A SIMULTANEOUS DETECTION SYSTEM OF CHROMOSOMAL ALTERATIONS BY SEQUENCING, CYTOMETRY AND IMAGING

New *in vitro* method to evaluate the presence of chromosomal alterations, particularly in 17q25. That applies three techniques combined (magnetic capture, flow cytometry and microscopy techniques) using a single specific DNA-labeled probe. The probe's multifunctional character opens the door to a powerful diagnostic, prognostic or monitoring kit for different types of cancer and diseases of genetic origin where these alterations are present.

Technology for Licensing

Keywords:

Chromosomal alterations, cancer stem cells, chromosomal capture, early tumor detection, multifunctional probe.

Description:

Cancer is a disease that arises from the gradual accumulation of modifications at both the genetic and epigenetic levels. The high genetic heterogeneity produces one of the main problems and difficulties in the management and characterization of tumors.

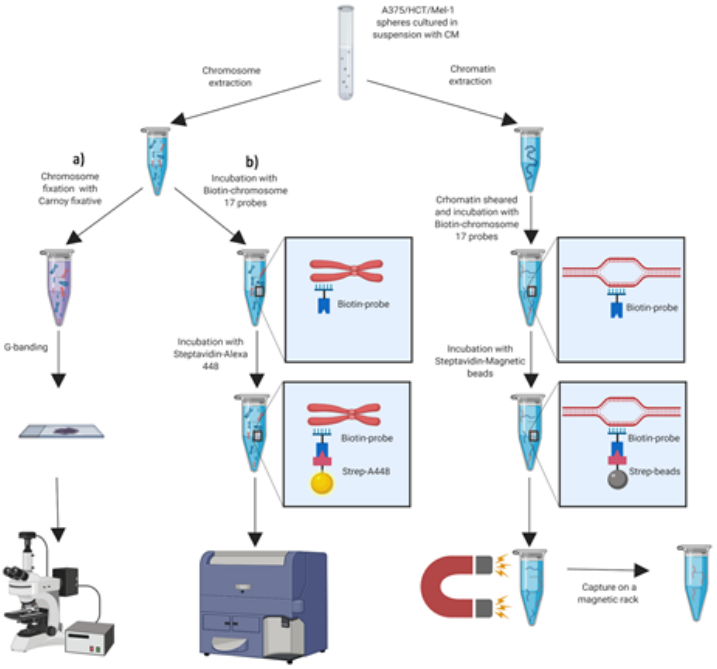
Within the tumor, cancer stem cells (CSCs) are one of the main sources of this heterogeneity. These cells have, among other characteristics, a high genomic instability that can be influenced in most cases by the surrounding tumor microenvironment. Previous studies have shown that CSCs cultured in a conditioned medium, which have been obtained from mesenchymal stem cells (MSCs), contain alterations in band q25 of chromosome 17. Capture, identify, track and describe this region is essential since it seems to be the pattern that marks tumor aggressiveness and can be transferred to the clinic for better diagnosis, better classification and progress both in the initial stages and in the treatment efficacy.

It has developed a fast and efficient method to evaluate the presence of chromosomal alterations in the chromosomal region 17q25. Through this protocol and methodology, it is possible to generate a rapid estimation by cytometry, visualization in microscopy and at the same time use the same probe for subsequent capture in next-generation sequencing. For the first time, a probe adopts this multifunctional character, opening the door to a powerful diagnostic, prognostic and monitoring kit for different types of cancer. In addition, the use of this novel technology can be extended for other diseases whose origin is based on genetic alterations.

Advantages and Benefits

- The selection of tumor regions of interest is safe and easy
- Use of a single probe with different methodologies

  It makes it easier to be sure of what is being captured by visualization with microscopy and its subsequent visualization, enrichment and capture with cytometry.
- Only a single sampling is needed
- The methodology can be universal for all tumors



Scheme of the method of this invention

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