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CIC biomaGUNE
CENTER FOR COOPERATIVE RESEARCH IN BIOMATERIALS

seminar

Thursday, 30th January, 12.00 pm, Seminar Room

Host: Prof. Luis Liz-Marzán

Aberrant activation of developmental programs in adult disease

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Epithelial homeostasis is crucial to maintain tissue architecture, and therefore, it needs to be tightly regulated in the adult. By contrast, embryonic cells show a high degree of epithelial plasticity required for proper morphogenesis and, in particular, for the implementation of massive cell movements that occur during gastrulation and neural crest delamination among other processes. We have been interested in the analysis of cell movements, plasticity and epithelial to mesenchymal transitions (EMT) for many years, and found that the aberrant activation of developmental EMT-like programs in adult cells leads to several pathologies including tumor progression and organ degeneration. While the epithelial and mesenchymal cells are usually considered as extreme phenotypes, intermediate EMT states also exist. Under those circumstances cells depict a hybrid phenotype expressing both epithelial and mesenchymal markers and from which they can reverse to the original state or move towards a more mesenchymal phenotype. Hybrid transitory states can favor coordinated cell migration or wound healing but they can also enable the formation of clusters of migratory cancer cells with increased metastatic potential. However, in contrast to the situation in cancer, the intermediate phenotype holds promise for new antifibrotic therapeutic approaches, as inhibiting EMT can attenuate established fibrosis. I will discuss different scenarios in which this intermediate phenotype is observed both in development and in disease, frame it in the context of debates in the field and refer to a new developmental EMT that we have found to be crucial for heart laterality and morphogenesis in vertebrates.

References:

Ocaña et al., Cancer Cell (2012)
Grande et al., Nat Med (2015)
Nieto et al, Cell (2016)
Ocaña et al. Nature (2017)
Brabletz et al., Nat Rev Cancer (2018)