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Conjugation of magnetic nanoparticle with miR-155 molecular beacon for the diagnosis of NSCLC

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Lung cancer is the leading cause of cancer death worldwide. Lack of effective methods for early diagnosis has greatly affected the prognosis and survival rate of cancer. Cancer stem cells are considered responsible for tumorigenesis mainly and can provide a new clue for early diagnosis of cancer. MicroRNAs (miRNAs) are non-coding RNA molecules regulating cell growth and differentiation in human cancers. Detection of related miRNAs in NSCLC stem cells is an important strategy for early diagnosis of lung cancer. Molecular beacon (MB) is a highly sensitive and specific detection tool. Magnetic nanoparticle is an ideal molecular beacon carrier that can be used at the cellular and organ level. CD133+CD338+ NSCLC stem cells were obtained using immunomagnetic bead isolation system. The expression of miR-155 in NSCLC stem cells was high. MiR-155 MBs had a high specificity. Complexes of magnetic nanoparticles conjugated with MBs were uniform in size via transmission electron microscope. The expression of miR-155 was detected in living NSCLC cells via laser confocal microscopy. The expression of miR-155 was detected in xenografted tumors injected with miR-155 MBs or complex of magnetic nanoparticles. These results demonstrate that the magnetic nanoparticles conjugated with miR-155 MBs can detect miRNA quickly. As a noninvasive monitoring approach capable of repeated image acquisition, magnetic nanoparticles conjugated with miR-155 MBs could be used to evaluate miRNA expression patterns and to diagnose lung cancer. This method will offer new insight into the early diagnosis of lung cancer

Biography

Jian-guo Sun has completed his Ph.D (at the age of 32 years) and postdoctoral study at the Third Military Medical University. He is the vice director of Cancer Institute of PLA in Xinqiao Hospital, a premier Bio-Soft service organization. He has published more than 10 papers in reputed journals and serves as an editorial board member of reputed

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