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CIC biomaGUNE
CENTER FOR COOPERATIVE RESEARCH IN BIOMATERIALS

seminar

Wednesday, 12th December, 12.00 pm, Seminar Room

Host: Dr. Niels C. Reichardt

Altered glycosylation in Cancer – targeting tumor heterogeneity and therapeutic implications.

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Alterations of glycosylation are common on the cell surface during the carcinogenesis process and are associated with cancer progression and poor prognosis of the patients [1]. This presentation will provide a general overview on glycosylation in human cells, the biosynthesis of glycans and their functions in normal conditions and in cancer [1].

Cancer is a heterogeneous disease that requires multidisciplinary treatment. Current targeted therapy depend on patient stratification based on molecular features of the tumor [2]. This presentation will reports the latest glycomic and glycoproteomic analyses in human gastrointestinal cancer cells providing novel relevant information with clinical implications. These results show that alterations of glycosylation impact the activation of tyrosine kinase receptors, such as MET (HGFR, Hepatocyte growth factor receptor) and RON (MSPR, Macrophage-stimulating protein receptor), in gastric cancer cells [3], leading to the activation of downstream intracellular signaling pathways and the induction of cancer cell aggressive phenotypes. We also disclosed novel glycosylation features of the human epidermal growth factor receptor 2 (ErbB2) [4]. The analysis of the cellular- and receptor-specific glycan profiling of ErbB2-overexpressing gastric cancer cells unveiled a heterogeneous glycosylation pattern harboring the tumor-associated sialyl Lewis A (SLeA) antigen. The expression of SLeA and FUT3, a key enzymes integrating its biosynthetic pathway were strongly upregulated in this gastric cancer cells and in cancer tumors. Finally, it will be presented the finding that the Thomsen-Friedenreich (TF) antigen, the simple *O*-glycan (Galβ1,3GalNAc-*O*-Thr/Ser), is highly associated with Microsatellite instability, a molecular feature of a distinct molecular subtype of gastric cancer [5]. These results disclose novel functional aspects of glycosylation modifications occurring in key proteins in gastric cancer and highlights their potential as cancer biomarkers for patient stratification, personalize medicine and improved therapeutic intervention [1, 6].

References:

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[4] Duarte, HO. *et al.* Int J Mol Sci. **2017**, 18(11).
[5] Mereiter S, *et al.* J Clin Med. **2018**, 7(9).
[6] Rodrigues JG, *et al.* Cell Immunol. **2018**; pii: S0008-8749(18)30121-7.