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Retinal pigment epithelium-derived exosomes contain VEGF receptors and induces the formation of new vessels by oxidative stress

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Exosomes are small membrane vesicles from MVB and are released by a wide variety of cell types. Exosomes contain proteins and genetic material. Retinal pigment epithelium (RPE) plays a critical role in the homeostasis of the retina and any alterations therein may trigger a cell change. Previous studies showed that ethanol induces activation of VEGF causing cell proliferation and the formation of new vessels. However, the presence of VEGF receptors in exosomes derived from a cell line of human RPE (ARPE-19) and the effect of ethanol on their content have not yet been explored. Exosomes derived from ARPE-19 cells were isolated by ultracentrifugation and characterized by electron microscopy. Exosomes were quantified by means of flow cytometry and the protein profile and content of VEGFR-1 analyzed by Western blot. qPCR was conducted to assess the RNA content of VEGFR-1 and VEGFR-2. An oxidative insult initiated by ethanol induces the release of increased amounts of exosomes in ARPE-19 cells. These "pathologic" exosomes demonstrate greater concentrations of membrane-bound VEGFR-1 and VEGFR-2, which contribute essentially to the formation of new vessels in retinal disorders.

Biography

Natalia Martínez Gil is a PhD Student at School of Medicine and Dentistry in Catholic University of Valencia, Spain. She's working with cellular communication via exosomes in retina. Specifically she is studying the effect of ethanol in the retinal pigment epithelium.

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