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Role of galectin-1 and hornerin in LRP1 stromal contribution to tumor angiogenesis

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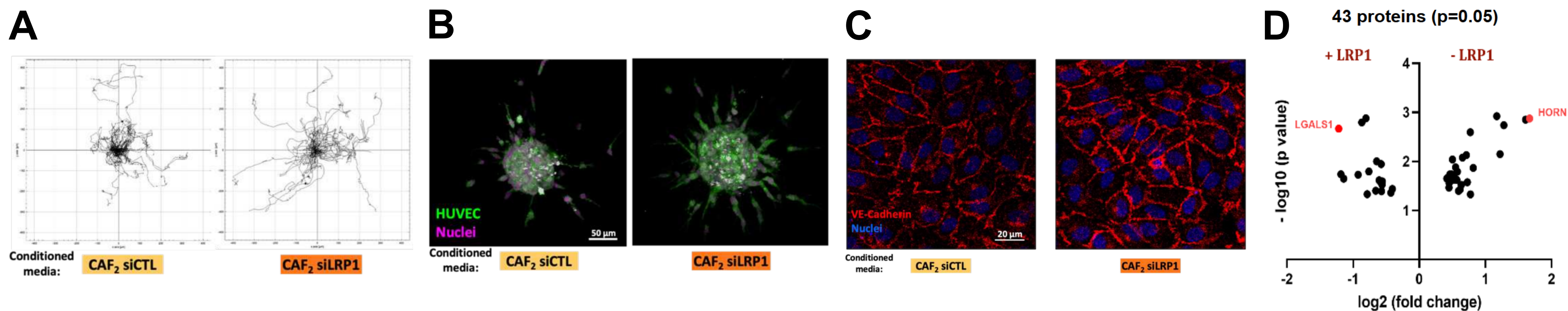


HAL Authorization

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Breast cancer is the leading cause of cancer-related death among women and relies heavily on angiogenesis to support tumor growth and metastatic spread. Although anti-angiogenic therapies have shown clinical benefits, their effectiveness is often limited by relapse. These relapses are partly driven by adaptive responses of endothelial cells, influenced by the tumor microenvironment—particularly by cancer-associated fibroblasts (CAFs). CAFs strongly express the receptor LRP1, a key regulator of extracellular matrix dynamics. Recent studies have highlighted a critical role for LRP1 in the regulation of tumor angiogenesis. Specifically, LRP1 knockdown in mammary CAFs profoundly alters their features with endothelial cells.



Conditioned media from LRP1-deficient CAFs promote endothelial cell migration (A), increase angio-invasion in spheroid sprouting assays within collagen matrices (B) and induce VE-cadherin-mediated stabilization of intercellular junctions (C). Membrane proteomic profiling of endothelial cells exposed to LRP1-deficient CAF secretomes revealed 43 differentially expressed surface proteins, including decreased galectin-1 and increased hornerin expression on the surface of endothelial cells (D). Galectin-1 secretion has been described in breast TME in response to chemotherapy. The protein modulates sensitivity to radiotherapy and vascular permeability. Hornerin has been associated with the control of angiogenesis in a tumor context. Its expression could constitute a biomarker of breast cancer progression. Datas from Julie Martin's Thesis.

