



Seminar series FOR2127 – Selection and adaptation during metastatic cancer progression

Thursday, 15 November 2018
Conference Room, Biopark III
14.00 h

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“Biology and Vulnerabilities of Circulating Tumor Cell Clusters”

Cancer patients that develop a metastatic disease are currently considered incurable. Mainly, this is due to a limited understanding of the molecular mechanisms that characterize the metastatic process, and the lack of effective metastasis-suppressing agents. The metastatic cascade begins with primary tumor cells entering the blood circulation, and it is followed by their extravasation at distant sites, where they form proliferative metastatic lesions. Cancer cells in circulation are referred to as circulating tumor cells (CTCs), and their isolation has been hampered for many years by technological constraints. However, CTC isolation and characterization has recently become possible, and it has revealed highly unexpected features of the metastatic process. For instance, using a combination of microfluidics, single cell sequencing, molecular and computational biology, we understood that CTC-clusters, rather than single CTCs, are highly efficient metastatic precursors in breast and prostate cancer. Our research now focuses on the identification of the vulnerabilities of CTC-clusters, with the ultimate goal of developing metastasis-suppressing agents.

Selected reading:

Aceto N, Bardia A, Miyamoto DT, Donaldson MC, Wittner BS, Spencer JA, Yu M, Pely A, Engstrom A, Zhu H, Brannigan BW, Kapur R, Stott SL, Shioda T, Ramaswamy S, Ting DT, Lin CP, Toner M, Haber DA, Maheswaran S. Circulating tumor cell clusters are oligoclonal precursors of breast cancer metastasis. *Cell*. 2014 Aug 28;158(5):1110-1122. doi: 10.1016/j.cell.2014.07.013. PubMed PMID: 25171411; PubMed Central PMCID: PMC4149753.

Sarioglu AF, Aceto N, Kojic N, Donaldson MC, Zeinali M, Hamza B, Engstrom A, Zhu H, Sundaresan TK, Miyamoto DT, Luo X, Bardia A, Wittner BS, Ramaswamy S, Shioda T, Ting DT, Stott SL, Kapur R, Maheswaran S, Haber DA, Toner M. A microfluidic device for label-free, physical capture of circulating tumor cell clusters. *Nat Methods*. 2015 Jul;12(7):685-91. doi: 10.1038/nmeth.3404. Epub 2015 May 18. PubMed PMID: 25984697; PubMed Central PMCID: PMC4490017.