ICFO COLLOQUIUM PETER FRIEDL 'Plasticity and Microenvironmental Control of Cancer Invasion and Metastasis'

PETER FRIEDL

February 05, 2018

Monday, February 5, 2018, 12:00. ICFO Auditorium

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Prof. Radboud Institute for Molecular Life Sciences (NL) and the University of Texas MD Anderson Cancer Centre (USA)$$ Peter Friedl is a Professor at the Radboud Institute for Molecular Life Sciences and holds a joint position as a Professor at the University of Texas MD Anderson Cancer Centre. His work with advanced microscopy and the technologies he has introduced have led to numerous awards, including the German Cancer Award, the Award of the City of Florence, and the Felix Wankel Animal Protection Award.

Cancer cell migration is a plastic and adaptive process integrating cytoskeletal dynamics,

cell-extracellular matrix and cell-cell adhesion, as well as tissue remodeling. In response to molecular and physical microenvironmental cues during metastatic dissemination, cancer cells exploit a versatile repertoire of invasion and dissemination strategies, including collective and single-cell migration programs. This diversity generates molecular and physical heterogeneity of migration mechanisms and metastatic routes, and provides a basis for adaptation in response to microenvironmental and therapeutic challenge. Time-resolved intravital microscopy combined with mechanical probing of cell adhesion has greatly advanced the understanding of how tumor cells adapt to microenvironmental cues. With tissue confinement, invading cancer cells undergo a jamming transition towards collective migration and circulate as multicellular clusters for collective organ colonization. Conversely, in progressing tumor lesions in vivo, molecular targeting of beta1 and beta3 integrins facilitates efficient single-cell propagation into the tissue which, despite impaired tumor growth and anoikis induction, is followed by enhanced organ colonization. Dissecting the microenvironmental determinants underlying individual-to-collective adaptation, and vice versa, will enhance to derive "antimigration" therapies and combat metastatic transitions.

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