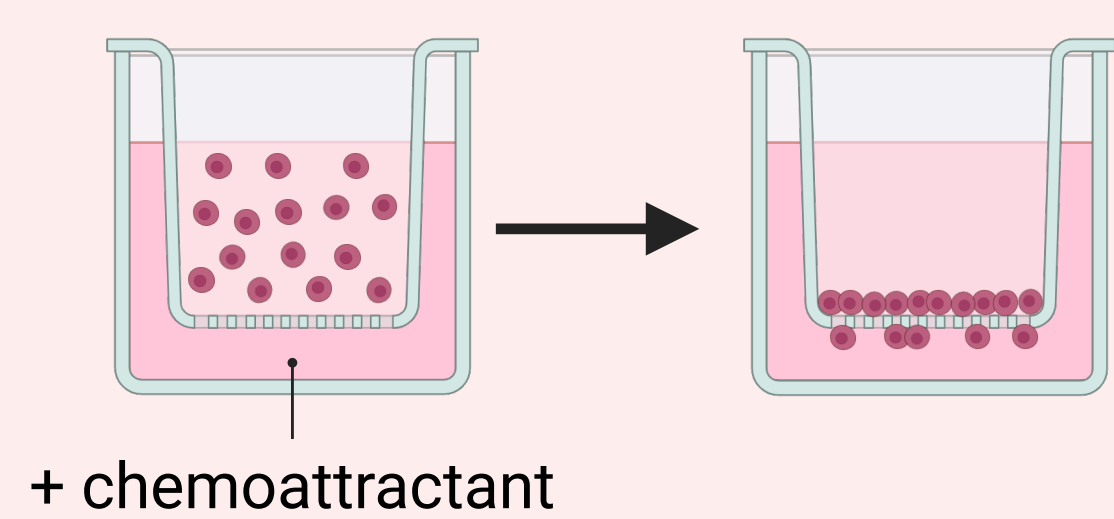
Galectin-1 and Hornerin functional modulation

