Cancer stem cells and miRNA in the early diagnosis of colorectal carcinoma

Cristiano Farace[1], Marina Serra[1], Andrea Pisano[1], Riccardo Oggiano[1], Carmen Griñan[2], Gema Jiménez Gonzaléz[2], Juan Antonio Marchal[2], Andrea Montella[1], Roberto Madeddu[1]

[1] Department of Biomedical Sciences, University of Sassari, Italy
[2] Department of Human Anatomy and Embryology, Faculty of Medicine, University of Granada, Spain

Colorectal cancer represents the third cause of death for malignant tumor by incidence and mortality.

Evidences suggest that tumor initiation, growth, invasion and cancer expansion are promoted by a small sub-population of tumor cells, called cancer stem cells (CSCs).

On the other hand, MicroRNAs constitute a recently discovered class of small non-coding RNAs (about 22 nucletides) found in plants, animals and some viruses, that play key roles in the regulation of gene expression. An increasing number of studies have identified miRNAs as potential biomarkers for human cancer diagnosis, prognosis and therapeutic targets. However, a real translation of miRNA significance into the clinical practice deserves and needs further investigation.

To this end, the aim of this work is to identify the expression of some specific microRNAs of this type of cancer, both in tissues and serum of cancer patients and in cancer stem cells, in order to allow early diagnosis. Therefore, some interesting micro-RNAs were chosen and their level was detected through amplification with real-time PCR method.

A preliminary analysis of results shows that in some patients microRNA 21, 221, 18a, 210, 34a, 10b, 16 are overexpressed, while in others they manifest a lower expression. Instead, the microRNA 31 is always overexpressed. We think that this result is related to the clinical stage of the tumor, because patients with similar clinical stage show the same expression.