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Membrane blebbing is required for mesenchymal precursor migration

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Mesenchymal precursors (MPs) are present in a great variety of adult tissues and have a variety of properties, such as differentiation and migration, which make them attractive candidates for cell therapy. However, the delivery of the cells is still a major problem thus a better understanding of MP migration characteristics would aid the development of cell delivery protocols. Studying the migration of MPs in vitro, we found the presence of blebs in them. Blebs are cytoskeleton-regulated dynamic structures pressure-driven, as a result of strong actomyosin forces. Not long-ago blebs were considered a hallmark of apoptosis, nevertheless their role in cell migration and in other physiologic processes are gaining great importance. Here, we report that MPs derived from different tissues present spontaneously dynamic cytoplasmic projections in sub-confluent culture, which appear as a combination of lamellipodia with blebs in the leading edge. Upon initial seeding, however, only bleb structures could be observed. Immunofluorescence revealed the presence of pERM, RhoA and F-actin during the blebbing process. Results from migration assays in the presence of blebbistatin, a myosin II inhibitor, showed that bleb formation correlated with migratory capacity, suggesting a functional role for blebs in migration. Bleb formation might be a useful mechanism to improve cell migration in cellular therapy protocols.

Biography

Beatriz de Lucas Moreno is pursuing her PhD at European University of Madrid (Spain). She has obtained her degree in Health Biology in 2013 at University of Alcalá and her Master's degree in Molecular Biomedicine in 2014 at Universidad Autónoma de Madrid. She is the author of five papers in reputed journals.

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