EuroSciCon

8th Annual Conference on

Clinical Research & Biomarkers

July 19-20, 2018

Prague, Czech Republic

Choulier L et al., Biomark J 2018, Volume 4
DOI: 10.21767/2472-1646-C1-001

APTAMERS TARGETING CELL-SURFACE BIOMARKERS AS PROBES FOR CYTO- AND HISTO-CHEMISTRY

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Nucleic acid aptamers are often referred as chemical antibodies. As they possess several advantages like their smaller size, temperature stability, ease of chemical modifications, lack of immunogenicity/toxicity and lower cost of production, aptamers are promising tools for diagnostic and therapeutic applications. Aptamers against cell-surface protein biomarkers are of particular importance for cancer diagnosis and targeted therapy. We identified and characterized RNA aptamers targeting integrin α5β1. This αβ heterodimeric cell-surface receptor is implicated in tumour angiogenesis and solid tumor aggressiveness. In glioblastoma, integrin α5β1, whose expression is associated with an aggressive phenotype and a decrease in survival of patients, is a pertinent therapeutic target. To target integrin α5β1, we used a complex hybrid Systematic Evolution of Ligands by Exponential Enrichment (SELEX) strategy combining protein-SELEX rounds on the recombinant α5β1 protein, surrounded by cell SELEX rounds. Cell-SELEX was itself realized using two different isogenic cell lines expressing different levels of the α5 subunit. We identified aptamer H02. In cyto- and histo-chemistry assays, aptamer H02 is able to differentiate glioblastoma cell lines and tissues from patient-derived tumor xenografts according to their α5 expression levels. Aptamer H02 is therefore an interesting tool for glioblastoma tumor characterization. Moreover, this aptamer, internalized into glioblastoma cells expressing high levels of α5, could therefore serve as a carrier for the delivery of therapeutics inside targeted cells.

Biography

Laurence Choulier has completed her PhD from University of Strasbourg (France) and Postdoctoral studies from Universities of Oxford (UK) and Bordeaux (France). Since 2004, she is a Research Scientist at the CNRS (the French National Center for Scientific Research) and actually heads projects related to the characterization of nucleic-acid aptamers to cell-surface biomarkers at the Pharmacy department of the University of Strasbourg. She has published 37 papers in reputed journals and has recently been Academic Editor for Cancers (Basel, Switzerland).

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