitro* models. We have also characterized the transcriptional changes that occur in the antler during the regeneration, identifying potential axonal growth promoters that were later validated *in vitro*.

-The development of technologies for recording, analysing and sharing information from experimental spinal cord injury. This is a very recent line that we are developing in collaboration with researchers from the Informatics Institute of Albacete (I3A). Up to now, we have developed a mobile and Tablet adapted app to record and store information from a commonly used behavioural test in mice (the BMS test).

Also, I still maintain collaborations with researchers from other fields of Biology related with my previous research in paleontology. These studies are focused on mammal paleobiology, antelope evolution, and histology of fossil remains.

### **Relevant contributions:**

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