Reverse stromal LRP1-dependent endothelial phenotype

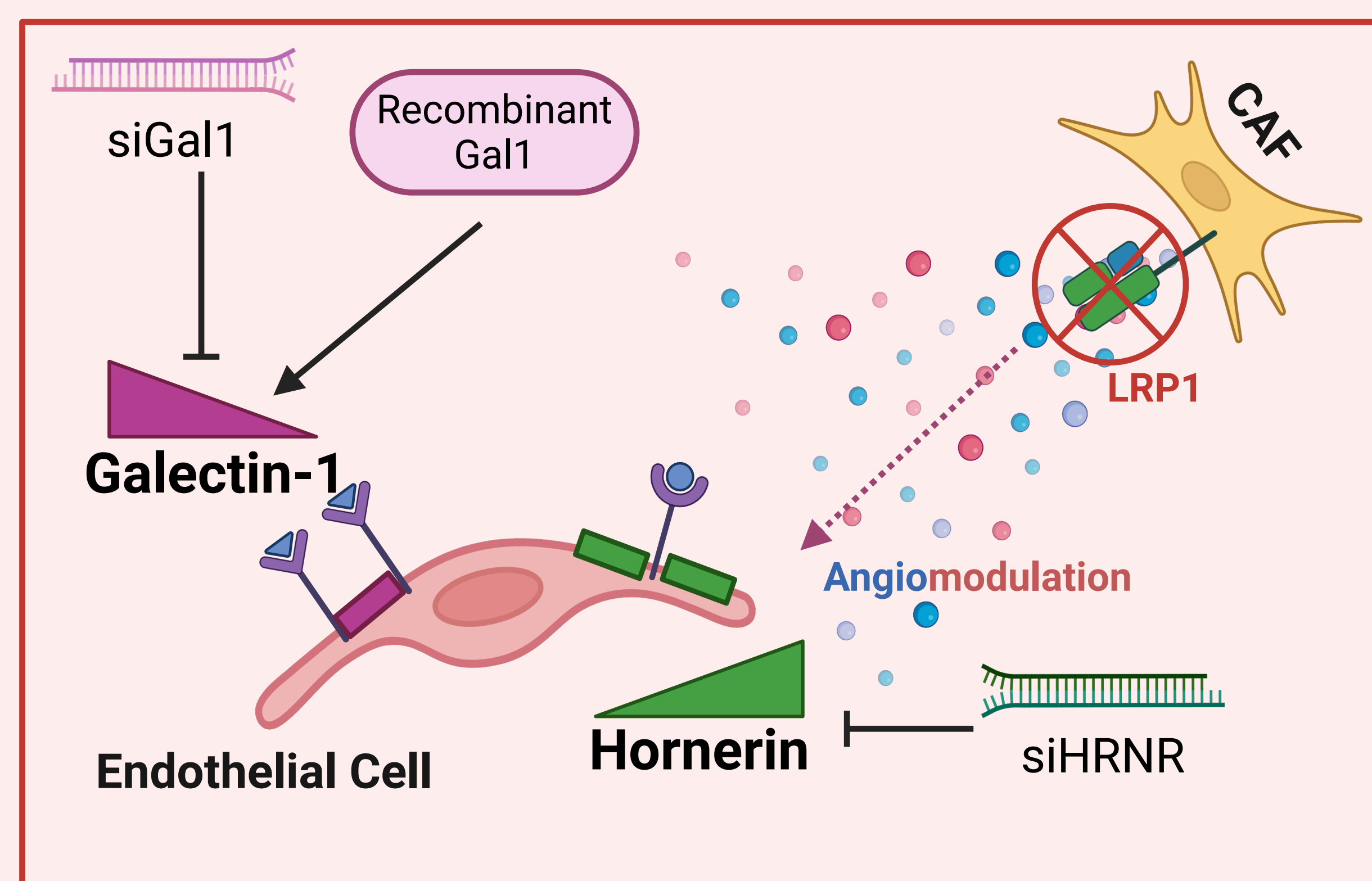
