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A novel nano-biotherapy called BI(G)MED to regulate cancer stem cells using non-coding RNAs

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Abstract

A tumour mass contains heterogeneous subsets of cells with diverse states of differentiation among which there is a functional subpopulation of cells that exhibit stem cell properties. These cells, named cancer stem cells (CSCs), are capable of initiating tumour formation, increasing tumour cell proliferation and expansion, and becoming differentiated tumour cells. Through the common sorting approach, CSCs have been isolated from hematologic malignancies, breast tumours, brain tumours, colon cancer, and other solid tumours. CSCs are defined by following properties: Unlimited self-renewal capacities, the ability to differentiate into non-CSC daughter cells, high tumorigenicity upon injection in immune-compromised mice and have remarkable resistance to conventional therapies. miRNAs are endogenously expressed small RNA sequences that act as post-transcriptional regulators of gene expression and have been extensively studied for their roles in cancers, whereas lncRNAs are emerging as important players in the cancer paradigm only in recent years. Generally, miRNAs can function as either oncogenes or tumour suppressors. Recent studies have highlighted several miRNAs to be differentially expressed in normal and cancer stem cells and established their role in targeting genes and pathways supporting cancer stemness properties. Long non-coding RNAs (LncRNAs) are a class of non-coding RNAs without potential to code proteins and more than 200 nucleotides in length. Accumulating evidence provides mechanistic insight demonstrating how lncRNAs regulate important cellular signalling pathways in cancer cells at transcriptional, post-transcriptional, and epigenetic levels. LncRNAs can affect the cancer development, such as tumorigenesis, apoptosis, metastasis, chemo-resistance, radio resistance and angiogenesis, through various pathways. Accumulating evidence indicates that lncRNAs are also key regulators of the CSCs subpopulation, thereby contributing to cancer progression. These non-coding RNA molecules represent particularly attractive targets for regulating CSCs; for this goal the author have developed a sublingual Nano therapy delivered without any undesirable side effects thanks to the use of ultra-low doses.

Biography

Gilbert Glady graduated from Med School in 1977 and he was then a resident in onco-haematology in the university clinic for several years. He was born in Strasbourg, France. After a specialization in natural medicines in Paris, he returned to the Alsace region to work as a private practitioner. Through his work and encounters, he developed interest and expertise in immunology and immunogenetics that leaded him to nanomedicine and nanobiotechnology. He thus became in 2010 the creator of the BI(G)MED method (Bio Immune (G) ene Medicine) and director of EBMA, the European association responsible for the communication and trainings in the field of BI(G)MED. He has participated in numerous international congresses in immuno-allergology, infectiology and oncology with posters and oral presentations, and is the author of several publications on Nano-biotherapy in different journals.

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