ABSTRACT

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Colorectal cancer nowadays represents one of the most common life threatening malignancies worldwide. Well describing and understanding the causes and development of this illness, especially on the molecular basis would provide a progress in the treatment. Defining cancer stem cells (CSC) that are considered as a potential cause of the tumour resistance and relapse would result in the development of a new targeted therapy.

CRC1, colorectal cancer cell line recently established by the laboratory IGF in Montpellier was confirmed to possess the primitive morphology and to contain a larger amount of stem-like cells. This cell line is positive of stem-like-cell markers such as CK-18 and EphB2 and its morphology observed in electron microscope was defined as primitive with big nuclei and rare presence of other organelles.

Change of Claudin 2 (CLDN2) expression is considered as another potential cause of colorectal cancer. Its increased expression is connected to the tumour initiation and development. Influencing the CLDN2 expression by plasmid transfection or viral construct infection resulted into the morphological changes observed by the electron microscope and in changed sphere formation correlated with the level of CLDN2 expression. Nevertheless, these results require additional controls and using of another cell line to confirm this observation.

Regarding the CSC, LGR5 was investigated as possible marker of these cells. The recent studies suggest that stem cell markers may do not stay stable. We established a model of cell culture of various subpopulations of cells sorted according to the LGR5 expression. Their phenotype does not remain stable over the time in 3D culture and the cells appear return to the equilibrium simulating their *in vivo* state.

All the results obtained in this project contribute to the understanding of molecular basis of colorectal cancer,