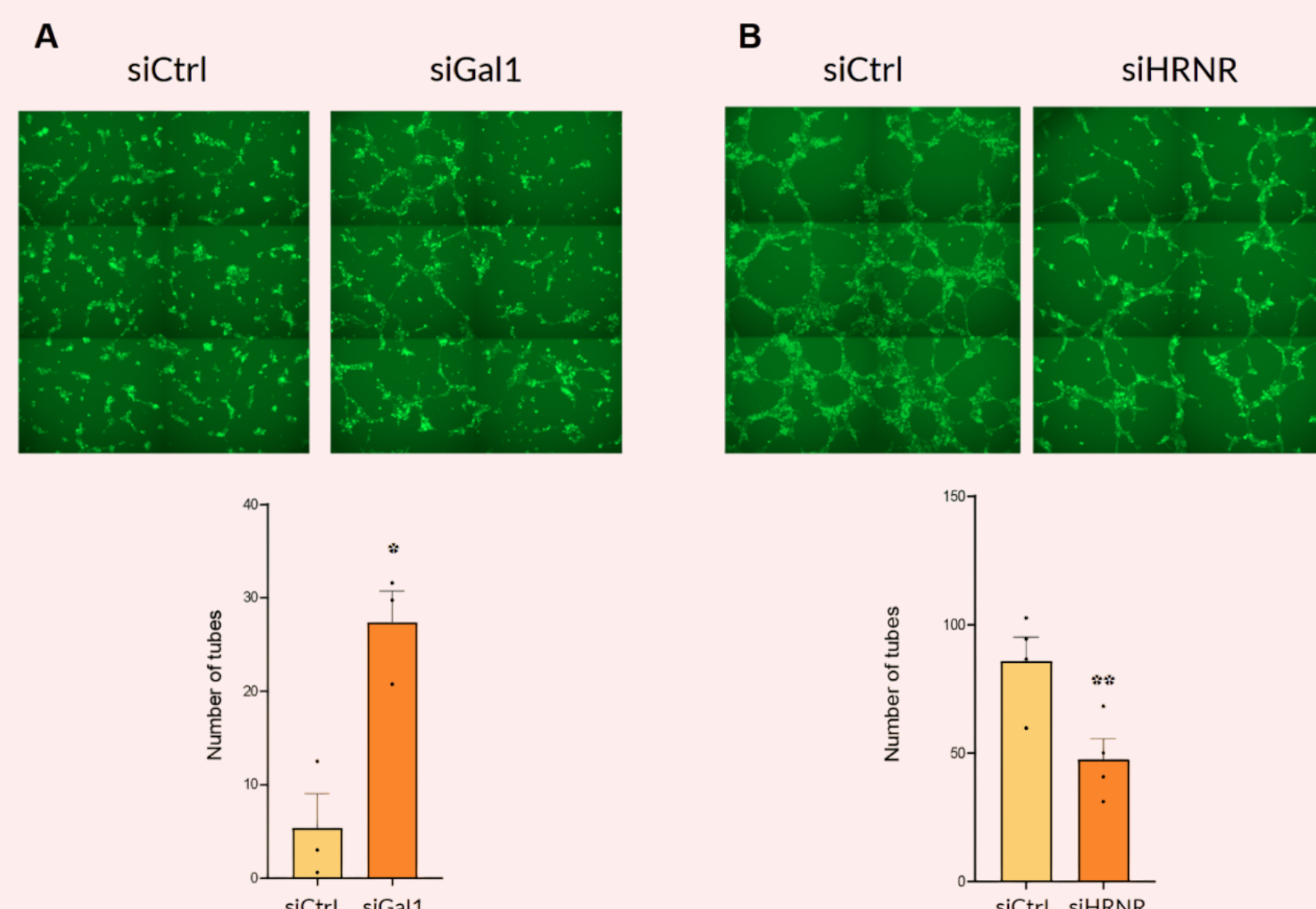
Galectin-1 and Hornerin angiogenic functions

