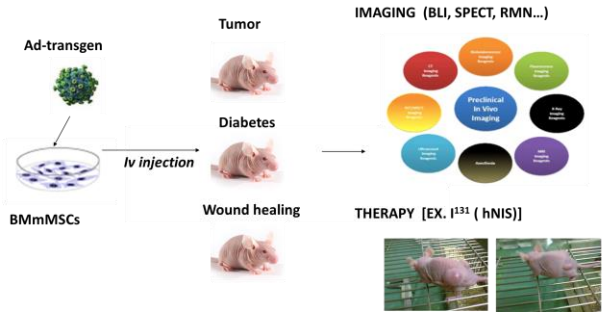
Simultaneous tracking of Mesenchymal Stem Cells on different pathologies by non-invasive Imaging Techniques

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Abstract

Mesenchymal stem cells (MSC) are capable of multilineage differentiation into osteoblasts, adipocytes, myocytes, neuronal cells, and chondrocytes under appropriate stimuli. Due to their ease of isolation and their pluripotent nature, MSCs are an ideal resource for clinical and regenerative medicine in a great variety of applications. MSCs are capable of migrating and proliferate in areas of inflammation and tumors as part of the tissue remodeling processes. By in vitro and in vivo approaches using different gene reporters (GFP, hNIS, and f-Luc) and non-invasive techniques (PET, BLI, or fluorescence) we demonstrated that MSC systemically and simultaneously injected into animals with different pathologies naturally migrate to damaged tissue independently of the pathology (diabetes, wound healing and tumors) with low or no signal in others tissues. Additionally, we demonstrated the effectiveness of suicide gene therapy with MSCs infected with the sodium/iodide symporter (Ad-hNIS), using 131I therapy to destroy tumor and surrounding stroma malignant cells in the microenvironment potentiated by the bystander effect. This strategy is thus an excellent theragnostic tool. Finally, we found MSCs and tumor cell fusion absence, but transdifferention of BMhMSCs into bone within the tumor. Taken together, our results show the great utility of MSC cells in cell/gene therapy, regardless of the pathology, and more importantly, the safety of such therapy for future clinical use.

Image



Recent Publications

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Biography (150 word limit)

Dr. Martín Duque has published more than 60 articles in international journals of high impact in the fields of gene and cell therapy,cancer and medicine (one of them in the journal Nature Medicine in 1999 and a Nature Catalysis 2019 and Nature Protocols in 2020). She also has an index h of 23, and 12 works as the last or corresponding author. It also has multiple communications for conferences, 5 doctoral theses directed, two prizes of research, four patents and two contracts with companies (Rhône-Poulenc and Rafer).

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