Endothelial monolayers
Immunostaining
VE-Cadherin
β-Catenin

Transendothelial Migration and Permeability

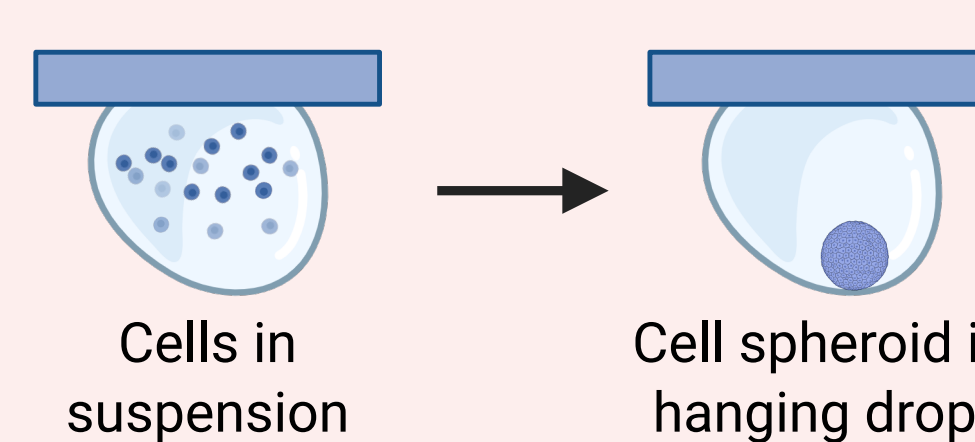


Tubulogenesis assay

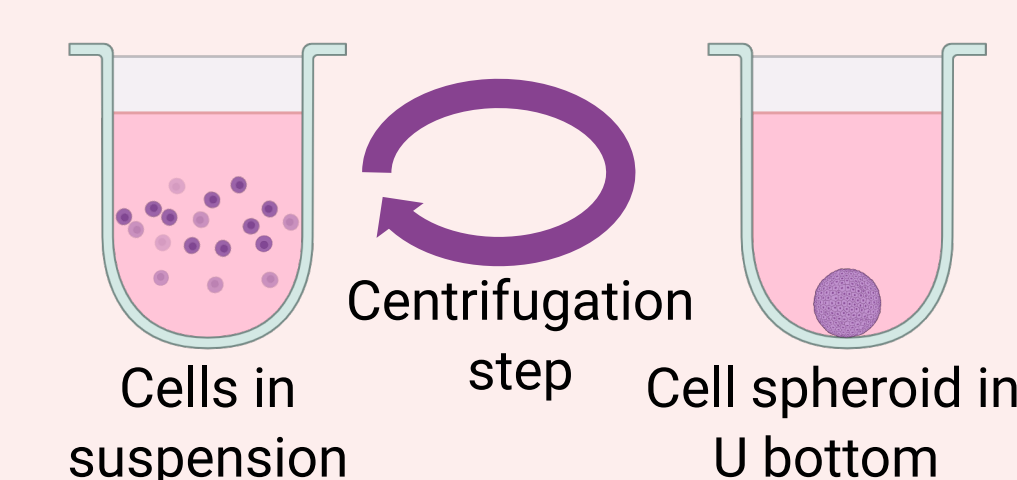


Endothelial spheroids

Hanging drop method

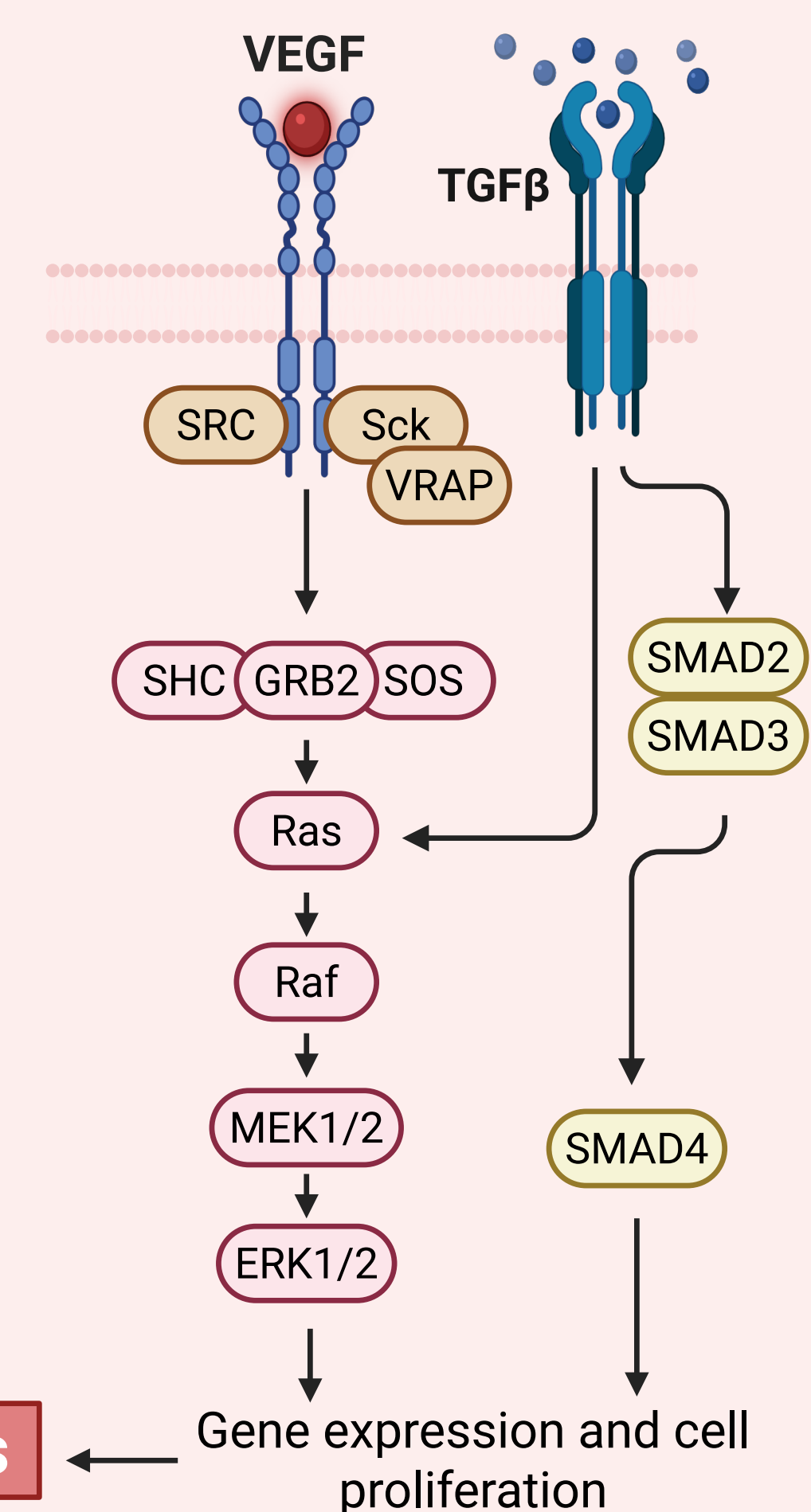


U bottom plate method

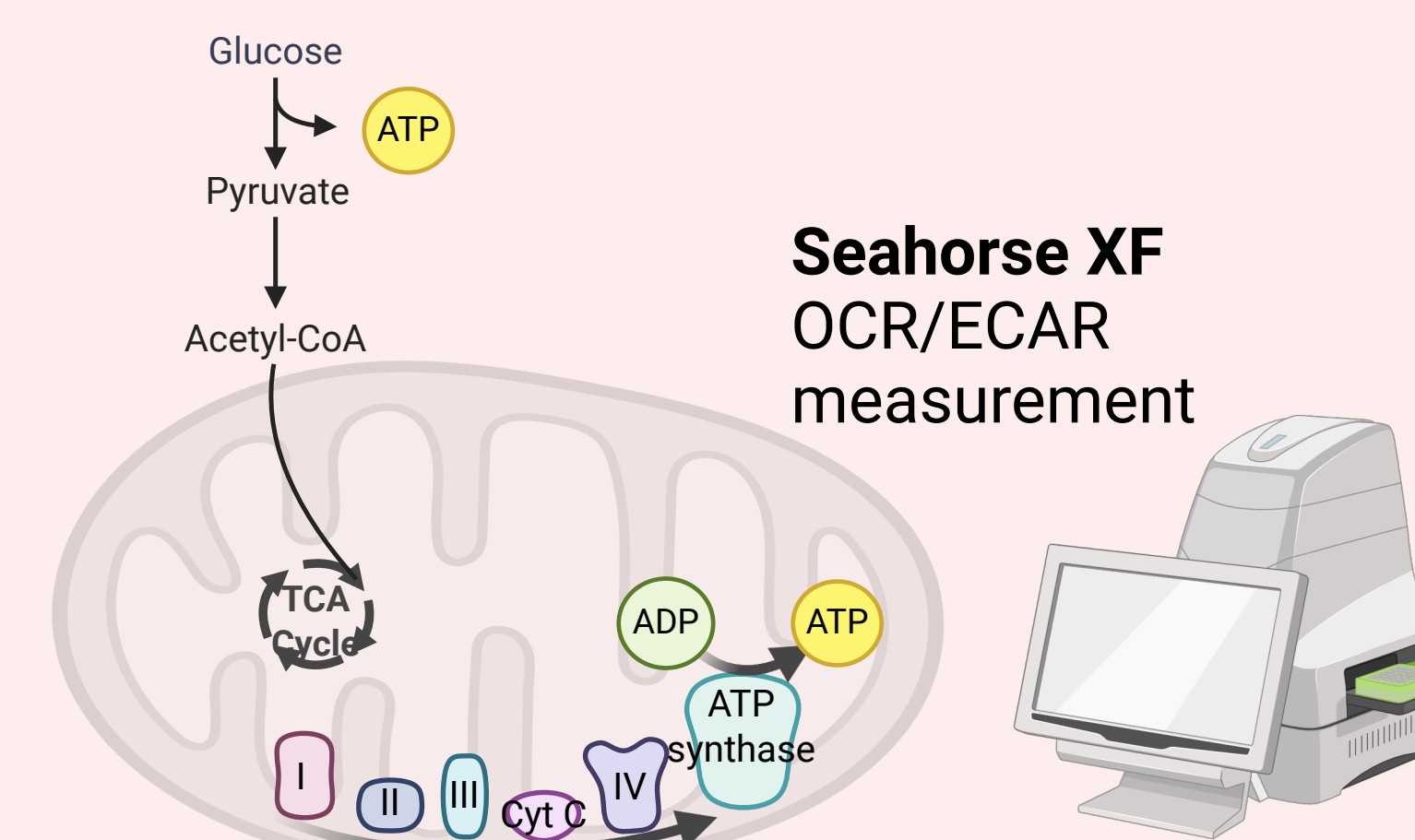


Angiogenesis

Protein interactions



Cellular metabolism



Preclinical Transfert

